

**ADDENDUM TO THE  
CITY OF AKRON  
AKRON ENGINEERING BUREAU  
CONSTRUCTION AND MATERIAL SPECIFICATIONS  
2008 EDITION**

**125 INSTRUCTION OF THE CITY'S PERSONNEL**

**The following section is a supplement to CMS General Provisions 100.**

**125.01 DESCRIPTION**

- A. This Section addresses the general requirements for the conduct of training of City's personnel on the care, maintenance and proper operation of the equipment. Specific requirements for training materials and for training are included in the individual sections of the Contract Documents.

**125.02 SUMMARY**

- A. This Section includes the preparation of the CONTRACTOR's Training Plan, Instructor Qualifications and the conduct of City's staff training. Training shall be conducted on all components of equipment, as specified in individual sections of Divisions 2 through 48 of the Project Manual.
- B. An initial Operations & Maintenance Instruction Manual, which has received an acceptable disposition, for the equipment shall be required to be utilized by the Instructor in the training.
- C. All Instruction of City's Personnel required by the Contract Documents must be submitted and have received an acceptable disposition by the CMT prior to the issuance of the Certificate of Substantial Completion.

**125.03 RELATED SECTIONS**

- A. CMS Section 112, Operation and Maintenance Manuals
- B. Divisions 2 through 48 of the Project Manual

**125.04 CONTRACTOR'S TRAINING PLAN**

- A. Training Plan: Training Plan is a submittal containing, as a minimum, the following:
  - 1. Training outline/syllabus
  - 2. Required trainee qualifications
  - 3. Pre-training trainee assessment process
  - 4. Description/examples of written training materials
  - 5. Description/examples of presentation materials
  - 6. Description/example of audio and visual training aids
  - 7. Training session take-away(s)
  - 8. Training documentation
  - 9. Post-training trainee assessment procedure
  - 10. Trainee assessment of training process
  - 11. Breakdown of classroom and field/hands-on training

12. Requirements for use of O&Ms, shop drawings, electronic media, etc., for training

B. Owner approval of the Plan will be a prerequisite to training actually taking place.

125.06 **SUBMITTALS**

A. At least five (5) copies of instructional materials used for training to be provided at time of the first training session. Quantity to be verified prior to training.

B. Provide two copies of all audio/visual aids utilized during training including films, slides, mock-ups, videotapes, DVDs or other training aids. All multimedia video shall be submitted in either Audio Video Interleave (AVI) format or Moving Pictures Expert Group (MPEG) format.

C. Submit the following:

1. Proposed Training Schedule: For the entire Contract showing tentative dates for each training session as specified in Divisions 2 through 48 of the Project Manual; include number, type and duration of each session. This schedule shall be submitted one-hundred twenty (120) days prior to the commencement of any individual training being performed. Schedule shall be refined and updated with input from those parties affected within sixty (60) and thirty (30) days of scheduled training.

2. Proposed Training Plan: shall be submitted sixty (60) days prior to the commencement of any training. Along with the items listed in Subparagraph 1.04A of this Section, the Plan shall also include:

a. A title page containing: Title of the Lesson Plan, product name and model of equipment; name of manufacturer, manufacturer address and phone number; name and phone number of manufacturer's contact; job location – Akron, Ohio – (Name of Facility); contract no.; specification number; CONTRACTOR name, address and phone number; Subcontractor name, address, phone – if applicable; submittal number assigned by CONTRACTOR; and submittal date.

b. A table of contents

c. A detailed instructional objective statement on the goal(s) intended to have been achieved by the end of the training session.

d. A list of all training materials to be used including the initial Operations & Maintenance Instruction Manual, which has received an acceptable disposition

e. A request of schedule dates and training attendees and times for each training session. CM to coordinate this between CONTRACTOR and City.

3. Sample Evaluation Form: Submit with Lesson Plan a sample Evaluation Form. Form shall include area for comments and evaluation of Instructor, classroom training and field instruction. Form shall identify Contract name and number, Specification section, Job location, date and time of training, title of training session, name of manufacturer, model number of equipment, Instructor name, and CONTRACTOR and Subcontractor's name.

4. Once the Lesson Plan submittal has received an acceptable disposition but at least 3 weeks prior to the actual commencement of the training, CONTRACTOR shall submit the training material as a Power Point presentation in an electronic format (DVD, CDR, or flash drive/micro storage) with appropriate labeling. In addition to the electronic format, the Power Point material shall be provided in hardcopy for CM review and approval. The number of copies shall be as defined in Section 01 33 01, Supplemental Submittal Requirements. The text and lettering on the presentation slides shall not be smaller than 12 font size and shall be black in color. Slides shall have an appropriate light colored background, resulting in a high contrast between the text and background.

