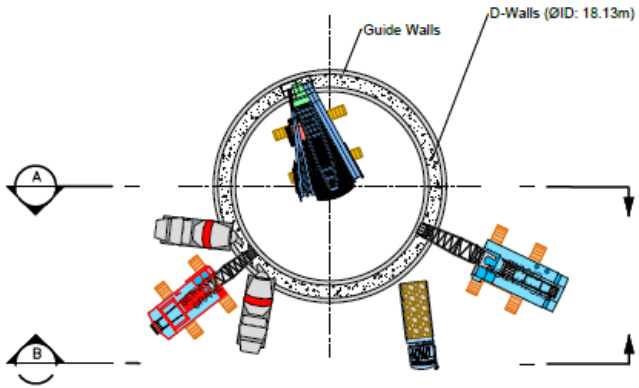


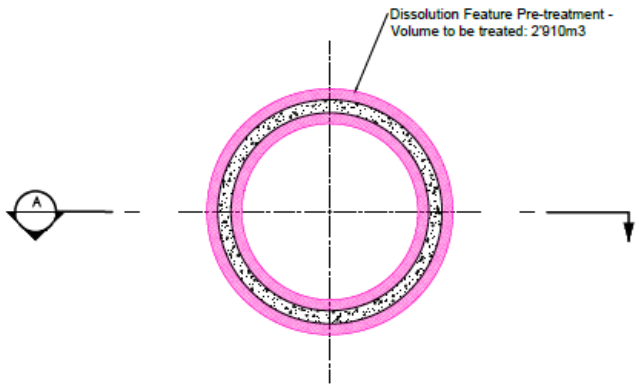
Appendix 1 Indicative construction sequence at Chalfont St Peter

Code 1 - Accepted

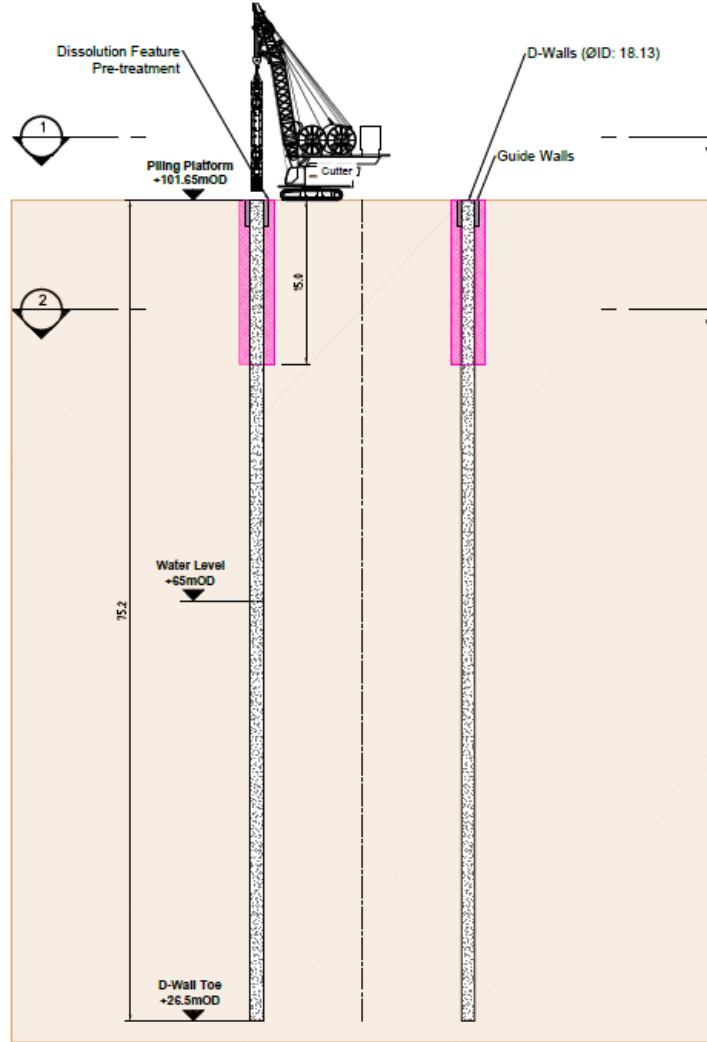
Stage 1 :
1. Dissolution Feature Pre-treatment Works
2. D-Walls Works



