

# CONTROLS Academy Centre

## Asphalt and Pavement Courses



# CONTROLS Academy Centre

CONTROLS is the global leader in the production of Testing Equipment for the construction industry with more than 4.000 products in three business areas.

With an Head Office in Milan, seven Branches and more than 100 dealers and distributors around the world CONTROLS is close to the customers offering local service and expertise.

In addition to this, CONTROLS offers targeted specialised modules in laboratory pavement techniques for laboratory technicians and operators. The modules aim at providing attendees with:

- › Specialised courses in pavement laboratory engineering techniques.
- › Tailored to the needs of the road laboratory executives and technicians for both public and private organization.
- › Possibility to adapt the courses to a more theoretical or practical level according to the needs of the customers.
- › For Continuing Professional Development (CPD) to be aware of the latest relevant evolution.
- › Two courses of five days each concerning Subgrade, Subbase, Hot mix asphalt, Mix design and SUPERPAVE™ recommendations.
- › Every course could be extended to two consecutive weeks in the case of availability of laboratory machines and equipments at the customer place, giving a more practical background to the customer.



## THE ROAD TO THE FUTURE



## Theme:

# Contributing to a better, durable and safer road network

### Targeted specialised modules in Asphalt and Pavement.

CONTROLS ACADEMY CENTRE deliver targeted specialised modules in laboratory pavement techniques. The modules aim at providing attendees with a quality blend of up to date knowledge, practical experience and interactive learning.

Continuing Professional Development and enhancement of attendees' skills and capabilities are outcomes that provide excellent value to both the attendees and their employer.

#### Scientific Supervision to Courses:

- **Prof. Maurizio Crispino,**  
Head of the Pavement Research Group  
at Politecnico di Milano
- **Prof. Emanuele Toraldo,**  
Assistant Professor  
at Politecnico di Milano

### To whom are the modules oriented?

The modules serve personnel at all levels in the Road Laboratory Sector (both public and private) who is involved in or responsible for conducting a wide range of basic and specialised tests in Road Engineering and in the analysis of materials test results for statistical compliance with the specifications. The planned limited enrolment of the courses (10 people maximum) is intended to assure a highly informal presentation and learning environment. Continuous interaction between the instructors and the attendees will be encouraged.

### Why CONTROLS ACADEMY CENTRE Road Pavement Modules?

Enhancing the specialist knowledge and skills means that the customer effectively increases his value and worth, becoming a technical specialist with "added value" in an industry sector already struggling to recruit and retain those with experience and knowledge who are in short supply. These modules are designed to provide an overview about flexible pavement, focusing on current practices, new developments and recent innovations in the laboratory testing. The subject range provides for a broader mix of roads, pavement engineering and construction subjects to suit the delegates' background as well as future interests and career development.

### How it works?

CONTROLS ACADEMY CENTRE offer two modules:

- **1st module, which is focusing on subgrade, subbase and an introduction to hot mix asphalt.**
- **2nd module which is focusing the attention to hot mix asphalt and in particular to the Superpave™ specifications.**

Each module consists of two consecutive weeks dedicated to the theoretical background, technical recommendations and with the presentation of the relevant standards related to the different laboratory test as well as practical preparations and executions of the major relevant testing methods. Simulations of the most relevant laboratory tests are presented directly to the attendees, giving the possibility to become expert and able to replicate the same test conditions at their own laboratory facilities.

These modules are conducted face-to-face in a classroom setup. Practical sessions are delivered directly through the collaboration with external certified Road and Construction laboratories and at the CONTROLS headquarter in Milan.

