

MH 1708 Estimating Workflow – AI Training Guide (Trainer Notes Edition)

This enhanced version adds **Trainer Notes** and detailed structural divisions for each phase of the 1708 takeoff process. Modules are now segmented by framing layer for improved training granularity.

Overview

Purpose: Train AI systems and new estimators to understand, replicate, and optimize your full takeoff and pricing workflow using standardized logic, terminology, and structure.

Training Source Videos:

1. *Building the Second Floor – Framing & Design Insights*
2. *Second Floor Joist System Overview and Planning*
3. *Roof Takeoffs and Elevation Planning*
4. *Inputting Pricing for the 1708 Exterior Unit*
5. *MH 1708 Elevation A Siding Takeoff*

Trainer Focus:

- Evaluate estimator speed, accuracy, and consistency across modules.
 - Highlight areas for automation or process improvement.
 - Annotate AI learning opportunities for visual, auditory, and behavioral cues.
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Module 1 – Setup & Calibration

Video Reference: *Second Floor Joist System Overview* (0:00–1:45)

Trainer Notes:

- **Timestamp 00:10–00:30:** Emphasize importance of setting correct scale early — include visual cue overlay for $\frac{1}{8}'' = 1'$.
- **Timestamp 01:00–01:30:** Reinforce naming convention steps (Elevation A/B) — recommend macro for auto-tagging imported plan sheets.
- **Improvement Cue:** Use a quick template check before scaling to eliminate double handling.
- **AI Training Cue:** Tag mouse movement near scale bar and verbal confirmation of scale for reinforcement.

Performance Metric: Setup time under 3 minutes, zero re-scaling corrections.

Section 2 – Main Floor Walls

Video Reference: *Building the Second Floor – Framing & Design Insights* (00:00–04:00)

Focus: Establishing the baseline wall framing for the main level, including wall sheathing and hardware setup.

Trainer Notes:

- **Timestamp 00:20–01:00:** Reinforce wall height and sheathing setup (8 ft ceilings, 5/8" DensGlass on exteriors).
- **Timestamp 01:30–02:30:** Note accurate material switching from TJI to 2×10 DF — highlight when and why changes occur.
- **Timestamp 03:00–03:45:** Identify and label half-wall conditions; trainer demonstrates half-wall tool use.

Improvement Cue: Automate wall height tagging using Plan Index metadata (8', 9', or 10' identifiers). **AI**

Training Cue: Annotate half-wall vs full-wall classification and transitions.

Performance Metric: Maintain under 2% material variance on sheathing and blocking.

Module 3 – Second Floor System

Video Reference: *Second Floor Joist System Overview and Planning* (00:00–14:00)

Focus: Constructing the full second floor framing system — joists, blocking, rimboard, and hangers.

Trainer Notes:

- **Timestamp 00:45–02:00:** Emphasize correct LSL rimboard identification; include overlay of S7 sheet reference.
- **Timestamp 03:20–05:40:** Demonstrate double-joist logic and blocking pattern at 48" O.C.
- **Timestamp 07:00–09:00:** Highlight LUS210 vs HUS210 hanger placement and spacing adjustments.
- **Timestamp 11:30–13:30:** Validate rimboard substitution logic (2×10 → 2×12 DF) and update macros for automated changes.

Improvement Cue: Create VBA module: `Sub ValidateJoistSystem()` to check hanger type and blocking spacing consistency. **AI Training Cue:** Capture speech-to-action cues (e.g., "Regenerate totals," "Double rim," "2×12 substitution").

Performance Metric: Maintain takeoff accuracy ±1%; eliminate manual total regeneration.

Module 4 – Second Floor Walls

Video Reference: *Building the Second Floor – Framing & Design Insights* (04:00–14:22)

Focus: Creating and validating the second floor walls, including half-walls, shear walls, and header detailing.

Trainer Notes:

- **Timestamp 04:20–06:00:** Demonstrate wall creation using ceiling height tags; show transitions from 8' to 9' walls.
- **Timestamp 07:30–09:00:** Identify double-stud and hardware reinforcement points (A35, MSTC40, LS50).
- **Timestamp 09:40–11:00:** Train on upper shear wall tagging; reinforce difference between MSTC40 vs MSTC48 applications.
- **Timestamp 12:00–14:00:** Introduce logic for copying walls across units; trainer emphasizes reuse efficiency.

Improvement Cue: Auto-apply shear wall hardware templates linked to wall height and load bearing. **AI**

Training Cue: Record cursor path when changing wall type and verifying shear-wall hardware callouts.

Performance Metric: Match shear wall hardware count 100% to engineering schedule.

Module 5 – Roof Framing & Sheathing

Video Reference: *Roof Takeoffs and Elevation Planning* (00:00–20:00)

Trainer Notes:

- **Timestamp 01:00–03:00:** Reinforce dual roof elevation logic (A/B packs) — potential automation using roof-pack templates.
- **Timestamp 05:00–07:30:** Tag scaling correction — trainer should pause video and emphasize why confirming scale first avoids rework.
- **Timestamp 08:00–12:00:** Call out FRT plywood placement; introduce visual overlay for fire-treated zones.
- **Timestamp 16:00–19:00:** LS50 spacing demonstration — add diagram in training overlay for A/B/D/F spacing differences.

