METROTUNNEL

# DOMAIN

## COMMUNITY REFERENCE GROUP

11 August 2021

RAIL PROJECTS VICTORIA

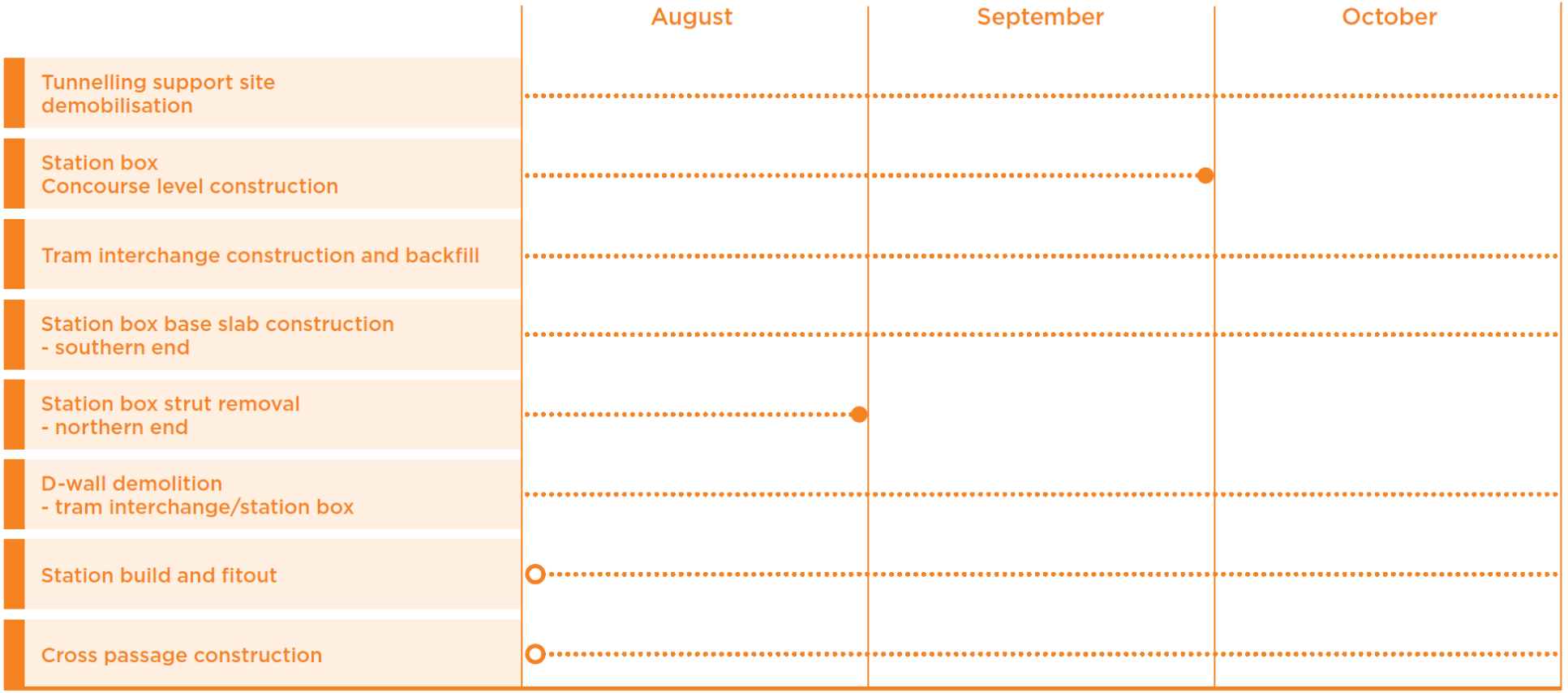
VICTORIA'S BIG BUILD

VICTORIA State Government

# CYP UPDATE

# WORKS UPDATE

## 2021 LOOK AHEAD




*All dates current at the time of publication, however are subject to change.*

# WORKS UPDATE: TUNNEL WORKS

# CROSS PASSAGES AND INVERT WORKS

## COMPLETED TUNNELS

- Cross passage construction is progressing between Anzac Station and Town Hall Station
- Excavation is completed on XP 18 and ongoing on cross passages 15, 17 and 19
- Between Anzac Station and Eastern Portal works are progressing on the concrete base invert for the future track
- Staged from Eastern Portal the team begin at Anzac Station and work their way back to Eastern Portal
- The team have currently completed 70% of invert concrete in the first tunnel.

*Invert pours underway*

# EDMUND HERRING OVAL

## SLURRY TREATMENT PLAN DECOMMISSIONING

- Decommissioning of Edmund Herring Oval slurry treatment plant is progressing well
- Last week the teams began removing the filter press bays at the northern end of the oval
- The area will become a future laydown area as well as accommodating additional site sheds.

