



Road Pavement Structural Design and Option Analysis Course

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Overview

Road Pavement Structural Design and Option Analysis Course is a five-day intermediate course for pavement engineers, infrastructure designers, public works teams, and technical consultants who leave with a Pavement Design Recommendation. Participants translate traffic, climate, subgrade, drainage, and material inputs into structural alternatives, response checks, distress criteria, sensitivity tests, and documented choices. The course emphasizes analytical design rather than construction supervision. Agile Leaders Training Center presents road pavement structural design as a traceable option-analysis process.

Who Should Attend

- Teams responsible for road pavement structural design and technical calculation
- Personnel who define traffic, climate, subgrade, drainage, and material inputs
- Functions that compare flexible and rigid pavement alternatives
- Staff who review pavement response, distress, reliability, and sensitivity results
- Consultants who prepare design notes and option recommendations

The course assumes participants can interpret geotechnical, traffic, and material data, and it leaves out geometric road alignment, construction supervision, production inspection, acceptance testing, and maintenance programming.

Departments and Industries

The course supports departments and industries that develop or review road pavement structural designs.

- Transportation engineering, infrastructure design, and public works
- Geotechnical consultancies and pavement design services
- Materials laboratories, asphalt producers, and concrete suppliers
- Industrial facilities, logistics networks, utilities, and property development
- Mining access roads, ports, campuses, and public facilities

Learning Objectives

By the end of this course, participants will be able to:



- Analyze traffic, climate, subgrade, drainage, and material design inputs
- Build flexible and rigid pavement structural alternatives
- Apply mechanistic-empirical response and distress logic
- Evaluate design criteria, reliability, and sensitivity results
- Compare pavement options using traceable technical evidence
- Prioritize design refinements and document a recommendation

Course Agenda

Day 1: Design Inputs and Criteria

- Road Function and Pavement Design Scope Statement
- Traffic Spectrum and Equivalent Axle Loading Worksheet
- Subgrade Characterization and Design Strength Profile
- Climate, Moisture, and Drainage Parameter Register
- Performance Criteria and Reliability Target Sheet

Day 2: Flexible Pavement Analysis

- Flexible Pavement Layer System Model
- Asphalt and Unbound Material Property Table
- Layered Response Stress and Strain Check
- Rutting and Fatigue Distress Criterion Map
- Flexible Pavement Thickness Iteration Log

Day 3: Rigid Pavement Analysis

- Rigid Pavement Slab and Foundation Model
- Concrete, Support, and Load-Transfer Input Sheet
- Slab Stress and Deflection Response Check
- Cracking, Faulting, and Joint Performance Criteria
- Rigid Pavement Thickness and Jointing Decision Record

Day 4: Option Evaluation and Documentation

- Input Uncertainty and Sensitivity Analysis Matrix
- Design Response and Distress Comparison Dashboard
- Drainage and Material Scenario Test
- Pavement Alternative Technical Evaluation Scorecard
- Design Assumption, Calculation, and Review File



Day 5: Pavement Design Practice

- Exercise: Validate Traffic and Subgrade Inputs
- Exercise: Configure a Flexible Pavement Alternative
- Exercise: Configure a Rigid Pavement Alternative
- Exercise: Test Sensitivity and Compare Distress Results
- Capstone Exercise: Pavement Design Recommendation

Practical Exercises

The course uses suggested activities to convert pavement inputs and analytical results into a defensible design recommendation.

- Suggested activity: organize traffic, climate, subgrade, drainage, and material assumptions in a design-input register.
- Suggested activity: build flexible and rigid layer alternatives and trace their structural response and distress checks.
- Suggested activity: vary selected inputs to identify sensitive assumptions and design refinements.
- Suggested activity: compare options and assemble the basis, calculations, limitations, and preferred choice in a Pavement Design Recommendation.

FAQs

Who suits the road pavement structural design course and what does it assume?

It suits professionals who develop or review pavement structures and assumes they can interpret traffic, geotechnical, drainage, and material information used in design calculations.

How does road pavement structural design differ from pavement construction supervision?

Road pavement structural design determines layer configurations and checks performance from analytical inputs, while construction supervision controls field execution, production, inspection, testing, nonconformance, and acceptance.

What inputs drive road pavement structural design?

Structural design uses traffic loading, climate and moisture, subgrade strength, drainage condition, material properties, performance criteria, reliability assumptions, design life context, and the limitations of available evidence.

How are flexible and rigid pavement structures analyzed?

Flexible and rigid structures are analyzed with different layer or slab models, material properties, load responses, distress criteria, thickness iterations, foundation assumptions, and performance checks.



Why is sensitivity analysis used in pavement option analysis?

Sensitivity analysis shows which traffic, subgrade, climate, drainage, material, or performance assumptions materially change the design response, distress prediction, thickness choice, or comparative ranking.

Conclusion

Participants take back a Pavement Design Recommendation containing the input basis, structural alternatives, response and distress checks, sensitivity findings, limitations, and selected option. It makes road pavement design choices traceable to evidence and assumptions. The recommendation supports technical review without replacing project-specific engineering verification or approval.



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