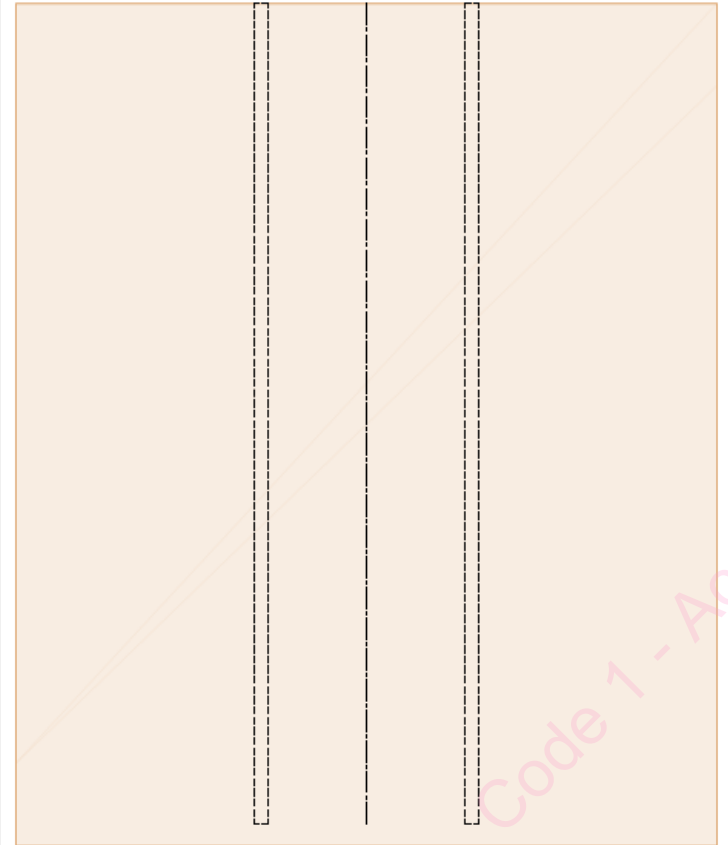
Plan View 1-1



Plan View 2-2



Cross Section A-A

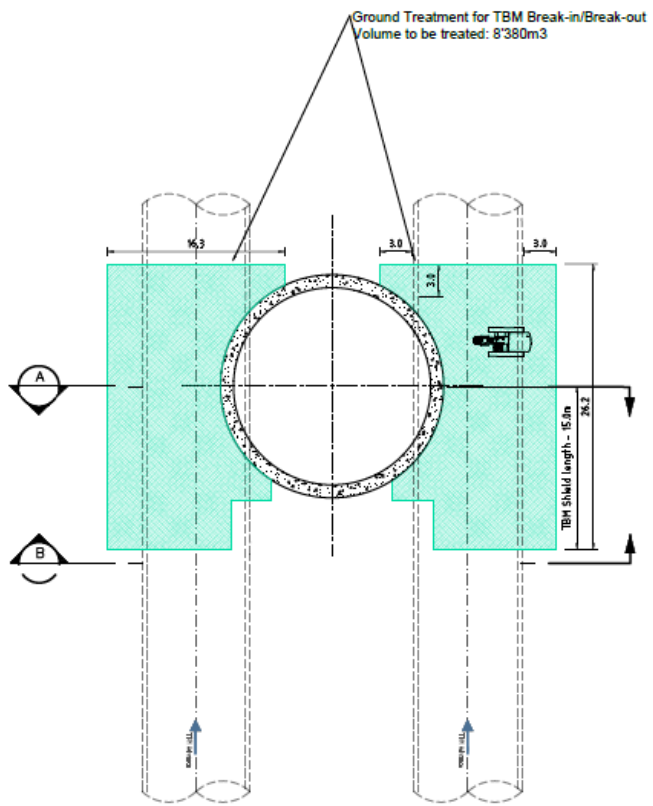


Cross Section B-B

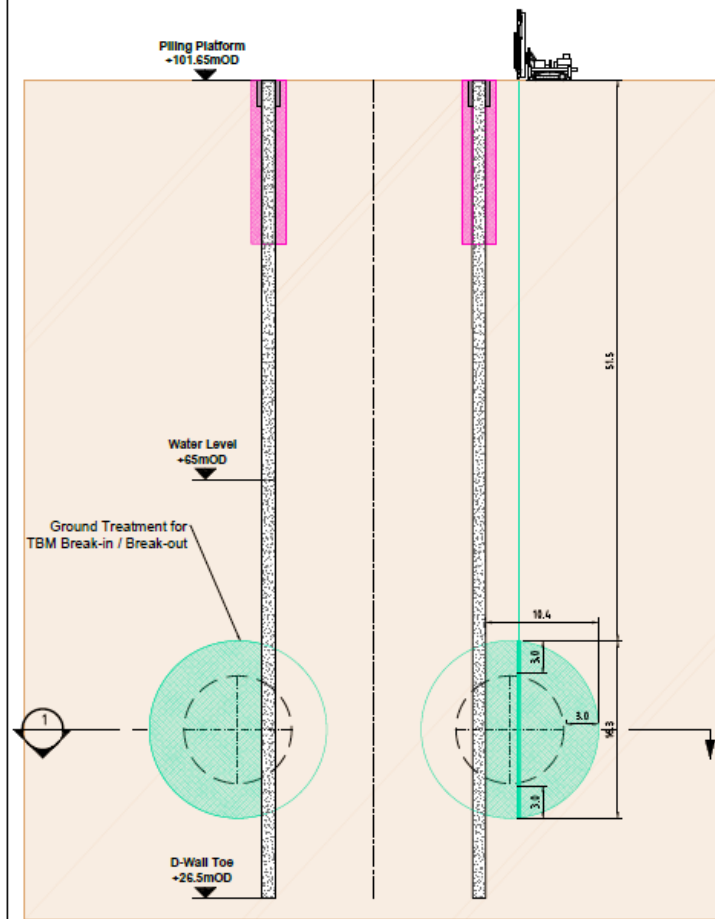
Code 1 - Accepted

Stage 2 :

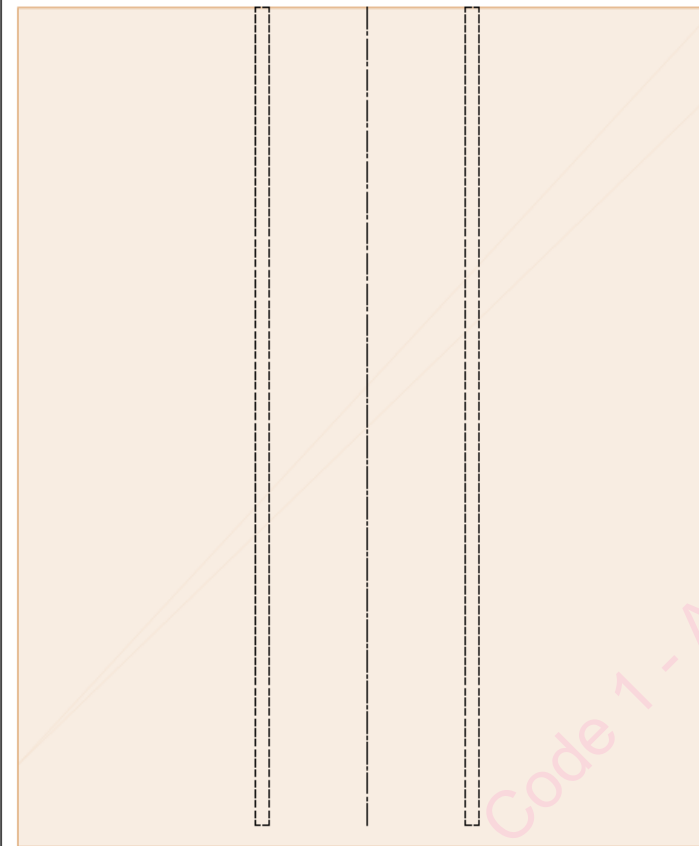
- 1. Start fissure grouting from surface for TBM Break-in / Break-out - 2 shifts
- NOTE:** Fissure grouting from surface for Grouted Base Plug considered as Risk
- Permeability test to be undertaken to confirm design assumption



Plan View 1-1



Cross Section A-A

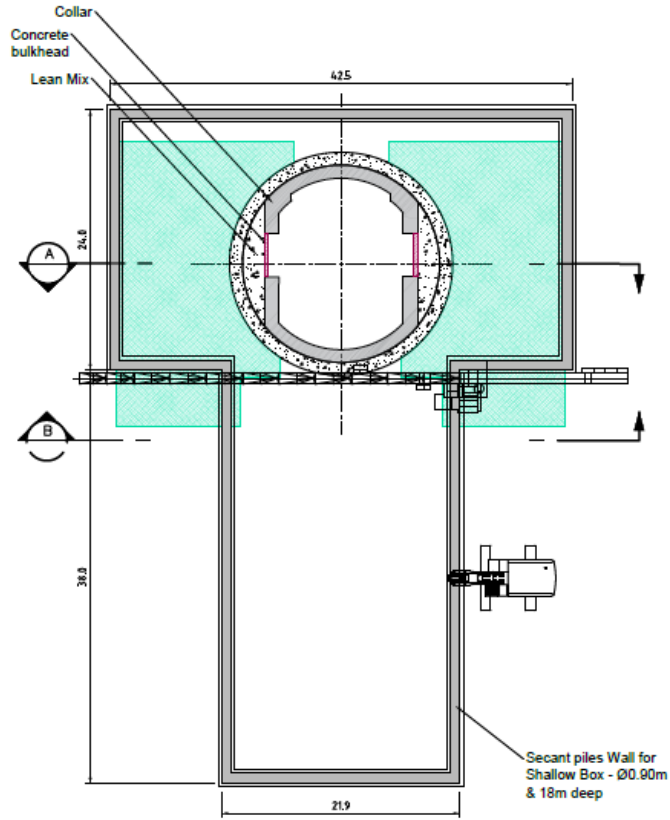


Cross Section B-B

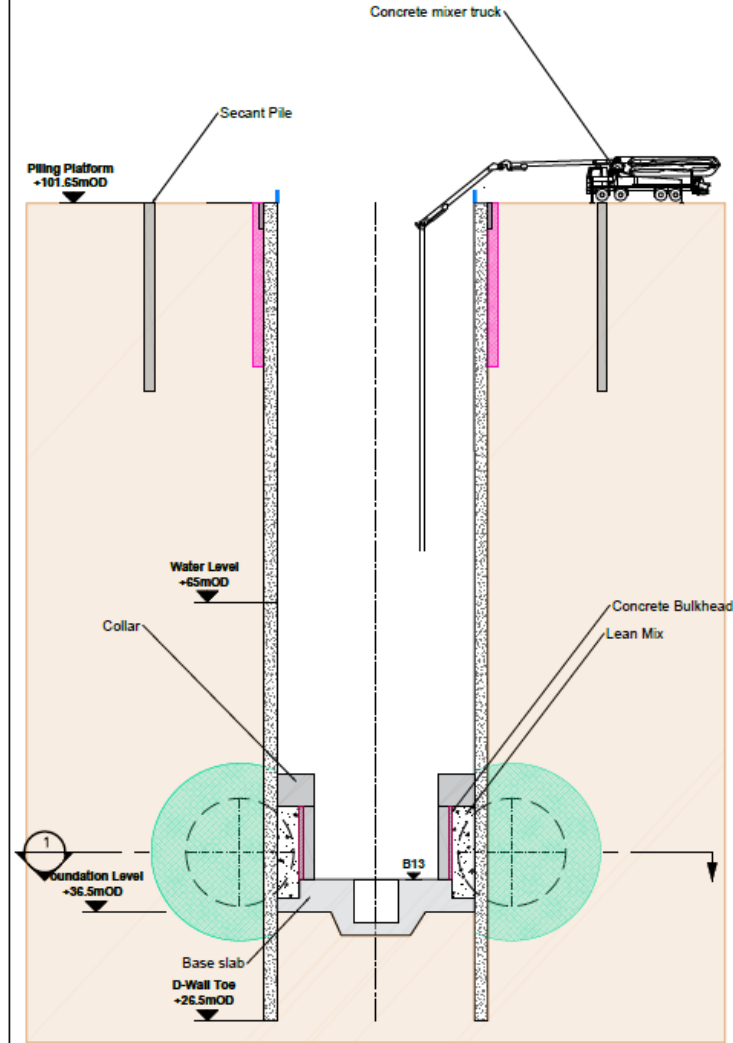
Stage 4 :