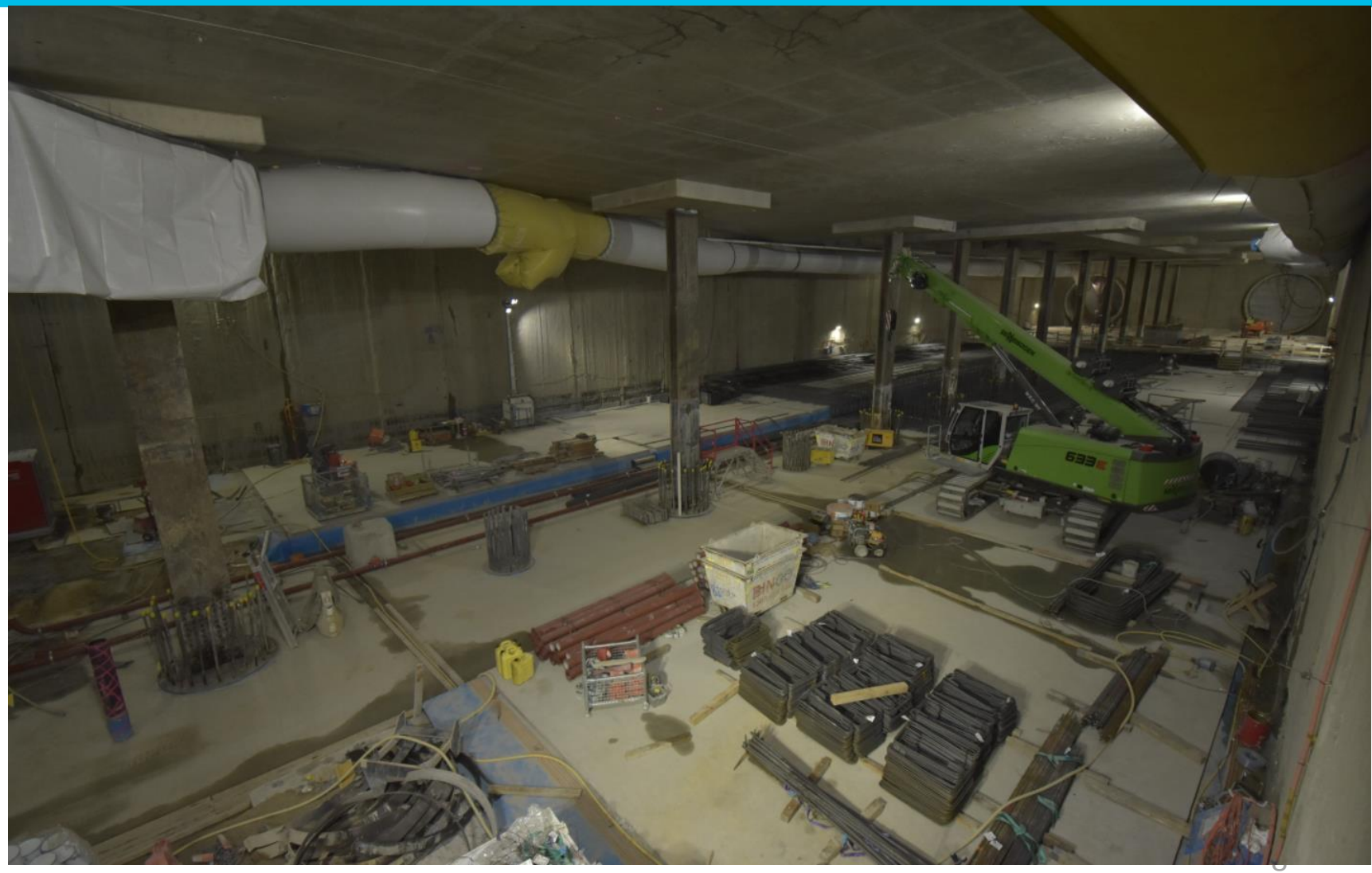

*Filter Press bays are demolished*

# WORKS UPDATE:
# STATION CONSTRUCTION

# WORKS UPDATE

## SOUTH BOX BASE SLAB CONSTRUCTION

- The base slab is being poured in sections, working from south to north, with works 24/7 underground
- The first section was poured on 27 July
- Formwork and concrete pours will continue on the internal columns and walls until the end of 2021.



