

ILX Construction Training Course Overview

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Block 1 - Basic Tools

Unit 1: How to Read a Plan

- Lesson 1: Views
 - Elevation
 - Floor Plan
 - Plot Plan
 - Section
 - Detail
- Lesson 2: Basic Symbols
 - Walls
 - Windows
 - Door
 - Water Closet
 - Tub
 - Shower
 - Outlet
 - Switch
 - Light Fixture
 - Cabinetry
 - Shortened Line
 - Section View
- Lesson 3: Dimensions
 - Architect's Scale
 - Engineer's Scale

Unit 2: Measurement Basics

- Lesson 1: Basic Tools
 - Measuring Tape
- Lesson 2: Mathematical Conventions
 - Order of Operations
 - Rounding Decimals
 - Converting Inches to Decimalized Feet

Unit 3: Basic Construction Math

- Lesson 1: One-dimensional Calculations
 - Each
 - Linear Feet
- Lesson 2: Basic 2-dimensional Calculations
 - Area of a Rectangle in Square Feet
 - Square Feet to Square Yard
 - Conversions
- Lesson 3: Other 2-dimensional Calculations
 - Parallelogram
 - Trapezoid
 - Triangle
 - Circle
- Lesson 4: Three-dimensional Calculations
 - Cubic Yards
 - Board Feet

Unit 4: Other Important Calculations

- Lesson 1: Pythagorean Theorem
 - Using the Pythagorean Theorem
- Lesson 2: Other Construction Calculations
 - Calculating Squares
 - Calculating Waste
 - Rounding Quantities

Block 2 - How Parts Fit

Unit 1: Structure Components And Functions

- Lesson 1: Basic Structure Parts
 - Soil
 - Footing
 - Foundation
 - Floor System
 - Walls (Bearing and Non-Bearing)
 - Roof
 - Structural Parts
 - Non-Structural Parts

Unit 2: Full Basement Home

- Lesson 1: Soil Considerations
 - Load Bearing Capacity
 - Footing Minimum Depth
 - Footing Maximum Depth
 - Excavation
- Lesson 2: Reinforced Concrete
 - Making Concrete
 - Concrete Plasticity
 - Hydration
 - Admixtures
 - Rebar
- Lesson 3: Concrete Footings
 - Footing and Rebar Location
 - Pouring Footings
 - Finishing Footings
- Lesson 4: Concrete Foundations
 - Forms and Rebar Placement
 - Pouring Foundations
 - Anchor Bolts and Holdowns
- Lesson 5: Basement Floor Slab
 - Work Under the Slab
 - Shovel Footings
 - Pouring and Finishing the Slab
 - Potential Problems
- Lesson 6: Controlling Ground Water
 - Dampproofing
 - Perimeter Drain
 - Backfill and Grading
- Lesson 7: Drying-In the Structure
 - Main Floor System
 - Walls
 - Roof
- Lesson 8: Completing the Structure
 - Rough-in Work
 - Interior Finish Work
 - Completing the Exterior

Unit 3: Other Types of Structures

- Lesson 1: Crawl Space Home
 - Depth Considerations
 - Columns and Footings
- Lesson 2: Post and Beam Construction
 - Foundation System
 - Special Considerations
- Lesson 3: Flood Plane Home
 - Foundation System
 - Footings and Columns
- Lesson 4: Pier and Grade Beam Construction
 - Pier and Grade Beams
- Lesson 5: Block Home
 - Footings and Foundation
 - Floor Slab
 - Materials Used

- Walls and Reinforcement
- Finishing Walls In and Out
- Lesson 6: Monolithic Pour Home
 - Construction Concepts
 - Construction Methods

Block 3 - Idea Through Wall Framing

Unit 1: Getting Started

- Lesson 1: Roles of Professionals
 - Architect
 - Engineer
 - Designer
 - Drafter
 - Developer
 - Contractors
 - Building Inspectors
- Lesson 2: Steps Before Construction Begins
 - Selecting Plans
 - Obtaining a Permit
 - Inspection Overview
- Lesson 3: Preparing the Hole
 - Hole Location
 - Hole Depth
 - Excavation