1. Base Slab
2. Switch off dewatering system for pressure relief before starting shaft internal structures - to be confirmed by Align D depending on actual water pressure

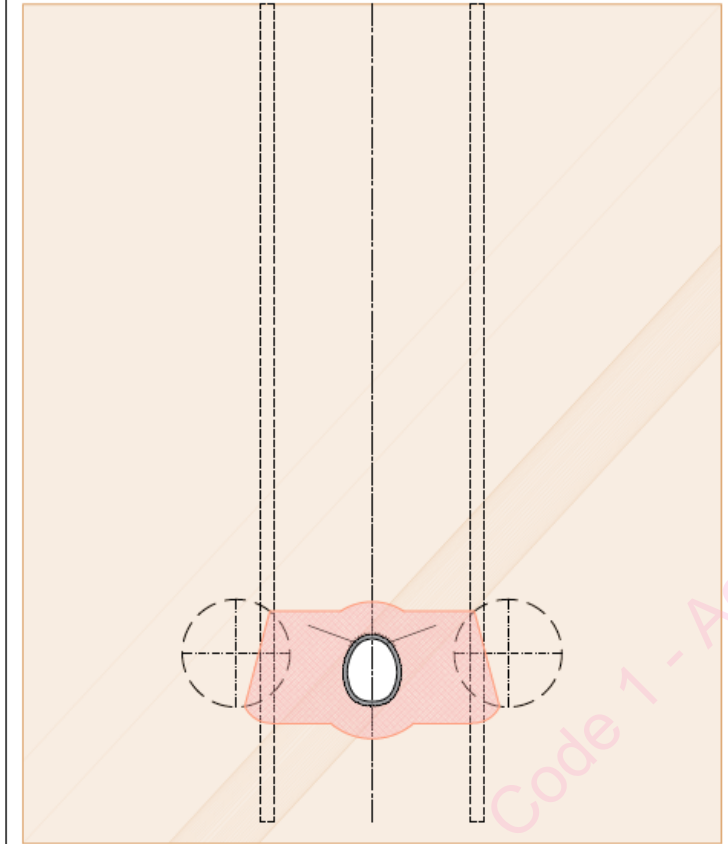
3. Cast-in situ Collar & ring wall
4. Lean Mix Backfill & cast in situ RC concrete wall to act as a bulkhead
5. Shaft ready for TBM to pass through
6. Secant piles works for Shallow Box & erection of Tower Crane



