



F-WAVE™ REVIA™ SYNTHETIC ROOFING SHINGLES

Installation Manual for Steep-Slope Residential Installations

For support with all other Steep-Slope Installations please call F-Wave™ Technical Support at 1-888-Go-F-Wave

To obtain a Spanish language version of this Installation Manual for Steep-Slope Residential Installations please visit www.f-wave.com or call F-Wave™ Technical Support at 1-888-Go-F-Wave™

Para obtener una versión en Español de este Manual de Instalación Para Instalaciones Residenciales de Empinada Pendiente por favor visite www.f-wave.com o llame al soporte técnico de F-Wave™ en el 1-888-463-9283

Purpose of These Instructions

The installation instructions in the following pages are meant to be a general guide for experienced roofing installation professionals to use when installing F-Wave™ Revia™ Roofing Shingles. F-Wave™ Revia™ Roofing Shingles are produced using advanced manufacturing techniques and materials, resulting in F-Wave™ Revia™ Roofing Shingles having many advantages over traditional asphalt roofing shingles. However, as a primary benefit the installation methods for F-Wave™ Revia™ Roofing Shingles are nearly identical to that of traditional asphalt roofing shingles.

The information in the following pages addresses the particular application of specific general roofing practices to F-Wave™ Revia™ Roofing Shingles. However, this manual and instructions does not cover every general roofing practice or every detail that an installer may encounter on a shingle installation. In the event that an installation of F-Wave™ Revia™ Roofing Shingles presents a question that is not covered in this manual, please call our Technical Support at 888-463-9283.

Before installation the installer must ensure adherence to all applicable State and Local Building Codes.

SAFETY:

- ✓ ALL ROOFING AND RELATED ACTIVITIES SHOULD ALWAYS BE COMPLETED WITH SAFETY IN MIND.
- ✓ ALL GOOD AND PROVEN SAFETY PRACTICES SHOULD BE FOLLOWED.
- ✓ FALL PROTECTION EQUIPMENT MAY BE REQUIRED AND IS ALWAYS ADVISABLE.
- ✓ ROOFING ACTIVITY CAN BE DANGEROUS. ALL NECESSARY PRECAUTIONS AND SAFETY GUIDELINES MUST BE FOLLOWED IN ACCORDANCE WITH PROPER ROOFING TRADE PRACTICES AND REGULATIONS, OSHA REQUIREMENTS, AND LOCAL BUILDING CODES.



Note: F-Wave™ Revia™ Roofing Shingles must be installed correctly. F-Wave™ assumes no responsibility whatsoever for leaks and other defects that result from improper installation, failure to follow the instructions in this manual, or the failure to properly prepare the surface to which the shingles are applied, or failure by the installer to provide proper attic ventilation in accordance with the standard minimum requirements. Installer is responsible for reviewing all applicable building codes and property standards and requirements for the shingles to be installed before using the application instructions below and printed on the inside of the F-Wave™ Revia™ Roofing Shingle wrapper.

GENERAL INSTRUCTIONS

When installing F-Wave™ Revia™ Roofing Shingles always make sure to consult your local building codes and regulations, and minimum property standards, and follow all applicable requirements. Additional installation information is available online at www.F-Wave.com or by calling 1-888-Go-F-Wave.

Installation of F-Wave™ Revia™ Synthetic Roofing Shingles

Any significant differences between the installation of traditional asphalt shingles and F-Wave™ Revia™ Roofing Shingles are set forth in this manual. Generally, the installation methods are similar but care should be taken by the installer to read and understand each section of this manual.

Roof Deck

The selection and installation of the roof deck should always be done after consulting and adhering to local building codes and minimum property standards, and manufacturer's recommendations. F-Wave™ recommends using well-seasoned plywood with a minimum thickness of 3/8 inches (10mm) or OSB decking with a minimum thickness of 7/16 inch (11mm), that is well supported. Always ensure the roof deck and other roofing materials are dry before installing the shingles.