*Base slab works underway in the south box*

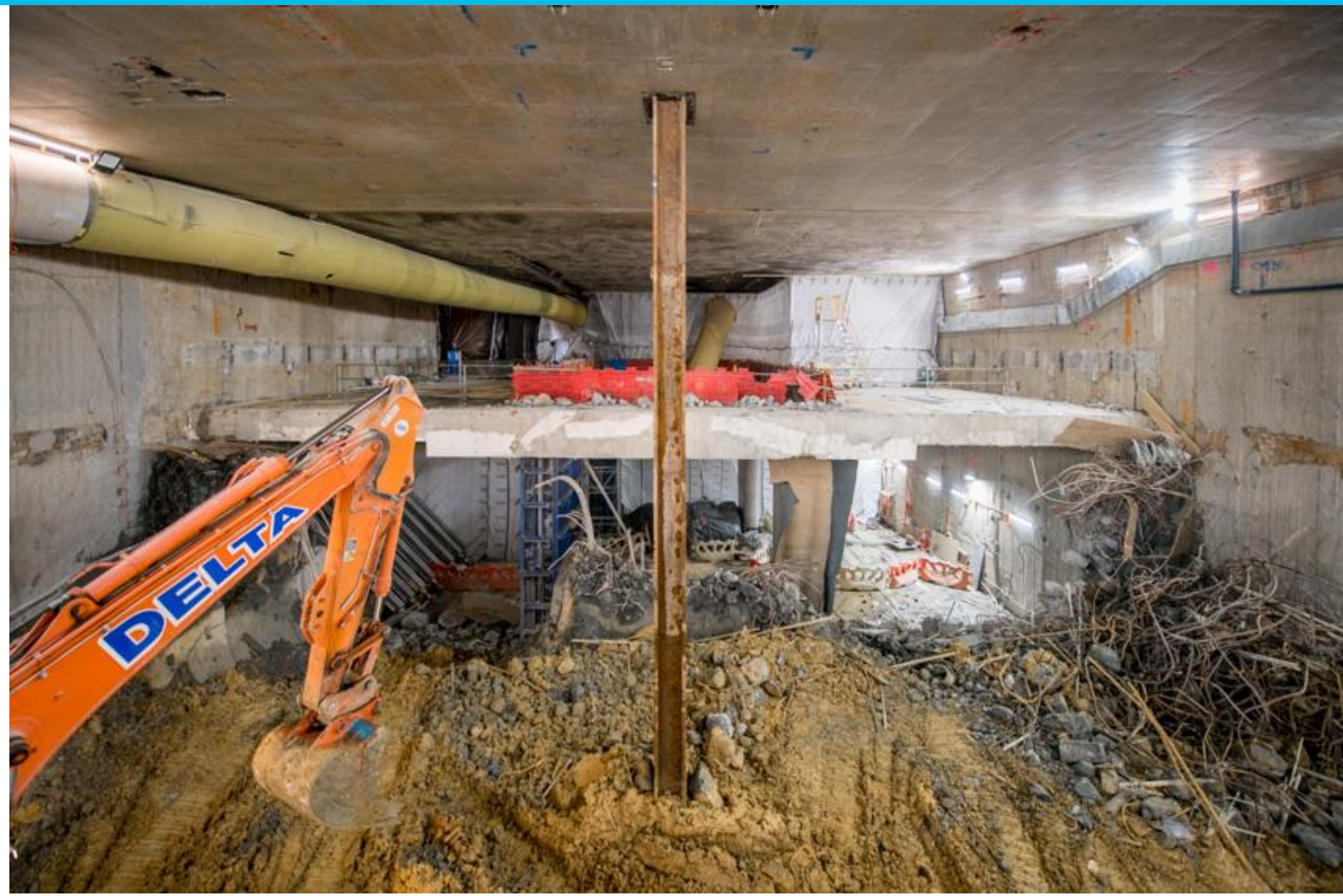
# SOUTH BOX CONSTRUCTION

SOUTH BOX FACING NORTH

# TEMPORARY D-WALL DEMOLITION

## BETWEEN NORTH BOX AND SOUTH BOX

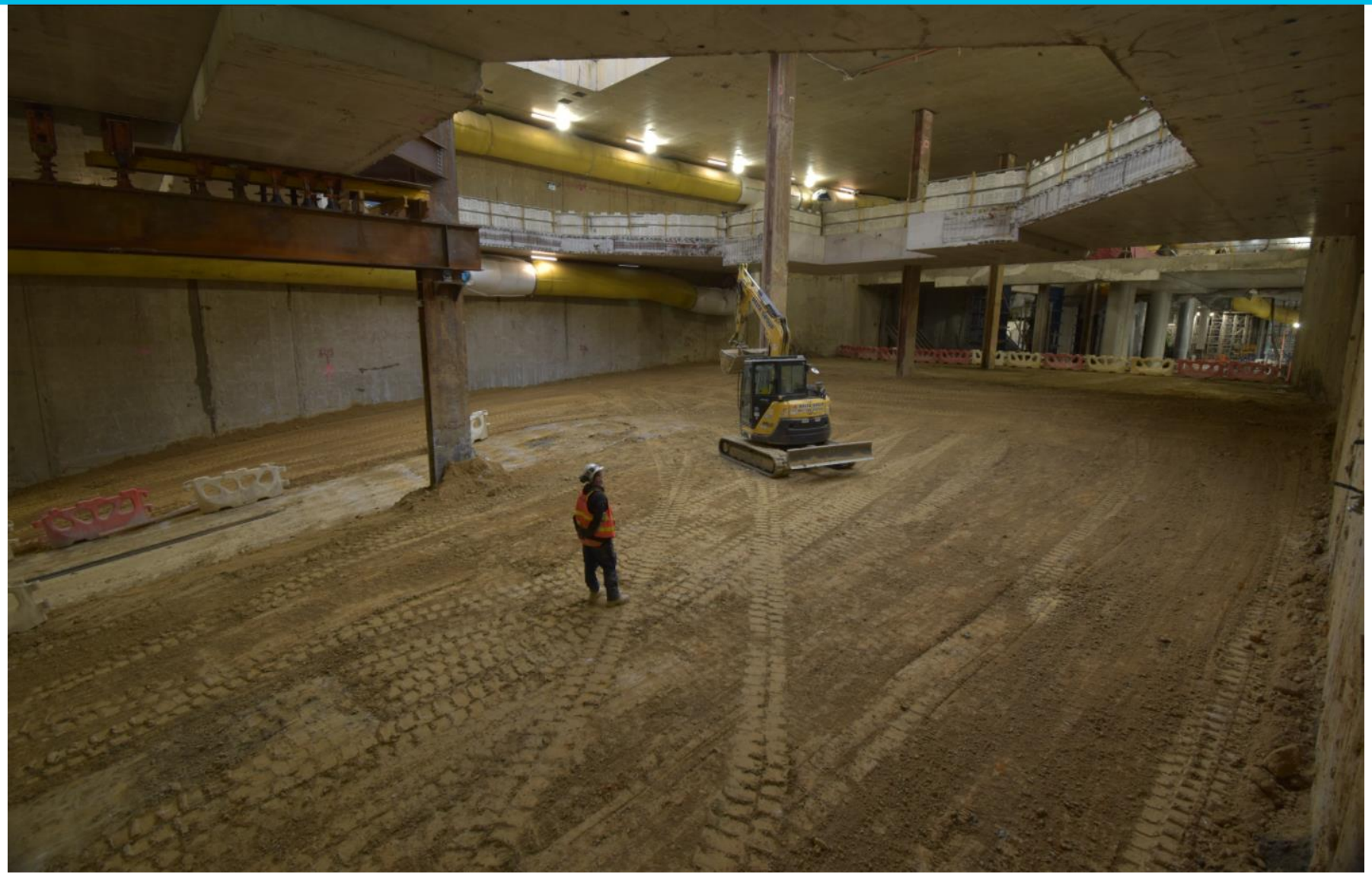
- The temporary D-wall separating the south box and north box has now been removed
- This has connected the entire station box for the first time
- Only a small section of excavation is remaining before the entire station box has been excavated.




