

Solstex®

# Installation Guide

## for Certified Installers



Architectural Facade Systems

Elemex Installation Guide - ELXD-078/01-21

# Tools Required

- 3/16" HSS drill bits; used to pre-drill the attachment clips.
- 5/32" HSS drill bits; used to pre-drill the back screwed attachment clip to the panel.
- #2 Robertson bits; used for all #10 panel attachment screws.
- Rounded shank to avoid damage to panels.



- Cordless impact drill; used for installation of all necessary screws during installation.
- Cordless driver drill; to be used for pre-drilling holes in attachment clip and during panel preparation.  
(Tighten to #2 on a Dewalt impact driver).



- Saw horses for panel preparation. Top of saw horses need to be free of debris and sharp edges to avoid scratches to panel.

- Plunge router with 130 dg. router bit to create custom bent infills to match the shape of the panel. Infill is to be routed on the back side to obtain the desired shape.



- 6' level to be used for larger panels. Will also require a 4' level and 2' level for smaller panels. Magnetic levels are preferred especially with galvanized steel framing.



- Line laser level to establish a vertical and horizontal benchmark to begin the layout from. These lines can be marked on the wall or framing to use as a reference.
- Clamps (needle nose, c-clamps - i.e. Irwin)
- Additional hand tools required such as aviation snips to cut infill to length. Also used for all metal flashing (i.e. drip flashing and cap flashing). Folding pliers can also be used to custom bend metal flashings to desired shape.



- MC4 Crimper; used to attach MC4 leads to RPVU 90 wire.



- MC4 Spanner tool; used to secure MC4 connectors/housing to crimped leads, and to decouple mated connectors.



- Wire strippers & wire snips.



- Multimeter; to check strings for proper connection, and for general maintenance.



- Cloth gloves; to avoid unnecessary marks when handling panels.



- Electrical Tape, Wire nuts; to cap loose wires.

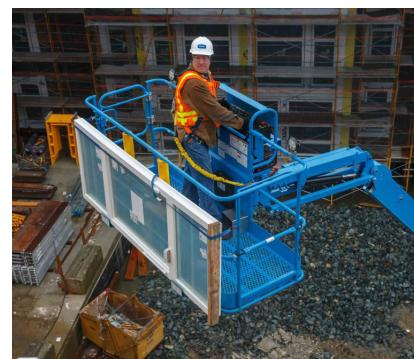


## Access Equipment and Aerial Platforms

Access equipment for your job-site is determined by the terrain and the height of which you need to access. 4 x 4 rough terrain lifts are commonly used in all circumstances. Scissors lifts can be used to increase the amount of men and material to be elevated with one machine. A variety of booms and scissor lifts are available to increase productivity.



Specialized accessories are used to protect the product and provide a safe working procedure for the workers and other trades on the job. The panel cradle is used to safely transport the panels into place. This will eliminate damage to the panel and provide a safe work procedure.



## AVB / VP Wall Construction

Air Vapor Barrier (AVB) and Vapor Permeable (VP) membranes are used to keep water and air "AVB" out of the wall cavity. "VP" is used and installed in the same way but it allows "vapor" to escape from the wall cavity without allowing water in.

All adjacent substrates such as brick, glass or siding need to use compatible membranes.

These substrates and membrane tie-ins should be installed before your work to allow a minimal of a 3" lap to tie into.

Upon completion of the building membranes, an inspection of the quality of work along with photos are suggested to document that the work is at or above manufacturers recommendations.

## Adjustable Framing / Fixed "Z" Bars / Wood Substrate/ Enviroclip

Adjustable steel angles are most commonly used as the support framing. This type of adjustable framing allows the installer to provide a perfectly level and straight plane of wall to successfully site dimension from. Enviroclips are used as the primary layer of framing to be attached to the substrate. Enviroclips come with a thermally broken layer to reduce heat loss within the building envelope.

Fixed "Z" bar framing can be used if the substrate is fairly level and straight. If this method of framing is used and applied directly to the substrate, more time will be spent on the site dimensions to assure

the "worst case" scenarios are found throughout each elevation. During panel installation some shimming will be required.

