

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes						
Noise and Vibration												
<p><b>Health, amenity and environmental quality</b> – to minimise adverse air quality, noise and vibration effects on the health and amenity of nearby residents, local communities and road users during both construction of the works and operation of the West Gate Tunnel Project</p>		<p>To minimise traffic noise impacts of West Gate Tunnel Project and local roads</p>	<p>NVP1A</p>	<p><b>Traffic noise limits</b></p> <p>Design and construct the works to meet the following limits on traffic noise levels.</p> <table border="1" data-bbox="825 435 1600 1101"> <thead> <tr> <th data-bbox="825 435 972 467">Aspect</th> <th data-bbox="972 435 1600 467">External Traffic Noise Levels</th> </tr> </thead> <tbody> <tr> <td data-bbox="825 475 972 1101">External traffic noise levels</td> <td data-bbox="972 475 1600 1101"> <p>a External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings<sup>Δ</sup> facing the traffic noise, being those adjacent to or with a direct line of sight to the freeway*, must be no greater than:</p> <ul style="list-style-type: none"> <li>i 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for Category A Buildings; and</li> <li>ii 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for Category B Buildings; and</li> </ul> <p>b External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings which do not fall within paragraph (a) above and which are adjacent to an identified section of Local Road*, must be no greater than the predicted traffic noise level under a 'no project' scenario. The 'no project' scenario must also assume that the road traffic noise attributable to the West Gate Freeway (without the project) is:</p> <ul style="list-style-type: none"> <li>• 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for the relevant Category A Buildings; and</li> <li>• 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for the relevant Category B Buildings.</li> </ul> </td> </tr> <tr> <td data-bbox="825 1109 972 1408">Applies at</td> <td data-bbox="972 1109 1600 1408"> <p>The noise criteria in paragraphs (a) and (b) above are to apply to the lowest habitable level of Category A Buildings and Category B Buildings existing and occupied or capable of being occupied at the time of announcing the design on 2 April 2017.</p> <p>In some cases off-site noise attenuation may be required to meet the noise criteria at any Category A or Category B Building. This may include implementation of noise attenuation measures in consultation with the owner of the relevant building to ensure that an equivalent <u>internal</u> level of attenuation is provided <del>internal</del> to the building.</p> </td> </tr> </tbody> </table>	Aspect	External Traffic Noise Levels	External traffic noise levels	<p>a External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings<sup>Δ</sup> facing the traffic noise, being those adjacent to or with a direct line of sight to the freeway*, must be no greater than:</p> <ul style="list-style-type: none"> <li>i 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for Category A Buildings; and</li> <li>ii 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for Category B Buildings; and</li> </ul> <p>b External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings which do not fall within paragraph (a) above and which are adjacent to an identified section of Local Road*, must be no greater than the predicted traffic noise level under a 'no project' scenario. The 'no project' scenario must also assume that the road traffic noise attributable to the West Gate Freeway (without the project) is:</p> <ul style="list-style-type: none"> <li>• 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for the relevant Category A Buildings; and</li> <li>• 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for the relevant Category B Buildings.</li> </ul>	Applies at	<p>The noise criteria in paragraphs (a) and (b) above are to apply to the lowest habitable level of Category A Buildings and Category B Buildings existing and occupied or capable of being occupied at the time of announcing the design on 2 April 2017.</p> <p>In some cases off-site noise attenuation may be required to meet the noise criteria at any Category A or Category B Building. This may include implementation of noise attenuation measures in consultation with the owner of the relevant building to ensure that an equivalent <u>internal</u> level of attenuation is provided <del>internal</del> to the building.</p>	<p>Detailed design, construction</p>	<p>Definition added below in response to comment by Counsel assisting the IAC</p> <p>Amendments made in response to Noise Conclave report, and evidence of Matthew Stead.</p>
Aspect	External Traffic Noise Levels											
External traffic noise levels	<p>a External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings<sup>Δ</sup> facing the traffic noise, being those adjacent to or with a direct line of sight to the freeway*, must be no greater than:</p> <ul style="list-style-type: none"> <li>i 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for Category A Buildings; and</li> <li>ii 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for Category B Buildings; and</li> </ul> <p>b External traffic noise levels from the freeway* and Local Roads* at Category A Buildings and Category B Buildings which do not fall within paragraph (a) above and which are adjacent to an identified section of Local Road*, must be no greater than the predicted traffic noise level under a 'no project' scenario. The 'no project' scenario must also assume that the road traffic noise attributable to the West Gate Freeway (without the project) is:</p> <ul style="list-style-type: none"> <li>• 63dB(A) L<sub>10(18h)</sub> measured between 6am and midnight for the relevant Category A Buildings; and</li> <li>• 63dB(A) L<sub>10(12h)</sub> measured between 6am and 6pm for the relevant Category B Buildings.</li> </ul>											