Unit 2: Basic Framing Terms

- Lesson 1: Lumber Terminology
 - Rough Cut
 - Surfacing
 - Drying
 - Grain
 - Moisture/Insect Resistance
- Lesson 2: Framed Wall Parts Terminology
 - Studs & Plates
 - Wall Ties
 - Door/Window Framing
- Lesson 3: Framing to Foundation Connection
 - Foundation Sill Plate
 - Sill Plate Attachment
- Lesson 4: Framed Wall Construction
 - Plate Placement
 - Stud Length
 - Crowning
 - Wall Placement
 - Top Plates
- Lesson 5: Main Floor Support System
 - Joist Placement
 - Band Joist
 - Horizontal Joist Support
 - Vertical Joist Support
- Lesson 6: Main Floor System Connectors
 - Headers and Joists for Stairs
 - Shearing
 - Nails
 - Metal Hangers
- Lesson 7: Beam Terminology
 - Use of Beams
 - Glue-Lam Beams
 - Dimensional Wood Beams
 - L-V-L Beams
 - Box Beam
 - Steel Beam

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Lesson 8: Beam Support
Metal Columns
Wood Columns
Floor Support

Lesson 9: Sheathing Terminology
Sheathing
Sheathing Materials
Exposure to Moisture

Lesson 10: Sheathing Installation
Floor Sheathing
Fasteners and Glue
Bending
Alignment on Joists

Lesson 11: Floor Joist Options
I Joists
Floor Trusses

Lesson 12: Stair System Basics
Stringers, Risers and Treads
Landing and Top Riser
Stair Assembly

Lesson 13: Main Floor Walls
Window/Door Location
Stud Location
Squaring the Wall
Wall Sheathing
Wall Bracing before Lifting
Placing the Walls

Lesson 14: Other Wall Framing
Considerations
Metal Studs
Metal/Wood Comparison
Framed to Square

Block 4 - Roof Framing

Unit 1: Roof Types and Parts

Lesson 1: Roof Styles
Gable Roof
Hip Roof
Gambrel Roof
Clerestory Roof
Shed Roof
Flat Roof
Mansard Roof
Butterfly Roof

Lesson 2: Roof Parts
Peak, Rake, Eave, and Overhang
Deck, Intersections, and Dormer
Chimney Cricket

Lesson 3: Roof Framing Parts
Ridge Board
Hip and Valley Rafters
Common Rafter
Jack Rafter
Cripple Rafter
Fascia and Soffit
Collar Tie
Bird's Mouth and Rafter Tail

Unit 2: Roof Rafter Support System

Lesson 1: Making the Common Rafter
Rise/Run/Span
Slope/Pitch
Cutting Common Rafters

Pattern

Lesson 2: Rafter Support and Reinforcement
Stabilizing Rafters
Rafter Size
Mid-Rafter Support

Lesson 3: Making Hips and Valleys
Rafter Placement
Hip Rafter Length
Jack and Valley Rafters

Unit 3: Post and Beam Roof Support System

Lesson 1: Post and Beam System
Examples
Purlins
Metal Buildings

Unit 4: Roof Truss Support System

Lesson 1: Facts About Trusses
Basic Parts of Trusses
Loads
Truss Centers and Span
Slope and Type of Truss

Lesson 2: Truss Types
Flat Truss
Gable Truss
Gambrel Truss
Scissor Truss
Mono Truss
Bowstring Truss

Lesson 3: Truss Dynamics
Forces
Gussets
Causes of Failure
Gusset Size at Critical Points
Gusset Placement

Lesson 4: Installing Gable Trusses
Gable End Trusses
Placing Trusses
Cat Walk

Unit 5: Building the Roof on the Support System

Lesson 1: Installing Rough Fascia and Fly Rafters
Rough Fascia & Fly Rafter Examples
Installing the Rough Fascia
Installing the Fly Rafter
Combines Truss and Rafter Roof

