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**Project Metrolink Railway Order
Estuary to Charlemont via Dublin Airport
(ABP-314724-22)**

AN BORD PLEANÁLA

04 MAR 2024

LTR DATED _____ FROM Irish Life

LDG- _____ Conor O'Donnell

ABP- _____

Oral Hearing
Statement of Evidence
on
Tunnelling Induced Ground Movements & Building Damage Assessment for the
Cadenza Building, Earlsfort Terrace, Dublin 2
by
Mr. Conor O'Donnell, BA, BAI, MS, FGS, CEng, MIEI, FConsEI
4th March, 2024

Phase 2a Building Damage Assessment (BDA) – Cadenza Building, Earlsfort Terrace

- No assessment for Cadenza Building in Building Damage Report (BDR), despite the fact that it would be classified in the BDR as a “Case B” Building requiring special consideration due to basement.
- Phase 2a assessment in the BDR (Appendix A5.17) carried out for Davitt House, which was demolished in 2019. Cadenza Building reached Practical Completion in October 2022 – prior to Railway Order
- Phase 2a Building Damage Assessment for the Cadenza Building presented in attached Technical Note (24-115-TN001).
- Used methodology for *Refined* Phase 2a BDA with lower ground loss parameters (0.5%/1.0%) considered by Jacobs/IDOM to be representative of equipment and methodology that will be used.
- Carried out assessment for revised Limits of Deviation proposed, i.e.:
 - +1.0m vertically upwards
 - -10.0m vertically downwards (Considered -5.0m)
 - ±15.0m on horizontal alignment (Assessed qualitatively)

Phase 2a Building Damage Assessment (BDA) – Cadenza Building, Earlsfort Terrace

- At Design Profile Level – Estimated damage category is **Risk Category RC-2 (Slight)** but damage criteria exceeds tolerances for façade and basement waterproofing system => likely significant effect.
- High concentrated building foundation loads (1,000kPa) could result in higher risk category.
- Significantly, **TBM will impact the base of the anti-flotation anchors** for the rainwater harvesting tank in the basement => likely very significant effect on building & tunnelling.
- Tunnel will need to be lowered to avoid anchors.
- At +1.0m LoD – slight increase in building distortion and damage, increasing to **RC-2/3 (Slight to Moderate)** for façade due to lower foundation level for perimeter structural piles.
- Increased impact of concentrated foundation loads & still hits anti-flotation anchors.
- Damage criteria at lower tunnel level (-5.0m) reduces to **RC-1 (Very Slight)** for building and **RC-1/2 (Very Slight to Slight)** for façade – could still exceed structural tolerances.
- Greater potential to comply with structural tolerances but would need to be confirmed by Phase 3 Assessment as part of approval process.

Risk Management

“It’s not what you don’t know that gets you into trouble, it’s the things that you know for sure will never happen”

Mark Twain

(paraphrased)