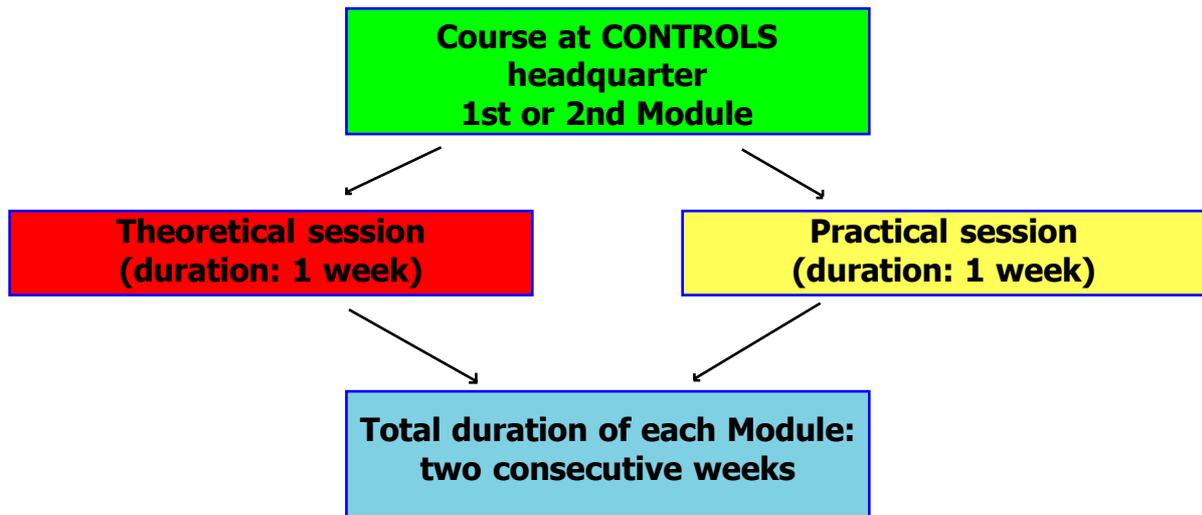
In the case that the customer would like to host the modules at his own client base, two possible solutions can be addressed.

Each module can be presented directly at the customer base for two consecutive weeks only if sufficient laboratory machines and equipments are available and operating.

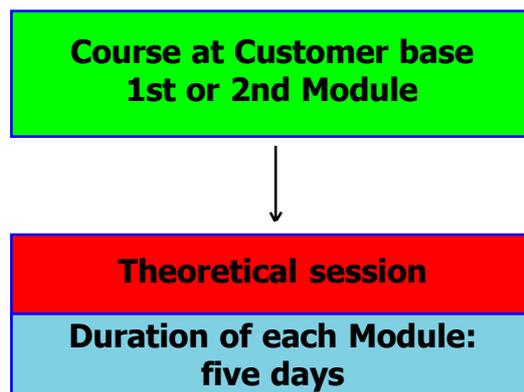
The two modules can be presented only in five days each, focusing more on the theoretical aspects and contents, if the customer is not able to provide a sufficient number of operating laboratory machines and equipments.

The diagrams on next page reassume the possible configurations for the two modules.

- **1st option: at the CONTROLS headquarters or at the customer base (if laboratory equipments are sufficient and operating)**



- **2nd option: at the customer base (if laboratory equipments are not sufficient)**



Each module will give practical tools and sufficient knowledge to understand and give an interpretation of the testing results according to the major international specifications (ASTM/AASHTO, BS, EN...), combined with the possibility to release certificates.

Attendees are provided with a Delegate Pack including comprehensive notes and power point presentations, and Certificates of Attendance at the end of each module.

From the Project Specifications to the interpretation of the results, passing through the major relevant Standards, the technical aspects of material preparation, testing and the printout of the certificates.



## Courses Outline

Aspects which will be covered during the courses include:

### ● 1st MODULE - INTENSIVE COURSE IN PAVEMENT TESTING

#### Soils, Subgrade/Subbase

1. Particle size analysis (ASTM D422)
2. Sieve Analysis of Fine and Coarse Aggregate (ASTM C136)
3. Liquid and plastic limit (ASTM D4318)
4. Moisture by calcium Carbide method (AASHTO T217)
5. Plate Bearing test (ASTM D1194)
6. Laboratory Compaction Characteristics of Soils Using Standard Effort (ASTM D698)
7. Laboratory Compaction Characteristics of Soils Using Modified Effort (ASTM D1557)
8. Maximum Index Density and Unit Weight of Soils Using a Vibratory Table (cohesion-less soils) (ASTM D4253)
9. Minimum Index Density and Unit Weight of Soils and calculation of Relative Density (cohesion-less soils) (ASTM D4254)
10. Density and Unit Weight of Soil in Place by Sand Cone Method (ASTM D1556)
11. Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine (ASTM C131)
12. CBR of Laboratory-Compacted Soils (ASTM D1883)

