

# ATCW-1250: INFRASTRUCTURE LAYOUT

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## Cuyahoga Community College

**Viewing: ATCW-1250 : Infrastructure Layout**

**Academic Term:**

Spring 2019

**Subject Code**

ATCW - AIT-Communication Workers

**Course Number:**

1250

**Title:**

Infrastructure Layout

**Catalog Description:**

Course covers the application of math concepts to the communications industry, the interpretation of construction working drawings for worksite requirements and the importance of site surveys. In addition, proposed and actual timelines are discussed.

**Credit Hour(s):**

2

**Lecture Hour(s):**

2

### Requisites

**Prerequisite and Corequisite**

Departmental approval: admission into the CWA apprenticeship program.

### Outcomes

**Course Outcome(s):**

I. Discuss the application of math concepts relative to communications transport including whole numbers, fractions, decimals and basic metric problems.

**Objective(s):**

1. Establish room and work space orientation with respect to true or assumed north.
2. Determine relative drawing scales on relative drawings to determine information transport equipment.
3. Identify construction plans used to establish cabling systems
4. Explain how room finish schedules are used for component selection and pathway determination.
5. Explain the required proficiency testing process required for industry certification.

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**Course Outcome(s):**

II. Interpret construction drawings, including respective plans, schedules and sections required for job orientation and information for proper equipment placement and installation

**Objective(s):**

1. Explain the required proficiency testing process required for industry certification.
2. Establish room and work space orientation with respect to true or assumed north.
3. Determine relative drawing scales on relative drawings to determine information transport equipment.
4. Identify construction plans used to establish cabling systems.
5. Explain how room finish schedules are used for component selection and pathway determination.

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**Course Outcome(s):**

III. Discuss the importance of conducting a site survey and establishing an accurate work scope.

**Objective(s):**

1. Evaluate the jobsite for potential hazards to the worker and transmission data equipment.
2. Compare the worksite to the construction drawings to verify accuracy of the proposed work scope.
3. Locate transmission data equipment rooms to work within design parameters.
4. Verify the completion of electrical contractor work scope.
5. Verify the location of outlets with scope description.
6. Evaluate the location of conduit stubs and work boxes to establish plan pathways.

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**Course Outcome(s):**

IV. Describe the fluidity of timelines with respect to inspections and establish realistic schedules that include remobilization fees and soft openings.

**Objective(s):**

1. List the timeline items that are required for various job phases.
2. Differentiate between established Gantt Charts and fluid timelines.
3. Explain the function of a Gantt Chart with respect to signal transmission equipment installation.
4. Describe how timelines interact between the trades, end users and inspectors.

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**Methods of Evaluation:**

1. Quizzes
2. Tests
3. Class participation

**Course Content Outline:**

1. Applied math for communications
  - a. Math application
    - i. Material quantities
    - ii. Fill ratios
    - iii. Weight estimates
    - iv. Footages
  - b. Concepts
    - i. Basic
      1. Addition/subtraction
      2. Multiplication/division
      3. Decimals
    - ii. Geometric
      1. Layout
      2. Fabrication
  - c. Estimating applications
    - i. Materials
    - ii. Design
    - iii. Time
    - iv. Concept application
  - d. Material estimating
    - i. Decimals
    - ii. Percentages
    - iii. Waste
  - e. Metric
    - i. Conversion
    - ii. Applications
2. Construction drawings
  - a. Workspace orientation
    - i. North
      1. True
      2. Assumed
    - ii. Room location
  - b. Equipment

- i. Scales
      - ii. Standards application
    - iii. Work space
      - 1. Current
      - 2. Future
      - 3. Serviceability
  - c. Cabling systems drawings
    - i. Electrical
    - ii. Communications
    - iii. Data
    - iv. Elevations
    - v. Systems
  - d. Room finish schedules
    - i. Jack covers
    - ii. Surface mounted boxes
    - iii. Furniture
    - iv. Pathway determination
      - 1. Wire re-route
      - 2. Outlet locations
    - v. Component selection
      - 1. Colors
      - 2. Type
      - 3. Labeling requirements
  - e. Reflected ceiling plans
    - i. Heights
    - ii. Ceiling treatment
    - iii. Speaker locations
  - f. Proficiency testing
    - i. Code
    - ii. Standards
    - iii. Manufacturer requirements
    - iv. End user requirements
    - v. As built drawings
3. Site survey and work scope
- a. Site survey
    - i. Jobsite hazards
      - 1. Worker related
        - a. Fall protection
        - b. Personnel Protective Equipment (PPE)
        - c. Electrical
    - ii. Equipment
    - iii. Environmental
    - iv. Security
  - b. Verification
    - i. Drawing versus actual
    - ii. Locations
    - iii. Equipment
    - iv. Accuracy
    - v. Electrical
  - c. Room locations
    - i. Design parameters
      - 1. Clearance
      - 2. Lighting
      - 3. Temperature
    - ii. Equipment rooms
    - iii. Points of demarcation
    - iv. Points of entry
  - d. Outlets and scope determination
  - e. Electrical completion

- i. Work boxes
    - ii. Bushings
    - iii. Conduits
    - iv. Plaster rings
    - v. Core holes
  - f. Plan pathways
    - i. Wall penetrations
    - ii. Hardware capacity
    - iii. Wire routes
- 4. Timelines
  - a. Site survey
    - i. Job phases
      - 1. Pre-survey
      - 2. Site
      - 3. Product delivery
      - 4. Rough in
      - 5. Inspections
      - 6. Finishes
      - 7. Compliance
  - b. Gantt Chart
    - i. Trade coordination
    - ii. Proposed schedule
    - iii. Equipment installation
    - iv. Service delivery
  - c. Fluid timeline
    - i. Actual
    - ii. Moves, add-ons and changes
  - d. Interaction
    - i. Trades
    - ii. End users
    - iii. Inspections

## Resources

BICSI. *Information Technologies Systems Installation Methods*. 6th. BICSI Tampa, Florida, 2007.

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BICSI. *Telecommunications Cabling Installation*. 6.1. BICSI Tampa, Florida, 2007.

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Independent Electrical Contractors Chesapeake and Western Electrical Contractors Association. *Electrical Pre Apprenticeship Workforce Development*. 2013 (Current). Delmar, Cengage Learning Clifton Park, New York, 2007.

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## Resources Other

1. [http://en.wikipedia.org/wiki/Structured\\_cabling](http://en.wikipedia.org/wiki/Structured_cabling)
2. [www.bicsi.org](http://www.bicsi.org)

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