Underlayment

F-Wave™ requires the use of synthetic underlayment that complies with ASTM D 226, Type I or Type II, ASTM D 4869, Type I or II or ASTM D 6757. In addition, F-Wave™ requires the use of self-adhering waterproofing underlayment (compliant to ASTM D1970) for critical areas, such as valleys and eaves. F-Wave™ also recommends the use of a smooth surface, non-granulated self-adhering waterproofing underlayment on other flashings such as ridges, hips, pipe penetrations, dormers, slope changes, skylights, and chimneys. F-Wave™ does not approve of the use of any radiant barrier type products as a shingle underlayment installed above the deck when used with F-Wave™ Revia™ Roofing Shingles. Underlayment must be applied flat and unwrinkled to the roof deck. The selection and installation of underlayment should always be done after consulting and adhering to local building codes. The underlayment and installation method used must comply with or exceed local building codes, the published installation requirements of the underlayment manufacturer, and F-Wave™ requirements. Shingles should be applied as soon as possible after the application of underlayment.

Re-Roofing Over Existing Asphalt Shingles and Other Roofing Materials is Not Allowed

The F-Wave™ WeatherForce™ Limited Lifetime Warranty requires installation over a clean roof deck covered with a synthetic underlayment that complies with ASTM D 226, Type I or Type II, ASTM D 4869, Type I or II or ASTM D 6757.



Other Re-Roofing Considerations

Check with local building codes to determine whether or not any pre-inspections or approvals are required, and to determine any specific standards must be followed as defined by the relevant building codes and minimum property standards. Existing structure and deck must be suitable for safe working conditions and the addition of the new shingles. It is also advisable to check that existing ventilation is adequate and ensure that the attic ventilation will meet the minimum standard as defined by the relevant building codes and minimum property standards.

Ice Dam Protection

In climates that have the potential for snow and ice there is always a possibility for the formation of Ice Dams at the eaves and any other uninsulated or unheated overhangs. In such climates, F-Wave™ requires that a smooth surface, non-granulated self-adhered waterproofing membrane be applied at the eaves and extended a minimum of 24 inches (610mm) up the roof deck from the location of the interior side of exterior walls. Please note, the requirements for smooth surface, non-granulated self-adhered waterproofing membrane must comply with or exceed local building codes and F-Wave™ requirements.

Use of Drip Edge at Roof Eaves and Rakes

The selection and installation of the drip edge metal should always be done after consulting and adhering to local building codes and minimum property standards. F-Wave™ recommends the use of a D-style drip edge made of corrosion-resistant materials that extends a minimum of 2 inches (51mm) back from the roof edge and bends downward over the fascia. When applying drip edge at the rake edge, all underlayment should be installed under the drip edge metal and shingles should be trimmed flush with the drip edge. When applying drip edge at the eaves, all underlayment should be installed over the drip edge metal and shingles should be trimmed flush with the drip edge or with an overhang of 3/4 inch (19mm) or less.

Roof Slopes

Standard installation slopes are defined as greater than 4:12 slope, which is 4 inches (102mm) vertical rise per 12 inches (305mm) horizontal run, and less than 21:12 slope, which is 21 inches (533mm) vertical rise per 12 inches (305mm) horizontal run. Low slopes are defined as greater than 2:12 slope, which is 2 inches (51mm) vertical rise per 12 inches (305mm) horizontal run, and less than 4:12 slope. Steep slopes are defined as slopes greater than 21:12 and are also covered in the following sections.

Low Slope Installation

For low slope applications please call F-Wave™ Technical Support at 1-888-Go-F-Wave™ for guidance

Recommended Fastening

The selection and use of fasteners should always be done after consulting and adhering to local building codes. The fasteners used must comply with or exceed local building codes and F-Wave’s requirements. F-Wave™ requires the use of 11 or 12 gauge roofing nails that are corrosion-resistant and with heads a minimum of 3/8 inch (9.5mm) in diameter and a minimum of 1-1/4 inches (32mm) long. In all roofing applications, including roofing over an existing asphalt roof, F-Wave™ requires that the nails should be long enough to penetrate 3/4 inches (19mm) into the roof deck. Where the roof deck is less than 3/4 inch (19mm) thick, the nails should be long enough to penetrate the deck fully and extend at least 1/8 inch (3.2mm) through the roof deck. Please note, staples are not an approved fastening method. When fastening, all nails must be driven straight and with the heads flush to the shingle surface, never cutting into the shingle as detailed in Figure 1. Fasteners must not be exposed or visible on the finished roof.