Applies at	<p>The noise criteria in paragraphs (a) and (b) above are to apply to the lowest habitable level of Category A Buildings and Category B Buildings existing and occupied or capable of being occupied at the time of announcing the design on 2 April 2017.</p> <p>In some cases off-site noise attenuation may be required to meet the noise criteria at any Category A or Category B Building. This may include implementation of noise attenuation measures in consultation with the owner of the relevant building to ensure that an equivalent <u>internal</u> level of attenuation is provided <del>internal</del> to the building.</p>											
				<p>* Freeway means the primary road connecting the West Gate Freeway (from</p>								

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes
				<p>the M80 interchange) with the Port of Melbourne, CityLink and the city to be constructed as a result of the Project and excludes:</p> <ul style="list-style-type: none"> <li>• The sections of the West Gate Freeway east of the Williamstown rail line; and</li> <li>• The sections of the Project which comprise widening of arterial roads, but includes:</li> <li>• The Dynon Road eastbound exit ramp and Dynon Road westbound entry ramp to the western abutment of the existing Dynon Road bridge over the railway lines; and</li> <li>• The Wurundjeri Way Extension from Dynon Road to the point at which the elevated section of the road ties into Wurundjeri Way south of Dudley Street.</li> </ul> <p>+ Local Road means</p> <ul style="list-style-type: none"> <li>• The sections of Grieve Parade, Millers Road, Williamstown Road, Hyde Street, MacKenzie Road, Simcock Avenue and Dynon Road which extend 100 metres from the interchange of the relevant road with the Freeway; and</li> <li>• The sections of Footscray Road between the intersection of Footscray Road with the Footscray Road ramps and the Sims Street loop intersection with Footscray Road.</li> </ul> <p><u>^ Category A Buildings and Category B Buildings means</u></p> <ul style="list-style-type: none"> <li>• <u>Category A Buildings: - Residential dwellings, aged persons homes, hospitals, motels, caravan parks and other buildings of a residential nature</u></li> <li>• <u>Category B Buildings: - Schools, kindergartens, libraries and other noise-sensitive community buildings</u></li> </ul>		<p>Definition added from VicRoads policy in response to comment by Counsel assisting the IAC</p>
			<u>NVP1B</u>	<p><u>Traffic noise reduction at open space</u>  <u>Construct noise barriers to reduce noise levels at the following open space areas:</u></p> <ul style="list-style-type: none"> <li>• <u>Crofts Reserve: extend the 8.25 metre high barrier on the south of the freeway, to the west for approximately 85 metres</u></li> <li>• <u>Mclvor Reserve: extend the 8.75 metre high barrier opposite Mclvor Reserve, on the north side of the freeway, to the west for approximately 150 metres</u></li> <li>• <u>Hyde Street Reserve: a 4.5 metre high noise barrier along the Hyde Street off ramp and shared use path adjacent to the Hyde Street Reserve for approximately 440 metres.</u></li> </ul>	<u>Construction</u>	<p>Amendment made in response to Noise Conclave report and Government announcement</p>
			<u>NVP 1CA</u>	<p><u>Operational noise limits</u>  <del>The</del> <u>Traffic noise barriers mitigation measures must be maintained to continue to meet</u> ensure that the traffic noise levels in NVP1A are not exceeded for 20</p>	<u>Operation</u>	<p>Amendment made in response to Noise Conclave report.</p>

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes
				<a href="#">years after opening of the Freeway for the same receptors used at the time of the design.</a>		Further amendment in response to evidence of Matthew Stead
			NVP2	<p><b>Traffic noise monitoring</b></p> <p>Traffic noise must be measured prior to and upon opening of the Freeway <a href="#">and during operation of the Freeway</a>, in accordance with the VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011, to verify conformance with the external traffic noise performance requirements set out in NVP1A above.</p> <p>Remedial action must be taken as soon as practicable in the event that the measured traffic noise levels demonstrate that the external traffic noise performance requirements set out in NVP1A are not met.</p>	Pre-operation <a href="#">Operation</a>	Amendment made in response to Noise Conclave report and evidence of Matthew Stead
