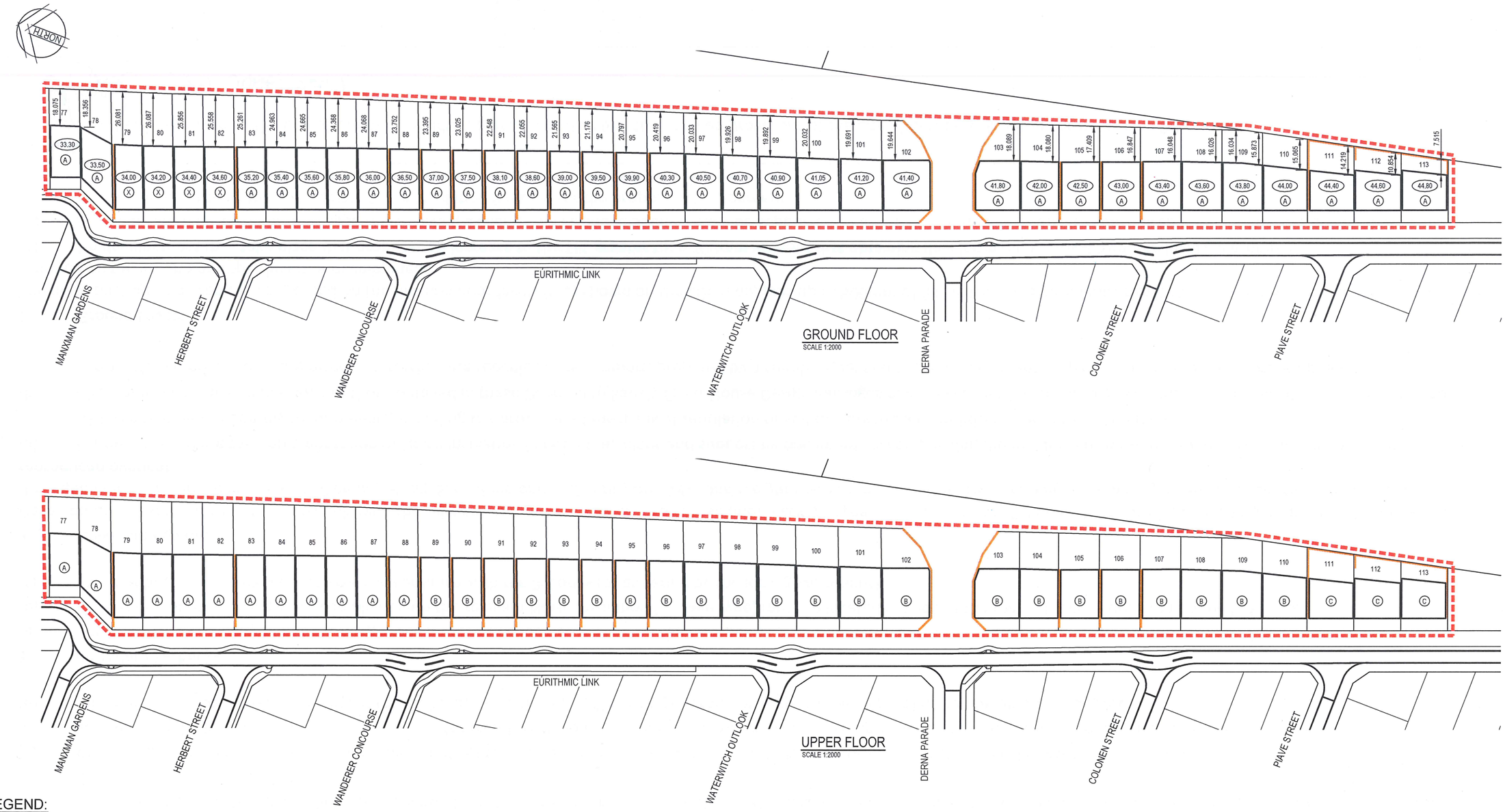

LEGEND:

- LOCAL DEVELOPMENT PLAN AREA
- 00.000 — REAR SETBACK TO VERITA ROAD (UPPER FLOOR SETBACK SAME AS GROUND FLOOR)
- PROPOSED BUILDING PAD
- (33.30) FINISHED FLOOR LEVEL (F.F.L. - mAHD)
- (A) NOISE INSULATION PACKAGE TYPE
- (B) NOISE INSULATION PACKAGE TYPE
- (C) NOISE INSULATION PACKAGE TYPE
- (X) NO NOISE INSULATION PACKAGE TYPE REQUIRED

Government of Western Australia
Housing Authority

0 50 100 150 200m
SCALE 1:2000 @A3

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APPROVAL

THIS LDP HAS BEEN APPROVED BY THE CITY OF GREATER GERALDTON PURSUANT TO PART 6 OF THE DEEMED PROVISIONS OF THE CITY OF GREATER GERALDTON LOCAL PLANNING SCHEME NO. 1.

SIGNATURE

29 JUNE 2017
DATE

PLAN No.: E14015-SK01

LOCAL DEVELOPMENT PLAN PROVISIONS

1. Background

The provisions below apply to all lots within the Local Development Plan (LDP) boundary, being Lots 77 to 113 Eurithmic Link, Wandina. The lots are affected by road noise from Verita Road and a specialist 'Transportation Noise Assessment' report (Ref: 17023878-01) has been prepared by Lloyd George Acoustics to assess the transportation noise impact. The results show that future traffic noise levels will exceed the target criteria on some lots, and therefore noise mitigation measures must be considered. This LDP details the noise mitigation measures required.

2. General

(a) The residential density code applicable to lots within this LDP area is R20, as identified on the Karloo Local Structure Plan Map.

(b) The requirements of the City of Greater Geraldton Local Planning Scheme No. 1 (LPS1) and the Residential Design Codes (R-Codes) apply to residential development on all lots unless varied by this LDP.

(c) Where there is a conflict between the requirements of LPS1 and/or the R-Codes with this LDP, the provisions of this LDP prevail to the extent of any inconsistency.

(d) Variations to the R-Codes provisions, as provided for by this LDP, do not require consultation with adjoining/other landowners where the design complies with this LDP.

(e) Minor variations to the requirements of this LDP may be approved by the local government subject to an application for development approval.

3. Boundary Setbacks

(a) Development containing habitable living space must not be located within the rear setback as depicted on the LDP map.

(b) At least one outdoor living area (compliant with the relevant Noise Insulation Package type) must be located outside of the rear setback as depicted on the LDP map.

(c) All other boundary setbacks are to be in accordance with the R-Codes (or as varied by the local government).

4. Noise Management

Development must be constructed to comply with the relevant 'Deemed to Comply' Noise Insulation Package types specified on the LDP map. Noise Insulation Package requirements are set out under the *Implementation Guidelines for State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning*. A summary of the packages from those Guidelines is reproduced overleaf.

(a) For lots that require the implementation of Noise Insulation Packages, all plans and supporting documents accompanying the Building Permit Application must clearly demonstrate compliance with the Deemed to Comply requirements, including the provision of mechanical ventilation or suitable ducted air conditioning with fresh air intakes.

(b) Alternative construction methods to those detailed in these Deemed to Satisfy Quiet House Design Packages may be accepted by the local government where the alternative design and construction methods are supported by a further site specific acoustic report, prepared by a suitably qualified acoustic consultant, as part of an application for development approval.

5. Ground Levels

The noise package requirements are based on the finished floor levels (FFL) shown on the LDP map, plus up to 500mm of fill. Fill above 500mm may result in a different Noise Insulation Package being required on the ground or upper levels of development.

(a) No development may take place that proposes an increase to the FFL greater than 500mm without first obtaining development approval from the local government.

(b) Any application for development approval involving a change in FFL above 500mm must be supported by a further site specific acoustic report, prepared by a suitably qualified acoustic consultant, identifying the appropriate Noise Insulation Package for the proposed development.

APPROVAL

This LDP has been approved by the City of Greater Geraldton pursuant to Part 6 of the deemed provisions of the City of Greater Geraldton Local Planning Scheme No. 1.

29 JUNE 2017

Signature / Date

Where outdoor noise levels are above the target level, excluding the effect of any boundary fences, these Guidelines propose acceptable treatment packages that may be implemented without requiring detailed review. The packages are also intended for residential development only. At higher noise levels or for other building usages, specialist acoustic advice will be needed.