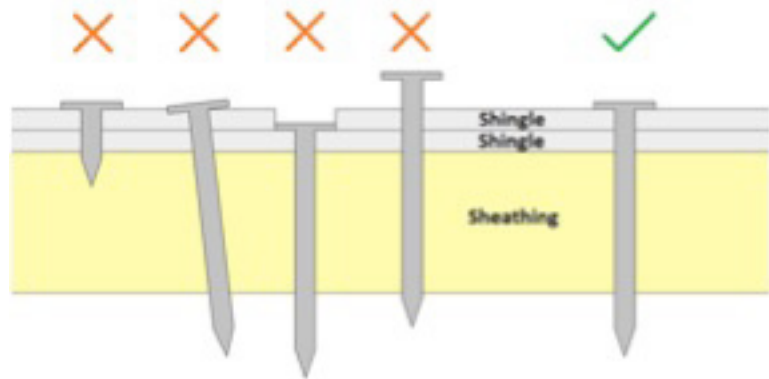


Figure 1

Fastener Locations

Use four fasteners per shingle except in high wind or steep slope applications. The fasteners must be located between the dashed “Nail Between Lines” marked on the F-Wave™ Revia™ Roofing Shingle wide nailing zone and are applied 1 inch (25mm) and 13 inches (330mm) in from either side of the shingle. The fasteners should never be exposed once the installation is complete.

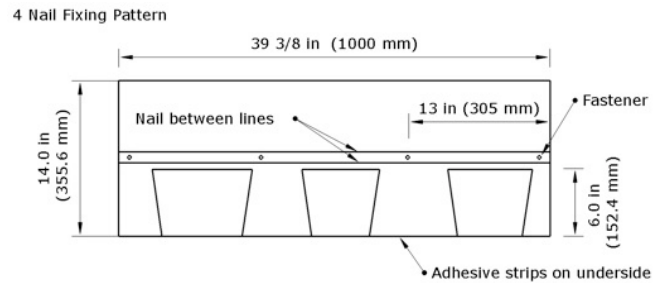


Figure 2

See Figure 2.

Sealing

Shingle sealing may be delayed when shingles are applied in cool weather. If shingles have not sealed after a reasonable amount of time it may be necessary to hand-seal any unsealed shingles. See the section below covering Steep Slopes and High Wind Installations for information on hand sealing.

Steep Slopes and High Wind Installation

For roof slopes greater than 21:12 or for high wind applications exceeding 110-MPH or the high wind standard as defined by the relevant building codes and minimum property standards, 6 fasteners per shingle must be used instead of the standard 4 fasteners per shingle. The fasteners must be located between the dashed “Nail Between Lines” and are applied 1 inch (25mm), 8 inch (203mm) and 15 inch (381mm) from each side. At the start of the slope and for the entire slope, apply four 1 inch (25mm) diameter sized spots of F-Wave™ approved sealant and adhesive (see Table 1 below). One spot is to be placed 1 to 2 inches (25mm to 51mm) and 13 inches (330mm) in from each side of the shingle and near the bottom; the shingle is then pressed down into position. See Figure 3. F-Wave™ approved sealant and adhesive should come near the edge of the shingle, but not be exposed. Failure to seal due to installation temperatures being below Sealant manufacturer’s minimum acceptable installation temperature is not a manufacturing defect and F-Wave™ accepts no responsibility for any loss whatsoever arising out of or relating to sealant failure due to installation temperatures being below or above the sealant manufacturer’s minimum acceptable installation temperature.

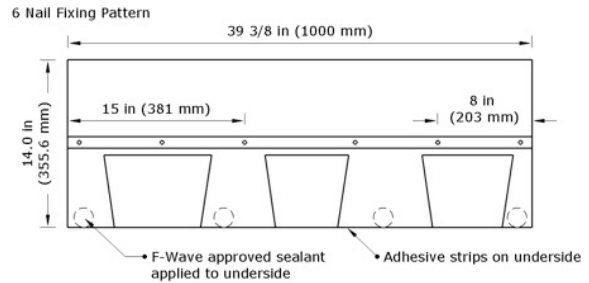


Figure 3

TABLE 1 – APPROVED SEALANTS AND ADHESIVES

Manufacturer	Product Name
NPC Sealants	#900 Solar Seal
R.M. Lucas Co.	#6600 Universal Terpolymer Sealant
OSI	Quad® Sealant

Attic Ventilation

Please consult your local building codes for requirements regarding attic ventilation. Improper attic ventilation can cause moisture build up in the attic, heat stress on the roofing materials, and ice damming. Those situations can lead to premature failure of the roofing materials including the wood decking. To ensure proper attic ventilation, air must be allowed to circulate freely from the attic eaves to the attic peaks. F-Wave™ requires that attic ventilation meet or exceed the minimum standard as defined by the relevant building codes and minimum property standards.