*Northern end of the south box – excavation and demolition*

# TEMPORARY D-WALL DEMOLITION

BETWEEN NORTH BOX AND SOUTH BOX



# WORKS UPDATE

## SOUTH BOX CONCOURSE CONSTRUCTION

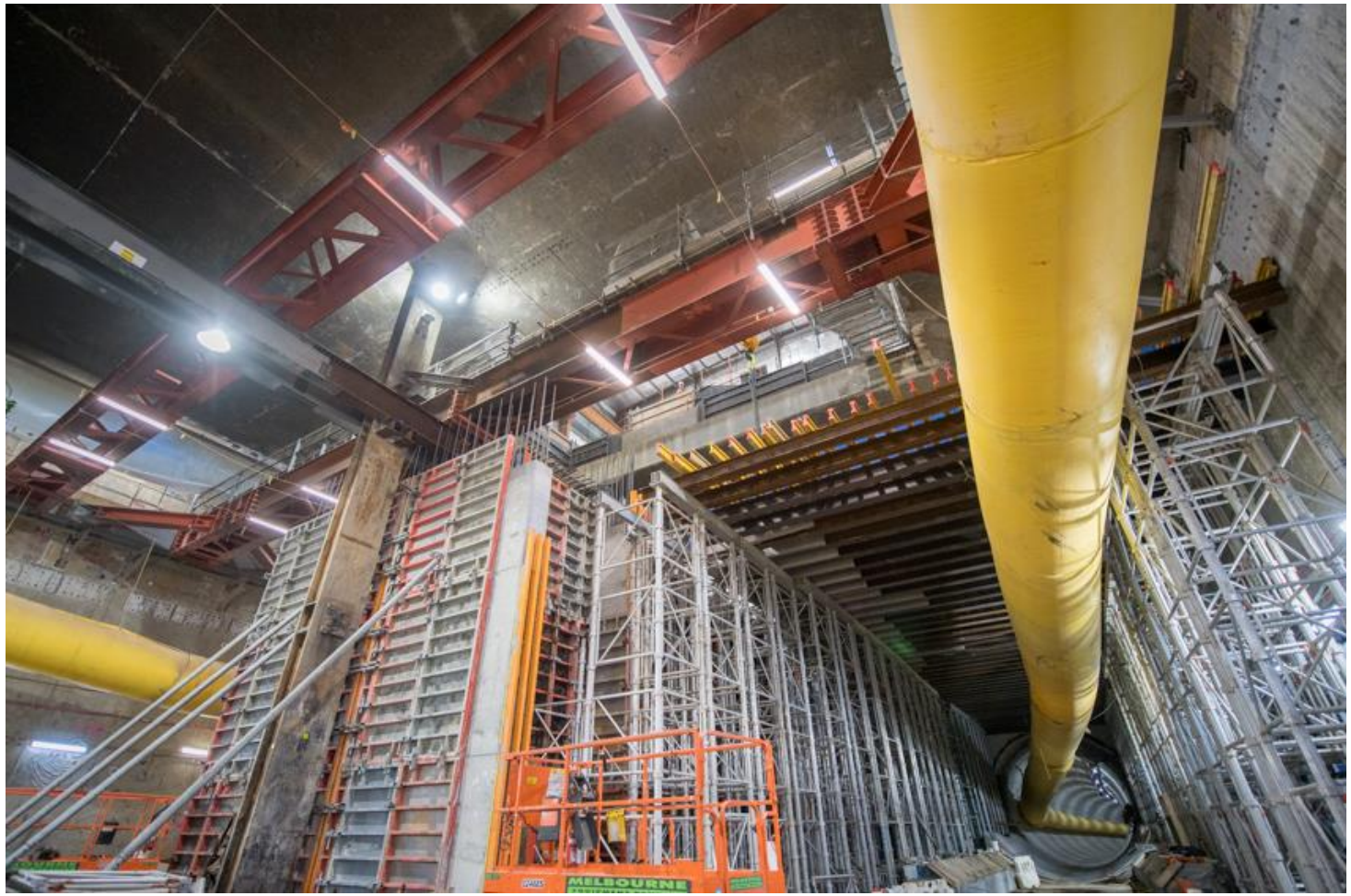
- The southern section of the concourse level is progressing well
- Rooms are progressively being formed up and poured with blockwork underway in other areas
- These rooms will serve as a ‘back of house’ section of the new station.

*Construction of internal rooms at the concourse level*

# WORKS UPDATE

## NORTH BOX (PLATFORM LEVEL)

- At the platform level of the north box, falsework has now been installed to fill-in one of the two concourse level voids
- Construction of internal columns and lift core are also underway
- The northern end of the station box is also the access point for cross passage works between Anzac Station and Town Hall Station
- Excavated cross passage material is being removed via Anzac Station, while materials are progressively fed down.



*Northern end of the north box*

# WORKS UPDATE

## NORTH BOX (CONCOURSE LEVEL)

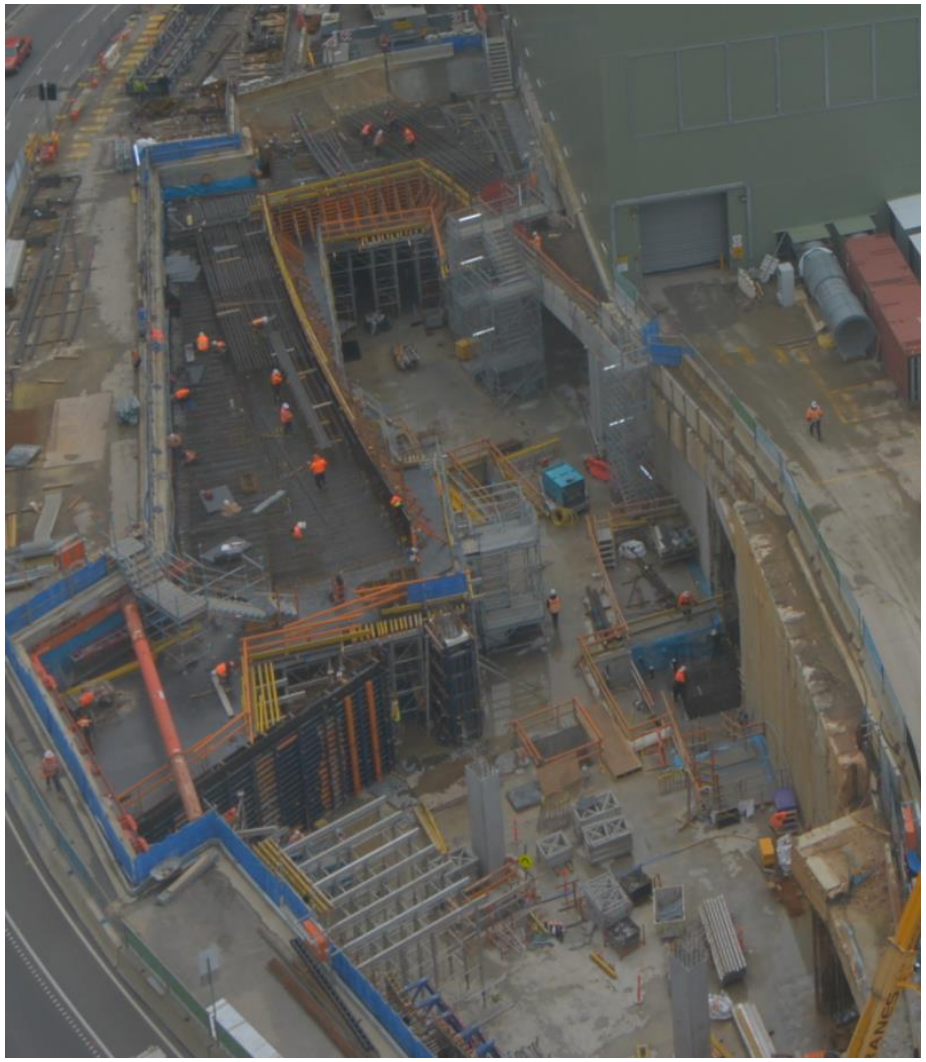
- At the southern end of the north box concourse, the first batch of red struts have now been removed
- As the remaining sections of the concourse are poured (including the void infill), the remaining struts will be progressively removed.