Plan View 1-1

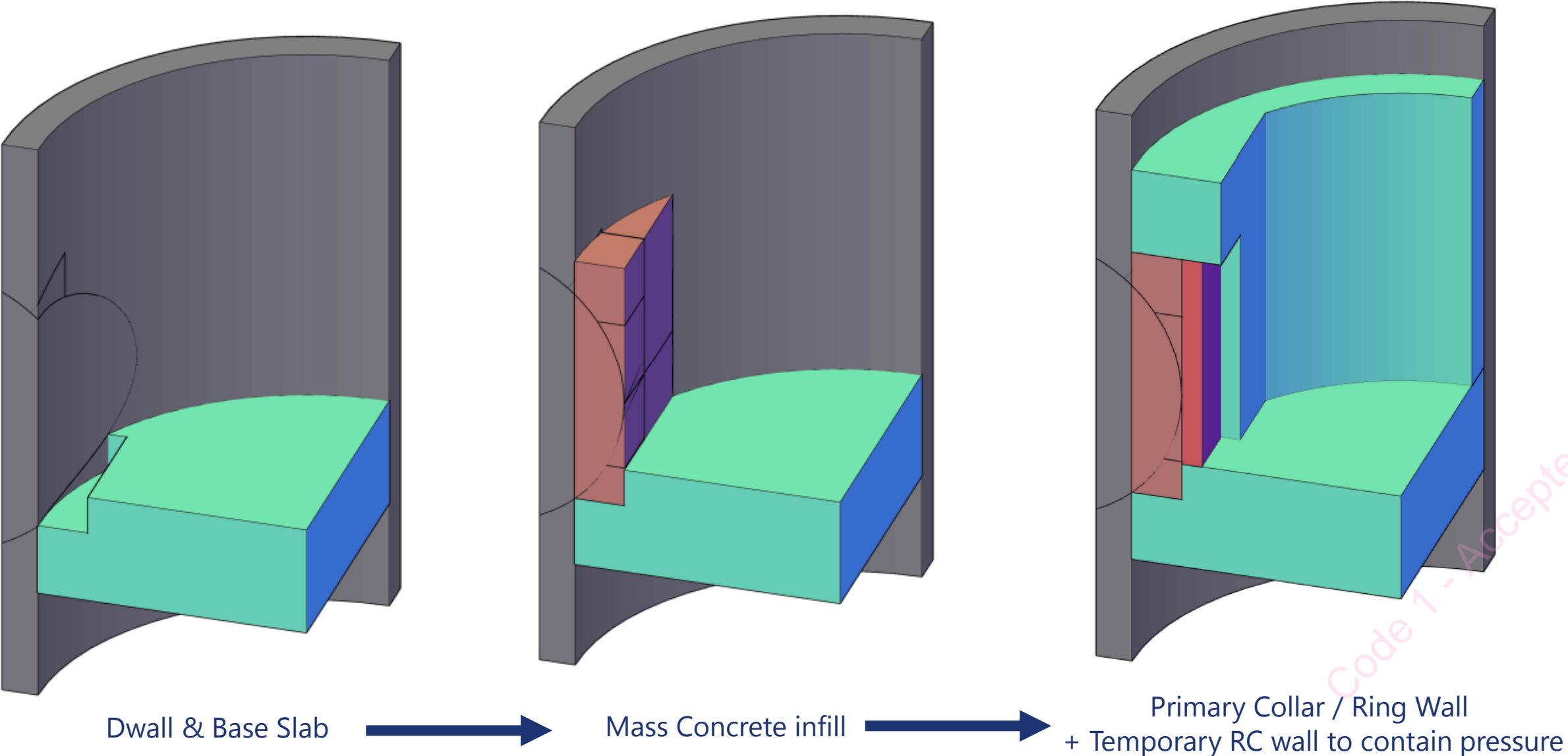


Cross Section A-A



Cross Section B-B

Opening Sequence

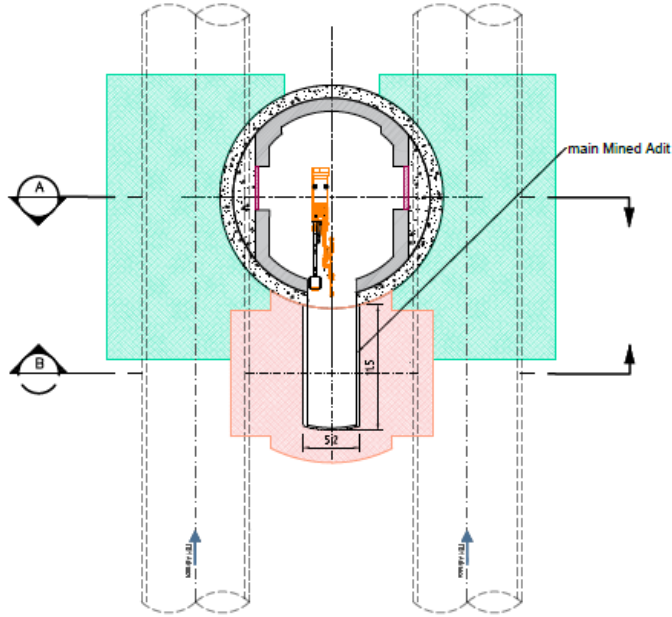


Indicative construction sequence for illustrative purposes only

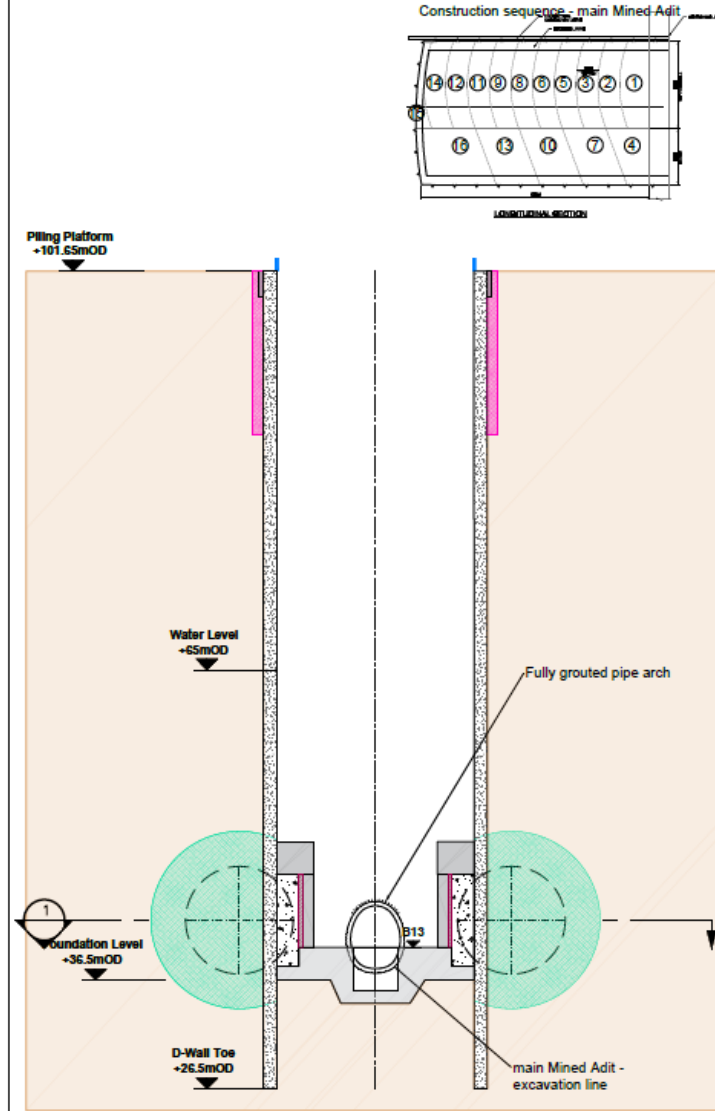
Stage 5 :

1. Pumping test to confirm sufficient water out-off for Mined Adit grouted plug
2. Open D-Walls
3. Mined main Mined Adit gallery using SCL techniques - excavation & primary lining only (sequence as shown on the *Construction sequence - main Mined Adit* from 1 to 15) - Working from shaft 24/7

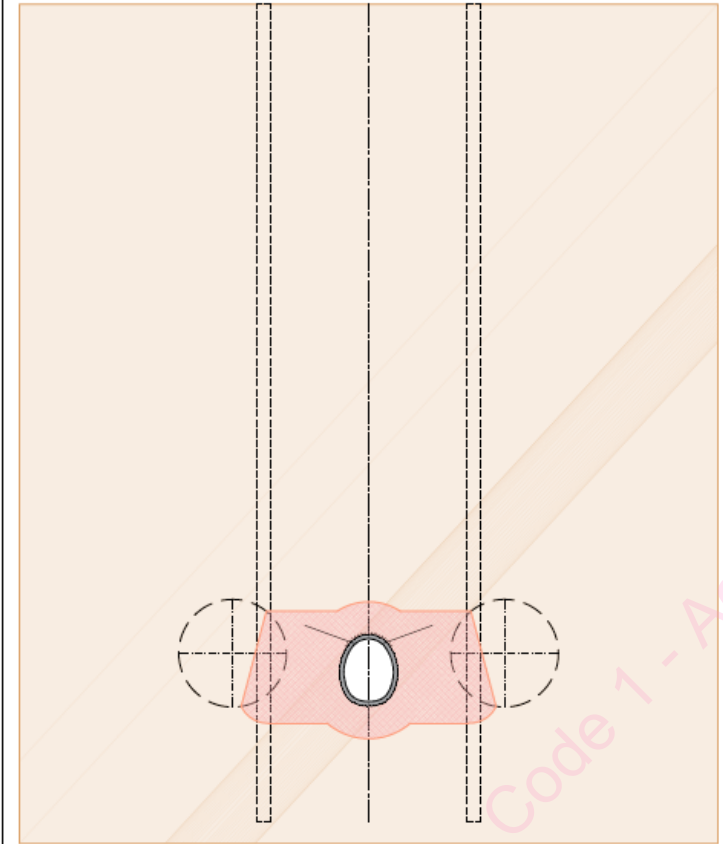
Design of Adit yet to be developed



Plan View 1-1



Cross Section A-A



Cross Section B-B

Stage 6 :

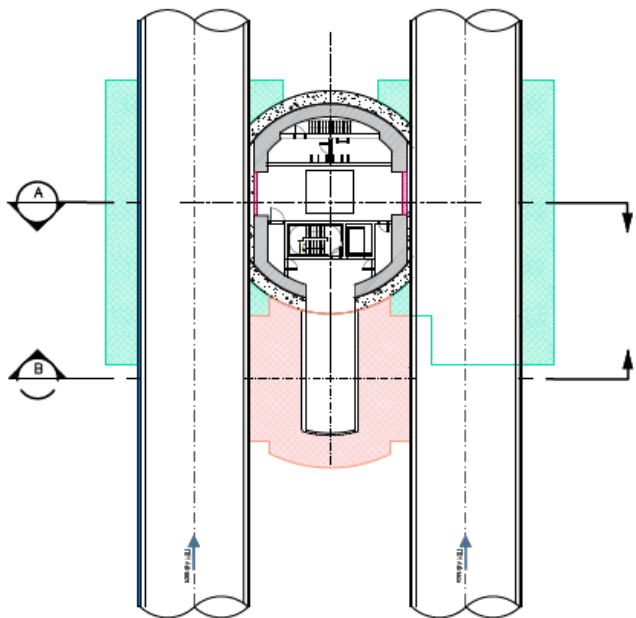
1. Start Shaft Internal Structures and secondary lining - Bottom-Up up to level B01

1.1. Option1: Traditional formwork/falsework floor by floor

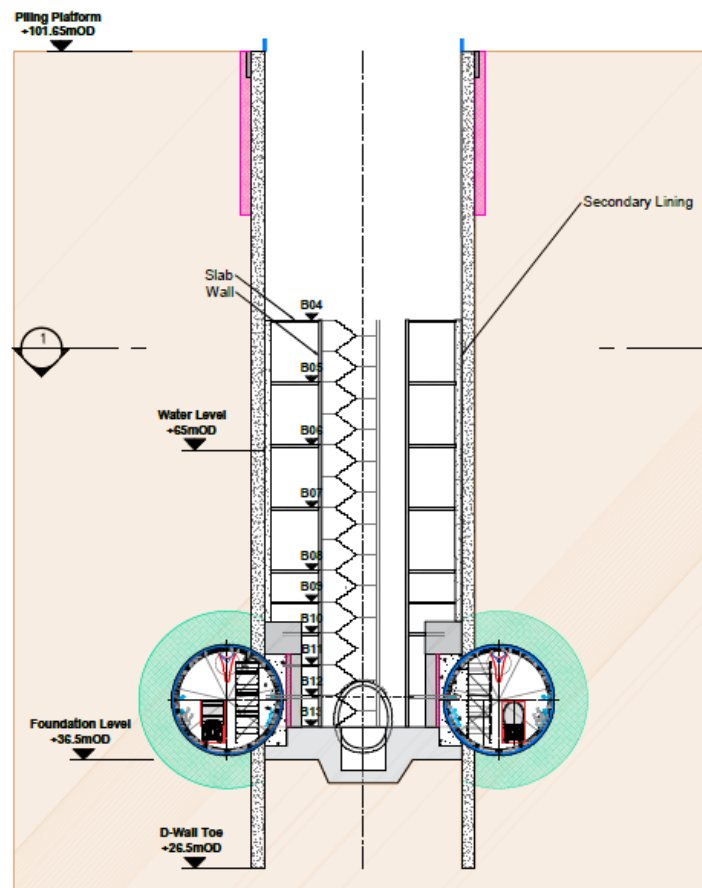
1.2. Option2: Climbing formwork for secondary lining and main wall then traditional formwork/falsework for other walls and slabs

