OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

DCO Submission

Environmental Statement

Chapter 5: Noise and Vibration
Appendix 5.10: Operational Noise Assumptions

Document 6.5J

On behalf of
Oxfordshire Railfreight Limited

Prepared by Vanguardia
February 2026

Appendix 5.10
Operational Noise Assumptions

HGV Activity

For the purposes of the assessment of HGV activity onsite, the traffic consultant provided a 24-hour profile of the likely heavy vehicle movements from each unit and at the rail freight terminal. From this profile, the peak hour of the day (07:00 – 23:00) and peak hour of the night (23:00 – 07:00) in terms of HGV activity was identified and included in the assessment.

A summary of the two-way HGV flows for the peak hour of the day and the night is provided in Table 1 below.

Table 1 Number of HGV movements (Two Way Flows)

Location on Main Site	**Daytime** Peak Hour 08:00-09:00	**Night** Peak Hour 05:00-06:00
Unit 1	53	31
Unit 2	50	29
Unit 3	34	19
Unit 4	38	22
Unit 5	25	15
Unit 6	30	18
Unit 7	30	18
Unit 8	6	3
Unit 9	14	8
Unit 10	6	3
Unit 11	7	6
Unit 12	15	9
Unit 13	8	5
Rail Terminal	73	55
Total	**389**	**241**

Based on experience of similar warehouse developments, it is assumed that during the 1-hour daytime assessment period, an HGV would arrive, reverse up to the warehouse unit dock leveller mechanism, be loaded or unloaded by forklift truck for 30 minutes, then pull away. Therefore, of the two-way flows provided, half the vehicles would reverse, be loaded or unloaded and then pull away. During the 15-minute night-time assessment period, it has been assumed that a quarter of the two-way flows would reverse, would load or unload, and pull away.

From the two-way flows in Table 1 above, the number of reversing, loading/unloading and pull away manoeuvres have been derived for the day and night-time assessment periods and are presented in **Error! Reference source not found.** and **Error! Reference source not found.** below.

Table 2 Number of sources allocated (Day)

Location on Main Site	Daytime period over a 1-hour assessment period		
	Reverse	Load / Unload	Pull Away
Unit 1	27	27	27
Unit 2	25	25	25
Unit 3	17	17	17
Unit 4	18	18	18
Unit 5	13	13	13
Unit 6	14	14	14
Unit 7	15	15	15
Unit 8	3	3	3
Unit 9	7	7	7
Unit 10	3	3	3
Unit 11	4	4	4
Unit 12	8	8	8
Unit 13	4	4	4
Rail Terminal	18	-	60

Table 3 Number of sources allocated (Night)

Location on Main Site	Night period over a 15-minute assessment period		
	Reverse	Load / Unload	Pull Away
Unit 1	8	8	8
Unit 2	7	7	7
Unit 3	5	5	5
Unit 4	5	5	5
Unit 5	4	4	4
Unit 6	5	5	5
Unit 7	5	5	5
Unit 8	1	1	1
Unit 9	2	2	2
Unit 10	1	1	1
Unit 11	2	2	2
Unit 12	3	3	3
Unit 13	1	1	1
Rail Terminal	12	-	42

The source sound levels for each manoeuvre/activity which form the basis of the operational calculations are presented in **Error! Reference source not found.**. To align with the assessment periods for day and night, corrections are applied to the source terms considered, which are presented in **Error! Reference source not found.** and **Error! Reference source not found.** below

Table 4 Source sound power levels of HGV movements within the warehousing yards

Source	Sound Power Level (dB)								
	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	dBA
Reverse	83	76	76	73	76	77	66	61	81
Load	87	86	87	86	83	80	76	70	88
Start-up/ pull away	89	83	80	79	79	76	69	60	83
Chiller reverse and pull away	92	88	75	75	72	70	64	40	79
Chiller hook up	78	83	83	80	80	78	75	73	85
Cab picking up trailer*	113	106	107	108	108	107	102	92	113
*Note this source is an L_{Max} level used in the assessment of maximum sound levels									

Table 5 Source sound power levels with on-time corrections as stated (Day)

Source	On time (mins)	Sound Power Level - corrected for day on-time (dB)								
		63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	dBA
Reverse	1	83	76	76	73	76	77	66	61	81
Load	30	87	86	87	86	83	80	76	70	88
Start-up/ pull away	1	89	83	80	79	79	76	69	60	83
Chiller reverse and pull away	1	92	88	75	75	72	70	64	40	79
Chiller hook up	30	78	83	83	80	80	78	75	73	85