Plywood substrates provide a solid surface to fasten to. A  $\frac{3}{4}$ " plywood should be used for adequate fastening and strength.

\*All substrates including plywood should be within  $\frac{1}{4}$ " of plumb. Shimming beyond  $\frac{1}{4}$ " is prohibited and would require additional framing such as a "Z" bar.

## Delivery of Material

Upon delivery of material, inspect the crate for any visible damage to the skid.

\* Photos should be taken at this time to show the condition. Any damage must be reported to Elemex along with photos within 48hrs. of receiving the material.

The skid(s) will be clearly labeled with instruction on which side to open first, please follow these

instructions to avoid damage to the tightly-packed panels inside. A list of panel numbers will be sent with the delivery for easy identification of the contents of each skid.

After removing the side wall of the skid, inspect the panels for any visible damage during shipping.

Do not leave any panels unsecured (it may take up to 6 weeks to replace any damaged panels).

## Storage & Handling Recommendations

- A forklift or crane should be used when moving crates.
- Open crates from designated wall. "Open here" is labeled on the correct wall. Walls not designated with this label should not be removed.
- Panels should be lifted off and removed from crates carefully, never slide them out as damage to panel may occur.
- Never carry flat.
- Handling panels should be done by 2 people.
- Always store panels upright and against stable structures. Panels should not be stored on top of each other flat.
- Never sit/stand or place things on finished panels.

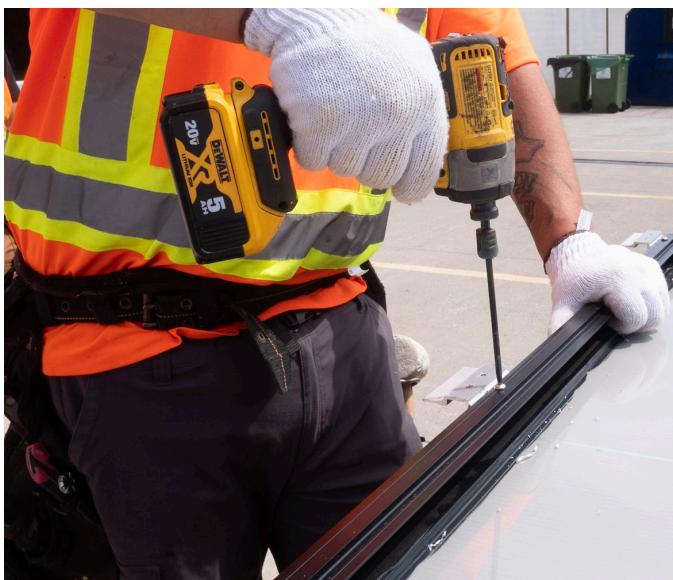
# Preparation of Panels

For instructional purposes our installation direction will be bottom up and left to right.



- Pre-drill 3" long attachment clips with two 3/16" holes equally spaced. This process should be repeated for all 3 different attachment clips; full, half and "J" starter clip.
- Sort and organize panels according to the wall layout provided. Our progressive systems work from the bottom up and the choice of left or right progression depending on your desired start point.
- Lay panel face down on protected saw horses. Please note the installation direction (panels with protective film will have arrows indicating "up" whereas ceramic/aluminum/stone panels will have weep holes with mesh indicating the bottom of the panel). All panels should be installed in the proper direction.
- With panel properly orientated, proceed to place full clips on top and right side (installation direction is "up" and to the "right"). Holding the full clip firmly into the extrusion, drill a 5/32" hole through the panel extrusion into the full clip and continue through. Secure the clip with a #10 S.S. Pan Tek screw.
- Continue to install the full attachment clips at spacing noted on shop drawings. Install full attachment clips to the remaining panels.
- Sort panels in the order of installation keeping them face-to-face and back-to-back to ensure no damage is done to the panels. Secure panels with rope or ratchet straps to avoid the panels tipping over due to wind or movement on site. Protect bottom edge with foam. Make sure it is free from debris.

\* Photos should be taken at this time to show the condition. Any damage needs to be reported to Elemex along with photos within 48 hrs. of receiving the material.



