

TRANSPORTATION & ROAD INFRASTRUCTURE MANAGEMENT AND LIFE CYCLE COST ANALYSIS

INTRODUCTION

Cost effective pavement and infrastructures management results from careful design, quality construction and timely maintenance. Engineers and technical managers are faced with the challenges of maintaining, within shrinking budgets, the investment in highways, urban roads and bridges. Although new materials and methods are being added to the engineer's repertoire, they must accommodate increasing traffic loads while continually fighting a challenging battle against rutted and cracked surfaces, and pesky and dangerous depressions and potholes. The course will highlight the following:

- A review of information necessary to deal with these challenges.
- A review of bridge evaluation, and rehabilitation and effective rehabilitations through the Canadian Methods of Rehabilitations
- Examine practical techniques for field evaluation of pavement conditions, causes and effective remedies of pavement deterioration.

The understanding is further enhanced through presentations of case studies and will be followed answered of any questions about maintenance and rehabilitation.

OBJECTIVES

To provide an update on transportation and infrastructure management, with special emphasis on materials and procedures used in design, construction, maintenance and rehabilitation.

PRESENTER

Hoda Seddik, M.A.Sc., P.ENG

Ms. Seddik is AMEC's Associate/Senior Asphalt and Pavement Engineer with over 25 years of experience in rigid and flexible pavement structural designs including; MTO, TAC, AASHTO, and AI, overlay design for asphalt and concrete pavements. Ms. Seddik was the World Bank pavement specialist for a 75 km project for Rehabilitation & Upgrading to 4/6 Lane Divided Hwy. from Panagarh - Palsit Section of NH-2 in West Bengal India Using Canadian Expertise. Ms. Seddik has wide experience in methods of rehabilitation, asphalt maintenance techniques, life cycle cost analysis. Ms. Seddik has a strong background in soil investigation and soil classification, and test methods. Also, she has experience in pavement management systems and asset management, pavement evaluation including; pavement deflection, traffic survey, roughness, deflection and friction resistance measurements, waterproofing of bridge decks and parking garages.

PROGRAM

DAY ONE

PAVEMENT MANAGEMENT SYSTEMS

- Introduction to pavement management
- Pavement management data collection
 - How much data we really need to collection
 - Manual and automated data collection
- Pavement management techniques
- Integration of pavement rehabilitation and maintenance

DAY TWO

EVALUATION OF CONCRETE AND ASPHALT PAVEMENTS

- Pavement condition data collection
- Surface condition evaluation
- Surface deflection techniques
- Ground penetrating radar
- Smoothness testing

DAY THREE

DETAILED BRIDGE CONDITION SURVEY

It involves the observation and recording of surface defects, a delamination survey, corrosion potential survey, coring of concrete components, physical testing of the cores, cover meter survey, asphalt sawn samples, expansion joint survey, etc.,

Also the bridge survey; Superstructure will cover including, Bridge Deck Wearing Surface, Waterproofing, Concrete Deck and Corrosion potential and Air void system analysis, Concrete Sidewalk, Concrete Barrier Walls, Railing System, Approach Slabs, Deck Expansion Joints, Deck Drainage. Substructures will cover including, Soffit, Abutments, Ballast and Wing Walls, Piers, and Slope Protection

DAY FOUR

REHABILITATION AND MAINTENANCE PROJECT SELECTION CASE STUDIES

Diamond grinding, Full-depth repair, Partial-depth repair, Dowel-bar retrofit Cross-stitching, Slab stabilization (grouting)

Case Study: Examples of appropriate pavement rehabilitation selection from 'live' projects. How would you rehabilitate this pavement?

Milling and Resurfacing, Cold in-place recycling (CIPR), In-Place Pulverization of Bituminous Pavement, In-Place Full Depth Reclamation (FDR) of Bituminous Pavement and Underlying Granular, Full Depth Reclamation with Expanded (Foamed) Asphalt

Case Study: Examples of appropriate pavement rehabilitation selection from 'live' projects. How would you rehabilitate this pavement?

DAY FIVE

LIFE CYCLE COST ANALYSIS, QUALITY ASSURANCE/QUALITY CONTROL ASSURANCE & END-RESULT SPECIFICATIONS

Deterministic Life-Cycle Costing

- Initial costs
- Future rehabilitation and maintenance costs
- Selection of discount rate
- User delay costs

CASE STUDY

Quality assurance. Quality assurance addresses the overall problem of obtaining the quality of a service, product, or facility in the most efficient, economical, and satisfactory manner possible. Quality control. This concept of quality control includes sampling and testing to monitor the process but usually does not include acceptance sampling and testing. Also called process control. Acceptance. Sampling, testing, and the assessment of test results to determine whether or not the quality of produced material or construction is acceptable in terms of the specifications.