

THEME 1 - ROAD ENGINEERING

Series 1A: COMPACTION

Module 1

GENERAL PRINCIPLES AND MATERIALS (duration: 25 minutes)

- Reasons for compaction and consequences of insufficient compaction.
- Static and dynamic compaction, the role of water and bitumen.
- The road surface and the materials of which it is made: road base asphalt concrete, cement bound aggregates, grave emulsions, asphalt concrete, surface dressing. - Controls when preparing and applying materials, on-site controls of level of compaction.

Module 2

MATERIALS AND MAINTENANCE (duration: 28 minutes)

- Tyre-mounted compactors : principles, characteristics.
- Vibrating machines : plate paving rammers, drums : principles and characteristics.
- Equipment maintenance : detection of anomalies, daily servicing operations.
- Precautions on start-up, instructions at end of works.
- Safety rules : using equipment, moving from site to site.

Module 3

PRINCIPLES, SITES & PRACTICAL HINTS (duration: 27 minutes)

- Review of main principles. Choice of the materials depending on the works to be carried out.
- Adjustments: pressure, weight, amplitude, frequency. Test section. Coverage plan: 1st pass, change of strip, edge.
- Practical hints: new strips, strip ends, changes of direction, completion of vibration.
- Specific points: tight turns, embankments, cuttings, slopes.
- Compacting quality and practical hints for each layer depending on the materials used: cement bound aggregates, road base asphalt concrete, asphalt concrete and surface dressings.

Series 1B: SURFACE DRESSINGS

Module 1

MAIN PRINCIPLES, COMPONENTS (duration: 20 minutes)

- Definitions and qualities: impermeability, roughness, durability.
- Function of binders and aggregates. Fields of use of surface dressings.
- The conditions for success, choice of a preparation, laying.
- Types of binders: bitumen, emulsions and other binders.
- Quality of aggregates: cleanness, hardness, shapes, dimensions, etc.
- Different types of surface dressings : single course surface dressings, raked-in surface dressing, double course, sandwich.

Module 2

SPRAYERS AND CHIPPINGS SPREADERS (duration: 30 minutes)

- Sprayers: tank, pump unit, spray-bar, jets. Heating systems, safety.
- Chippings spreaders: tractor/trailer units, self-propelled.
- Principles for adjusting rates of binders and aggregates. Control of the rates.

Module 3

ON-SITE LAYING OPERATIONS ROLE OF THE SITE MANAGER (duration: 25 minutes)

- Preparation: traffic management, sweeping, protection of structures, adjustment of equipment.
- Installation of the equipment. Site scheduling: practical hints and rolling.
- End of the site: site clearance, sweeping, cleaning of equipment.
- Responsibilities and role of site managers: Before the work: preparation, inspections; During the work: controls, control of the rates.
After the work: restoration of traffic, daily reports.

Series 1C: ROADS AND MAINS

Module 1

SITES (duration: 24 minutes)

- Preparation: Initial conditions, surveying, protection of existing features, installations, layouts.

- Foundation work: Roadways, water run-off, earth movements, top soil removal, the use of cuts, fills and deposits.
- Sub-grades: The different types of sub-grades, adjustment, compaction, bonding layer, tests and controls, sub-grades made from additional materials, geotextiles, treatment in situ, adjustments and compaction, bonding layers and grading tests.

Module 2

SEWERAGE AND DRAINAGE SYSTEMS (duration: 29 minutes)

- Trenches: Foundations, shielding and safety, pumping and ground water lowering, protection of the existing environment, layouts, cuttings trenches. Installation of sewerage and drainage networks : Sub-grades, pipe supply, installation, services.
- Structural work: Manholes, drain outlets and gutters with grids, connections, covers, manhole set up, weatherproofing, levelling.

Module 3

OTHER NETWORKS (duration: 21 minutes)

- Installation of other networks: Standards, conventional laying techniques, laying in sleeves, concrete surfacing, safety, constraints.
- Fillers for run-off waters, rain waters and other networks: Filling materials, compaction, inspection.
- Site reception procedures: The quality of the supplies, weatherproofing, control, inspection plan, self-checking.

Module 4

KERBS, CHANNELS, SIDEWALKS AND MODULAR PAVING (duration: 26 minutes)

- Kerbs and channels: Types of kerbs and their different functions, types of channels and their different functions, supplies, installation, material handling.
- Pavements and sidewalks: characteristics, making a structure for pavements and sidewalks.
- Modular paving: Characteristics of cobble stones, foundations, sub-grades, laying, paving and joints.

Module 5

ROADWAYS (duration: 41 minutes)

- Roadways structures, various sub-grades: forms, foundations, bases and bonding.
- Trials, preparation prior to start-up, supplies, methods used with the various courses, inspections.
- Paving materials: Surface dressings, hot mixes, cold slurries, concrete, preparation prior to start-up, use of surfacing dressings, laying hot mixes, laying cold slurries. - Maintenance: Repairs, planing, over-bonding, overlay, examples of maintenance sites.

Module 6

TASK OF THE SITE MANAGER (duration: 26 minutes)

- Preparation: Understanding the site, ordering the supplies, ordering the equipment, contacts with other construction companies, subcontractors and task scheduling. - Action - Organisation - Management: Work allocations, reception procedures for supplies and equipment, controls, management, verification, plans, additional works.
- Environment and quality: Road signs & signals, safety, public relations, quality.

Series 1D: LAYING ASPHALT CONCRETE

Module 1

EQUIPMENT AND MAINTENANCE (duration: 32 minutes)

- The main components of pavers.
- Characteristics, adjustment parameters and bed variation factors.
- Automated process control and trends.
- Reference systems for levelling.
- Different types of compactors used on asphalt concrete and their characteristics.
- Cleaning and daily maintenance of the paver.
- Control of compactor component.
- Control of signalling equipment.