# Pre-Panel Install

- The Solstex Solar Facade System can be mounted on a vertical or horizontal adjustable thermally broken galvanized framing system. Framing can be installed vertically or horizontally on concrete block or poured concrete but in most cases vertical framing is used. If the substrate is constructed with vertical steel studs, horizontal framing is preferred. The project design will dictate how the sub-framing will be installed. Solstex panels are attached using aluminum clips at a maximum of 24" (600mm) on center to the sub-framing.



Before panel install, wiring and grounding should be installed per the following:

- From relevant drawings, determine where the ends of each solar string are, both positive and negative. Also determine where grounding lugs are required.



- Install cable trays leading from the building penetration, to both ends of each solar string. Trays are to be installed to the building framing.
  - a. For horizontal framing, horizontal cable trays can be installed on top of a row

of framing, in the space reserved as an air gap. Vertical cable trays are installed through each row of framing, by drilling a hole through the horizontal framing.

b. For vertical framing, vertical cable trays can be installed on top of a row of framing, in the space reserved as an air gap. Horizontal cable trays are installed through each column of framing, by drilling a hole through the vertical framing.

- Install exterior electrical conduits if necessary. Electrical conduits should be used to contain wiring underneath facade materials not considered part of the solar array. Conduits are recommended to be installed before insulation, and to be integrated within framing.
- Install electrical conduit through building penetration. Conduit must be metallic.
- Install grounding lugs by screwing them into the framing.
- Cut RPVU 90 wire to lengths detailed in drawings. Red wire represents a positive homerun, black wire represents a negative homerun. Label wiring by string number at each end, utilizing tape and a marker.
- Crimp MC4 connectors to the end of the homerun cables. Male connectors are used to connect the negative ends of the solar string, whereas female connectors are used with the positive end.



- Lay the RPVU 90 cable in the appropriate cable trays/conduits, leading from the building penetration to the appropriate location within the facade. Leave at least an extra 2 m of wire at the interior of the building penetration, and cap the wires with wire nuts and electrical tape. Leave 1 m of slack at the connector end, to accommodate panel install.

- Cut grounding wire to lengths detailed in drawings. Lay ground wire through grounding lugs. If using insulated wire, strip the wire where it passes through the grounding lug.

## Installation of Panels

- Using the horizontal and vertical line laser, clearly mark both lines for a level reference while installing the panels.
- Layout the panels according to the provided layout across the elevation. This will assure a successful start and a chance to make adjustments needed to fit the supplied panels.



- Install "J" starter at base of wall plumb, straight and free of debris.
- Place first panel in the "J" starter making sure the edges of the panel are aligned with your panel layout. While the panel is engaged along its bottom edge, lean the top of the



panel out to make any necessary electrical connections behind the panel. Check that the panel is level, recheck panel to the laser line previously marked on the wall.

- Install 2 #10 SS Tek screws per attachment clip.  
(Tighten to #2 on a Dewalt impact driver).



- Proceed to install the next panel to the right into the "J" starter leaving a 2" gap between panels. Once the panel is properly in the "J" starter, slide panel to the left engaging into the full attachment clips on the previously installed panel. Make sure all clips are engaged.
- Continuing installing the bottom row of panels in the same sequence – always referencing back to the vertical and horizontal laser lines and aligning with the panel layout that was marked on the wall.



- Always double check the layout to critical openings or features. Continuously check measurements.
- Cut the vertical infills to size. Slide the infill down the joint passing the attachment clips. After the verticals are installed, place in the horizontal infill strips securely setting it tight down into the extrusion.