SHINGLE INSTALLATION

Application Pattern

F-Wave™ Revia™ Roofing Shingles must be installed in 6-1/2 inches (165mm) offsets in a diagonal application pattern. It is important to follow the installation method as described and shown in Figure 4 and Figure 5 to ensure the integrity of the roof. F-Wave™ is not responsible for the integrity of the roof if the installation method is not followed.

Starter Course

- F-Wave™ requires the use of an F-Wave™ Revia™ Starter Shingle to ensure proper water proofing and aesthetics. Only F-Wave™ Revia™ Starter Shingles are designed specifically to work with F-Wave™ Revia™ Roofing Shingles. Cut 6.5 inches (165mm) off the length of the first starter strip installed on the roof. The starter course should overhang the eaves by 1/4 - 3/8 inch (6-10mm).

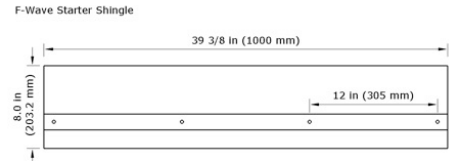


Figure 4

- Continue applying the starter shingles across the roof eave. Install with four fasteners 1-1/2 to 3 inches (40-75mm) in from the eave, one fastener 1 inch (25mm) from each side of the starter with the remaining two evenly spaced on the same line as the end fasteners. All fasteners must be located between the dashed “Nail Between Lines” marked on the F-Wave™ Revia™ Roofing Shingle wide nailing zone.

First Course

- Apply a full shingle flush with the starter course at the lower left hand corner of the roof and secure with fasteners. Please note, shingles can be installed from the right-hand corner as long as the same offset patterns are used. Apply full shingles for the remaining first course.

Second Course

- Cut 6-1/2inches (165 mm) from the left end of the shingle and apply the remaining shingle section over the first course shingle, exposing the first course 6.0 inches (152mm) from the bottom. Apply full shingles for the remaining second course.

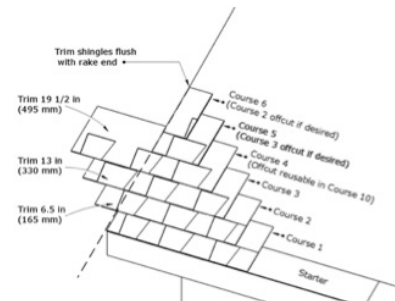


Figure 5

Third Course

- Cut 13 inches (330mm) off the left end of the shingle and apply the remaining shingle section over the second course shingle, exposing the second course 6.0 inches (152mm). Secure with fasteners. Apply full shingles for the remaining third course.

Succeeding Courses

- Courses 2 through 6 begin with a partial shingle progressively 6-1/2inches (165 mm) shorter, establishing the overall diagonal method or stair step effect.
 - Course 1 = Full Shingle, 39-3/8in (1000mm).
 - Course 2 = Trim 6-1/2inches (165 mm) trimmed off the left side. Shingle will be 32-7/8in (835mm) long.