Systems

Lesson 2: Roof System Ventilation
Blocking/Insulation Stop
Need for Ventilation
Improperly Ventilated Roof

Lesson 3: Positioning Trusses for Sheathing
Truss Layout Position
Truss Movement
Truss Bracing

Lesson 4: Installing the Sheathing
Spaced Sheathing
Purlins
Sheathing Placement
Nailing of Sheathing

Lesson 5: Backing
Backing Examples
Ceiling Joist or Rafter as Backing
Truss System as Backing

Lesson 6: Fire Blocking
Walls
Floor Systems
Basement Framed Walls
Stairways
Dropped Ceilings

Block 5 - Exterior Finishes

Unit 1: Concrete Work

Lesson 1: Supporting Exterior Concrete
Fracturing Due to Settling
Haunch
Tube Formed Columns
Footing and Foundation Walls

Lesson 2: Strengthening Exterior Concrete
Concrete Strength
Wire Reinforcement
Synthetic Fibers
Concrete Surface Strength

Lesson 3: Common Flatwork and Related Finishes
Broom Finish
Trowl Pattern Finishes
Exposed Aggregate
Epoxy Finish
Concrete Stamp
Pavers

Unit 2: Decks

Lesson 1: Exterior Decks
Deck Support
Deck Materials

Unit 3: Windows and Overhead Doors

Lesson 1: Window Parts
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Placing the Window
Flashing
Jambs and Sill
Stop
Stool and Apron
Pane, Sash, and Lights
Muntin, Grid, and Mullion

Lesson 2: Window Materials
Thermal Break
Frame Materials
Glass Types
Tinting and Low E

Lesson 3: Types of Windows
Windows that Slide Open
Other Windows that Open
Fixed Windows
Bay and Bow Windows
Storm Windows

Lesson 4: Overhead Garage Doors
Single Piece and Sectional Doors
Materials and Patterns
Door Features

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Unit 4: Masonry and Stucco

- Lesson 1: Brick Patterns and Bonds
 - Vapor Barrier
 - Brick Bonds
 - Brick Courses
 - Mortar Joints
- Lesson 2: Structural Masonry
 - Exteriors
 - Block Types
 - Wythe
 - Fired and Unfired Brick
- Lesson 3: Nonstructural Brick Veneer
 - Story Pole
 - Anchoring
 - Lintels
 - Quoins
- Lesson 4: Stone Veneers
 - Cultured Stone
 - Installing Natural
 - Mortar and Grout
 - Installing Cultured Stone
 - Cleaning Veneer
- Lesson 5: Stucco
 - Installing Common Stucco
 - Three Stucco Layers
 - Synthetic Stucco
 - Installing Synthetic Stucco

Unit 5: Siding

- Lesson 1: Common Siding Materials and Joints
 - Siding
 - Butt Joint
 - Overlap Joint
 - Tongue and Groove Joint
 - Rabbet Joint
 - Corner Joints
 - Miter Joint
- Lesson 2: Sheet Siding
 - Fastening Sheet Siding
 - Horizontal Butt Joint
 - Unfinned Windows
 - Sheet Siding Textures
- Lesson 3: Horizontal Siding
 - Lap Siding
 - Fastening and Joints
 - Rabeted Taper Siding
 - Shiplap Siding
- Lesson 4: Vertical Siding
 - Board and Batten
 - Board on Board
 - Fastening Vertical Siding
- Lesson 5: Interlocking Siding
 - Metal and Vinyl Siding
 - Expansion and Contraction
 - Metal Channel

Unit 6: Soffit, Fascia, and Gutters

- Lesson 1: Soffit and Fascia
 - Metal Installation
 - Wood Installation
 - Frieze Board
 - Cornice

- Lesson 2: Gutters and Downspouts
 - Materials Used
 - Installation
 - Aluminum Gutters

Unit 7: Fences

- Lesson 1: Fencing
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 - Wrought Iron
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Unit 8: Paint