The acceptable treatment packages in Table 1 are intended to simplify compliance with the noise criteria, and the relevant package should be required as a condition of development in lieu of a detailed assessment.

Transition between each package should be made on the basis of the highest incident '$L_{Aeq,Day}$' or $L_{Aeq,Night}$' value to the nearest whole number determined for the building development under assessment.

Any departures from the acceptable treatment specifications need to be supported by professional advice from a competent person that the proposal will achieve the requirements of the Policy.

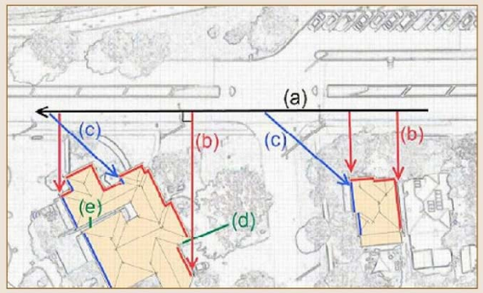
Definition of terms used in Tables 1 – 3 and illustrated in the figure below (sourced from the Guideline document):

- **Facing** the transport corridor: Any part of a building façade is 'facing' the transport corridor if any straight line drawn perpendicular to its nearest road lane or railway line intersects that part of the façade without obstruction (ignoring any fence). See example below.
- **Side** on to transport corridor: Any part of a building façade that is not 'facing' is 'side on' to the transport corridor if any straight line can be drawn from it to intersect the nearest road lane or railway line without obstruction (ignoring any fence).
- **Opposite** to transport corridor: Neither 'side on' nor 'facing', as defined above.

The approval may require that the construction drawings be checked for compliance with the detailed assessment, and that follow-up verification be carried out to certify compliance.

Determining building face orientation

The following sketch shows two residences in proximity to a road.



'Facing' façades are identified by drawing straight lines (b) perpendicular (at a 90 degree angle) to the road (a). Where these lines intersect a façade – without obstruction – the façades are shown in red as 'facing' the road.

Façades shown in blue are not 'facing' but have clear lines (c) that intersect the road at any angle, and are therefore classed as 'side on' to the road.

The remaining façades are 'opposite' to the road.

Mechanical ventilation requirements

It is noted that natural ventilation must be provided in accordance with F4.6 and F4.7 of Volume One and 3.8.5.2 of Volume Two of the National Construction Code. Where the noise limit is likely to be exceeded, a mechanical ventilation system is usually required.

Mechanical ventilation systems will need to comply with *AS 1668.2 - The use of mechanical ventilation and air-conditioning in buildings*. Fresh intake and relief air paths will need to be fully ducted to allow windows to be closed, and be located at positions furthest from the traffic noise sources where practicable.

For acceptable treatment packages A, B and C, if a ventilation system is provided in addition to operable windows, on all sides facing or side on to the transport corridor it must either provide:

- closed roof eaves and wall openings on those sides; or
- acoustically rated openings and ductwork arrangements to provide a minimum sound reduction performance of R w and 40dB into sensitive spaces.

Outdoor Areas

The Policy requires that at least one outdoor living area be reasonably protected from transport noise. This protected area should have at least the minimum space requirements for outdoor living areas as defined in the Residential Design Codes of Western Australia.

In many ways, outdoor living areas are the most susceptible to noise from adjacent transport corridors as they are open and therefore difficult to protect, particularly where they are elevated with a direct line of sight to the traffic.

Outdoor areas should always be located furthest away from the noise source, so screened by the building itself.

In cases where a development cannot comply with the acceptable treatment requirements listed in the Guidelines for upper level locations and balconies, and there are no screened ground-level locations, a best 'reasonable and practicable' design approach should be demonstrated.

Table 1 - Package A

Area	Orientation to Road Corridor	Package A (up to 60 dB $L_{Aeq(Day)}$ and 55dB $L_{Aeq(Night)}$)
Bedrooms	Facing	Windows systems: Glazing up to 40% of floor area (minimum $R_A + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Side	Windows systems: As above.
	Opposite	No requirements
Other Habitable Rooms including Kitchens	Facing	Windows and external door systems: • Glazing up to 60% of floor area (minimum $R_w + C_{tr}$ 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. • Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to be same performance including brush seals.
	Side	Windows and external door systems: As above.
	Opposite	No requirements
General	Any	• Walls (minimum R w +C tr 45) – Two leaves of 90mm thick brick with minimum 50mm cavity • Roof and ceiling (minimum R w + C tr 35) – Standard roof construction with 10mm plasterboard ceiling and minimum R2.5 insulation between ceiling joists. • Eaves to be closed using 4mm compressed fibre cement sheet. • Mechanical ventilation – as per note following.
Outdoor Living Area		Boundary wall to be minimum 2m high; or Locate on the side of the building that is opposite to the corridor; or Locate within alcove area so that the house shields it from corridor.