Improvement Cue: Convert LS50 spacing logic into formula-driven macro linked to roof type. **AI Training**

Cue: Pair voice and mouse input for pattern recognition of pitch, soffit type, and hardware placement.

Performance Metric: LS50 and A35 callouts match plan spec within 100% accuracy.

Module 6 – Siding, Trim & Soffit

Video Reference: *MH 1708 Elevation A Siding Takeoff* (00:00–12:00)

Trainer Notes:

- **Timestamp 00:15–02:30:** Note scale confirmation — trainer should flag visual alignment between siding elevation and framing layout.
- **Timestamp 03:00–05:45:** Efficient use of Area vs Linear tool — recommend shortcut training or hotkey mapping.
- **Timestamp 06:00–09:00:** Categorize trim types — introduce color-coded overlays (green=trim, blue=siding, orange=soffit).
- **Improvement Cue:** Create SmartSiding lookup reference for automated waste % assignment.
- **AI Training Cue:** Capture cursor behavior for differentiating trim and soffit segments.

Performance Metric: Keep siding square footage variance under 2%; ensure correct soffit classification 100% of the time.

Module 7 – Pricing Integration

Video Reference: *Inputting Pricing for the 1708 Exterior Unit* (00:00–48:00)

Trainer Notes:

- **Timestamp 00:00–02:00:** Highlight export filter logic — show difference between interior vs exterior data cleanup.
- **Timestamp 03:30–08:00:** Recommend pre-built Excel formula library for ReadyFrame, quantities, and extensions.
- **Timestamp 18:00–24:00:** Note manual re-entry of repeat materials — suggest central “Material Map” reference workbook.
- **Timestamp 40:00–45:00:** Verify consistency in unit pricing; trainer demonstrates Power Query merge of multiple takeoff sheets.

Improvement Cue: Introduce color-coded validation rule for missing pricing. **AI Training Cue:** Label cursor hover events over pricing cells and verbal confirmations (“Exterior only,” “ReadyFrame at .45”).

Performance Metric: Manual entry time reduced by 30%; zero missing unit price cells.

Module 8 – QA & Continuous Improvement

Video Reference: Apply across all videos (post-export phase)

Trainer Notes:

- Build a **QA Summary Worksheet** for every project: auto-log scale errors, naming mismatches, and hardware count variance.
- **Timestamp 05:00+ in each video:** Capture AI learning moments where corrections occur (scale adjustment, hardware check).
- **Improvement Cue:** Encourage on-screen error correction with commentary for reinforcement learning.
- **AI Training Cue:** Flag corrections, highlight tool panels, and log before/after states for contextual model training.

Performance Metric: Zero missed hardware after final QA check; automated QA triggers generated via Power Automate.



Trainer Implementation Workflow

1. Watch each recording once fully, then annotate timestamps with errors or inefficiencies.
2. Capture 5-10 microlearning clips (2-4 minutes each) with specific improvement demonstrations.
3. Link each clip to AI tag categories (joist_logic, roof_pitch_detection, pricing_cleanup, etc.).
4. Export transcript snippets with visual annotation for dataset training.
5. Review every 10 projects to retrain AI and update QA dashboards.



Long-Term Vision



Visual Framing Hierarchy Diagram

Below is a conceptual map showing how each structural component connects across the MH 1708 estimating system. It represents both physical framing relationships and digital workflow dependencies.

```
graph TD
    A[Main Floor Walls] --> B[Second Floor System]
    B --> C[Second Floor Walls]
    C --> D[Roof Framing & Sheathing]
    D --> E[Siding, Trim & Soffit]
    E --> F[Pricing Integration]
    F --> G[QA & Continuous Improvement]

    subgraph Structural Flow
        A --> B --> C --> D --> E
    end

    subgraph Data Flow
        A1[Setup & Calibration] --> B1[Component Exports]
```




```

    B1 --> C1[Excel Consolidation]
    C1 --> D1[Power Automate QA]
end

subgraph AI Learning Links
    A2[Joist Logic Recognition]
    B2[Wall Type Detection]
    C2[Roof Pitch Classification]
    D2[Siding Material Tagging]
    E2[Pricing Pattern Learning]
end

A2 --> B2 --> C2 --> D2 --> E2

```

Legend: -  **Structural Flow:** Represents how each framing component builds upon the last. -  **Data Flow:** Outlines digital relationships between Excel, Power Automate, and AI. -  **AI Learning Links:** Shows how AI pattern recognition evolves from material identification to cost analysis.