2. Stops in TBM plug prior to crossing shaft for outer inspection

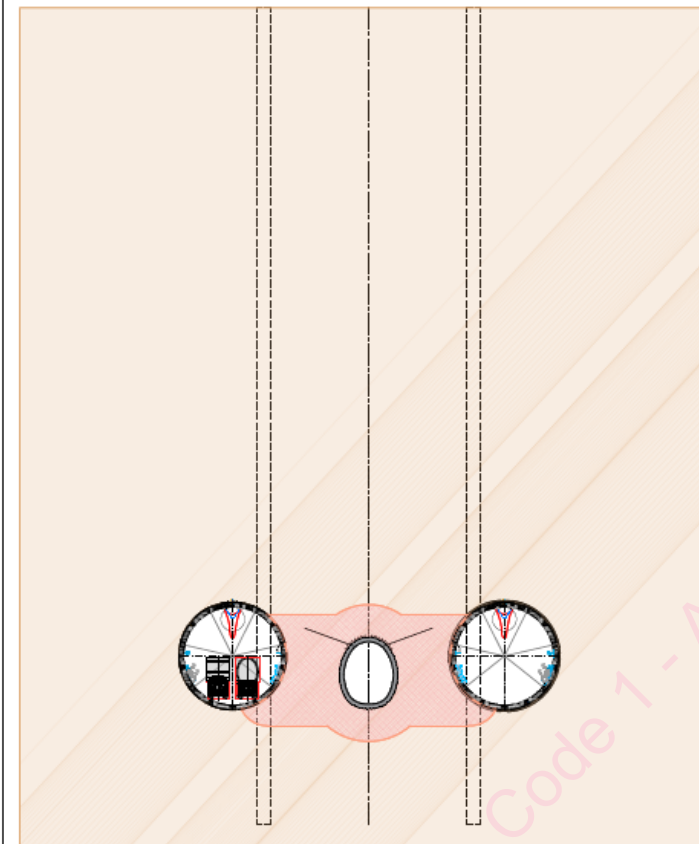
3. TBMs pass through shaft with full confinement pressure at face