## 125.07 TRAINING OUTLINE

- A. Training outline shall indicate the category of training (maintenance and operation, electrical, mechanical and instrumentation or system); description of the session; length, and type (classroom or field). The training shall include as a minimum:
1. System (Equipment) Overview:
    - a. Describe system (equipment) fundamental operating principals and dynamics.
    - b. Identify system's (equipment's) mechanical, electrical and instrumentation components and features. Review system (equipment) wiring diagrams and process and instrumentation diagrams.
    - c. Identify support systems (equipment) associated with the operation (e.g., air intake filters, valve actuators, motors).
    - d. Identify and describe safety precautions and potential hazards related to maintenance.
    - e. Identify and describe in detail safety and control interlocks.
    - f. Identify and describe alarm conditions and response to alarms.
    - g. Cover the supply of power to process equipment and related appurtenances, lighting, etc.
    - h. Cover low voltage controls, monitoring devices, etc.
  2. Equipment Preventive Maintenance (PM):
    - a. Describe PM inspection procedures required to perform an inspection of the equipment in operation, spot potential trouble symptoms and anticipate breakdowns and forecast maintenance requirements (predictive maintenance).
    - b. Define the recommended PM intervals for each component.
    - c. Provide lubricant and replacement part recommendations and limitations.
    - d. Describe appropriate cleaning practices and recommend intervals.
    - e. Identify and describe the use of special tools required for maintenance of the equipment.
    - f. Describe component removal and installation, and disassembly and assembly procedures.
    - g. Perform at least two (2) "field" demonstrations of preventive maintenance procedures.
    - h. Describe recommended measuring instruments and procedures, and provide instruction on interpreting alignment measurements, as appropriate.
    - i. Define recommended torque settings, mounting, calibration and alignment procedures and settings, as appropriate.
    - j. Describe recommended procedures to check or test equipment following a corrective repair.
  3. Equipment Troubleshooting:
    - a. Define recommended systematic troubleshooting procedures.
    - b. Provide component specific troubleshooting checklists.
    - c. Describe applicable equipment testing and diagnostic procedures to facilitate troubleshooting.
  4. Maintenance and Operation Training: Overview:
    - k. Describe system (equipment) operating (process) function and performance objectives.
    - l. Describe system (equipment) fundamental operating principals and dynamics.
    - m. Identify system's (equipment's) mechanical, electrical and electronic components and features.
    - n. Identify support systems (equipment) associated with the operation (e.g., air intake filters, valve actuators, motors).
    - o. Identify and describe safety precautions and potential hazards related to operation.

- p. For systems (equipment) comprised of several components: Identify and describe in detail each component's function. Where applicable, group related components into subsystems. Describe subsystem functions and their interaction with other subsystems.
- q. Identify and describe in detail safety and control interlocks.
- 5. Maintenance and Operation Training: Operation of Equipment:
  - a. Describe operating principles and practices.
  - b. Describe routine operating, start-up and shutdown procedures.
  - c. Describe abnormal or emergency start-up, operating, and shutdown procedures that may apply.
  - d. Describe alarm conditions and responses to alarms.
  - e. Describe routine monitoring and record keeping procedures.
  - f. Describe recommended housekeeping procedures.
- 6. Maintenance and Operation Training: Troubleshooting:
  - a. Describe how to determine if either corrective maintenance or an operating parameter adjustment is required.

#### 125.08 **PRE-INSTRUCTION CONFERENCE**

- A. Conduct a pre-instruction conference to review methods and procedures related to the training. The participants in this Pre-instruction Conference shall include the CONTRACTOR, CM, owner's representative, and Training Coordinator. The conference will include, but not limited to, the following:
  - 1. Inspect and discuss classroom and field locations and other facilities required for Instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, Instructors' personnel, audiovisual equipment, and facilities needed in order to facilitate the execution of the scheduled training in a timely manner.
  - 3. Review required content of instruction.

#### 125.09 **COORDINATION**

- A. CONTRACTOR to coordinate instruction schedule with Owner. Adjust schedule as required to minimize disrupting City's operations and to ensure availability of the City's personnel.
- B. CONTRACTOR to coordinate Instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. CONTRACTOR to coordinate content of training modules with content of accepted emergency, operation, and maintenance manuals. Do not submit instruction program(s) for review until the operation and maintenance data required under Section 01 78 23, Operation and Maintenance Manuals, has been reviewed and accepted by CM.