		Manage surface construction noise and vibration to protect amenity	NVP3	<p><b>Construction noise, vibration management, and monitoring</b></p> <p>Prepare and implement a Construction Noise and Vibration Management Plan (CNVMP) in accordance with the limits and methodologies outlined in the Noise and Vibration EPRs.</p> <ul style="list-style-type: none"> <li>The CNVMP must be informed by monitoring and modelling undertaken by a suitably qualified acoustic and vibration consultant prior to the construction works and include (but not be limited to) Identification of sensitive receptors potentially impacted by the construction stage of the Project</li> <li>Identification of the scheduling, duration, activities and equipment with the potential to generate airborne noise or surface vibration impacts at the identified sensitive receptors</li> <li>Implementation of construction noise and surface vibration limits</li> <li>Updated noise and vibration modelling of the noise and vibration impacts</li> <li><a href="#">Condition surveys to be undertaken for properties which are identified during modelling as potentially experiencing exceedances of vibration limits</a></li> <li>Noise and vibration monitoring commitments (<a href="#">including real time monitoring in high risk areas</a>) and response protocols for managing noise complaints and remedial action</li> <li>Detail of practicable measures adopted to manage noise and surface vibration impacts that exceed the targets set out in the CNVMP</li> <li>Details of the communication plan to be adopted throughout construction.</li> </ul>	Pre-construction, construction	Amendments made in response to Noise Conclave report, evidence of John Heilig
			NVP4	<p><b>Construction Noise Targets</b></p> <p><b>1 <del>Highly Sensitive Areas</del> <a href="#">(non-residential)</a></b></p>	Construction	Amendments made in response to comment by Counsel

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes																		
				<p>For <b>Highly Sensitive Areas</b> <a href="#">land uses</a> (based on AS/NZS 2107:2000/2016) implement management actions if construction noise is predicted to or does exceed the internal and external noise levels below, and a noise sensitive receptor is adversely impacted.</p> <p>If construction exceeds the noise levels below:</p> <ul style="list-style-type: none"> <li>• Consider the duration of construction noise</li> <li>• Consider the existing ambient noise levels</li> <li>• Consult with the owner or operator of the noise sensitive receptor</li> <li>• Consider any specific acoustic requirements of land uses listed below</li> </ul> <p>To determine whether a noise sensitive receptor is adversely impacted.</p> <table border="1" data-bbox="829 641 1598 1356"> <thead> <tr> <th data-bbox="829 690 1186 722">Land use</th> <th data-bbox="1186 641 1598 722">Construction noise management level, <math>L_{Aeq}</math> (15 min) (applies when properties are in use)</th> </tr> </thead> <tbody> <tr> <td data-bbox="829 722 1186 787">Classrooms in schools and other educational institutions</td> <td data-bbox="1186 722 1598 787">Internal noise level 45 dB(A)</td> </tr> <tr> <td data-bbox="829 787 1186 820">Places of worship</td> <td data-bbox="1186 787 1598 820">Internal noise level 45 dB(A)</td> </tr> <tr> <td data-bbox="829 820 1186 950">Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion</td> <td data-bbox="1186 820 1598 950">External noise level 65 dB(A)</td> </tr> <tr> <td data-bbox="829 950 1186 1112">Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation</td> <td data-bbox="1186 950 1598 1112">External noise level 60 dB(A)</td> </tr> <tr> <td data-bbox="829 1112 1186 1209">Community centres</td> <td data-bbox="1186 1112 1598 1209">Depends on the intended use of the centre. Refer to the recommended "maximum" internal levels in AS/NZS 2107:2016 for specific uses.</td> </tr> <tr> <td data-bbox="829 1209 1186 1242">Industrial premises</td> <td data-bbox="1186 1209 1598 1242">External noise level 75 dB(A)</td> </tr> <tr> <td data-bbox="829 1242 1186 1274">Offices, retail outlets</td> <td data-bbox="1186 1242 1598 1274">External noise level 70 dB(A)</td> </tr> <tr> <td data-bbox="829 1274 1186 1356"><a href="#">Other noise sensitive land uses as identified in AS/NZS 2107:2016</a></td> <td data-bbox="1186 1274 1598 1356"><a href="#">Refer to the noise levels in AS/NZS 2107:2016 for specific uses.</a></td> </tr> </tbody> </table>	Land use	Construction noise management level, $L_{Aeq}$ (15 min) (applies when properties are in use)	Classrooms in schools and other educational institutions	Internal noise level 45 dB(A)	Places of worship	Internal noise level 45 dB(A)	Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion	External noise level 65 dB(A)	Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation	External noise level 60 dB(A)	Community centres	Depends on the intended use of the centre. Refer to the recommended "maximum" internal levels in AS/NZS 2107:2016 for specific uses.	Industrial premises	External noise level 75 dB(A)	Offices, retail outlets	External noise level 70 dB(A)	<a href="#">Other noise sensitive land uses as identified in AS/NZS 2107:2016</a>	<a href="#">Refer to the noise levels in AS/NZS 2107:2016 for specific uses.</a>		<p>assisting the IAC and evidence of Matthew Stead</p> <p>Amendment made in response to Noise Conclave report and evidence of Matthew Stead</p>
Land use	Construction noise management level, $L_{Aeq}$ (15 min) (applies when properties are in use)																							
Classrooms in schools and other educational institutions	Internal noise level 45 dB(A)																							
Places of worship	Internal noise level 45 dB(A)																							
Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion	External noise level 65 dB(A)																							
Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation	External noise level 60 dB(A)																							
Community centres	Depends on the intended use of the centre. Refer to the recommended "maximum" internal levels in AS/NZS 2107:2016 for specific uses.																							