Plan View 1-1

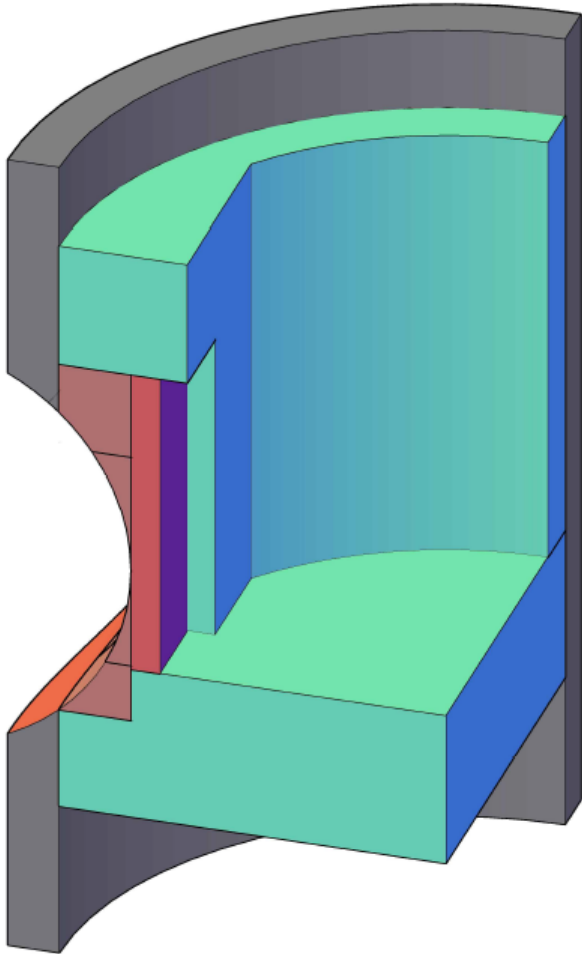


Cross Section A-A

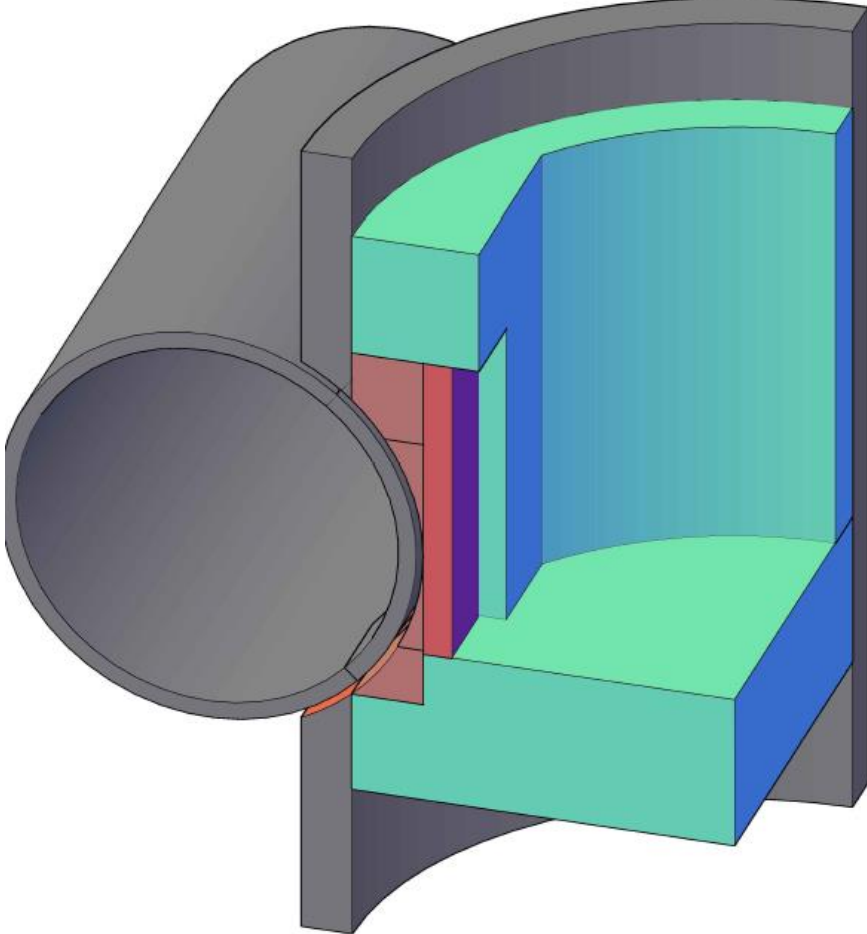


Cross Section B-B

Opening Sequence



TBM Breakthrough



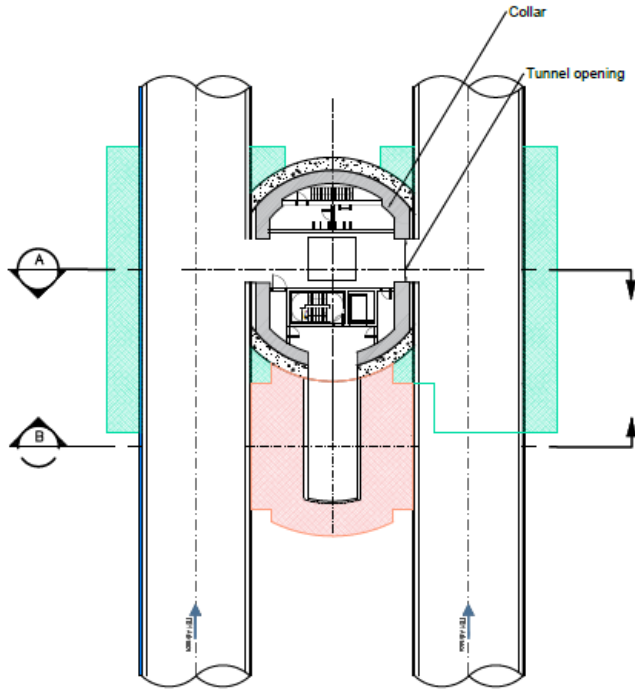
Tunnel Lining Installation

Code 1 - Accepted

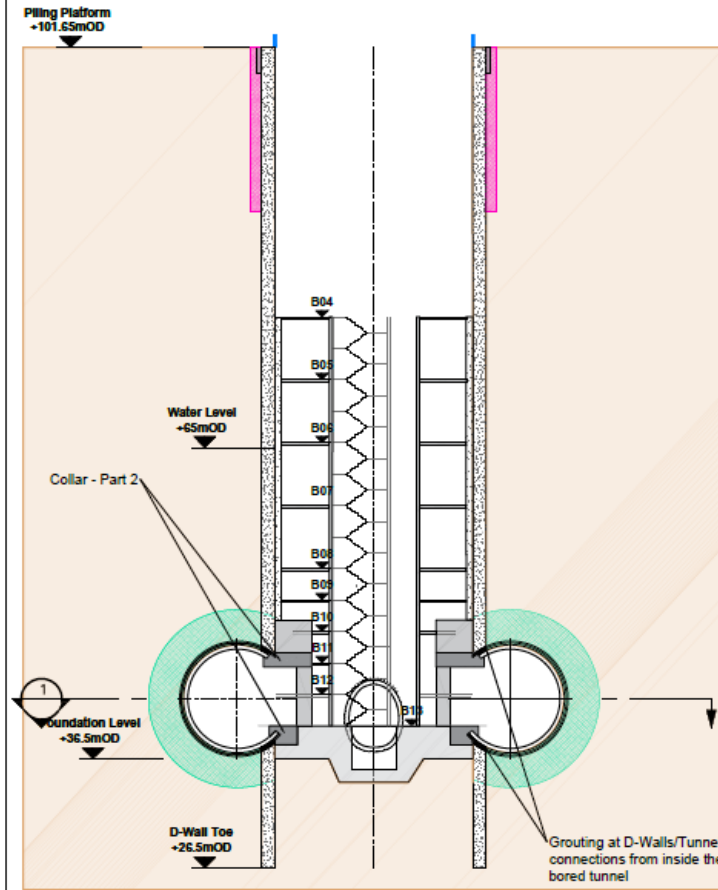
Stage 7 :

1. Grout interface D-Walls/Segments from bored tunnels
2. Drill holes through tunnel lining to depressurise tunnel rings
 - 2.1. Option1: pressure on the lining low enough
 - 2.2. Option2: pressure on the lining requires anchors to be installed to connect tunnel rings to the D-Walls

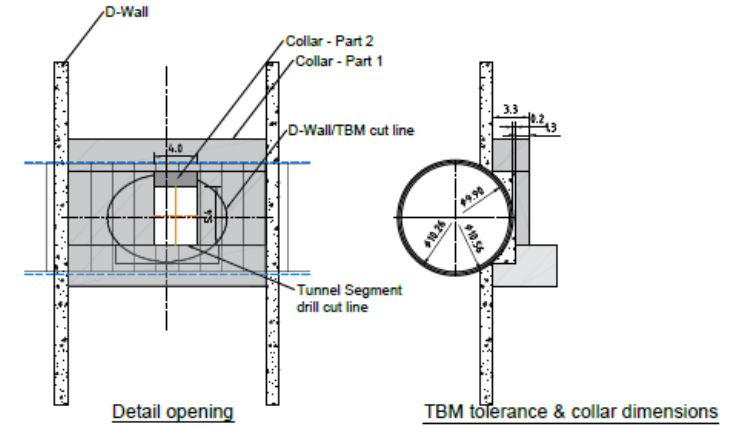
- 2.3. Option3: in addition of Option2, temp. steel props to be installed within the tunnels
3. Remove temporary concrete Bulkhead and Lean Mix
4. Cut segments ring by ring
5. Connect waterproofing and seal to segments
6. Cast in-situ final top and bottom collar