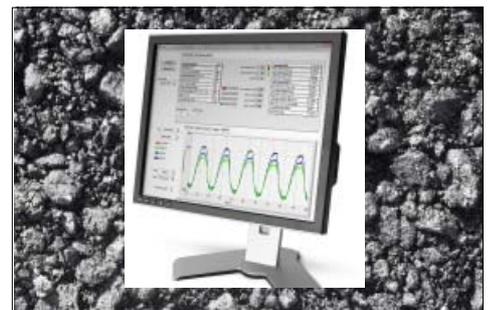
#### Flexible pavement

##### Bituminous binders

13. Foam and Emulsion (ASTM D244)  
Sampling (TG 2, Asphalt Academy, 2009)
14. Penetration of Bituminous Materials (ASTM D5)
15. Softening Point of Bitumen (ASTM D36)
16. Ductility of Bituminous Materials (ASTM D113)
17. Rotational Viscometer (AASHTO T316 - ASTM D4402)

##### Hot mix asphalt (Volumetric/rheological properties)

18. Quantitative extraction of Bitumen from Bituminous Paving Mixtures (ASTM D2172)
19. Test method for Theoretical Maximum Specific Gravity and Density of bituminous paving mixtures (ASTM D2041)
20. Preparation of Bituminous Specimens Using Marshall Apparatus (ASTM D1559 - D6926)
21. Marshall stability and flow of Bituminous Mixtures (ASTM D1559 - D6926)
22. Compaction (Gyratory) (ASTM D6925-AASHTO T312)
23. ITS (ASTM D4867)
24. Sampling compacted bituminous mixture for laboratory testing (ASTM D5361)



**Courses Outline**

Aspects which will be covered during the courses include:

**2nd MODULE - INTENSIVE COURSE in SUPERPAVE™ TESTING**

**Flexible pavement**

Bituminous binders

1. Penetration of Bituminous Materials (ASTM D5)
2. Softening Point of Bitumen (ASTM D36)
3. Force Ductility Test of Bituminous Materials (AASHTO T300)
4. Rotational Viscometer (AASHTO T316 - ASTM D4402)
5. Determining the Rheological Properties of Asphalt Binder Using a Dynamic shear Rheometer (DSR) (AASHTO T315)
6. Effect of Heat and Air on a Moving Film of Asphalt, Rolling tin-film Oven test (ASTM D2872-AASHTO T240)

Hot mix asphalt composition (Volumetric/analysis)

7. Quantitative extraction of Bitumen from Bituminous Paving Mixtures (ASTM D2172)
8. Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method (ASTM D6307)
9. Recovery of Asphalt from Solution Using Rotary Evaporator (ASTM D5404)
10. Test method for Theoretical Maximum Specific Gravity and Density of bituminous paving mixtures (ASTM D2041)
11. Preparation and Determination of the relative Density of Hot Mix Asphalt by Means of the Superpave Gyrotory Compactor (ASTM D6925-AASHTO T312)
12. ITS (ASTM D4867)

Hot mix asphalt rheological properties

13. Standard Method of Test for determining the Dynamic Modulus and Flow Number for Hot Mix asphalt using the Asphalt Mixture Performance Tester (AASHTO TP79)
14. Determining the Fatigue Life of Compacted HMA subjected to repeated Flexural bending (AASHTO T321)
15. Hamburg Wheel-Track Testing of Compacted Hot mix Asphalt (AASHTO T324)

Note: 1.2.6.8.11 are also included in the 1st Module. These points are not going to be replicated in the 2nd Module, if the customer decides to choose both of the courses.



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for the construction industry

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In line with its continual program of product research and development, CONTROLS S.R.L. reserves the right to alter specifications to equipment at any time.

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