Table 6 Source sound power levels with on-time corrections as stated (Night)

Source	On time (mins)	Sound Power Level - corrected for the night on-time (dB)								
		63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	dBA
Reverse	1	89	82	82	79	82	83	72	67	87
Load	15	90	89	90	89	86	83	79	73	91
Start-up/ pull away	1	95	89	86	85	85	82	75	66	89
Chiller reverse and pull away	1	98	94	81	81	78	76	80	66	85
Chiller hook up	15	81	86	86	83	83	81	78	76	88

The predictions of HGV activity noise at the receptors have been carried out in accordance with ISO 9613-2. All sources associated with HGV activity have been modelled as point sources.

Rail terminal activity

Following consultation with the rail consultant, a set of assumptions have been identified to reflect the typical operation of the site with respect to HGV activities, i.e., entrance, delivery / pickup, and departure. These source allocations have used the full peak hourly flow during the day and night based on the following steps:

- Each HGV entering the Rail Terminal would arrive at the gatehouse and then either reverse into a parking bay or be directed where to go within the terminal to be loaded or unloaded;
    - Half of the arrivals would go to a parking bay and reverse and do not access the rail terminal;
    - The other half of the arrivals pull away from the gatehouse and move into the rail terminal;
- HGV activity in the terminal is then represented by sources departing the terminal, where it is assumed that all would be loaded/unloaded, with the loading/unloading element would be undertaken by reach stackers/telehandlers (covered in the operational plant section); and
- It is assumed half of the total number of departures would use the primary (train to truck or truck to train) loading and half would use the secondary (container stack to truck/truck to container stack) loading. It is assumed that for safety reasons there would be no reverse activity associated with this but there would be a pull-away manoeuvre.

Vehicles travelling along access routes within the SRFI

The movement of HGVs between the entrance to the site and the destination warehouses has been modelled. Noise from heavy vehicles has been modelled as line sources based on the principles detailed in BS 5228 and ISO 9613. The number of vehicles has been derived for the daytime and night-time assessment periods based on the 24-hour vehicle profile provided by the traffic consultant (see Table 1). This profile has been applied to the relevant assessment period and the measured source terms presented in Table 7 below.

Table 7 Source sound power levels of HGVs travelling within the development

Source	Sound Power Level (dB)								
	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	dBA
HGV at 30mph	108	102	101	101	101	95	88	83	104
HGV at 10mph	97	95	90	91	92	90	83	75	96

These source reference levels (based on measured data) are then applied to line sources in the modelling software, corrected with the flows for the day and night assessment periods and then distributed across the site.

Operational plant sources at the Rail Terminal

The dominant operational plant sources serving the rail terminal are based on information provided by the rail consultants and experience of other schemes. These dominant noise sources are from the associated loading and unloading activities interfacing with the HGV deliveries and collections within the terminal. The main sources are Gantry Crane units, Container Handlers and Reach Stackers. The assumed number of plant units for the day and night assessment scenarios for the opening year is presented in Table 8 and for the future year in Table 9.

Table 8 Opening Year Operational plant sources at the rail terminal

Opening year - 4 trains per 24 hours					
Plant	**Sound Power Level (L_w)**	**Day (1 hour)**		**Night (15 min)**	
		Quantity	**On Time %**	**Quantity**	**On Time %**
Reach Stacker	108 dB	1	100	1	100
		1	50	1	50
Empty Container Handler	106 dB	1	100	1	100
		1	50	1	50
Note: no Gantry cranes are expected in the opening year and are not included in the modelling					

Table 9 Future Year Operational plant sources at the rail terminal

Future Year - 12 trains per 24 hours					
Plant	**Sound Power Level (L_w)**	**Day (1 hour)**		**Night (15 min)**	
		Quantity	**On Time %**	**Quantity**	**On Time %**
Reach Stacker	108 dB	3	100	3	100
Empty Container Handler	106 dB	3	100	3	100
Gantry Crane	Various (range from 99 dB – 84 dB)	3	85	3	100

The Reach Stacker and Container Handlers elements are evenly distributed around the operational areas of the rail terminal, with the Gantry Crane sources distributed along the terminal across the rail reception areas. The sound power levels allocated to these sources are presented in