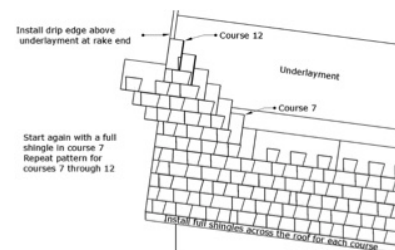


Figure 6

- Course 3 = Trim 13in (330mm) off left side. Shingle will be 26-3/8in (670mm) long.
 - Course 4 = Trim 19-1/2 in (495 mm) off the left side. Shingle will be 19-7/8in (505mm) long.
 - Course 5 = Trim 26in (660mm) off the left side. Shingle will be 13-3/8 (340mm) long. Note, the 13in piece cut at course 3 can be used if desired.
 - Course 6 = Trim 32-1/2in (825mm) off the left side. Shingle will be 6-7/8 in (175mm) long. Note, the 6-1/2in piece from course 2 can be used if desired.
 - Course 7 = Full shingle. Repeat pattern.
- Pieces cut from shingles along the left rake can be used elsewhere in the roof where a short piece may be needed.
 - Courses 7 through 12: Repeat pattern, beginning with a full shingle and continue succeeding courses with a partial shingle 6-1/2 inches (165mm) shorter each time. Succeeding courses repeat this procedure beginning each sixth course set with a full shingle.
 - F-Wave™ suggests that it is good practice to apply a chalk line every 4-6 feet up the roof surface to keep the courses straight and the exposures consistent at 6.0 inches (152mm).

Valleys

F-Wave™ recommends the use of either an open valley method or a closed-cut method. It is important to note that all valley flashings should be in place before shingles are installed near the valleys. For both applications start with a layer of at least 36 inches (915mm) wide smooth surface, non-granulated self-adhered waterproofing membrane and apply directly to the roof deck. Next, fasten underlayment over the smooth surface, non-granulated self-adhered waterproofing membrane by 6 inches (152mm). For both the metal valley and the closed-cut valley, cut the top corner of the shingle going into the valley at a 1 inch (25mm) 45° angle. See Figure 7.

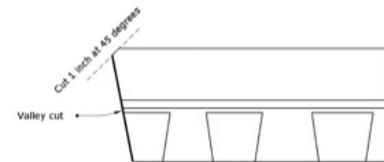


Figure 7

Open Valley

- Consult local building codes for width of the metal valley and for allowed materials. The width should be a minimum of 12 inches (305mm) on each side. Install the metal valley on top of the underlayment and fasten 1 inch (25mm) from the edges of the valley. When overlapping metal valley pieces, ensure a minimum overlap of 4 inches (102mm) and seal together with an F-Wave™ approved sealant and adhesive (see Table 1 on Page 6). Do not apply fasteners at the overlaps except on the edges.

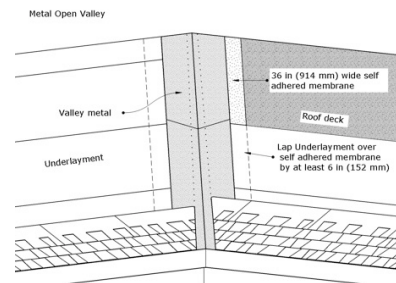


Figure 8

- Apply a chalk line on either side of the valley. Start at 4 inches (102mm) width at the top of the valley and add 1/8 inch (3mm) for every 12 inches (305mm) of length of the valley. This will allow for increased water flow near the eaves of the roof.

- Apply the first course of shingles along the eave until it meets the center of the valley. Trim the valley shingle so that it matches the chalk line and also has a 1 inch (25mm) 45° angle cut from the top of the shingle. See Figure 8.
- Apply two parallel 1 inch (25mm) wide beads of F-Wave™ approved sealant and adhesive (see Table 1 on Page 6) to the underside of the cut valley shingle. This will seal the valley shingle to the metal.
- Apply the remaining courses of shingles as was done for the first course. Ensure that the edges of the valley shingles are cut to match the chalk lines.

Closed-Cut Valley

- Apply the shingle courses on the left-hand side of the valley first. Apply the shingles along the roof eaves and up to the valley. Extend the valley shingle at least 12 inches (305mm) into the adjacent side of the valley. Press the shingles well into the valley and fasten no closer than 6 inches (152mm) from the valley centerline.
- Apply the shingle courses on the opposite roof face (right side as drawn) and trim the valley shingles 2 inches (51mm) back from the centerline of the valley. Crop the tops of each valley shingle on this side with a 1 inch (25mm) 45° cut. See Figure 9.

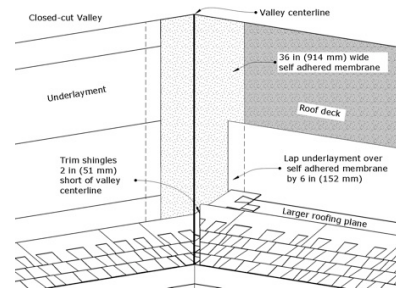


Figure 9

- Apply two parallel 1 inch (25mm) wide beads of F-Wave™ approved sealant and adhesive to the underside of the cut valley shingle.