Industrial premises	External noise level 75 dB(A)																							
Offices, retail outlets	External noise level 70 dB(A)																							
<a href="#">Other noise sensitive land uses as identified in AS/NZS 2107:2016</a>	<a href="#">Refer to the noise levels in AS/NZS 2107:2016 for specific uses.</a>																							
				<p><b>2 Residential dwellings</b></p> <p>For residential dwellings, implement management actions if construction</p>																				

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes										
				<p>noise is predicted to or does exceed the noise targets in EPA Victoria Publication 1254 or the daytime management levels specified for noise at residences during recommended standard hours in Part 4.1.1 of the NSW Interim Construction Noise Guidelines (ICNG) with the hours amended to correspond to the EPA Victoria Publication 1254 hours as shown in the table below.</p> <table border="1" data-bbox="827 483 1598 1143"> <thead> <tr> <th data-bbox="827 537 1121 574">Time of day</th> <th data-bbox="1121 483 1598 574">Construction noise management level, <math>L_{Aeq}</math> (15 min) (applies when properties are in use)</th> </tr> </thead> <tbody> <tr> <td data-bbox="827 574 1121 711">7am–6pm Monday to Friday 7am–1pm Saturday</td> <td data-bbox="1121 574 1598 711">Noise affected Background <math>LA_{90}+10dB</math> Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</td> </tr> <tr> <td data-bbox="827 711 1121 847">7am–6pm Monday to Friday 7am–1pm Saturday</td> <td data-bbox="1121 711 1598 847">Highly noise affected 75d(BA) Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</td> </tr> <tr> <td data-bbox="827 847 1121 1016">6pm–10pm Monday to Friday 1pm–10pm Saturday 7am–10pm Sunday and public holidays</td> <td data-bbox="1121 847 1598 1016">Noise level at any residential premises not to exceed background noise (<math>L_{A90}</math>) by: <ul style="list-style-type: none"> <li>• 10 dB(A) or more for up to 18 months</li> <li>• 5 dB(A) or more after 18 months</li> </ul> Source: EPA Publication 1254 Section 2</td> </tr> <tr> <td data-bbox="827 1016 1121 1143">10pm–7am Monday to Sunday</td> <td data-bbox="1121 1016 1598 1143">Noise inaudible within a habitable room of any residential premises Source: EPA Victoria Publication 1254 Section 2</td> </tr> </tbody> </table> <p><i>Notes</i></p> <ol style="list-style-type: none"> <li><i>The noise affected level represents the point above which there may be some community reaction to noise.</i></li> <li><i>The highly noise affected level represents the point above which there may be strong community reaction to noise.</i></li> </ol>	Time of day	Construction noise management level, $L_{Aeq}$ (15 min) (applies when properties are in use)	7am–6pm Monday to Friday 7am–1pm Saturday	Noise affected Background $LA_{90}+10dB$ Source: NSW ICNG Chapter 4.1.1 Table 2, page 12	7am–6pm Monday to Friday 7am–1pm Saturday	Highly noise affected 75d(BA) Source: NSW ICNG Chapter 4.1.1 Table 2, page 12	6pm–10pm Monday to Friday 1pm–10pm Saturday 7am–10pm Sunday and public holidays	Noise level at any residential premises not to exceed background noise ( $L_{A90}$ ) by: <ul style="list-style-type: none"> <li>• 10 dB(A) or more for up to 18 months</li> <li>• 5 dB(A) or more after 18 months</li> </ul> Source: EPA Publication 1254 Section 2	10pm–7am Monday to Sunday	Noise inaudible within a habitable room of any residential premises Source: EPA Victoria Publication 1254 Section 2		Amendments made in response to Noise Conclave report and evidence of Matthew Stead
Time of day	Construction noise management level, $L_{Aeq}$ (15 min) (applies when properties are in use)															
7am–6pm Monday to Friday 7am–1pm Saturday	Noise affected Background $LA_{90}+10dB$ Source: NSW ICNG Chapter 4.1.1 Table 2, page 12															
7am–6pm Monday to Friday 7am–1pm Saturday	Highly noise affected 75d(BA) Source: NSW ICNG Chapter 4.1.1 Table 2, page 12															
6pm–10pm Monday to Friday 1pm–10pm Saturday 7am–10pm Sunday and public holidays	Noise level at any residential premises not to exceed background noise ( $L_{A90}$ ) by: <ul style="list-style-type: none"> <li>• 10 dB(A) or more for up to 18 months</li> <li>• 5 dB(A) or more after 18 months</li> </ul> Source: EPA Publication 1254 Section 2															
10pm–7am Monday to Sunday	Noise inaudible within a habitable room of any residential premises Source: EPA Victoria Publication 1254 Section 2															
			NVP5	<p><b>Blasting trials and assessment</b></p> <p>Where blasting is proposed, a series of initial trials at reduced scale must be conducted prior to production blasting to determine site-specific blast response characteristics and to define allowable blast sizes to meet air blast</p>	Construction											