Role-Based Overlays – Interaction Map

To visualize who interacts with each stage of the process, this overlay highlights the responsibilities of **Estimators**, **Trainers**, and **AI Assistants** across the framing hierarchy.

```

graph LR
    subgraph Estimator
        E1[Setup & Calibration]
        E2[Takeoff & Measurement]
        E3[Pricing Entry]
        E4[QA Checklist]
    end

    subgraph Trainer
        T1[Video Review & Timestamping]
        T2[Module Annotation]
        T3[AI Feedback Review]
    end

    subgraph AI Assistant
        A1[Pattern Recognition]
        A2[Error Detection]
        A3[Predictive Correction]
        A4[Workflow Optimization]
    end

    E1 --> E2 --> E3 --> E4

```

```

T1 --> T2 --> T3
A1 --> A2 --> A3 --> A4

E2 -. feeds .-> A1
E3 -. feedback .-> A2
T3 -. retrains .-> A3
A4 -. suggests .-> E1

```

Role Breakdown: - 🛠️ **Estimator:** Executes takeoff, measurement, and pricing steps; provides data foundation for AI learning. - 🎓 **Trainer:** Reviews recorded sessions, timestamps key actions, and manages dataset tagging. - 🛠️ **AI Assistant:** Learns estimator behavior, detects anomalies, and proposes workflow optimizations.

Integration Flow: 1. Estimator performs → Trainer annotates → AI learns → Trainer reviews AI → AI assists estimator. 2. Over time, AI transitions from reactive feedback to proactive assistance.

Role-Based Efficiency Metrics & KPIs

Use these targets to track progress and drive automation. Customize thresholds per builder or plan type.

🐱 Estimator KPIs

Metric	Target	Measure	Notes
Setup & Calibration time	≤ 3 min	Timestamp start→scale confirmed	Fail if any rescaling occurs later
Main Floor Walls variance (sheathing/blocking)	≤2%	Plan vs. takeoff SF / LF	Based on QA worksheet
Second Floor System accuracy	±1%	Joist/Rim/Blocking totals	Includes hanger type checks
Second Floor Walls shear hardware match	100%	A35/LS50/MSTC vs schedule	No missing callouts
Roof LS50/A35 spacing correctness	100%	A/B/D/F zones	Auto-checked by macro
Siding SF variance	≤2%	Field vs takeoff	Separate gable from wall
Pricing completeness	0 blanks	Unit Price cells	Conditional formatting red for blanks
Rework events	≤1 per module	Count rescales/redraws	Logged in QA sheet

Metric	Target	Measure	Notes
Automation adoption	≥80%	Macro use per session	e.g., “Regenerate Totals”, strap auto-fill

Trainer KPIs

Metric	Target	Measure	Notes
Timestamp density	6–10 per 10 min	Count per module	Aim for action-rich cues
Clip creation	5–10 clips	2–4 min microlearning	Per module
Annotation coverage	100%	Steps tagged to AI taxonomy	e.g., <code>joist_logic</code> , <code>roof_pitch_detection</code>
Feedback turnaround	≤24 hrs	Record→notes posted	SharePoint/Teams notification
Error classification accuracy	≥95%	Match to final QA	Confirms trainer labeling quality

AI Assistant KPIs

Metric	Target	Measure	Notes
Pattern recognition precision	≥95%	Correct tag suggestions	From annotated clips
Error detection recall	≥90%	Catches scale, rim mismatch, missing hangers	Compared to QA sheet
Predictive prompts accepted	≥70%	Suggested fixes applied	e.g., switch 2×10→2×12 rim
Time saved per session	≥15%	Session duration vs baseline	Rollup by module
False-positive rate	≤5%	Suggestions dismissed	Track by reason code

Threshold Colors (for dashboard)

- **Green (On Target):** Meets/exceeds metric.
- **Yellow (Watch):** Within 10% of target.
- **Red (Action):** Misses target by >10% or any 0/100 hard requirement.

Dashboard Fields (Excel/SharePoint)

- Project, Plan/Elevation, Estimator, Trainer, Date

- Module (1 Setup, 2 Main Walls, 3 2nd Floor System, 4 2nd Floor Walls, 5 Roof, 6 Siding, 7 Pricing, 8 QA)
- Start/End Timestamps, Duration (min)
- KPI values per module (auto-calculated)
- Automation Used (checkboxes): Scale Macro, Strap Auto-Fill, Regenerate Totals, Pricing QC
- Issues/Notes (drop-down + comment): Scale, Hardware, FRT, Siding Split, Pricing Blank

Suggested Excel Formulas

- **Duration (min):** $\text{=(EndTime-StartTime)*1440}$
- **Variance %:** $\text{=(|Actual-Plan|)/Plan}$
- **Green/Yellow/Red:** Use IFS() with thresholds; apply Conditional Formatting icons.

Data Collection Workflow

1. Estimator completes module → **Power Automate** logs timestamps from Teams “Done” message.
2. Trainer updates KPI cells & annotations in SharePoint list or Excel file.
3. AI training job ingests new clips + KPI outcomes weekly.
4. Dashboard refresh via Power Query; alerts sent for any **Red** metrics.

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- Each training video doubles as an AI dataset and an onboarding module.
 - Trainers refine efficiency per estimator by comparing timestamps and completion duration.
 - The AI will eventually detect and correct errors during live takeoff sessions.
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