



Underground Mining Course: Stopping Methods, Mine Ventilation and Ground Support



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Introduction:

Underground mining training on stoping methods, mine ventilation and ground support is a 5-day course for mining engineering, underground production, geotechnical and ventilation teams, ending with a Stope Design, Ground Support and Ventilation Plan for a case ore body. Underground operations lose ore, time and safety margin when the stoping method suits the equipment rather than the rock mass, support is installed by habit and airflow lags behind new development headings. Nominees already plan, supervise or audit underground workings and build each design figure through modelling build exercises. CoreConcept Training Center delivers this underground mining course.

Course Objectives:

- Evaluate ore body geometry, ground conditions and access options to select between sublevel stoping, cut-and-fill, room-and-pillar and block caving
- Classify rock mass with RQD, RMR, Q-system and GSI and size open stope spans with the stability graph method
- Specify rock bolts, cable bolts, mesh and shotcrete for development drives and stope openings by support class
- Plan drilling, loading and haulage cycles, LHD fleet needs and an underground production schedule with dilution and development KPIs
- Design primary and auxiliary ventilation circuits, select fans and set controls for diesel exhaust, dust, gas and heat
- Locate refuge chambers and escapeways and compile a stope design, support and ventilation plan for a case ore body

Target Audience:

- Mining engineering teams responsible for stope layouts, development design and underground mine plans
 - Underground production supervisors responsible for drilling, mucking and haulage cycles at the working face
 - Geotechnical teams responsible for rock mass mapping, support standards and ground control inspections
 - Ventilation teams responsible for airflow surveys, fan operation and air quality monitoring
 - Mine safety teams responsible for refuge chambers, escapeways and underground emergency preparedness
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Course Outline:

Day 1: Underground Mine Landscape, Ore Body Geometry and Access Design

- Ore Body Dip, Thickness and Grade Distribution Assessment
- Underground Mining Method Families Compared by Ground Behaviour
- Decline, Vertical Shaft and Adit Access Option Comparison
- Level Spacing, Ore Pass and Footwall Drive Layout
- Current Underground Operation Gap Review Using Design Checklist

Day 2: Rock Mechanics, Rock Mass Classification and Stoping Method Selection

- RQD Logging From Drill Core for Rock Quality
- RMR Rating Sheet Built From Six Rock Mass Parameters
- Q-System and GSI Values Assigned per Geotechnical Domain
- Stability Graph Method for Open Stope Span Sizing
- Sublevel Stopping, Cut-and-Fill, Room-and-Pillar and Block Caving Screening

Day 3: Ground Support Design, Production Cycles and Underground Scheduling

- Resin-Grouted Rebar, Friction Stabiliser and Expandable Bolt Selection
- Cable Bolt Length and Spacing for Stope Hangingwalls
- Welded Mesh and Fibre-Reinforced Shotcrete Surface Support Specification
- Drill, Load and Haul Cycle Planning With LHD Fleets
- Underground Production Schedule, Dilution and Development Metre KPIs

Day 4: Mine Ventilation Networks, Air Quality, Heat and Emergency Escape

- Primary Ventilation Circuit With Main Fans and Regulators
- Fan Duty Point and Booster Fan Selection Calculations
- Auxiliary Forcing and Exhausting Ducts for Development Headings
- Diesel Exhaust, Blasting Fume, Dust and Heat Control Measures
- Refuge Chamber Siting and Secondary Escapeway Route Planning

Day 5: Modelling Build of the Stope Design, Ground Support and Ventilation Plan

- Case Ore Body Briefing With Geotechnical and Grade Data
 - Stope Layout and Span Check Using Stability Graph Results
 - Support Class Schedule for Development and Stope Openings
 - Airflow Quantity Build From Diesel Fleet and Active Headings
 - Stope Design, Ground Support and Ventilation Plan Completion
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Skills You Will Gain:

- Ore Body Access Evaluation
- Rock Mass Classification
- Stope Span Sizing
- Ground Support Specification
- Underground Cycle Planning
- Ventilation Network Design
- Air Contaminant Control
- Underground Egress Planning

Why Attend This Course:

- Hand the underground manager or technical services manager a Stope Design, Ground Support and Ventilation Plan for a case ore body as a reference for the next stope release
- Decide which stoping method, support class and fan arrangement suit each ore zone before development begins
- Prevent hangingwall failures, unplanned dilution and blocked headings caused by undersized support or airflow that trails development
- Pass on rock mass rating sheets, support class tables and airflow calculation templates to junior engineers and shift supervisors

Conclusion:

Back at work, the participant gives the underground manager or technical services manager a Stope Design, Ground Support and Ventilation Plan that sets out the stoping method, stope dimensions, support classes, airflow quantities, fan duties and escape provisions for an ore zone. The planning and geotechnical teams use it when releasing new stopes for production and when development opens new headings. After the first stopes are mined against the plan, the unit should review dilution, ground falls, measured airflow and tonnes delivered against target.

Frequently Asked Questions FAQ:

What should participants know before the underground mining course on stoping methods, ventilation and ground support?

Participants should already work in or with underground workings and read level plans, drill core logs or ventilation survey sheets. Bringing a level plan, support standard or airflow survey from their own operation helps them apply the modelling exercises.

How does the underground mining course on stoping methods, ventilation and ground support differ from an open pit planning or civil tunnelling course?

It addresses extracting ore underground: stoping method choice, stope spans, mining support and mine-wide airflow. Open pit courses design pit shells, benches and pushbacks, while civil tunnelling courses cover linings, surface settlement and infrastructure tunnel systems.

Why does underground mining depend on rock mass classification for ground support design?

Classification turns core logging and mapping data into a rating that predicts how openings behave. Engineers use RMR, Q-system or GSI values to choose bolt type, length and spacing, decide when mesh or shotcrete is needed and check whether a stope span will stand.

What does a participant take back from the underground mining course on stoping methods, ventilation and ground support?

Each participant returns with a Stope Design, Ground Support and Ventilation Plan for a case ore body, plus rock mass rating sheets, support class tables, fan duty calculations and a KPI set adaptable to their own operation.