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes																												
				overpressure and ground vibration limits. If blasting is required, an assessment of the potential noise and vibration impacts, and a strategy to minimise and manage those impacts must be prepared, including preparation of an appropriate community information program.																														
		Manage construction vibration and regenerated noise impacts to protect amenity	NVP6	<p><b>Construction vibration targets (amenity)</b></p> <p>Implement management actions if the following guideline target levels for continuous vibration from construction activity to protect human comfort of occupied buildings (including heritage buildings) are not achieved (levels are calculated from the British Standard BS6472-1:2008).</p> <table border="1"> <thead> <tr> <th rowspan="3">Type of space occupancy</th> <th colspan="4">Vibration Dose Values (m/s<sup>1.75</sup>)</th> </tr> <tr> <th colspan="2">Day (7am to 10pm)</th> <th colspan="2">Night (10pm to 7am)</th> </tr> <tr> <th>Preferred Value</th> <th>Maximum Value</th> <th>Preferred Value</th> <th>Maximum Value</th> </tr> </thead> <tbody> <tr> <td>Residential</td> <td>0.2</td> <td>0.4</td> <td>0.1</td> <td>0.2</td> </tr> <tr> <td>Offices, schools, educational institutions, places of worship</td> <td>0.4</td> <td>0.8</td> <td>0.4</td> <td>0.8</td> </tr> <tr> <td>Workshops</td> <td>0.8</td> <td>1.6</td> <td>0.8</td> <td>1.6</td> </tr> </tbody> </table> <p><i>Notes</i></p> <ol style="list-style-type: none"> <li><i>The Guideline Targets are non-mandatory; they are goals that should be sought to be achieved through the application of practicable mitigation measures. If exceeded then management actions would be required</i></li> <li><i>The VDV's may be converted to PPV's within a noise and vibration construction management plan.</i></li> </ol>	Type of space occupancy	Vibration Dose Values (m/s <sup>1.75</sup> )				Day (7am to 10pm)		Night (10pm to 7am)		Preferred Value	Maximum Value	Preferred Value	Maximum Value	Residential	0.2	0.4	0.1	0.2	Offices, schools, educational institutions, places of worship	0.4	0.8	0.4	0.8	Workshops	0.8	1.6	0.8	1.6	Construction	
Type of space occupancy	Vibration Dose Values (m/s <sup>1.75</sup> )																																	
	Day (7am to 10pm)		Night (10pm to 7am)																															
	Preferred Value	Maximum Value	Preferred Value	Maximum Value																														
Residential	0.2	0.4	0.1	0.2																														
Offices, schools, educational institutions, places of worship	0.4	0.8	0.4	0.8																														
Workshops	0.8	1.6	0.8	1.6																														
			NVP7	<p><b>Construction vibration targets (structures)</b></p> <p>Construction vibration targets for structures are summarised in the tables below.</p> <p>Guideline values for the vibration velocity to be used when evaluating the effects of short term vibration on structures.</p> <table border="1"> <thead> <tr> <th rowspan="2">Type of structure</th> <th colspan="2">Guideline values for velocity (mm/s)</th> </tr> <tr> <th>Vibration at the foundation at a frequency of</th> <th>Vibration at horizontal plane of</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Type of structure	Guideline values for velocity (mm/s)		Vibration at the foundation at a frequency of	Vibration at horizontal plane of																									
Type of structure	Guideline values for velocity (mm/s)																																	
	Vibration at the foundation at a frequency of	Vibration at horizontal plane of																																

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes																				
				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 10%; text-align: center;">1 to 10 Hz</th> <th style="width: 10%; text-align: center;">10 to 50 Hz</th> <th style="width: 10%; text-align: center;">50 to 100 Hz*</th> <th style="width: 10%; text-align: center;">highest floor All frequencies</th> </tr> </thead> <tbody> <tr> <td>1. Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td> <td style="text-align: center;">20</td> <td style="text-align: center;">20 to 40</td> <td style="text-align: center;">40 to 50</td> <td style="text-align: center;">40</td> </tr> <tr> <td>2. Dwellings and buildings of similar design and/or occupancy</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5 to 15</td> <td style="text-align: center;">15 to 20</td> <td style="text-align: center;">15</td> </tr> <tr> <td>3. Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)</td> <td style="text-align: center;">3</td> <td style="text-align: center;">3 to 8</td> <td style="text-align: center;">8 to 10</td> <td style="text-align: center;">8</td> </tr> </tbody> </table> <p>*At frequencies &gt; 100 Hz, the values given in this column may be used as a minimum</p> <p><i>Notes</i></p> <ol style="list-style-type: none"> <li>1 <i>Vibration levels marginally exceeding those vibration levels in the table would not necessarily mean that damage would occur and further investigation would be required to determine if higher vibration levels can be accommodated without risk of damage.</i></li> <li>2 <i>For civil engineering structures (e.g. with reinforced concrete constructions used as abutments or foundation pads) the values for Type 1 buildings may be increased by a factor of 2</i></li> <li>3 <i>Short-term vibration is defined as vibration which does not occur often enough to cause structural fatigue and which does not produce resonance in the structure being evaluated.</i></li> </ol>		1 to 10 Hz	10 to 50 Hz	50 to 100 Hz*	highest floor All frequencies	1. Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40	2. Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	3. Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)	3	3 to 8	8 to 10	8		
	1 to 10 Hz	10 to 50 Hz	50 to 100 Hz*	highest floor All frequencies																						
1. Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40																						
2. Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15																						
3. Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)	3	3 to 8	8 to 10	8																						
				<p>Guideline values for the vibration velocity to be used when evaluating the effects of long term vibration on structures.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;"><b>Type of structure</b></th> <th style="width: 50%; text-align: center;"><b>Guideline values for velocity (mm/s) Vibration at horizontal plane of highest floor All frequencies</b></th> </tr> </thead> <tbody> <tr> <td>Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td> <td style="text-align: center;">10</td> </tr> </tbody> </table>	<b>Type of structure</b>	<b>Guideline values for velocity (mm/s) Vibration at horizontal plane of highest floor All frequencies</b>	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10																		
<b>Type of structure</b>	<b>Guideline values for velocity (mm/s) Vibration at horizontal plane of highest floor All frequencies</b>																									
Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10																									

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement		Project Phase	WDA comments on changes								
				Dwellings and buildings of similar design and/or occupancy	5		Amendments made in response to Noise Conclave report and evidence of Matthew Stead								
				Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of intrinsic value (eg. Heritage buildings)	2.5										
				<p><i>Notes:</i></p> <p>1 <i>Vibration levels marginally exceeding those in the table would not necessarily mean that damage would occur and further investigation would be required to determine if higher vibration levels can be accommodated without risk of damage</i></p> <p>2 <i>Limits in the above table may need to be adjusted <a href="#">where deemed necessary and/or appropriate to protect the structural integrity of structures based on following a pre-construction condition survey and/or modelling</a></i></p> <p>3 <i>Long-term vibration relates to events that may result in a resonant structural response.</i></p> <p>Implement management actions if, due to construction activity, the DIN 4150.3 Guideline Targets for structural damage to buildings (for short-term vibration or long-term vibration) are not achieved.</p>											
			NVP8	<p><b>Ground-borne (internal) noise targets</b></p> <p>Implement management actions as determined in consultation with potentially affected land owners to protect amenity at residences where the following ground borne noise guideline targets are exceeded during construction.</p> <table border="1" data-bbox="827 1133 1598 1304"> <thead> <tr> <th colspan="2" data-bbox="827 1133 1598 1182"><b>Internal noise level measured at the centre of the most affected habitable room</b></th> </tr> <tr> <th colspan="2" data-bbox="827 1182 1598 1222"><b>Time of Day</b></th> </tr> </thead> <tbody> <tr> <td data-bbox="827 1222 1125 1263">Evening (6pm to 10pm)</td> <td data-bbox="1125 1222 1598 1263">L<sub>Aeq</sub> (15 minute) = 40dBA</td> </tr> <tr> <td data-bbox="827 1263 1125 1304">Night (10pm to 6am)</td> <td data-bbox="1125 1263 1598 1304">L<sub>Aeq</sub> (15 minute) = 35dBA</td> </tr> </tbody> </table> <p><i>Notes</i></p> <p>1 <i>Levels are only applicable when ground borne noise levels are higher than airborne noise levels.</i></p> <p>2 <i>Management actions include community consultation to determine acceptable level of disruption and provision of respite accommodation in</i></p>		<b>Internal noise level measured at the centre of the most affected habitable room</b>		<b>Time of Day</b>		Evening (6pm to 10pm)	L <sub>Aeq</sub> (15 minute) = 40dBA	Night (10pm to 6am)	L <sub>Aeq</sub> (15 minute) = 35dBA	Construction	
