



Quarry Operations and Aggregate Production Course: Quarry Planning, Crushing and Screening



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Introduction:

Quarry operations and aggregate production, covering quarry planning, crushing and screening, is the subject of this 5-day course for quarry, aggregate plant, product quality and site environmental leads, who build a Quarry and Aggregate Plant Improvement Plan for a case producer. Crushed stone, sand and gravel suppliers lose margin when face layouts stall loaders, crushers run choke-starved, screens blind and stockpiles drift out of grading. Nominees already supervise extraction, plant output or product testing, and teaching is by modelling build on face, haul, crusher and lab data. CoreConcept Training Center delivers this quarry operations course.

Course Objectives:

- Plan quarry face advance, bench height, haul ramps and overburden stripping to sustain a reserve-backed extraction sequence
- Match loader and haul truck fleets to face output and crusher intake using cycle time and payload records
- Select primary, secondary and tertiary crusher and screen arrangements to meet a target product split
- Optimise crusher settings, screen decks and recirculating loads to raise saleable tonnes per hour
- Test aggregate grading, particle shape, cleanliness and durability against EN 12620, EN 13242 and ASTM C33 product specifications
- Control dust, noise and water impacts and prepare a progressive restoration sequence within a Quarry and Aggregate Plant Improvement Plan

Target Audience:

- Managers responsible for quarry face development, extraction sequencing and reserve depletion
 - Superintendents accountable for crushing and screening plant throughput, availability and product yield
 - Production engineers who analyse load-and-haul cycles, equipment costs and plant mass balances
 - Quality leads responsible for aggregate sampling, laboratory testing and product conformity records
 - Site environmental and restoration coordinators responsible for dust, noise, water and land after-use
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Course Outline:

Day 1: Quarry Business Context, Deposit Types and Site Performance Baseline

- Crushed Rock, Sand and Gravel Deposit Types Compared
- Aggregate Product Families From Base Course to Concrete Sand
- Quarry Value Chain From Overburden Stripping to Weighbridge
- Saleable Tonnes per Hour and Cost per Tonne Baseline
- Site Performance Gap Review Using Quarry Audit Checklist

Day 2: Quarry Layout, Benching and Load-and-Haul Fleet Matching

- Bench Height, Face Width and Haul Ramp Gradient Layout
- Overburden Stripping Ratio and Soil Storage Bund Planning
- Face Advance Sequence Linked to Reserve Depletion Map
- Loader Bucket Passes and Truck Payload Matching Calculation
- Haul Cycle Time Study and Fleet Match Factor Analysis

Day 3: Crushing and Screening Circuit Selection and Aggregate Quality Testing

- Jaw, Gyratory, Cone and Impact Crusher Reduction Ratio Selection
- Vertical Shaft Impactor Use for Cubical Chippings and Manufactured Sand
- Vibrating Screen Deck Sizing and Aperture Selection
- Sieve Grading, Flakiness Index and Sand Equivalent Testing
- Los Angeles Abrasion, Water Absorption and Soundness Test Interpretation

Day 4: Plant Optimisation, Stockpile Control, Dust, Noise and Rehabilitation

- Closed Side Setting and Choke Feed Adjustment for Product Yield
- Recirculating Load and Screen Blinding Fault Diagnosis
- Stockpile Segregation, Contamination and Grading Drift Control
- Dust Suppression, Wheel Wash and Noise Barrier Measures
- Progressive Restoration Sequence, Slope Reshaping and Topsoil Replacement

Day 5: Modelling Build of the Quarry and Aggregate Plant Improvement Plan

- Case Producer Face, Haul and Plant Data Briefing
 - Fleet Match and Face Sequence Model for Case Quarry
 - Plant Mass Balance and Product Split Model Applying Circuit Choices
 - Quality, Environmental and Restoration Actions Costed per Tonne
 - Quarry and Aggregate Plant Improvement Plan Completion
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Skills You Will Gain:

- Quarry Face Sequencing
- Haul Fleet Matching
- Crushing Circuit Design
- Screen Performance Analysis
- Aggregate Specification Testing
- Stockpile Quality Management
- Quarry Environmental Control
- Restoration Planning

Why Attend This Course:

- Deliver a Quarry and Aggregate Plant Improvement Plan to the quarry manager, plant superintendent and commercial lead as the basis for next season's capital and operating priorities
- Decide whether a product shortfall needs a crusher setting change, an extra screen deck or a different face blend
- Prevent rejected loads, idle trucks, choked crushers and community dust complaints that cut saleable tonnes and margin
- Coach shift supervisors, plant operators and lab technicians on cycle studies, mass balances and grading checks

Conclusion:

Back at work, the participant presents the Quarry and Aggregate Plant Improvement Plan to the quarry manager, plant superintendent and commercial lead, who use it to decide which face, fleet, plant and quality changes to fund first and which products to promise customers. Quality staff adopt its sampling and testing routine, while site teams follow its dust, noise and restoration actions. After the first quarter of operation, the unit should compare saleable tonnes, cost per tonne, product conformity and complaint records with the plan, then update it.

Frequently Asked Questions FAQ:

What should participants know before a quarry operations and aggregate production course?

Participants should already supervise quarry extraction, aggregate plant output or product testing and be comfortable with spreadsheets. Bringing anonymised haul cycle records, crusher settings, screen analyses or lab results from their own site helps during the modelling build.

How does a quarry operations and aggregate production course differ from a blasting or mineral processing course?

It covers the whole aggregate business after the rock is broken: face layout, haul fleets, crushing and screening plant, product specifications, stockpiles and restoration. Blasting courses design shots, and mineral processing courses recover metal through grinding, flotation and leaching.

Why does particle shape matter in quarry operations and aggregate production?

Flaky and elongated particles weaken concrete and asphalt and fail product specifications. Crusher type, closed side setting and choke feeding control shape, so plant decisions directly decide whether chippings and sand can be sold at a premium.

What do participants take back from the quarry operations and aggregate production course?

Participants take back a Quarry and Aggregate Plant Improvement Plan, plus a fleet match calculator, a plant mass balance template, a sampling and testing schedule and a restoration sequence checklist adaptable to their own site.