*Steel fixing underneath the station support struts*

# WORKS UPDATE

## TRAM INTERCHANGE

- The base slab for the Tram interchange is now complete
- Lining walls and columns continue to be poured in the tram interchange
- The first section of the D-Wall was removed last month. These demolition works will recommence later in August
- As the formwork for the tram box roof progresses, the opening in the tram interchange starts to take shape.




*Steel fixing and demolition in the tram interchange*

# WORKS UPDATE

ANZAC STATION AERIAL

# ENVIRONMENT UPDATE

# ENVIRONMENT UPDATE

TRAM BOX D-WALL BREAKOUT

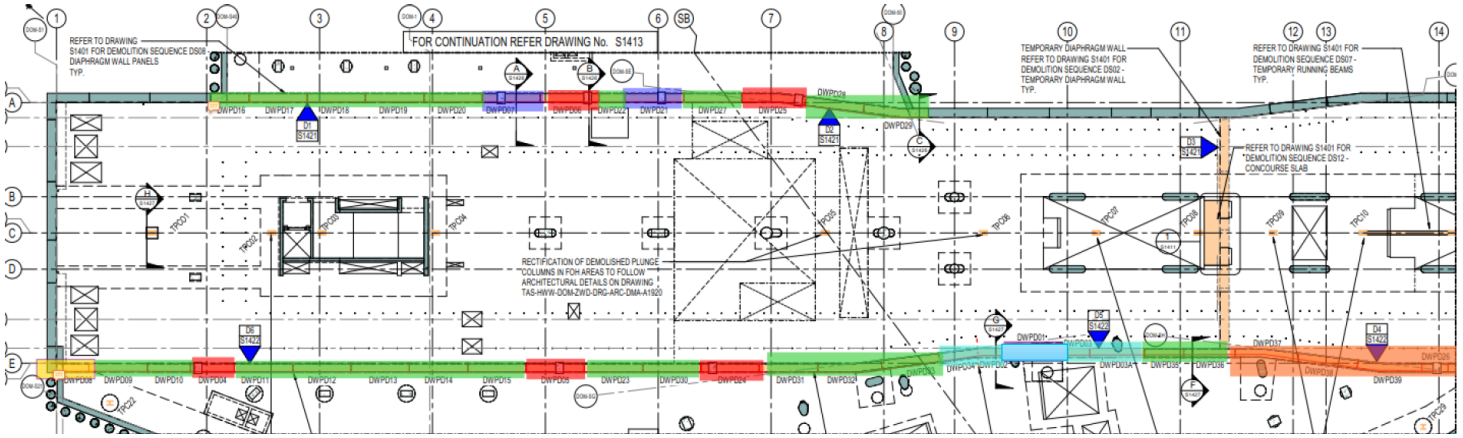

**Excavator with jackhammer**

| Building | Modelled Noise Level dBa Laeq | Measured Noise Level dBa Laeq |
|---|---|---|
| The Domain | 73-76 | 76 |
| The Botanica | 62-64 | 66 |
| Hallmark | 69-71 | 71 |
| Domain Hill | 71-72 | 71 |
| Melbourne Grammar School (Internal) | 40-48 | 47 |

# PROGRAM REFRESHER

## D-WALL DEMOLITION

- All demolition of the D-walls will take place during the day
- The team will first saw cut the section to be removed, before using excavators with breakers to demolish the D-wall
- At times these works will generate periods of high level noise




**Stage 1 (Blue)**

- Late June to Early July

**Stage 2 (Red and Purple)**

- August to September
- Includes construction of structural columns

**Stage 3 (Green and Orange)**

- September to October

# ENVIRONMENT UPDATE

# OPERATIONAL NOISE MODELLING

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AAW Design Joint Venture
Arcadis | Arup | WSP