<b>Internal noise level measured at the centre of the most affected habitable room</b>															
<b>Time of Day</b>															
Evening (6pm to 10pm)	L <sub>Aeq</sub> (15 minute) = 40dBA														
Night (10pm to 6am)	L <sub>Aeq</sub> (15 minute) = 35dBA														



EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes										
				<i>some circumstances.</i>												
		To manage construction vibration to protect utility assets	NVP9	<p><b>Utility asset protection</b></p> <p>Prior to construction undertake condition assessments of above and below ground utility assets and establish construction vibration limits in consultation with asset owners to maintain asset integrity. Where construction vibration limits are not agreed with the asset owner, the guideline values in the table below apply.</p> <table border="1"> <thead> <tr> <th colspan="2">Guideline values for velocity measured on the pipe</th> </tr> <tr> <th>Pipe Material</th> <th></th> </tr> </thead> <tbody> <tr> <td>Steel (including welded pipes)</td> <td>100mm/s</td> </tr> <tr> <td>Clay, concrete, reinforced concrete, pre stressed concrete, metal (with or without flange)</td> <td>80 mm/s</td> </tr> <tr> <td>Masonry, plastic</td> <td>50 mm/s</td> </tr> </tbody> </table> <p><i>Notes</i></p> <p>1 These values may be reduced by 50% when evaluating the effects of long-term vibration on buried pipework</p> <p>2 It is assumed pipes have been manufactured and laid using current technology.</p> <p>Monitor vibration limits during construction to demonstrate compliance with agreed vibration limits. Identify contingency measures to be implemented if limits are not met. Where necessary rectify any defects that are attributable to the Project.</p>	Guideline values for velocity measured on the pipe		Pipe Material		Steel (including welded pipes)	100mm/s	Clay, concrete, reinforced concrete, pre stressed concrete, metal (with or without flange)	80 mm/s	Masonry, plastic	50 mm/s	Pre-construction, construction	
Guideline values for velocity measured on the pipe																
Pipe Material																
Steel (including welded pipes)	100mm/s															
Clay, concrete, reinforced concrete, pre stressed concrete, metal (with or without flange)	80 mm/s															
Masonry, plastic	50 mm/s															
	SEPP N-1 – Control of Noise from Commerce, Industry and Trade	To minimise noise impacts of the tunnel ventilation system	NVP10	<p><b>Tunnel ventilation system noise design</b></p> <p>Design and implement the tunnel ventilation system <a href="#">in accordance with the Works Approval and</a> to achieve compliance with State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1) <del>and in accordance with the Works Approval</del>. Provide detailed design to the satisfaction of EPA Victoria prior to commencement of the works permitted by the Works Approval.</p>	Detailed design. operation	Amendment made in response to Noise Conclave report and evidence of Matthew Stead										
			NVP11	<p><b>Tunnel ventilation system noise monitoring</b></p> <p>Measure noise from the tunnel ventilation system on commencing road operation and monitor noise from the tunnel ventilation system for up to five years post opening of the Freeway, or as agreed with EPA Victoria, to verify compliance with State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1). Identify contingency measures to be implemented if noise level targets are not met.</p>	Operation											

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement	Project Phase	WDA comments on changes												
		Manage construction blasting impacts to protect amenity	NVP12	<p><b>Amenity – Blast Vibration</b></p> <p>Implement management actions if the following vibration values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Type of blasting operations</th> <th>Peak component particle velocity (mm/s)</th> </tr> </thead> <tbody> <tr> <td>Sensitive site</td> <td>Operations lasting longer than 12 months or more than 20 blasts</td> <td>5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply</td> </tr> <tr> <td>Sensitive site</td> <td>Operations lasting less than 12 months or less than 20 blasts</td> <td>10mm/s maximum unless agreement is reached with occupier that a higher limit may apply</td> </tr> <tr> <td>Occupied non-sensitive sites such as factories and commercial premises</td> <td>All blasting</td> <td>25mm/s maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specification or levels that can be shown to adversely affect the equipment operation</td> </tr> </tbody> </table> <p><i>Note</i></p> <p>1 Sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.