

ATGL-2330: TRANSITS, LEVELING INSTRUMENTS, AND LASERS

Cuyahoga Community College

Viewing: ATGL-2330 : Transits, Leveling Instruments, and Lasers

Board of Trustees:

March 2020

Academic Term:

Spring 2020

Subject Code

ATGL - Appld Indus Tech - Glazing

Course Number:

2330

Title:

Transits, Leveling Instruments, and Lasers

Catalog Description:

Use of transits, levels and lasers for glazing installation including elements of instruments; types of instruments; care and handling; setting up, leveling, and using instruments; and specific applications of leveling and installation.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

ATPT-1300 Introduction to Painting, Drywall Finishing and Glazing, and ATGL-1330 Hand Tools for Glaziers; or departmental approval.

Outcomes

Course Outcome(s):

I. Identify the different elements of a transit and a level

Objective(s):

1. Understanding what a telescope is
2. Determining if the Leveling vial is level
3. Establishing the Circle
4. Establishing the Vernier
5. Reading a Plumb bob

Course Outcome(s):

II. Types of Instruments

Objective(s):

1. Differentiating when to use a Level
2. Differentiating when to use a Transit

Course Outcome(s):

III. Set up an instrument quickly on any type of surface

Objective(s):

1. Determining if the tripod is set-up accurately
2. Understanding how to set-up an Instrument

Course Outcome(s):

IV. Handling and care

Objective(s):

1. Realizing how to Handle the Instrument
2. Making one aware how to care for the Instrument

Course Outcome(s):

V. Use a transit and level to accurately complete a variety of glazing installations

Objective(s):

1. Learning how to use the Four leveling screw method
2. Learning how to use the Three leveling screw method
3. Understanding how to read the Leveling rod
4. Using a transit
5. Understanding how to Read a transit
6. Establishing how to Install sliding glass door track

Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation
4. Demonstration of project assignments

Course Content Outline:

1. Elements of a transit and level
 - a. Telescope
 - i. Optics
 - ii. Magnification
 - iii. Zoom
 - iv. Lens
 - b. Leveling vial
 - i. Bubble
 - ii. More accurate
 - iii. Symmetrical in shape
 - iv. Aligned and centered
 - c. Circle
 - i. Horizontal circle
 1. Establishes horizontal angles
 - ii. Vertical circle
 1. Establishes vertical circles
 - d. Vernier
 - i. Stationary auxiliary scale
 - ii. Uniformly graduated
 - iii. Graduated to a fractional part
 - e. Plumb bob and optical plummets
 - i. Plumb bob
 1. Used to position over a selected point
 2. Plumb bob has tapered body
 3. Can be difficult to use
 - ii. Optical plummet

1. Small prismatic telescope
2. Adjusted with vertical axis
2. Types of instruments
 - a. Levels
 - i. Dumpy levels
 1. Simplest of levels
 2. Most rugged
 3. Swings in horizontal circle
 4. Doesn't move vertically
 - ii. Self-leveling
 1. Line level
 2. Dot level
 3. Rotating level
 - b. Transits
 - i. Builders transit
 1. Most common
 2. Also a dumpy level
 3. Leveled with 3 or 4 thumb screws
 - c. Engineers transit
 - i. More complex
 - ii. Highly accurate
 - iii. Rotates horizontally and vertically
 - iv. Magnification is higher
3. Setting up
 - a. Tripod
 - i. Sloping surfaces
 1. Use extra care
 2. use adjustable leg tripod
 3. one leg uphill and two legs downhill
 - ii. soft surfaces
 1. drive 3 stakes in the ground
 2. form equilateral triangle
 3. take precautions to prevent slipping
 - iii. smooth or slippery surfaces
 1. use caution
 2. maintain a stable base
 3. use wood frame to set up in
 - b. Instrument
 - i. transit
 1. screw baseplate to tripod
 2. don't over tighten
 3. screw on straight
4. Care and handling
 - a. Handling
 - i. Transporting
 1. Transport in proper case
 2. Set on cushioned seat when in vehicle
 3. Never transport on a hard surface
 - ii. Use
 1. Leave in case until ready to use
 2. Set up tripod first
 - iii. Leveling screws
 1. Tighten until firm
 2. Don't over tighten
 3. Strips easily
 - b. Carrying a tripod mounted instrument
 - i. Carry under arm
 - ii. Keep facing front
 - iii. Never carry on shoulder
 - c. Care

- i. Keep covered
 - ii. Never leave in sun
 - iii. Don't touch scales with bare hands
 - iv. Use lightly oiled cloth to clean
5. Leveling the instrument
- a. 4 leveling screw method
 - i. Turn instrument until bubble is centered
 - ii. Adjust screws in opposing pairs
 - iii. Turn 90 degrees using the second pair of screws
 - iv. Turn instrument to the original position
 - v. Repeat until bubble remains centered
 - b. 3 leveling screw method
 - i. Leveled in similar fashion
 - ii. Turn 90 degrees
 - iii. Repeat until bubble is centered
 - c. Leveling rod
 - i. Measuring device
 - 1. Used to measure vertical distance
 - 2. Focused on when sighting
 - 3. Common graduated upward
 - d. Using a transit or level
 - i. Control points
 - 1. Stakes
 - 2. Monuments
 - 3. Benchmarks
 - e. Reading transits
 - i. Horizontal circle
 - 1. Read in degrees
 - 2. Numbered clockwise and counter-clockwise
 - 3. From 0 degrees to 90 degrees
 - ii. Vertical circle
 - 1. Read in degrees
 - 2. Numbered clockwise and counter-clockwise
 - 3. From 0 degrees to 90 degrees
 - f. Vernier
 - i. Secondary scale
 - ii. Provides further division of units
 - iii. Attains greater accuracy
 - g. Installing sliding glass door track
 - i. Set in finished floor
 - 1. Flush with floor
 - 2. Determine height of floor
 - 3. Position and secure track
 - 4. Check for level
 - 5. Shim if required
 - ii. establish level line
 - 1. Set up instrument
 - 2. Hold tape against wall
 - 3. Sight tape
 - 4. Acknowledge mark
 - 5. Pivot Instrument to mark other areas
 - iii. Transferring the benchmark
 - 1. Find benchmark
 - 2. Hold tape on benchmark
 - 3. Record measurement
 - 4. Transfer mark

Resources

Finishing Trades Institute. *Transits and Leveling Instruments*. 1st. 7230 Parkway Drive Hanover, Md 21076:Finishing trades Institute ,

Finishing Trades Institute. *Using Transits and levels*. 7230 Parkway Drive Hanover, Md 21076: Finishing trades Institute ,

Finishing Trades Institute. *Aquariums/ Shower Doors Tub Enclosures and Showcases*. 1st. 7230 Parkway Drive Hanover, Md 21076: Finishing trades Institute ,

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