# Operational Groundborne Noise & Vibration Design

## Melbourne Metro Tunnels and Stations

# Operational Groundborne Noise and Vibration (GBN&V)

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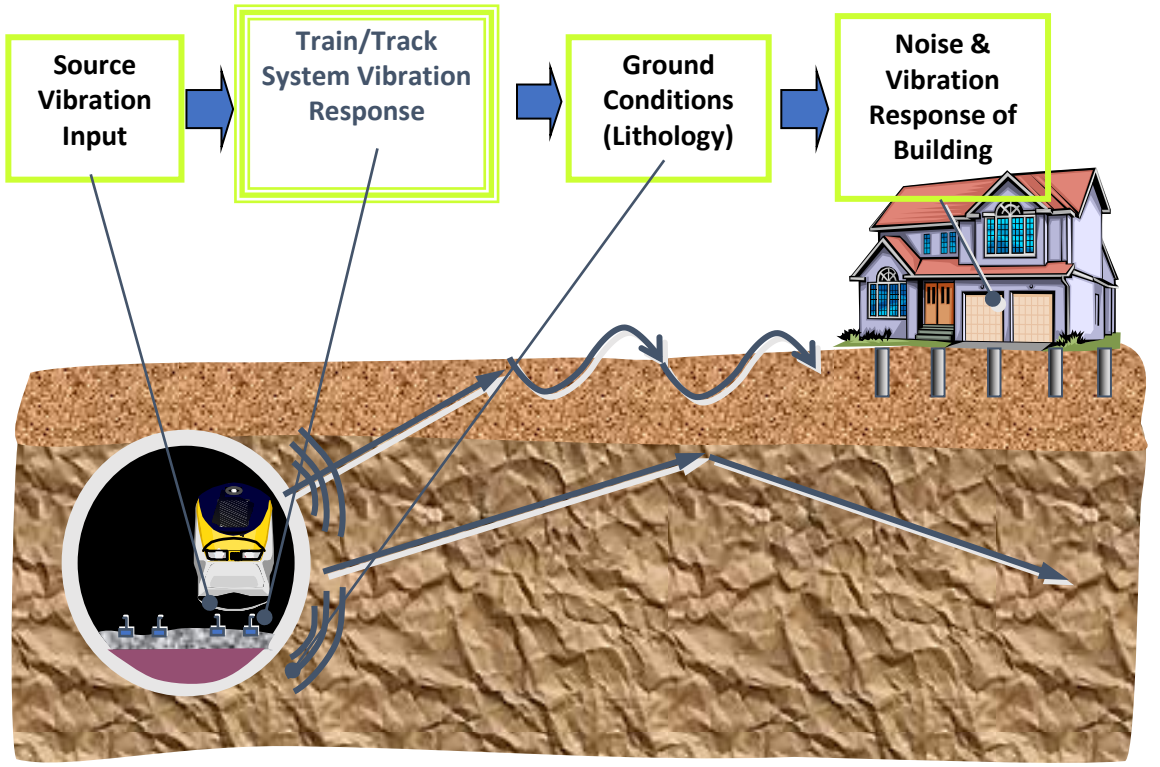
AAW Design Joint Venture
Arcadis | Arup | WSP

- GBN&V Design has been undertaken as a major design package with interfaces to other packages;
  - In Car Noise
  - Track Design
- Detailed review & approval by RPV (Graham Brown, AJM), IR (Michael Allen, AECOM), MTM (NDY)
- EPRs
  - NV12 Sensitive Equipment Guideline Targets
  - NV19 Groundborne Noise Guideline Targets for Operation
  - NV20 Vibration Guideline Targets for Operation
- PS&TR requirement to *design* to 5 dB less than the EPR requirement and *achieve* 2 dB less than the EPR requirement, represent *additional* contingency

# Approach



- Adopt validated CTRL/HS1/Crossrail hybrid empirical method
  - Based on > 3,000 measurements. Tested, validated and scrutinised at public enquiry on urban mass transit systems globally.
- Consistent with ISO 14837
  - Train design
  - Train speed
  - Track design
  - Tunnel design
  - Tunnel depth
  - Ground conditions
  - Receiving building foundations and building type.



# Roughness Input

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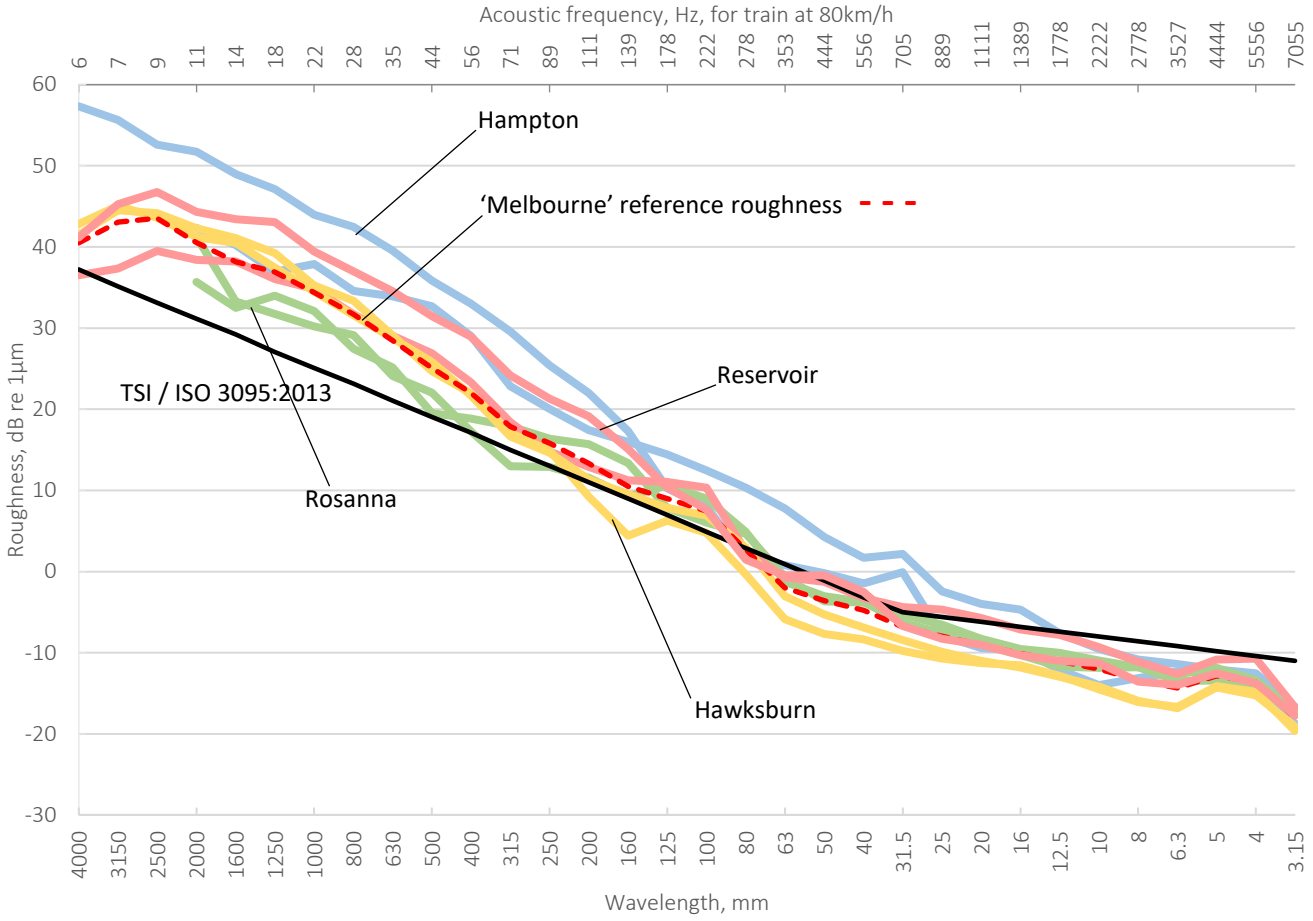