</p>	Category	Type of blasting operations	Peak component particle velocity (mm/s)	Sensitive site	Operations lasting longer than 12 months or more than 20 blasts	5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply	Sensitive site	Operations lasting less than 12 months or less than 20 blasts	10mm/s maximum unless agreement is reached with occupier that a higher limit may apply	Occupied non-sensitive sites such as factories and commercial premises	All blasting	25mm/s maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specification or levels that can be shown to adversely affect the equipment operation	Construction	
Category	Type of blasting operations	Peak component particle velocity (mm/s)																
Sensitive site	Operations lasting longer than 12 months or more than 20 blasts	5mm/s for 95% blasts per year 10mm/s maximum unless agreement is reached with the occupier that a higher limit may apply																
Sensitive site	Operations lasting less than 12 months or less than 20 blasts	10mm/s maximum unless agreement is reached with occupier that a higher limit may apply																
Occupied non-sensitive sites such as factories and commercial premises	All blasting	25mm/s maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturer's specification or levels that can be shown to adversely affect the equipment operation																
			NVP13	<p><b>Amenity – Blast Overpressure</b></p> <p>Implement management actions if the following overpressure values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Type of blasting operations</th> <th>Peak Overpressure Value (dBL)</th> </tr> </thead> <tbody> </tbody> </table>	Category	Type of blasting operations	Peak Overpressure Value (dBL)	Construction										
Category	Type of blasting operations	Peak Overpressure Value (dBL)																

EES Evaluation Objective	Applicable Legislation and Policy	Performance Objective	EPR Code	Environmental Performance Requirement			Project Phase	WDA comments on changes	
				<p>Sensitive Site</p> <p>Operations lasting longer than 12 months or more than 20 blasts</p> <p>Operations lasting less than 12 months or less than 20 blasts</p>	<p>115 dBL for 95% blasts per year. 120dBL maximum unless agreement with occupier that a higher limit may apply</p> <p>120dBL for 95% blasts per year. 125 dBL maximum unless agreement with occupier that a higher limit may apply</p>				
				Occupied non-sensitive sites such as factories and commercial premises	All blasting	125 dBL maximum value unless agreement is reached with occupier that a higher limit may apply. For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturers specification or levels that can be shown to adversely affect the equipment operation			
<p><i>Note</i></p> <p>1 Sensitive site includes houses and low rise residential buildings, theatres, schools and other similar buildings occupied by people.</p>									
<b>Social</b>									
<p><b>Social, business, land use, public safety and infrastructure</b> – to minimise adverse effects on the social fabric of the community in the project area, including with regard to community cohesion and access to community services and facilities, business</p>	<p><i>Planning and Environment Act 1987</i></p>	To minimise impacts on social and community infrastructure	SP1	<p><b>Urban design principles and vision</b></p> <p>Detailed design to protect and, where practicable, improve access to and amenity for potentially affected residents, open space, social and community infrastructure and commercial facilities by responding to the urban design principles and vision and implementing the principles of Crime Prevention Through Environmental Design.</p>			Detailed design		
		To minimise impacts on the community through engagement during construction and operation	SP2	<p><b>Communications and Community Engagement Plan (CCEP)</b></p> <p>Develop and implement a Communications and Community Engagement Plan in consultation with affected local councils to engage and consult the community and potentially affected stakeholders and discuss progress of construction activities and operation. The plan must include:</p> <ul style="list-style-type: none"> <li>Community issues identification, management and resolution approach and procedures</li> <li>Enquiry management and record keeping approach and procedures</li> <li>Approach to mitigating community impacts including dust, noise and light</li> </ul>			Pre-construction, construction, operation		