Roof to Wall Flashings

F-Wave™ recommends that wherever the roof meets a vertical wall the shingles must be properly flashed with metal under the shingles. In many cases it is advisable to use a counter flashing over the top of the shingles for added waterproofing. All siding materials should terminate at least 2 inches (51mm) above the roofing surface and overlap the metal flashing by at least 2 inches (51mm). When shingles overlap a metal flashing do not fasten through the metal. Use F-Wave™ approved sealant and adhesive (see Table 1 on Page 6) to adhere the shingle to the metal. See Figure 10.

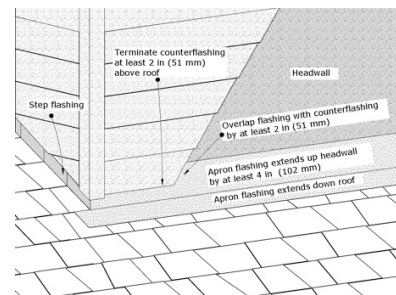


Figure 10

Roof to Sidewalls

F-Wave™ recommends the use of a 10.0 inch x 8.17 inches (254mm x 208mm) step flashing piece. Interlace step flashing with shingle courses as the shingles are applied. Step flashing must extend at least 4 inches (102mm) up the sidewall and at least 4 inches (102mm) over underlapping shingles. Fasten step-flashing to the roof deck only, using two nails installed into the top overlapped region. Overlap pieces of step flashing by 2 inches (51mm). Use F-Wave™ approved sealant and adhesive (see Table 1 on Page 6) to adhere the underside of the shingle to the metal step flashing.

Roof to Headwalls

Apply roof shingles up to the edge of the headwall. Install an apron flashing at least 5 inches (127mm) up the headwall and extending at least 4 inches (102mm) down the roof. Nail apron flashing to the roof deck only and seal to shingles with F-Wave™ approved sealant and adhesive (see Table 1 on Page 6). Do not nail the apron flashing to the wall and instead secure with siding material over the top. Apply a second row of shingles over the metal flashing on the roof surface and trim to cover just exposed metal. Use F-Wave™ approved sealant and adhesive (see Table 1 on Page 6) to adhere the cut shingle to the metal apron. See Figure 11.

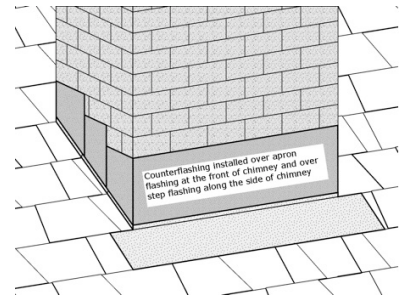


Figure 11

Chimney Flashings

Apply underlayment up to the base of the chimney. Install an apron flashing on the front of the chimney and step flashing along the sides. For further details see the Roof to Wall Flashings section. Install pre-fabricated metal cricket flashing or field fit using roofing flashing of sufficient width to cover the cricket. The metal flashings of chimneys, skylights, vents, and adjoining walls must be counter-flashed with sheet metal cap flashing. See Figure 11.

Hips and Ridges

Install F-Wave™ Revia™ High-Style Hip and Ridge Shingles along the hips and ridges. Only F-Wave™ Revia™ High-Style Hip and Ridge Shingles are designed specifically to work with F-Wave™ Revia™ Roofing Shingles. Attach using two fasteners installed 1 inch (25mm) from the edge of the shingle and penetrating through or at least 3/4 inch (19mm) into the roof deck or 1/8 inch (3.2mm) through the roof deck. Begin at the bottom of the hip. When installing at the ridge, start the hip and ridge shingles from the opposite direction of the prevailing winds. See Figure 12 & 13

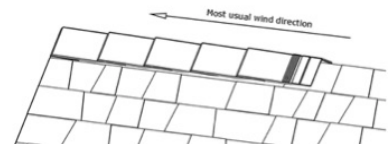


Figure 12

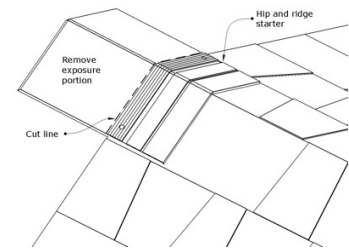


Figure 13