# MURL Roughness

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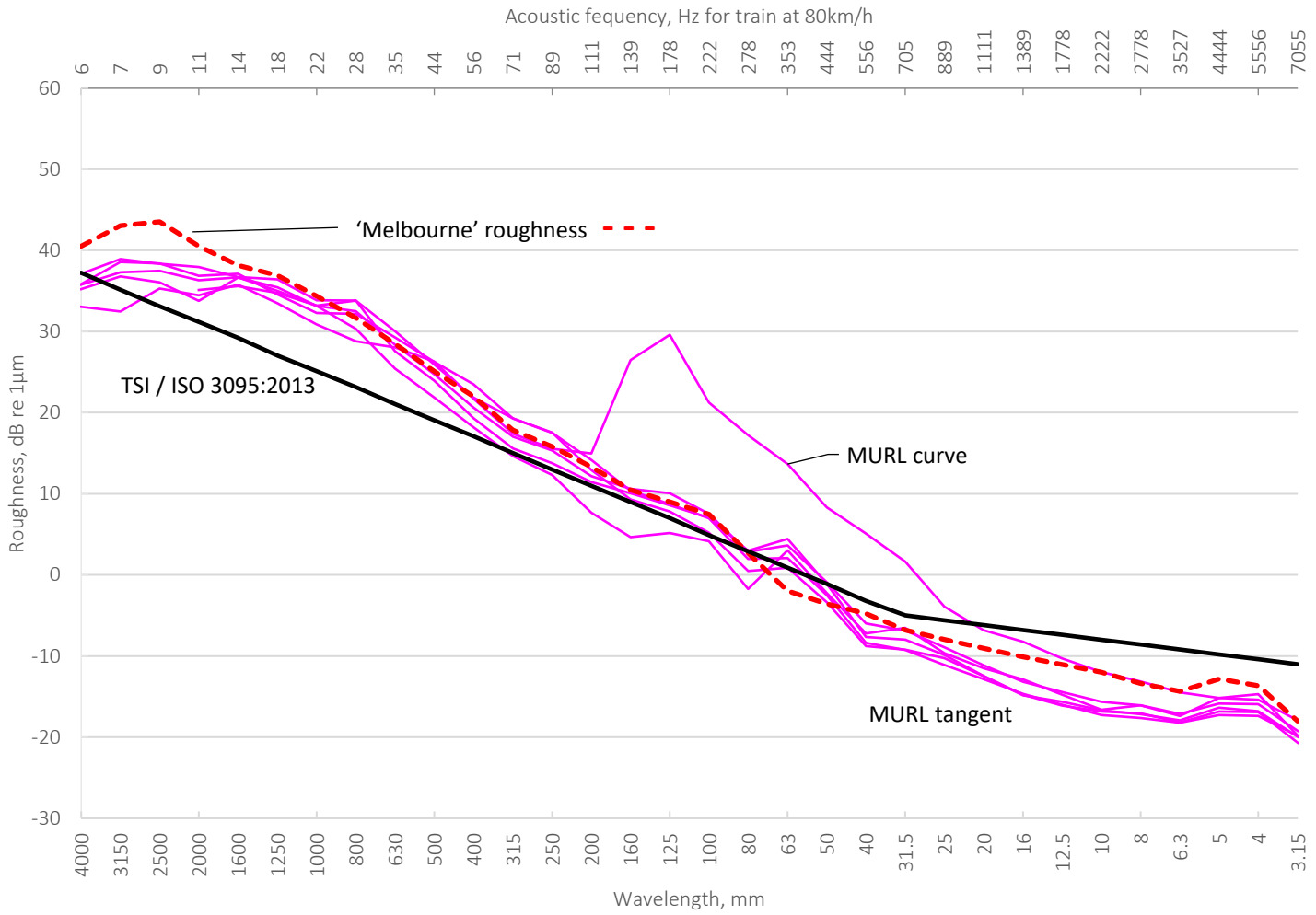

