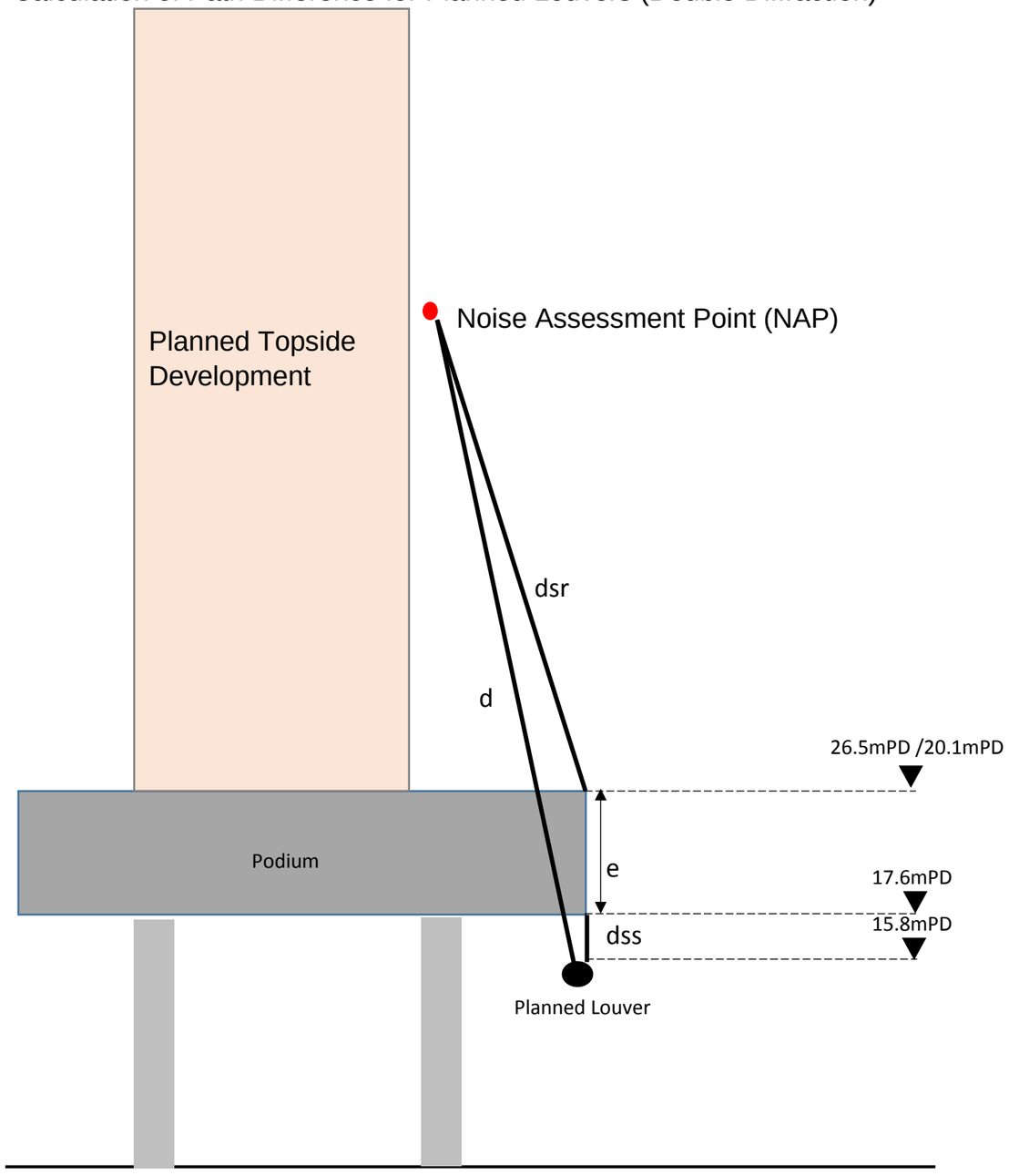
Calculation of Path Difference for Fixed Plant Noise Source