- Lesson 1: Exterior Painting
 - Surface Preparation
 - Primer Coat
 - Brushes and Rollers
 - Sprayers
 - Masking and Painting Techniques

Block 6 – Roofing

Unit 1: Common Roofing Materials

- Lesson 1: Asphalt Based Roofing Materials
 - Shingles and Membranes
 - Asphalt Saturated Products
 - Fiberglass vs. Organic Mat
 - Composition Shingles
- Lesson 2: Composition Shingle Production
 - Surface Granules
 - Release Film/Sealant Strip
 - Splices in Production

Unit 2: Flat Roof Systems

- Lesson 1: Membrane Roof System
 - Roof Flashing
 - Flat Roof Slope
 - Roof Drain
 - Parapet Wall Joint
 - Scupper Roof Drains
- Lesson 2: Multi-ply Membrane Roof System
 - Built-up Roof
 - Built-up Roof Plies
- Lesson 3: Multi-ply Membrane Roof
 - Installation
 - Base Sheet
 - Hot Tar
 - Surface Finishes
 - Determining Plies
 - Common Problems
- Lesson 4: Single Membrane Roof Systems
 - Joining Different Materials
 - Modified Bitumen Roof System
 - Modified Bitumen Installation
 - Surface Finish

Lesson 5: Elastomeric Roof System

- Materials
- Installation
- Roof Deck Preparation
- Seams
- Problems and Maintenance

Unit 3: Sloped Roof Characteristics

- Lesson 1: Roof Shingles
 - How They Work
 - Roofing Felt
 - Rubberized Asphalt Membrane
 - Problems
- Lesson 2: Roof Flashing
 - Purpose
 - Step and L Flashing
 - Counterflashing
 - Valley and Pipe Flashing
 - Drip Edge
- Lesson 3: Sloped Roof Considerations
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Unit 4: Composition Shingles

- Lesson 1: Identification
 - Organic vs Fiberglass
 - Tabs
 - Laminated
 - Interlocking
- Lesson 2: Cost Factors
 - Style
 - Warranty
 - Labor
- Lesson 3: Non-interlocking Installation
 - Courses
 - Attachment
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- Lesson 4: Interlocking Installation
 - Courses
 - Attachment
 - Valley Flashing

Unit 5: Wood Roofs

- Lesson 1: Shake and Wood Shingle Identification
 - Wood Shake Production
 - Types
 - Thickness
 - Wood Shingle Production
 - Recognizing Grades
 - Grade Categories
- Lesson 2: Prep for Installation
 - Exposure and Quantities
 - Patterns and Cost
 - Decking
- Lesson 3: Installation
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Unit 6: Tile Roofs

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 - Concrete Tile
- Lesson 2: Tile Shingle Cost Factors
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- Barrel Tile Placement
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Unit 7: Metal Roofs

- Lesson 1: Metal Roof Products
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- Lesson 2: Metal Roof Installation
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- Standing Seam
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Unit 8: Other Shingle Types

- Lesson 1: Slate Shingles
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- Lesson 2: Fiber and Cement
- Shingles
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Unit 9: Other Roof Topics

- Lesson 1: Ventilation
- Effects of Improper Ventilation
- Vapor Barrier
- Air Flow
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Block 7 - Finishing the Interior

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- Lesson 1: Electricity to the Home
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- House Connection
- Lesson 2: Wiring Concepts and Terms
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- Grounding
- 120 Volt and 240 Volt
- Wire Gauge
- Knob and Tube Wiring
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- Lesson 3: House Wiring
- Electrical Circuits
- Rough Electrical
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- Wire Connections
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- Pump Systems
- Irrigation Water
- Water Piping
- Copper Water Pipe
- PB Water Supply Pipe
- Problems with PB Pipe
- Lesson 2: Manifold PB Systems
- Advantages
- Special Precautions
- Lesson 3: Special Plumbing Issues
- Hydraulic Shock
- Freeze Less Hose Bibbs
- Appliances with Plumbing Attached
- Lesson 4: Water Softeners & Water Heaters
- Water Softeners
- T & P Valves
- Supply through Manifold Systems
- Water Heaters
- Lesson 5: Sewer Connections & Septic Tank Systems
- The Sewer Lateral
- Septic Tanks and Drain Fields
- Positioning the Septic Tank & Drain Field
- Septic Tank Strength
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- Lesson 6: Drain & Waste Collection Systems
- Plumbing Stack
- Venting
- Drain and Soilage Pipes
- Traps
- Lesson 7: Installing Plumbing Fixtures
- Installing a Rimmed Sink
- Installing a Rimless Sink
- Placing the Water Closet
- Tub and Shower Materials
- Tub and Shower Rough Plumbing
- Installing the Shower Pan