# Modelling and Prediction Methodology

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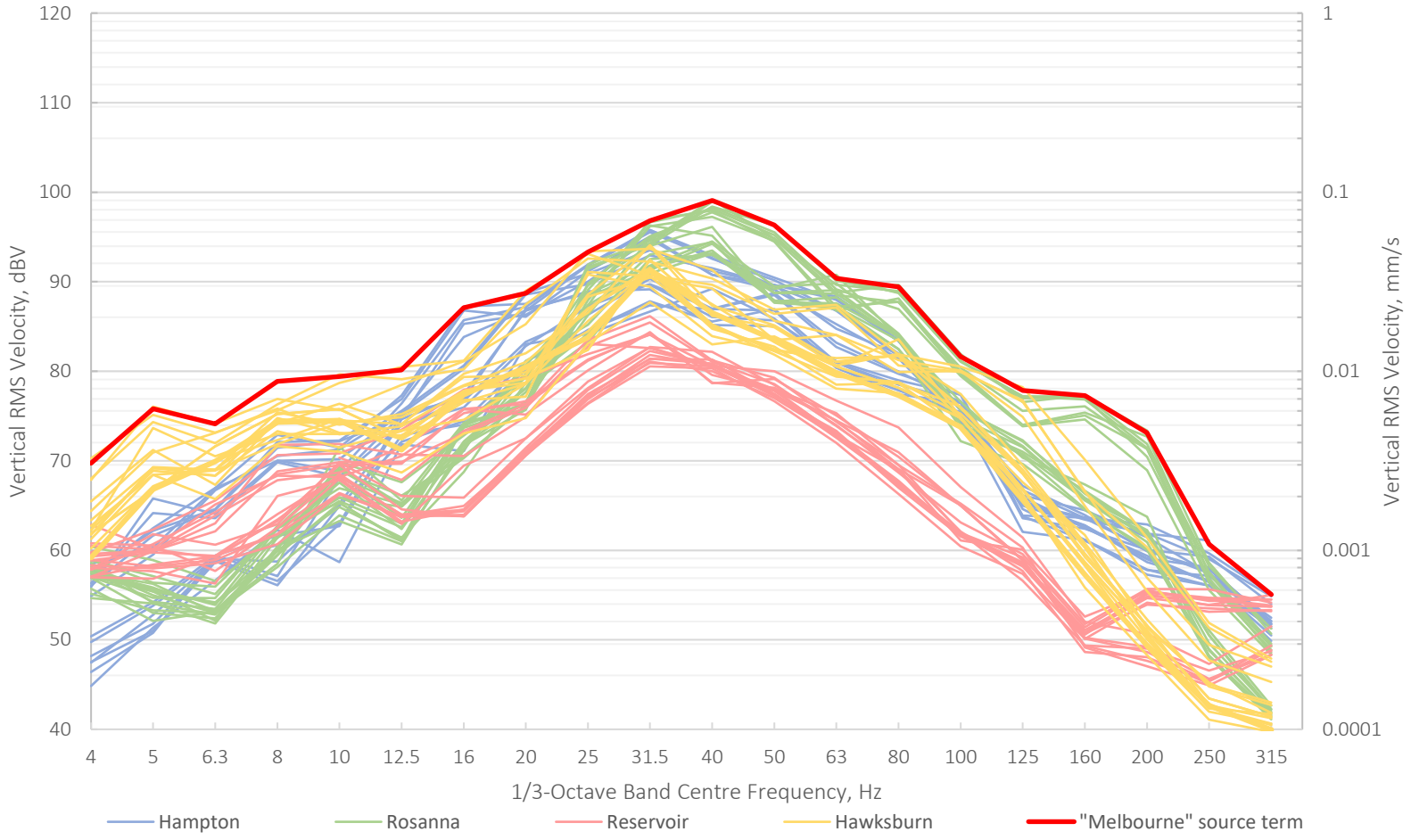
- Normalised Source level measurements
  - Speed
  - Distance
  - Track Roughness



# Track fixing assemblies

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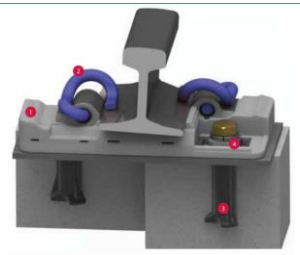
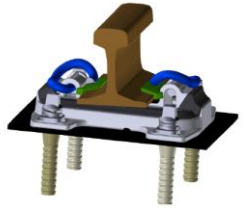
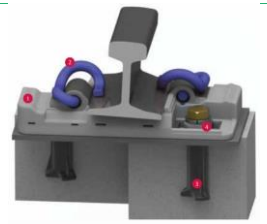
| Fastening System | Key Properties | |
|---|---|---|
| Delkor Alt 1 RF 191 | Static Stiffness: 22kN/mm<br>Dynamic Stiffness: 25kN/mm<br>Max Axle Load: 26T<br>Lateral Adjustment: +/- 24mm<br>Vertical Adjustment: 0 - 25mm (with packers)<br>Vertical Deflection: Up to 4.5mm |  |
| Pandrol Vipa | Static Stiffness: 20kN/mm<br>Dynamic Stiffness: 25kN/mm<br>Max Axle Load: 26T<br>Lateral Adjustment: +/- 10mm<br>Vertical Adjustment: 0 - 20mm<br>Vertical Deflection: 2.2mm |  |
| Pandrol DFF High Stiffness | Static Stiffness: 20kN/mm<br>Dynamic Stiffness: 25kN/mm<br>Max Axle Load: 26T<br>Lateral Adjustment: +/- 10mm<br>Vertical Adjustment: 0 - 20mm<br>Vertical Deflection: 2.2mm |  |
| Vossloh 300 | Static Stiffness: 17kN/mm<br>Dynamic Stiffness: 28kN/mm<br>Max axle load: 26T<br>Lateral adjustment: +/- 8mm<br>Vertical adjustment: -4/+76mm<br>Vertical Deflection: <1.5mm<br>Note: This fastener is only compatible with the longitudinal plinth trackform. |  |

| Fastening System | Key Properties | |
|---|---|---|
| Delkor Egg RF 167 | Static Stiffness: 6.5kN/mm<br>Dynamic Stiffness: 7.6kN/mm<br>Max axle load: 25T<br>Lateral Adjustment: +/- 30mm<br>Vertical Adjustment: 0 - 15mm (with packers)<br>Vertical Deflection: Up to 4.5mm |  |
| Pandrol Vanguard | Static Stiffness: 9kN/mm<br>Dynamic Stiffness: 11kN/mm<br>Max Axle Load: 26T<br>Lateral Adjustment: +/- 10mm<br>Vertical Adjustment: 0 – 20mm<br>Vertical Deflection: 4.7mm |  |
| Pandrol DFF Low Stiffness | Static Stiffness: 9kN/mm<br>Dynamic Stiffness: 11kN/mm<br>Max Axle Load: 26T<br>Lateral Adjustment: +/- 10mm<br>Vertical Adjustment: 0 – 20mm<br>Vertical Deflection: 4.7mm |  |
| Vossloh 336 | Static Stiffness: 8kN/mm<br>Dynamic Stiffness: 8.5<br>Max axle load: 18T<br>Lateral adjustment: +/- 10mm<br>Vertical adjustment: + 20mm<br>Vertical Deflection: Up to 3mm |  |

# Sensitive Receiver Locations



- CYP Verification of ‘ambient’ levels
- Assessment of Isolation system performance

# Construction, Commissioning & Compliance

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- Validation measurements
- Review and evaluation of detailed track component selections with suppliers (Ongoing)
- Preparing commissioning measurement & compliance plan (Dec 2020)
  - Outline proposed commissioning test procedure
  - Locations

# Groundborne N&V Summary

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- Ground Borne Noise is compliant with EPR
- eVDV Compliant at all residential locations

# METRO TUNNEL CREATIVE PROGRAM

# Tai Snaith: Collected Walks

From September 2021


# RU OK Day

Thursday 9 September 2021

# QUESTIONS?