Calculation of Path Difference for Planned Louvers (Double Diffraction)

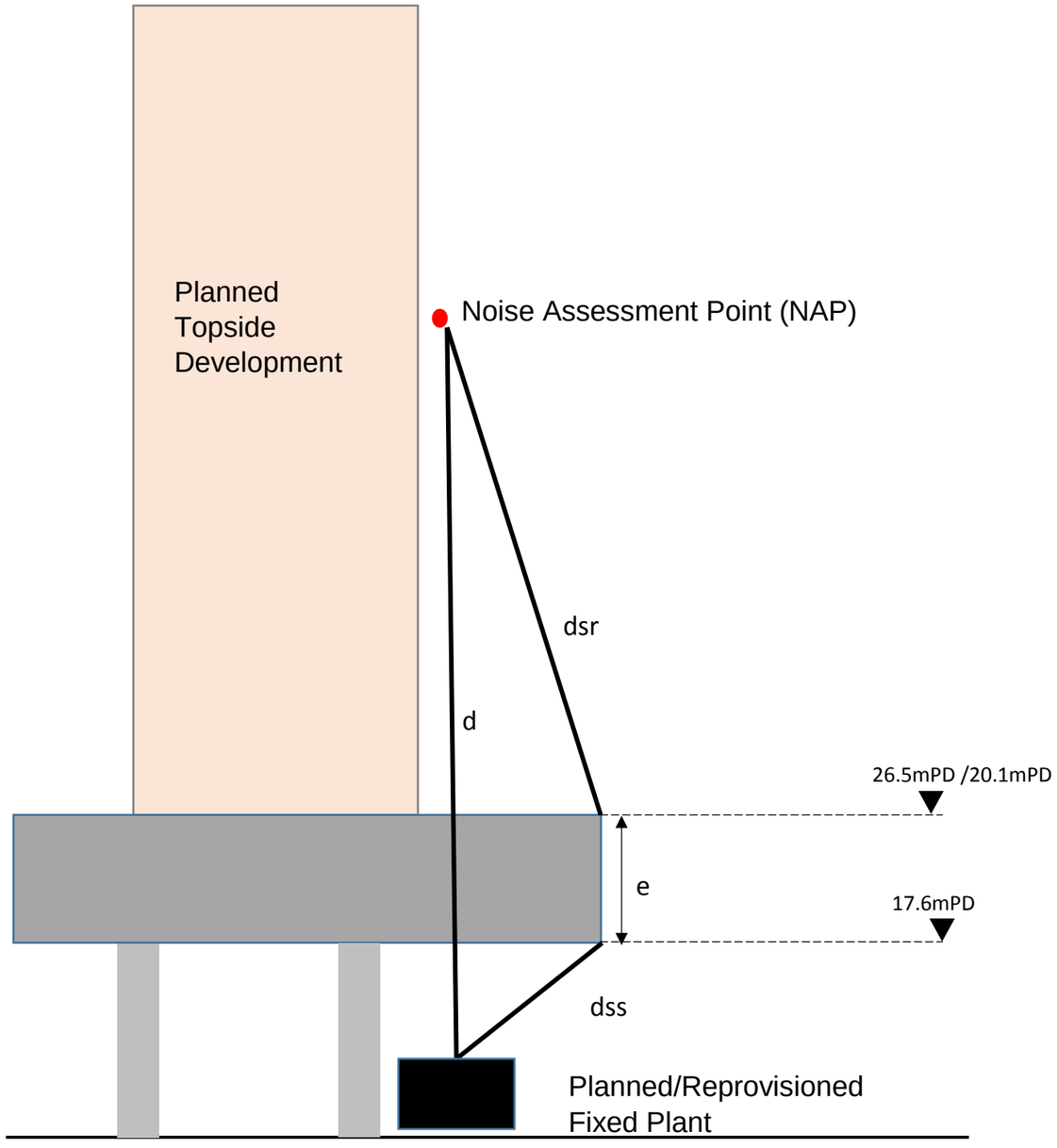


$$z = [(dss + dsr + e)^2 + a^2]^{1/2} - d$$

where

dss	is the distance from the source to the (first) diffraction edge, in metres;
dsr	is the distance from the (second) diffraction edge to the receiver, in metres;
a	is the component distance parallel to the barrier edge between source and receiver, in metres.

