

Earth Pressure Balance TBM Excavation - JSA - B

en-US · Technical failure review · v1.0 · 2026-10-14 · Sources: article section 9

Site: | Item ID: | Work area:

Approval	Work supervisor	Technical reviewer	Release / handover authority

1. Job details and team signatures

Date / time		Location / area		Assessor		Supervisor	
Team signatures							

2. Conditions and hold points

Stage	Time	Location / area	Environment / readings	Item / condition	Controls	Plant / tools	Approval / signature
HP-0 Start							
HP-1 Connect and commission							
HP-2 Launch and begin advance							
HP-3 Erect ring and grout							
HP-4 Transfer and approve restart							

Complete after actual checks. Recheck after changes, defects or shift handover.

3. JSA risk assessment

Job stage	Hazards and effects	Failure factors	Technical and procedural controls	Site verification	P	S	R	A
1. Assemble and control zone	1. Assembly crush 2. Pressure release 3. Unexpected rotation	1. Temporary support incomplete 2. Energy boundary unclear 3. Concurrent operation allowed	1. Provide accepted assembly support 2. Identify energy sources 3. Separate assembly from operation	1. Temporary support and sequence 2. Power pressure and gravity 3. People and zone control				
2. Connect and commission	1. Electrical or hydraulic injury 2. Failed emergency response 3. Loss of safe atmosphere	1. Connections untested 2. Communications fail 3. Ventilation not accepted	1. Test protective functions safely 2. Test communications and escape 3. Verify air and drainage readiness	1. Electrical and hydraulic checks 2. Communication and escape test 3. Monitoring ventilation and drainage				
3. Launch and begin advance	1. Launch-seal damage 2. Uncontrolled inflow 3. Early ground movement	1. Launch support unaccepted 2. Leakage ignored 3. Monitoring baseline uncertain	1. Coordinate advance and discharge 2. Observe seals and leakage 3. Record synchronized early trends	1. Pressure advance and muck trends 2. Time and location alignment 3. Ground response and alarms				
4. Control advance and muck	1. Conveyor entanglement 2. Gas or fire exposure 3. Unexpected soil inflow	1. Muck system accessed running 2. Air monitoring interrupted 3. Blockage left unresolved	1. Exclude access to moving systems 2. Maintain air and fire controls 3. Apply approved abnormal response	1. Pressure thrust and discharge 2. Surface and structure monitoring 3. Escape ventilation and drainage				
5. Erect ring and grout	1. Erector crush 2. Lining deformation 3. Tail leakage	1. People in rotation envelope 2. Joint or seal defect 3. Grout record missing	1. Clear erector envelope 2. Inspect joints and seals 3. Link grouting to ring records	1. Support and joint checks 2. Seal damage and leakage 3. Backfill quantity and condition				
6. Stop and isolate for work	1. Loss of support pressure 2. Stored-energy release 3. Unsafe chamber entry	1. Support functions shut blindly 2. Pressure or gravity retained 3. Entry scope not reviewed	1. Maintain required support functions 2. Isolate task-specific energies 3. Hold entry for separate procedure	1. Cutter screw thrust isolation 2. Pressure gravity and access limits 3. Personnel and guard restoration				

P/S/R/A: Complete only after actual site assessment using the site risk method.

4. Pre-work checklist

☐ Temporary support and sequence	☐ Electrical and hydraulic checks	☐ Pressure advance and muck trends
☐ Pressure thrust and discharge	☐ Support and joint checks	☐ Cutter screw thrust isolation
☐ People and zone control	☐ Escape ventilation and drainage	☐ Personnel and guard restoration