Unit 3: HVAC

- Lesson 1: Basic Heating Concepts
- The Thermostat
- Heat Systems
- Forced Air Systems
- Forced Air Furnaces
- Lesson 2: How Heat is Created & Transferred
- Producing Heat & Venting Gases
- Heat Exchangers
- "Pulse" Furnaces
- Combustion Air for Furnaces
- Lesson 3: Central Air Conditioning and Heat Pumps
- Air Conditioning
- Heat Pumps
- Lesson 4: Miscellaneous HVAC
- Evaporative Coolers
- Humidifiers
- Electrostatic Filters
- Kitchen and Bath Ventilation
- Lesson 5: Masonry Fireplaces
- Installing a Masonry Fireplace
- The Hearth, Firebox and Mantel
- Inside the Masonry Fireplaces
- The Fireplace Flue

- Lesson 6: Factory Built Fireplaces
- Clearance for Factory Built Fireplaces
- Parts of the Factory Built Fireplace
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Block 8 - Finishing the Interior

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- Injected and Poured-In Insulation
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- Lesson 1: Drywall
- Properties of Drywall Board
- Hanging Drywall
- Drywall Joints and Corners
- Drywall Board Tapered and Square Edges
- Drywall Mud and Tape
- Drywall Texture
- Drywall Fire Resistance
- Lesson 2: Plaster
- Lath
- Plaster Finishes
- Lesson 3: Tile Ceilings
- Glue-Up Tile
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- Lesson 4: Wall Paneling
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- Lesson 1: Doors
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- Door Swing
- Door Slab Surfaces
- Inside the Door Slab
- Other Parts of the Door
- Pre-Hung Doors
- Hanging the Door
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- Hanging Exterior Doors
- Door Hardware
- Lesson 2: Trim
- Baseboard
- Specialty Base and Casing
- Trim Joints
- Precautions for Stain Grade Trim
- Specialty Trim and Joints
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- Preparation for Paint
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Block 9 - Cabinets, Floor Coverings and Other Final Finishes

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Lesson 2: Recognizing Wood
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Recognizing Wood Grains
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Lesson 3: Judging Cabinets
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Lesson 4: Installing Cabinets
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Unit 2: Floor Covering

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Lesson 2: Carpet Pad and Carpet Installation
Carpet Pad
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Lesson 3: Tile
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Lesson 4: Vinyl
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Lesson 5: Wood
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Lesson 6: Other Floor Finishes
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Lesson 1: Finish HVAC and Electrical
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Unit 5: Finishing the Rooms

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Kitchen Sinks
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Lesson 3: Laundry Rooms
Laundry Room Plans
Laundry Sinks
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Block 10 - How to Inspect

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The Six Points
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Lesson 2: Diagramming
An Effective Diagram
Rectangular Rooms with Flat
Ceilings
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Lesson 3: Safety Issues and Damage Clues
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Other Safety Issues

Unit 2: Common Losses and Repair Issues

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Sources of Heat, Fuel, & Oxygen
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Charring
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Lesson 2: Common Repair Issues
Removing Sources of Odor
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Lesson 3: Other Repair Issues
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Deciding Whether to Clean or Replace

Lesson 4: Water Damage
Water Extraction & Dehydration
The Effects of Moisture

Lesson 5: Vehicle Collision & Earthquake Damage
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Lesson 6: High Wind Losses
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