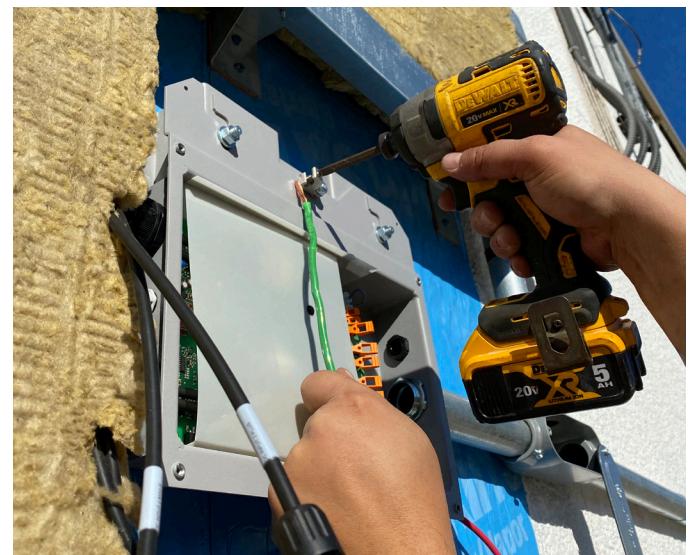


- Install the next row of panels using the same procedures and guidelines as outlined previously. Continue to check that the panels are aligned and level. Always reference the original panel layout to ensure the panels will terminate at adjacent substrates or turn a corner properly.
- A 2-sided corner panel or a fascia to soffit panel will require a custom infill to be routed on the back side to allow it to bend with shape of the panel. Using the specified tools this can easily be achieved in a short period of time.





- Y-shaped branch connectors can be utilized to join solar strings in parallel. Reference system design / drawing set for specifics of each project.



- If combiner boxes are needed, the strings can be joined here. The unit shown also functions as part of the rapid shutdown system. The electrical box should be ground as per standard electrical practices.

# Post Panel Install

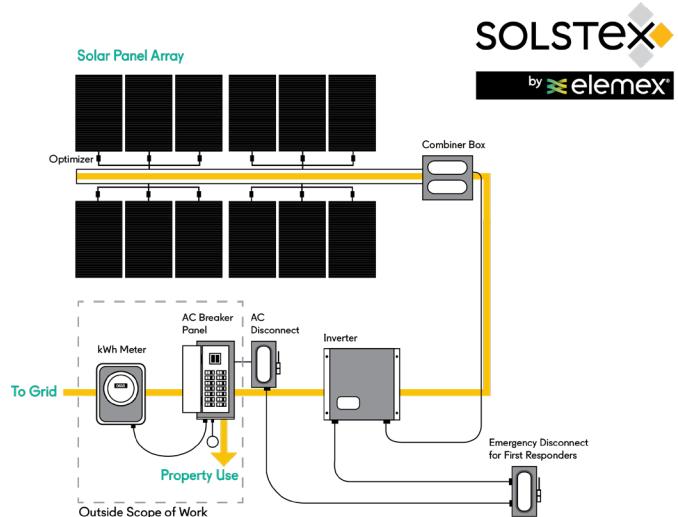
Install relevant equipment as per the following list:

- **Rapid shutdown Equipment** – Pending the local electrical code, rapid shutdown equipment should be installed within 10' of the solar array. Rapid shutdown equipment comes in 2 main forms; optimizers to be installed with every panel, or string based solutions that operate off pass through units or combiner boxes. Optimizers integrate with select inverters. String based solutions can be integrated with activation switches/buttons. Install per manufacturer's directions.
- **Combiner Box** – Depending on the project specifics, combiner boxes may or may not be required. Install per manufacturer's instructions, by a licensed electrical contractor.
- **Inverter** – All homeruns from the solar array should return to the inverter. They may go through additional units, like a combiner box or RSD pass through unit, but they eventually all collect at the inverter. Inverters communicate with optimizers, if present, for both optimizing



and rapid shutdown functions. Install per manufacturer's instructions, by a licensed electrical contractor.

- **Disconnect Switch** – Disconnects will be required throughout the project, but mainly on the AC side of the inverter. They can trigger the rapid shutdown under an optimizer/inverter protection model. Install per manufacturer's instructions, by a licensed electrical contractor.
- **Tie in to building Infrastructure** – The connection to existing building electrical infrastructure should be completed by a licensed electrical contractor. Types of units that can be tied into include: switchboards, distribution boards, AC breaker panels, load centers or service panels, etc.
- **Revenue grade meter** – While not required by electrical codes, some customers prefer to have their own meter measuring the electricity produced by the solar array. Additionally, in a net-metering arrangement, there may be a need to swap out a customer's current meter with a bi-directional meter capable of measuring electricity flow in both directions. All meter work should be done by a licensed electrical contractor.



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