Module 2

PREPARATION OF THE SITE (duration: 33 minutes)

- Documents related to the contract.
- Estimating and up to date costing.

- Organising schedules.
- Preparation of equipment: mechanical condition, transfer.
- Preparation of safety equipment.
- Organising the spreading plan.
- Determining levelling reference points.
- Order confirmation.

Module 3

SITES (duration: 36 minutes)

- Starting the site: informing people concerned, preparing of the surface and keying-in.
- Final adjustments to the bed: calibration of the falls, regulating wedges, levelling beam, adjustment of levelling sensors.
- Display of paver operating parameters.
- Start of the application: first inspections, compaction of the cross joint.
- Execution of a current section: working with "wedged screws", working in the "manual mode", working in the "automatic mode", camber correction.

Module 4

PARTICULAR FEATURES OF THE SITE (duration: 47 minutes)

- Inspections and precautions to take when travelling between sites.
- Managing obstacles: practical hints.
- Execution of the cross expansion joint.
- Site shutdowns: unexpected, at day end, at site end.
- Connections to site roads.
- Regulating course.
- Implementation of special products and processes.

Module 5

INSPECTIONS (duration: 17 minutes)

- Cost-related tasks and inspections: prior to beginning work, during working.
- Controls and readjustments: controls of the support, physical controls when starting, controls carried out by the work-up team, controls carried out by outside sources.
- Resource management: making the right choice.
- The end of the site: site finishing, objective analysis of the results.

THEME 2 - SAFETY

Series 2A: SAFETY WHEN WORKING ON ROADS WHICH REMAIN OPEN TO TRAFFIC

Module 1

GENERAL PRINCIPLES (duration: 25 minutes)

- Awareness training about problems relating to sites where traffic continues to flow: We can do better.
- Traffic is something worth discussing! We have to reduce risks.
- Solutions to problems: Methods. Main principles. Traffic management.
- Logical use of signing.

Module 2

URBAN AND FIXED SITES (duration: 32 minutes)

- Urban sites: General traffic management for long-term sites. Pedestrian traffic. Protection of specific places: the island concept. Movements of supply vehicles. Maintenance of traffic management. Safety zone. Storage of materials.
- Fixed sites : General traffic management of fixed sites. Maintenance and cleaning of signalling devices. Automatic traffic lighting for alternate traffic flow. Site trucks leaving and joining normal traffic flows. Personal protective equipment. Guidance signs. Materials on the roadway. Procedures for night work.
- General review of behaviour to be adopted: We are all responsible. Practical hints. Understanding safety and taking the appropriate action.

Module 3

MOBILE SITES - 2x2 LANE SITES (duration: 33 minutes)

- Mobile sites: Manual radio controlled alternate traffic signal. Position of the signallers. Management of

the approach signals. Sweeper signalling. Compactor signalling. Individual safety systems.

- 2x2 lanes sites: Reception procedures and safety training. Daily instructions to drivers. Insertion in the site and in the normal traffic flow. Individual equipment. Awareness of danger. Respect of instructions. Responsible behaviour.
- General review of behaviour to be adopted: We are all responsible. Practical hints. Understanding safety and taking the appropriate action.

Series 2B: SAFETY GUIDE FOR NEWCOMERS

Module 1

THE FIRST DAY (duration: 12 minutes)

- Explanations and advice to the road industry's new employees in order to reduce the risk of accidents. The arrival of a young employee in a company is an opportunity to highlight the basic principles and safety gear to be used on the job in view to drastically cut the risk of accidents.
- Personal safety gear: shoes, traffic vests, gloves, glasses, ear protection. Labels for dangerous products or equipment.
- Drainage or sewerage sites. Going in and out of the trench with a ladder. Shoring up trenches. Getting in and out of trucks.
- Road sites and kerbing. Working near heavy equipment. Protecting your back: lifting heavy loads. Using personal safety gear.
- Asphalt mix sites. Behaviour on the job: working around heavy equipment. Vehicle traffic, electrical lines, moving around the site.

THEME 3 - COLD TECHNIQUES

Series 3A: BITUMEN EMULSION-BASED ROAD TECHNIQUES

Module 1

GENERAL PRINCIPLES (duration: 30 minutes)

- Theory: why is bitumen emulsion used? What is bitumen emulsion? Advantages, Manufacturing, Storage.
- Emulsion-based surface dressings. Principles. Areas of use. Advantages.
- Cold micro asphalt mix. Principles. laying. Grave-emulsion Other applications. Tack coats. Emulsion-based asphalt mixes. Conclusions: a proven product with a bright future.

Module 2

THE MANAGER OF A BITUMEN EMULSION PLANT (duration: 30 minutes)

- Basic principles: quality and safety, respect of procedures, traceability.
- Plants facilities: description and organisation.
- People: responsibility, skills and know-how.
- Supplied : inventories and orders. Reception procedures for truck drivers.
- Manufacturing: procedures, compliance with specifications, compliance tests.
- Finished product storage: stock management.
- Deliveries: operator safety, maintaining product specifications.
- Compliance with instructions.
- Technical plant management : preventive maintenance.
- Plant manager : expertise required.

Module 3

THE FOREMAN OF SLURRY SURFACING (duration: 25 minutes)

- Definitions: general specifications, basic tests.
- Equipment: types, methods and descriptions.
- Site organisation. - Road Bed preparation.
- Laying : start~up, work section, shut-down, end of finishing.
- Parameters which influence work, and material (mix design).
- Supplies.
- Daily equipment maintenance.
- Scope of use.