



# Roll To Roll Overview

*Turning  
Technology  
into Customer  
Value*



# Overview

- Roll to Roll Handling option is available for 52xx/53xx
- Allows completely automated continuous roll processing
- ESI provides electrical, mechanical, & software interface to external web handlers
- Indexing feature allows the web to be advanced by a specified length



# Overview

- ESI can provide web handlers or interface to Customer supplied handlers
- Features
  - Laser Drill Y Axis stage indexes the material
  - Independent control of fixed and chuck clamps, including dwell time
  - Ability to advance past a roll splice



# Laser System Modifications

- Load Door assembly replaced with a laser safe “slot” for feeding the web into the system
- Rear Shroud assembly replaced
  - Also has a laser safe “slot” for feeding the web out of the system
- Additional Opto Isolated I/O capability added to allow the system to communicate with the Handler



# Roll to Roll Handler



# Roll to Roll Handler



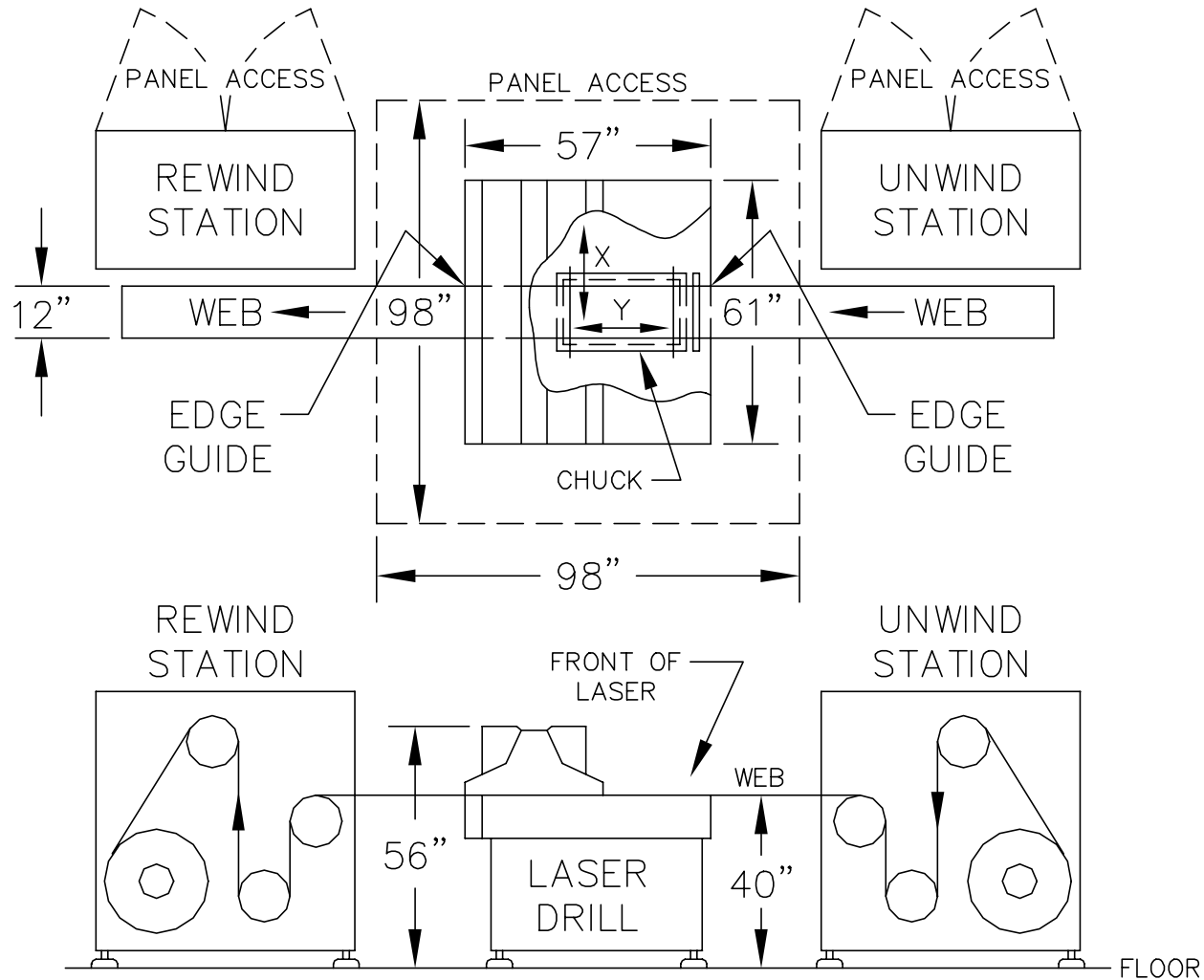
# Roll to Roll Handler



# Roll to Roll Handler



# Roll to Roll Handler Example

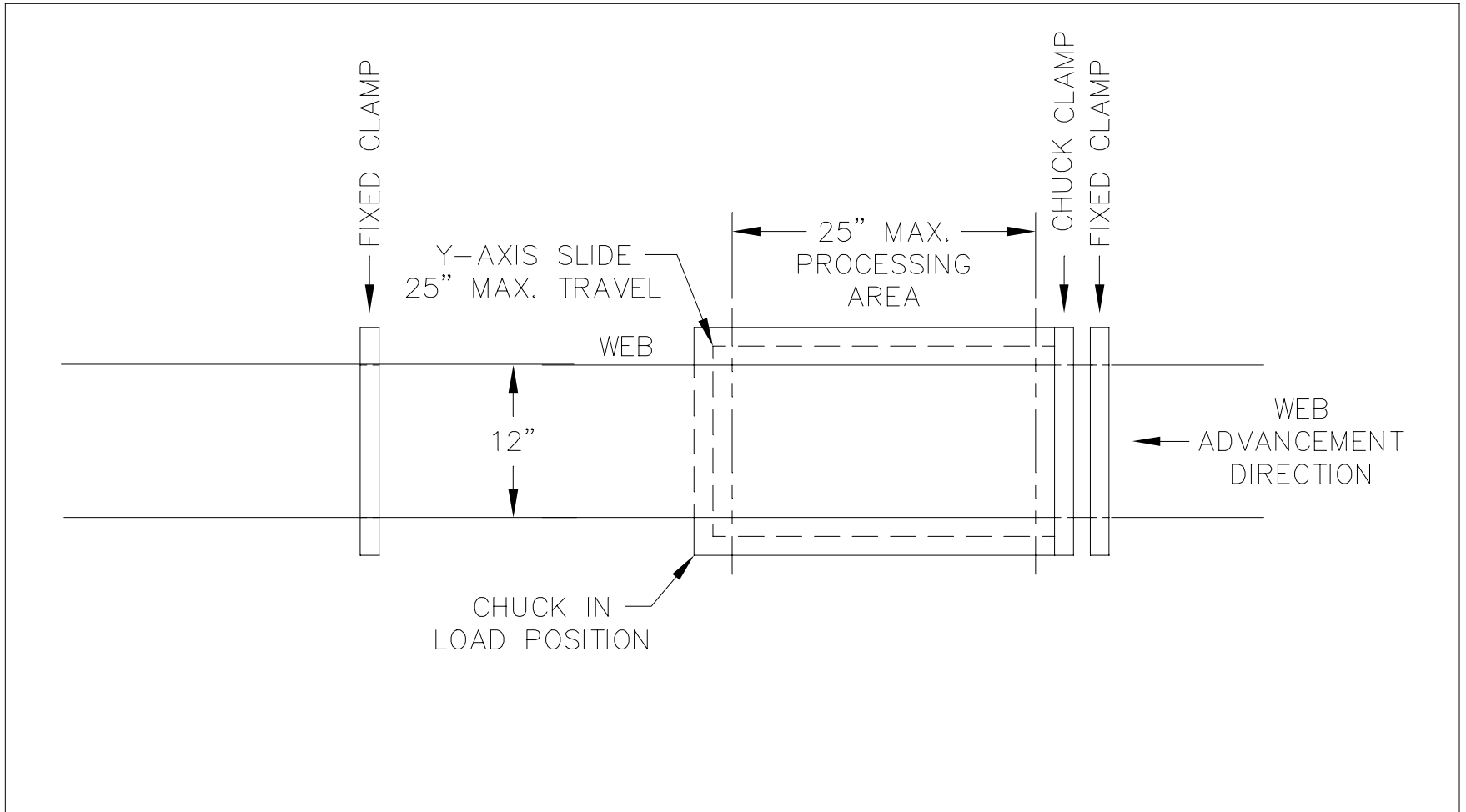


# Handler Interface

- Unwind & Rewind stations will be required external to the Laser Drill
  - ESI or Customer provided
- ESI provides the following capabilities..
  - Web Indexing capability via the Y axis of the Beam Positioner
  - Vacuum control
  - Air control
  - Clamp control



# Indexing the Web



# Index Sequence

- 1) Load the Web
- 2) Engage chuck clamp
- 3) Enable chuck vacuum