Appendix 5.10 Operational Noise Assumptions

Table 10 below

Table 10 Source sound power levels of plant sources within rail terminal

Item	Sound Power Level - not corrected for on-time (Frequency Hz)								dBA	Source Heights (m)	Data Source
	63	125	250	500	1K	2K	4K	8K			
Reach stacker	104	110	104	102	103	102	96	-	108	1.5	Kalmar Eco reach stackers measured at EMG
Empty container handler	122	111	105	103	99	97	93	85	106	1.5	Telehandler Level from Database
Gantry movement	103	99	99	95	95	90	83	73	99	18.5*	Measurements Electric Gantry Crane
Gantry Alarm	89	90	88	86	85	89	84	74	93	3	Measurements Electric Gantry Crane
Gantry Spreader	98	93	92	92	88	83	77	67	93	6^	Measurements Electric Gantry Crane
Gantry Placement	90	86	85	81	78	76	69	59	84	6^	Measurements Electric Gantry Crane

Notes on Heights:
* Drive motors may be at a significantly lower height, just above the wheels; however, for the purposes of the predictions, all movement noise is assumed to be located at the top of the gantry crane as a worst-case.
^ Approximately the height of two stacked containers

Operational Train Movements within the Main Site

Rail activity associated with the Proposed Development is split into operational and Mainline Rail assessments; the key distinction between the two is the any rail activity on the new sidings or within the Proposed Development site is included in the operational assessment.

Based on discussions with the rail consultant, the following rail activities have been assumed once a train has entered the SRFI site:

1. A train enters from the north or south and pulls into the reception sidings;
2. The locomotive uncouples from the wagons then performs a “Runaround Activity” within the reception sidings, getting in position to move the wagons into rail served warehousing;
3. The locomotive, pulls or shunts the wagons to the rail served warehousing;
4. The locomotive then uncouples and returns to the other end of the wagons ready to shunt back to the reception siding;
5. The train then departs to the north, or the locomotive performs another runaround activity then the train departs to the south.

With regard to the activities assumed to be taking place within the day and night-time assessment periods, the following assumptions have been made based on 4 Trains per 24 hours in the opening year and 12 trains per hour in full occupancy in Table 11 below.

Table 11 Rail source assumptions per assessment

Phase	Activity	Number during peak hour of the day (07:00 – 23:00)	Number during peak 15 minutes at night (23:00 – 07:00)
Opening Year Peak Capacity of 4 trains per 24 hours	Arrival into the site	either 1 arrival or 1 departure	either an arrival, departure or pull away would occur in the 15-minute period but not all 3
	Run around	1	
	Departure	either 1 arrival or 1 departure	
	Shunting to rail served warehouse sidings	None	None
Future Year Peak Capacity of 12 trains per 24 hours	Arrival into the site	1	either an arrival, departure or pull away or shunt would occur in the 15-minute period but not all 4
	Run around	2	
	Departure	1	
	Shunting to rail served warehouse sidings	2	

For assessment purposes, the train arrivals and departures have been modelled in both directions, i.e. from/to both the north and south, and the higher predicted level has been taken to represent that activity at each receptor. For the night-time assessment, the highest predicted level of the different activity types has been selected at each receptor.

Noise from train movements within the SRFI has been modelled following the procedures in the Calculation of Railway Noise 1995 (CRN). This has included the following assumptions:

- All trains have been assumed to comprise a single Class 66 Locomotive with 37 Composite Tread Braked Wagons;
- The speed of trains as they arrive or depart the SRFI has been advised by the rail consultant, with a minimum speed of 8 km/h (5 mph);
- The speed of trains for wholly internal activities (i.e. activities 2 to 4) has been assumed to be 8 km/h (5 mph);
- Periods where the locomotive is on-power (as opposed to rolling) during an arrival or departure activity have been advised by the rail consultant. For wholly internal activities, the associated locomotive has been assumed to be on-power at all times;
- CRN does not include a source term for a shunting type of locomotive. Therefore, a Class 66 Locomotive has been assumed to be carrying out the shunting operations.

Noise levels have been predicted using the normal CRN metrics of $L_{Aeq,18hr}$ for the day and $L_{Aeq,6hr}$ for the night, and then re-averaged to arrive at 1 hour and 15-minute noise levels respectively for use in the operational noise assessment.