#### 125.10 **EXAMINATION AND VERIFICATION OF CONDITIONS**

- A. The training site for the classroom instruction will be arranged by the CONTRACTOR. It will take place at a location to be determined by the City. The CONTRACTOR will provide this location which will be in the limits of the City of Akron.
- B. The CONTRACTOR shall coordinate and verify to ensure that, prior to the scheduled training time(s):
  - 1. That all associated construction required to operate the equipment in all normal and anticipated operating modes is complete.

2. That the equipment area is well lit and unobstructed, so that all training class attendees may access, hear, and view the training.
3. That the equipment area is free of construction activities that could present a hazard to training class participants.
4. That adequate training material, as required by this Section, is on hand for use during the training session.
5. Any representatives of interfacing equipment manufacturers needed to perform supporting operations allowing demonstration of equipment operation have been notified and will be available.

#### 125.11 **PREPARATION**

- A. Videotaping of all training will be conducted by the CONTRACTOR. Before the start of training the CONTRACTOR, and the CM will review the training site(s) to establish acceptable sight lines, lighting and locations for the participants.
- B. Training classes shall be scheduled through the owner per the approved Training Schedule. Because City's operations personnel requiring training will be working different shifts at the WD.
- C. Training classes shall be conducted and separated for the following personnel:
  1. Maintenance personnel
  2. Operations personnel
  3. Systems Training
- D. The CONTRACTOR is responsible for providing audio/visual equipment and training aids as needed.
- E. Coordinate with CM to determine availability and suitability of City's facilities for training.
- F. Classroom and field instruction shall be provided for each group. Field instruction will include attention to applied familiarization with the actual equipment. Training hours as required in the Contract Documents do not include travel, set-up or cleanup time by the Instructor.
- G. For field training, the Instructor will demonstrate all operations of the equipment and may be expected to show assembly and disassembly procedures, maintenance procedures, replacement procedures, and the like. Field training will occur at the installed location of the equipment or material unless mock-ups are approved in the Lesson Plan and provided by the CONTRACTOR. Such mock-ups will become property of the City after the training sessions unless previously requested in the Training Plan.
- H. Systems Training: The CM will provide a detailed description of the system design, intended operation, and interactions of systems components. The CONTRACTOR's portion of Systems Training will provide additional detail descriptions of system's components and their interface with each other and other systems. CONTRACTOR's personnel for system training will be the same personnel who provided training described in CMS Section 125.07.

#### 125.12 **CONDUCT OF TRAINING**

- A. All topics of the approved Training Plan shall be discussed, in the classroom or the field, in complete and sufficient detail to allow plant operating personnel to knowledgeably operate and maintain the equipment in accordance with manufacturer's recommended procedures and safety considerations during all anticipated operational and maintenance situations.

- B. Safety concerns and features intended to enhance safety should be specifically addressed.
- C. Tasks required for maintaining the Warranty should be specifically addressed.
- D. Frequent reference shall be made to the Operation and Maintenance Manuals.
- E. Address all questions and comments proposed by the training session participants as they are raised to the maximum extent practicable. If questions or comments cannot be addressed during the training session, additional materials and/or training may be required as determined by the CMT.
- F. If any training session exceeds three (3) hours in duration, provide a ½-hour break.
- G. Cooperate with the CONTRACTOR videotaping personnel to ensure that all parts of the training session are legible or audible on the final tape. The Instructor must repeat all questions to ensure that they are audible. Final acceptance of the training is contingent on the acceptability of the videotape.
- H. Training Sessions may be attended not only by the City's Operating Personnel but also by members of the CM or any other entities designated by the City.

#### 125.13 **EVALUATION**

- A. Immediately following training, the Instructor shall pass out an evaluation form to the City's personnel. This form shall provide a means for the City's personnel to comment on the Instructor and the quality, completeness, and value of the session.
- B. Evaluation Forms shall be collected by the CM, along with the Attendance Sheet at the end of each training session and the original documents shall be used by the CM in determining if additional training is required by the CONTRACTOR. If additional training is required due to the material as outlined in the Training Plan not being covered correctly or in its entirety or the inability of the Instructor to answer questions pertaining to the operation and maintenance of the equipment, or if the training aids or equipment fail to operate as intended, the CONTRACTOR shall provide such additional training at no additional cost to the City.

END OF SECTION