Plan View 1-1

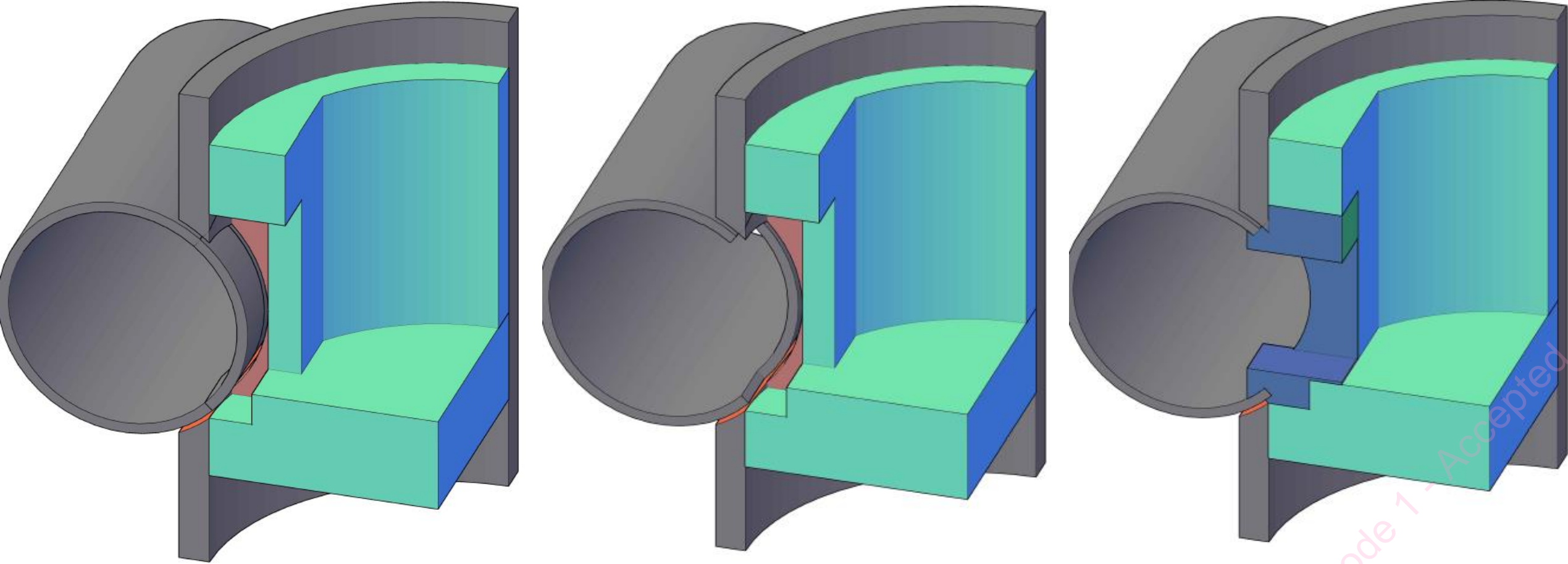


Cross Section A-A



Code 1 - Accepted

Opening Sequence



Removal of Temporary Wall, Mass Concrete and Secondary Collar Section

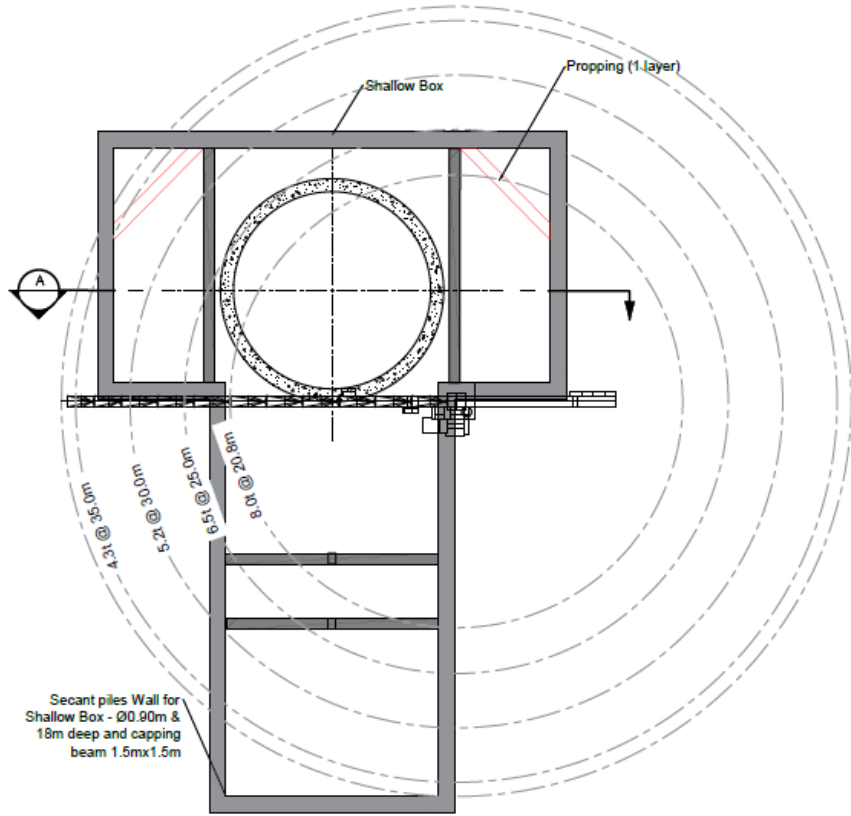
Tunnel Lining Opening

Secondary Collar & Waterproofing

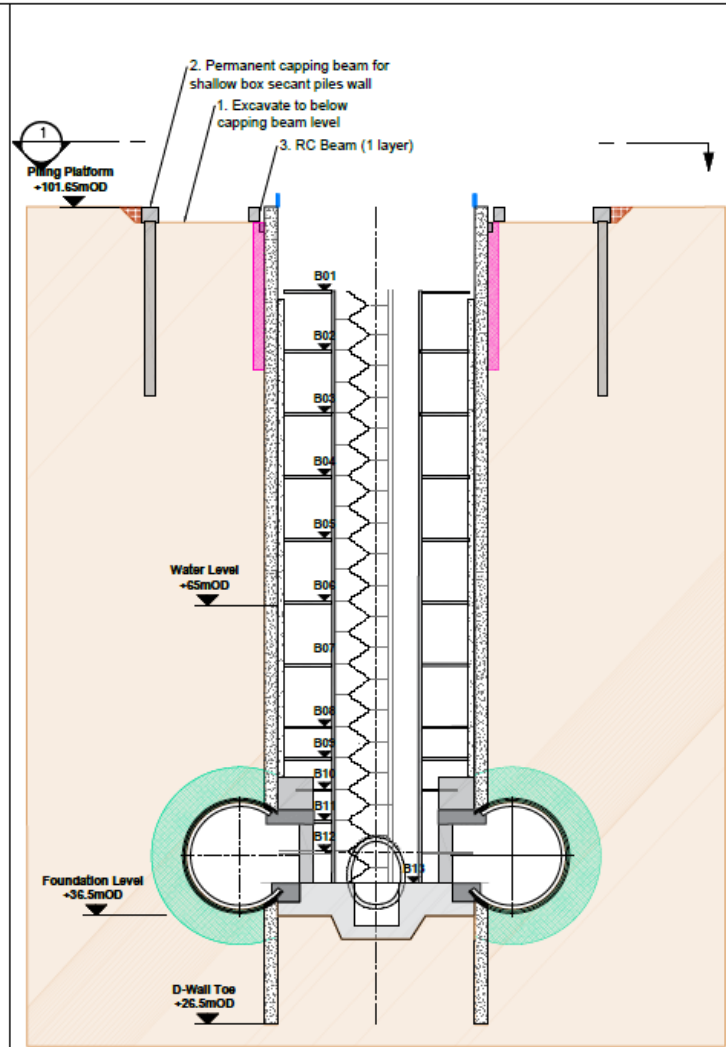
Indicative construction sequence for illustrative purposes only

Stage 8 :

1. Start construction of the Shallow Box following a top-down methodology
2. Shallow Box excavation / installation of Shallow Box permanent capping beam, beam and propping (1 layer)



Plan View 1-1

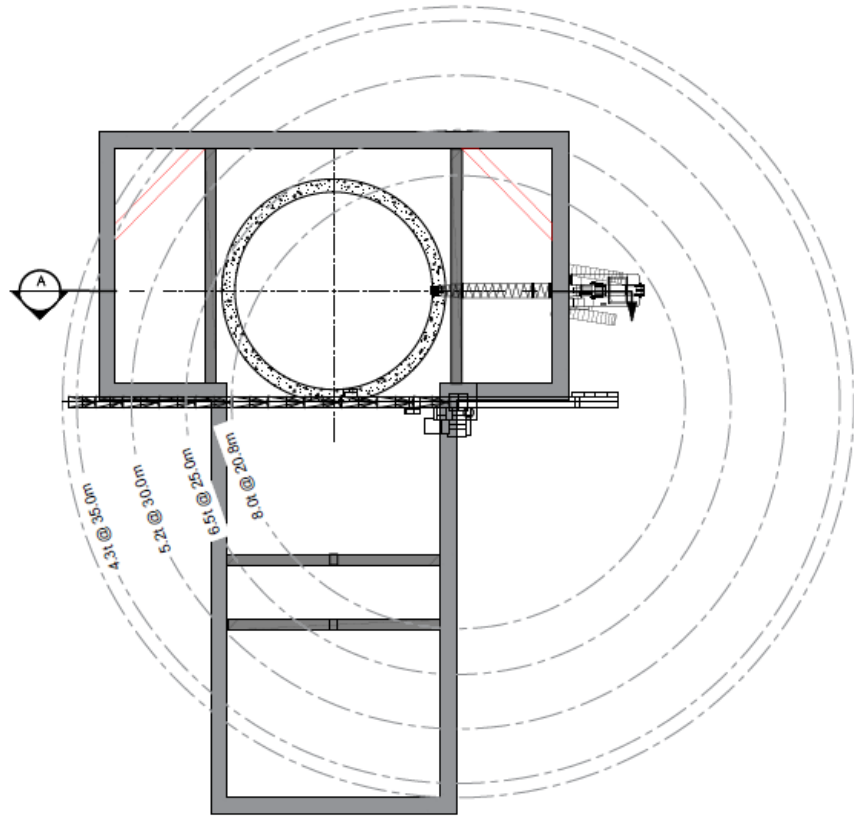


Cross Section A-A

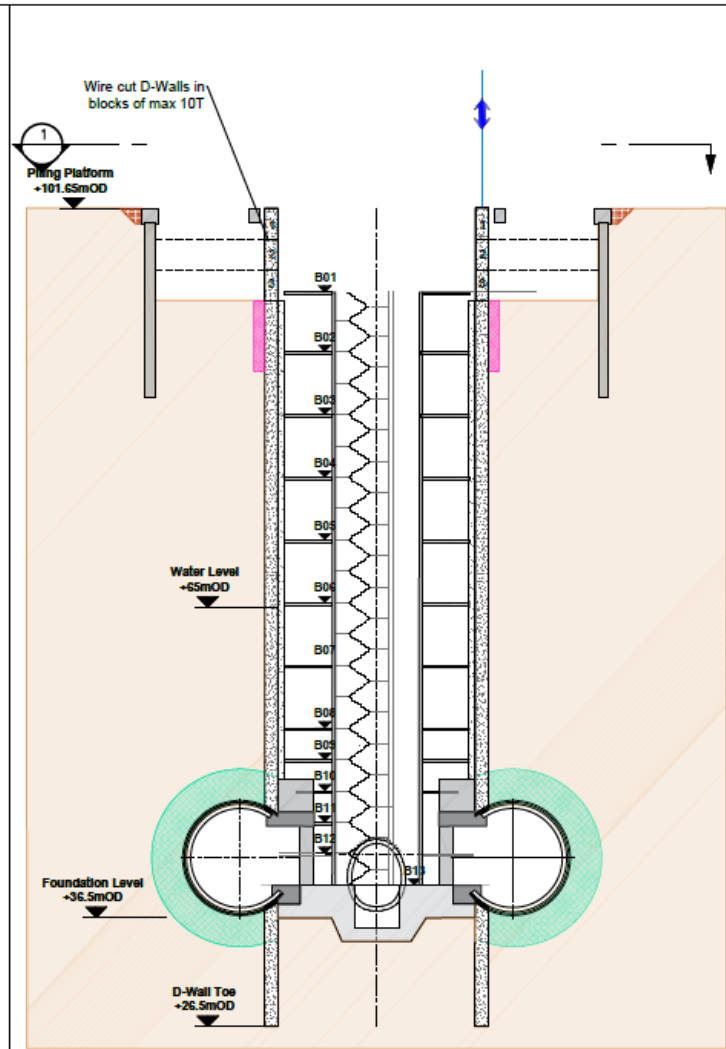
Stage 9 :