Calculation of Path Difference for Underdeck Planned Fixed Plant (Double Diffraction)

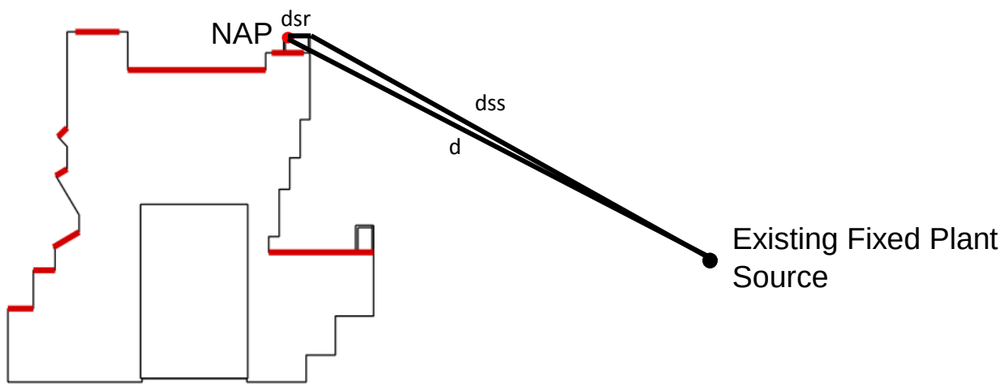


$$z = [(dss + dsr + e)^2 + a^2]^{1/2} - d$$

where

dss	is the distance from the source to the (first) diffraction edge, in metres;
dsr	is the distance from the (second) diffraction edge to the receiver, in metres;
a	is the component distance parallel to the barrier edge between source and receiver, in metres.

Calculation of Path Difference for Existing Fixed Plant Source Screening by Utility Platform (Single Diffraction)