Any penetrations in a part of the building envelope must be acoustically treated so as not to degrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

Table 2 - Package B

Area	Orientation to Road Corridor	Package A (up to 63 dB $L_{Aeq(Day)}$ and 58 dB $L_{Aeq(Night)}$)
Bedrooms	Facing	Windows systems: Glazing up to 60% of floor area (minimum $R_A + C_{tr}$ 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Side	Windows systems: As above.
	Opposite	No requirements
Other Habitable Rooms including Kitchens	Facing	Windows and external door systems: • Glazing up to 60% of floor area (minimum R w + C tr 31) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. • Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming R w + C tr 31 performance. Alternative, change to hinged door with perimeter acoustic seals and 10mm thick glass.
	Side	Windows and external door systems: • Glazing up to 60% of floor area (minimum R w + C tr 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. • Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to be same performance including brush seals.
	Opposite	No requirements
General	Any	• Walls (minimum R w +C tr 50) – Two leaves of 90mm thick brick with minimum 50mm cavity. Cavity to include 50mm thick insulation and where wall ties are required, these are to be anti-vibration/resilient type. • Roof and ceiling (minimum R w + C tr 35) – Standard roof construction with 10mm plasterboard ceiling and minimum R2.5 insulation between ceiling joists. • Eaves to be closed using 4mm compressed fibre cement sheet. • Mechanical ventilation – as per note following.
Outdoor Living Area		Boundary wall to be minimum 2.4m high; or Locate on the side of the building that is opposite to the corridor; or Locate within alcove area so that the house shields it from corridor.

Any penetrations in a part of the building envelope must be acoustically treated so as not to degrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

Table 3 - Package C

Area	Orientation to Road Corridor	Package A (up to 65 dB $L_{Aeq(Day)}$ and 60 dB $L_{Aeq(Night)}$)
Bedrooms	Facing	Windows systems: Glazing up to 20% of floor area (minimum R A + C tr 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Side	Windows systems: Glazing up to 40% of floor area (minimum R w + C tr 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
	Opposite	Windows systems: Glazing up to 40% of floor area (minimum R w + C tr 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
Other Habitable Rooms including Kitchens	Facing	Windows and external door systems: • Glazing up to 40% of floor area (minimum R w + C tr 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. • Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming $R_w + C_{tr}$ 31 performance. Alternative, change to hinged door with perimeter acoustic seals and 10mm thick glass.
	Side	Windows and external door systems: • Glazing up to 60% of floor area (minimum R w + C tr 31) – 10mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings. • Doors to be either 35mm thick solid timber core door with full perimeter acoustic seals. Glazed inserts to match the above. Sliding glass doors to have laboratory certificate confirming R w + C tr 31 performance. Alternative, change to hinged door with perimeter acoustic seals and 10mm thick glass.
	Opposite	Windows systems: • Glazing up to 40% of floor area (minimum R w + C tr 28) – 6mm thick glass (monolithic, toughened or laminated) in fixed sash, awning or casement opening with seals to openings.
General	Any	• Walls (minimum R w +C tr 50) – Two leaves of 90mm thick brick with minimum 50mm cavity. Cavity to include 50mm thick insulation and where ties are required, these are to be anti-vibration/resilient type. • Roof and ceiling (minimum R w + C tr 40) – Standard roof construction with 10mm plasterboard ceiling and minimum R 3.0 insulation between ceiling joists. • Eaves to be closed using 6mm compressed fibre cement sheet. • Mechanical ventilation – as per note following.
Outdoor Living Area		Locate on the side of the building that is opposite to the corridor; or Locate within alcove area so that the house shields it from corridor.

Any penetrations in a part of the building envelope must be acoustically treated so as not to degrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.