Appendix 10B: Construction Plant & Methodology

Table 10.28 shows construction plant together with sound levels used to predict construction noise levels. At the time of undertaking this assessment, there was no construction contractor appointed. Therefore, limited construction information was provided, and the assessment of construction impacts has been based upon reasonable assumptions as to the methods of construction. The information provided included a preliminary construction programme, see Volume 2, Chapter 3: Project Description. This information has been supplemented with construction plant noise levels that have been taken from the current sound level data presented in Annexes C and D of BS 5228-1.

Table 10.28 Construction plant used in the construction noise predictions

Phase	Plant type	Sound levels (L_{Aeq} at 10m - obtained from BS5228 or from Sound Pressure Level conversion)
Phase 1	35t Excavator	79
	9t Dumpers	76
	Articulated dump truck; 25 t	80
	Vibrating/Deadweight Roller 13t	80
Phase 2	Concrete ready mix truck discharging	75
	Truck mounted concrete pump + boom arm; 26 t	80
	Concrete Vibrator	69
	13t Excavator (Piling Attendant)	68
	9t Dumpers	76
Phase 3	Asphalt paver 12 t hopper or similar	76
	Tandem Vibratory Roller (Bomag Oszillation BW 216 PD-5)	80
	Wheeled backhoe loader 3t	68
	Tack coat sprayer (including bitumen boiler)	73
	Floor saw	87
	Road Sweepers	76
	Road Planer	82
	Compressor	66

Construction works are expected to take place between the following hours:

- 08:00 to 18:00 Monday to Friday; and
- 08:00 to 13:00 on Saturdays.

XC201 Thomastown

Indicative construction methodology and sequencing has been provided. Construction has been broken down into three main phases:

Phase 1 comprises the stripping and excavation of the existing ground for new road formation and the formation of the temporary road access to new bridge location to allow plant access

Phase 2 (which requires rail possessions) comprises the installation of bridge support foundation using mobile crane, the installation of pre cast bridge beams and concrete infill during rail possession and applying bridge deck waterproofing.

Phase 3 includes formation of new reinforced earth ramp approach roads on each side, vibratory rolling, completion of new road surface, markings and signage and tie in of new and existing roads.

XC211 and XC212 Newtown and Ballycoskery

Due to the close proximity of the sites they will be constructed as one overall site. However, the construction methodology is slightly different for each site. Indicative construction methodology and sequencing has been provided. Construction of XC211 is broken down into three phases:

Phase 1 comprises the stripping and excavation of the existing ground for new road formation and the formation of the earthworks embankment for road construction.

Phase 2 comprises the road surfacing and vibratory rolling.

Phase 3 includes tying in new and existing roads.

Construction of XC212 is broken down into three phases:

Phase 1 comprises the stripping and excavation of the existing ground for new road formation, and the formation of the temporary road access to new bridge location to allow plant access and the construction of retaining walls.

Phase 2 (which requires rail possessions) comprises the installation of bridge support foundation using mobile crane, the installation of pre cast bridge beams and concrete infill during rail possession and applying bridge deck waterproofing.

Phase 3 includes formation of new reinforced earth ramp approach roads on each side, vibratory rolling, completion of new road surface, markings and signage and tie in of new and existing roads.

XC215 Shinanagh

Indicative construction methodology and sequencing has been provided. Construction of XC215 has been broken down into three phases:

Phase 1 comprises the stripping and excavation of the existing ground for new road formation and the formation of the earthwork's embankment for road construction.

Phase 2 comprises the road surfacing.

Phase 3 includes tying in new and existing roads.

XC219 Buttevant

Indicative construction methodology and sequencing has been provided. Construction of XC219 is broken down into three phases:

Phase 1 comprises the stripping and excavation of the existing ground for new road formation, the formation of the temporary road access for residents as well as the formation of temporary road access for new bridge location to allow plant access.

Phase 2 (which requires rail possessions) comprises the installation of a culvert over stream on the west side; the formation of temporary road to bridge structure; installation of retaining walls; the installation of bridge support foundation using mobile crane and the installation of pre cast bridge beams and concrete infill during rail possession and applying bridge deck waterproofing.

Phase 3 includes formation of new reinforced earth ramp approach roads on each side, vibratory rolling, completion of new road surface, markings and signage and tie in of new and existing roads.

Construction Vibration Calculations – Vibratory Earthworks Compaction

Vibration emissions resulting from the operation of the proposed vibratory roller during construction have been predicted using the empirical formulae presented within Table E.1 of BS 5228-2. Predictions have been made of vibration levels during steady state compaction and during the start-up and run-down transients. The formulae used in this assessment are presented below.

Vibratory compaction (steady state):

$$V_{res} = k_s\sqrt{n_d}\left(\frac{A}{x + L_d}\right)^{1.5}$$

Where V_{res} is the resultant PPV (mm/s), n_d is the number of vibrating drums, A is the maximum amplitude of drum vibration (mm), x is the distance measured along the ground surface (m), L_d is the vibrating roller drum width (m) and where k_s is the scaling factor for the probability of the predicted value being exceeded, and equates to 75 and 276 for a 50% and 5% probability of exceedance, respectively.

Vibratory compaction (start up and run down):

$$V_{res} = k_t\sqrt{n_d}\left(\frac{A^{1.5}}{(x + L_d)^{1.3}}\right)$$

Where k_t is the scaling factor for the probability of the predicted value being exceeded and equates to 65 and 177 for a 50% and 5% probability of exceedance, respectively.

The differences in prediction between a 50% probability and 5% probability of the predicted value being exceeded gives an indication of the uncertainty of the predicted levels, due to conditions that are not considered within the equation, including local ground conditions.