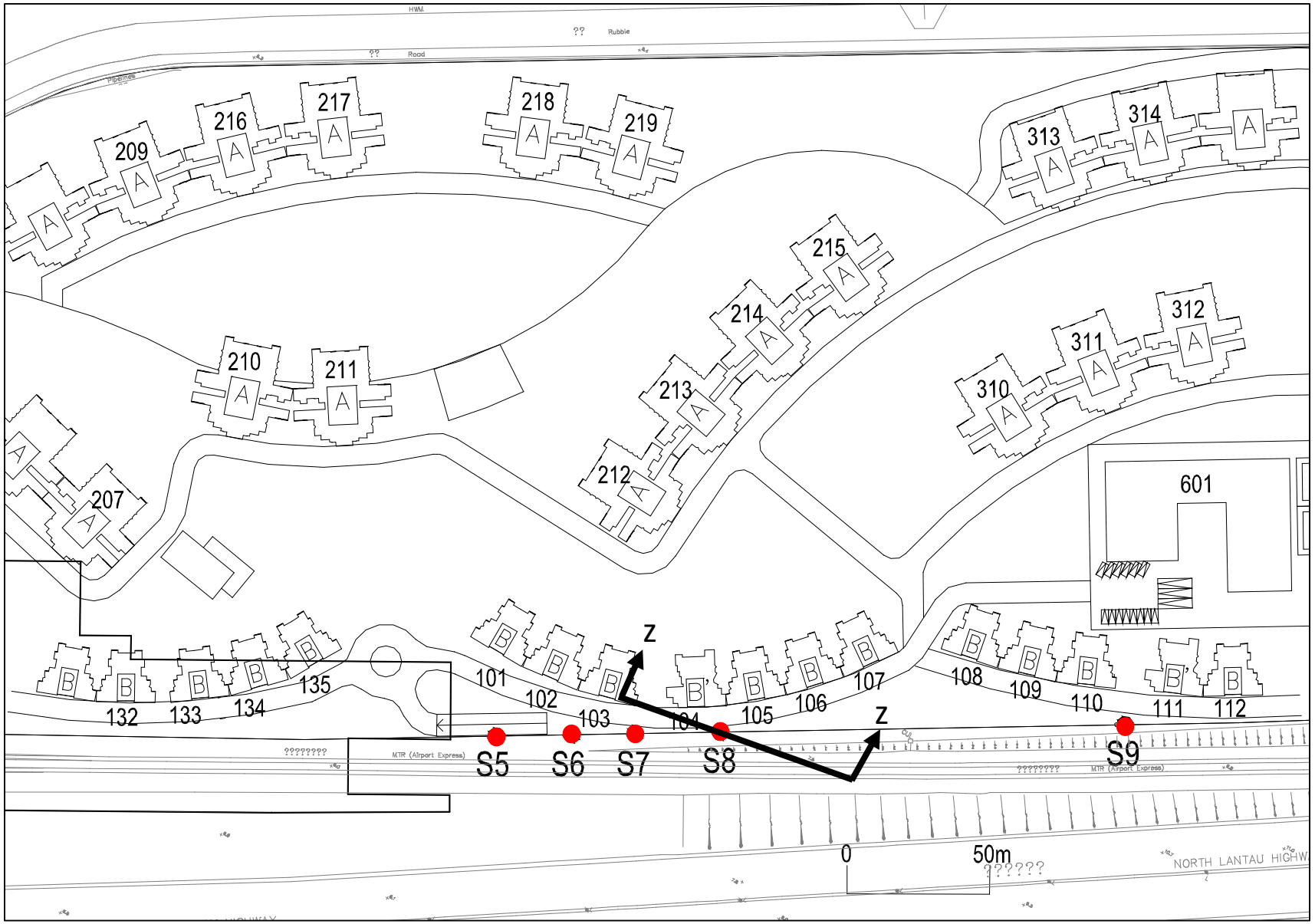


$$z = [(dss + dsr)^2 + a^2]^{1/2} - d$$

where

dss	is the distance from the source to the (first) diffraction edge, in metres;
dsr	is the distance from the (second) diffraction edge to the receiver, in metres;
a	is the component distance parallel to the barrier edge between source and receiver, in metres.

Noise Canopy Section for R103-01



R103-01 (Section Z-Z)

Source:

1. Louver S8

Parameter		Remark	Input/ Results
D	Barrier attenuation	D = 10*log [3+(C2/λ)*C3*z*k] (dB(A))	**19.7**
C2	Ground reflections	20 for normal ground reflection effects	20
C3	Diffraction	1 for single diffraction	1
f	Frequency	Sound frequency (Hz)	200 [1]
v	Velocity	Sound velocity (m/s)	343
λ	Wavelength	v/f (m)	1.7
z	Path difference	z = [(a+b)^2+(a')^2]^1/2 - c (m)	7.8
a	Path 1	Distance from diffraction edge to receiver (m)	67.5
b	Path 2	Distance from source to diffraction edge (m)	2.0
c	Path 3	Slant distance from source to receiver (m)	69.2
k	Meteorological factor	k = exp(-(1/2000)*SQRT((a*b*c)/(2*z))) for z > 0	1
a'	Component distance	Distance parallel to the barrier edge between source and receiver (m)	33.2

Notes:

[1] Based on site measurement conducted by Railway EIA, the dominant frequency of louvers ranges from 200Hz to 1kHz. Therefore 200Hz is adopted in the fixed noise assessment for conservative purpose.

[2] 10dB(A) has been adopted in the fixed noise assessment for conservative purpose.