1. Wire cut D-Wall into 10T elements & complete excavation to formation level

Note: No works within the Shaft during activity 1



Plan View 1-1



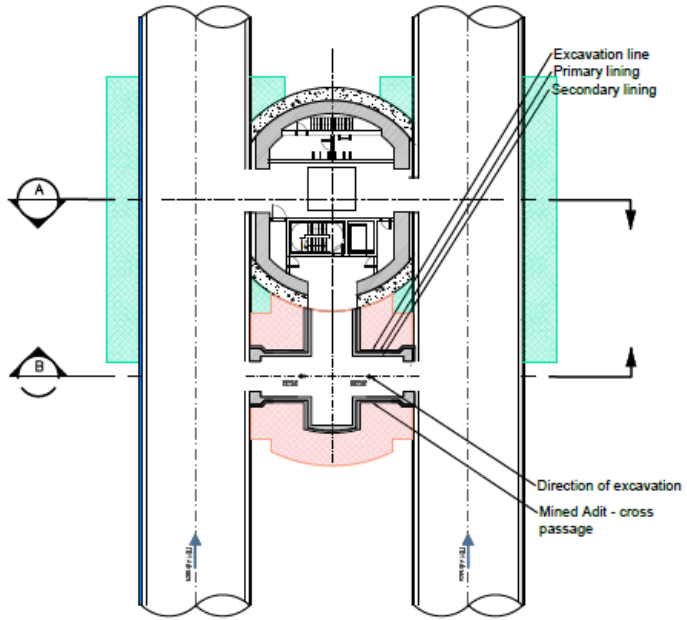
Cross Section A-A

Code 1 - Accepted

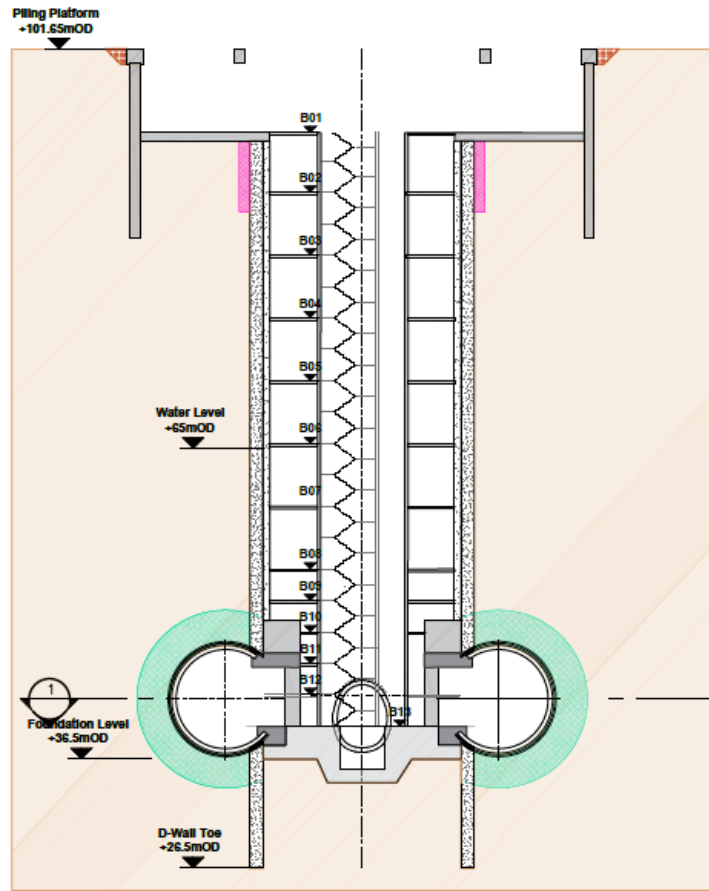
Stage 10 :

- 1. Shallow Box base slab
- 2. Mined Adit cross passage from Upline Tunnel using SCL techniques - Working from shaft 24/7

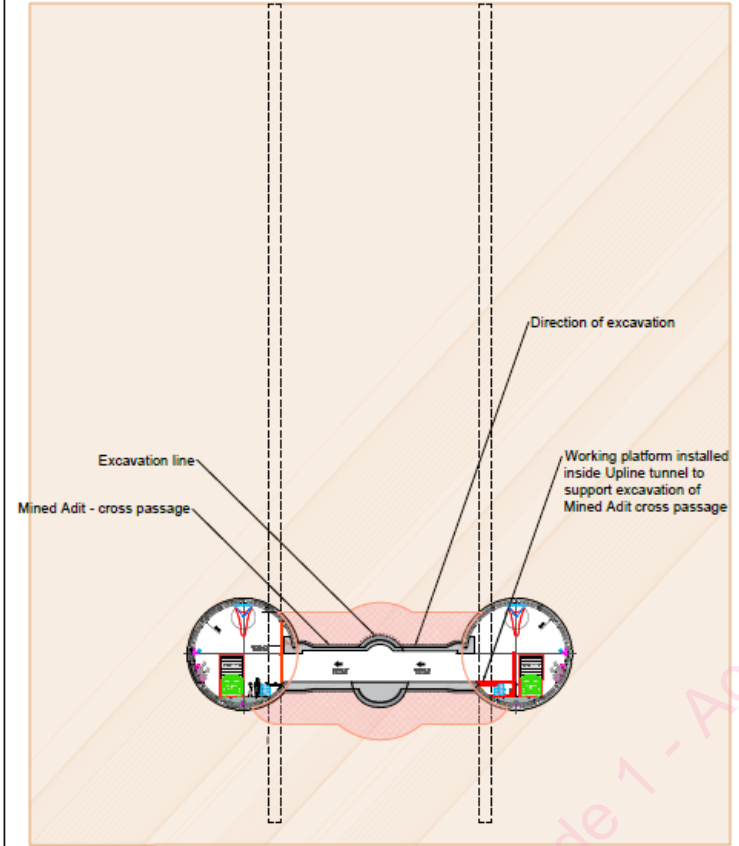
Note: Construction sequence same as Cross Passage sequence



Plan View 1-1



Cross Section A-A

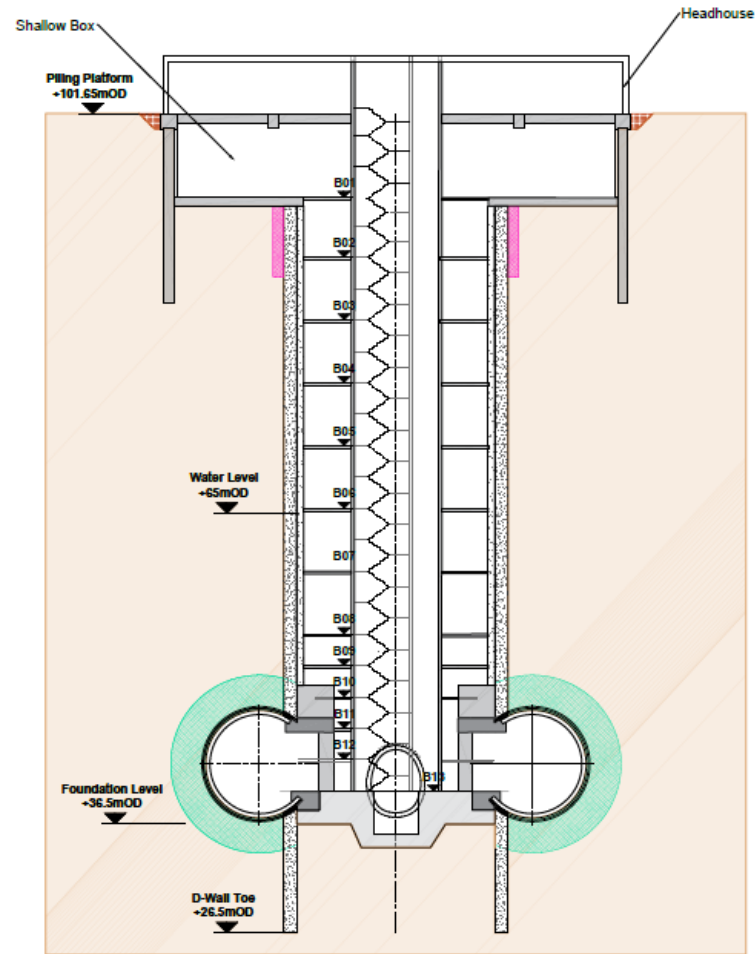


Cross Section B-B

Code 1 - Accepted

Stage 11 :

1. Complete internal structures for Shaft and Shallow box
2. Headhouse
3. Install M&E
4. Landscaping



Cross Section A-A