- 4) Locate fiducials and Drill pattern
- 5) Move Y axis to INDEX position
- 6) Engage fixed clamps
- 7) Disengage chuck clamp
- 8) Disable chuck vacuum



# Index Sequence

- 9) Move Y Axis to LOAD position
- 10) Engage chuck clamp
- 11) Disengage fixed clamps
- 12) Repeat steps 3) to 11) until end of reel



# Interface Signals

- Additional Laser Drill Signals
  - Chuck Air
    - Air is applied to the chuck to “float” the material when vacuum is not applied.  
Air and vacuum are mutually exclusive.



# Interface Signals

- Signals sent from Laser Drill to Handler
  - Chuck Clamp
    - Enabled to index the material. This is optional, as chuck vacuum may be sufficient to keep the material firmly on the chuck
  - Clamp1, Clamp2
    - External fixed clamps, enabled to “lock” the material in position as a part of the beam positioner Y axis “index” operation



# Interface Signals

- Signals sent from Handler to Laser Drill
  - Unwind Ready, Wind Ready
    - Asserted to indicate that the Unwind and Wind mechanisms are ready.
  - Unwind Splice, Rewind Splice
    - Asserted to indicate that an “Unwind Splice” or “Rewind Cut” operation is taking place, and therefore the material cannot be indexed
    - Optional signals that may be permanently de-asserted if all logic is controlled through the Unwind Ready / Wind Ready signals



# Interface Signals

- Guide Limit

- Asserted to indicate that input guide limits have been reached
- Optional signal that may be permanently de-asserted if required



# Roll to Roll Contact Information

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