

NBP SHINGLE APPLICATION INSTRUCTIONS

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NBP International will not be responsible for damage resulting from failure to follow application instructions. Any deviation from printed instructions shall be the sole responsibility of the user and may void the warranty. Please report any difference between local building codes or practices and those recommended in this document to your local NBP dealer or directly to NBP by fax (+1 514 935 9823) or by e-mail <sales@nbpintl.com>.

INTRODUCTION

While the primary purpose of a shingle roof is to protect you and your house from the uncertainties of a harsh climate, we at NBP believe that it should also serve to enhance the overall appearance of your home. Properly installed, your new shingle roof will beautify your home and provide you with many years of worry-free protection.

This program has been designed to tell you everything you need to know to install any model of NBP shingle, plus a lot more! We'll take you step by step through the entire process—from selecting and storing your materials to caring for your new roof.

The exceptional quality of NBP products has earned them an unparalleled reputation for value and dependability worldwide. It is with these high standards in mind that we have produced this installation guide. We hope that, after reading these pages, you will be prepared to undertake your roof renovation or installation safely and with confidence, and achieve long-lasting, professional results.

Remember: a premium roof is not only one that uses premium, high value shingles, but is also one installed according to the best roofing practices and takes into account your home's overall aesthetics.

S E C T I O N 1

GETTING READY FOR THE JOB

1.1

CALCULATING THE ROOF AREA

The simpler your roof, the easier it will be to calculate its area. Start by measuring the length and width of the house, including overhangs. Multiply these two figures to obtain a horizontal projection of the roof. The slope will affect the roof's dimensions, so this must also be taken into account: the steeper the roof, the longer the sides.

To calculate the area of a simple roof (one with just two plain, unbroken sides) you therefore multiply the length of the house by its width, as explained above, and then multiply this total by a pre-determined conversion factor corresponding to the roof slope. The conversion factors are listed on the slope calculator and are included here for your convenience:

SLOPE		FACTOR
2 - 12 OR 1:6 OR	9⁰	1.01
3 - 12 OR 1:4 OR	14⁰	1.03
4 - 12 OR 1:3 OR	18⁰	1.05
5 - 12 OR 1:2.4 OR	23⁰	1.08
6 - 12 OR 1:2 OR	27⁰	1.12
8 - 12 OR 1:1.5 OR	34⁰	1.20
10 - 12 OR 1:1.2 OR	40⁰	1.30
12 - 12 OR 1:0.86 OR	45⁰	1.41
14 - 12 OR 1:0.86 OR	49⁰	1.54
16 - 12 OR 1:0.75 OR	53⁰	1.67
18 - 12 OR 1:0.67 OR	56⁰	1.80

If your roof is complicated by intersecting wings, gables, dormers, etc., your best bet is to draw a detailed horizontal projection of the roof. The necessary measurements can be taken from the ground, from inside the attic or from the house plans. The roof can then be broken down into simple geometric shapes whose areas are added together to determine the total roof area. Remember: areas with different slopes must be calculated separately using the appropriate conversion factors. Once all calculations are complete and the total area is calculated, add 10% as a margin of error.

On very complex roofs, a number of technical problems may arise that make installing shingles much more difficult. In such cases, it may be best to call a professional roofer.

TOOLS

- Tape measure
- Chalk line
- Carpenter's square
- Hammer (claw hammer, roofer's hatchet or pneumatic nailer)
- Utility knife - for cutting shingles and rolls
- Tin snips - for cutting metal flashing
- Caulking gun
- Notched trowel
- Work gloves and tool belt or nail apron
- Saw, chisel and plane for repairing or replacing damaged decking
- Square-mouth shovel - for removing old shingles (where re-roofing)
- Pry-bar - for lifting hard-to-reach shingles and flashings
- 8 or 10 mm nylon or polypropylene rope - to secure the ladder and use as a safety line (or as required by local laws and practices)
- Safety harness
- A strong, safe ladder (wood or fiberglass) or scaffolding
- Cutting board - to prevent accidentally cutting through the shingle into the roof below
- Waste receptacle
- Broom & Rake - for cleaning up afterwards

MATERIALS

- NBP Shingles
- Galvanized roofing nails (preferably hot dipped)
- NBP Plastic Cement
- Eave protection (Self-sealing, self adhesive, Gripgard Waterproofing Membrane, NBP Smooth or Slate Surface Roll Roofing)
- Underlayment (Gripgard Waterproofing Membrane, No.15 Asphalt Felt Plain, Standard Asphalt Sheathing or Shingle Base Underlayment)
- Valley treatment - Slate Surface Roll Roofing, Mineral Surface Roll Roofing, Gripgard Waterproofing membrane .
- Flashings - Smooth or Slate Surface Roll Roofing, Gripgard, Waterproofing Membrane or metal flashing.
- NBP Roofguard

- Roof ventilators

1.2 STORING SHINGLES

From the time of delivery to the time of installation, the roofing materials may have to be stored. To protect your investment and ensure optimal results, follow these basic recommendations:

- Don't store shingles in the hot sun or leave them exposed to bad weather. If the shingles must be stored outdoors (and factory pallet packaging has been removed) protect them with a tarpaulin or plastic sheet. Be sure to make a few holes in the sheet to allow for air circulation.
- Don't cut or bend shingles that have been stored in extreme cold without first allowing them to warm up.
- Don't store the bundles directly on the ground; place them on a raised platform.
- Never stack shingle bundles more than 1.2 m high.

1.3 SAFETY TIPS

A roof can be a dangerous place to work, so read the following section carefully and take the necessary precautions to avoid accidents.

The primary, and most obvious, danger is falling. If you have difficulty walking on the roof, it is probably too steep for you to work on safely.

First and foremost, make sure that you are fastened safely. Your local NBP dealer can assist you in locating a safety harness with a large snap hook specially for this purpose. Fasten the harness around your waist and clip it to a nylon or polypropylene rope 8 to 10 mm thick. The other end of the rope should be tied to a solid, immovable object on the other side of the roof. A strong tree or a 5 x 10 cm (minimum) board placed across the inside of a window frame provide reliable anchors for this purpose. Don't tie the rope to your car, to a TV antenna, or to a chimney. Make a series of non-slip loops at 1 to 2 m intervals between your harness and the ridge. As your work progresses across the roof you can attach the safety harness to these loops. Use short lengths of hose or rubber to protect the rope from friction where it rubs against the ridge and eaves.

THE FOLLOWING SUGGESTIONS WILL HELP YOU AVOID ELECTROCUTION:

- Keep ladders and other metal objects away from electrical wires and make sure you don't touch any wires yourself.
- Don't try to remove a TV antenna by yourself. Most antenna distributing companies will take care of this for you. Otherwise, arrange to have somebody else help you and exercise extreme caution. Above all, keep the antenna away from electrical wires.

If you are working with a ladder, remember these important tips:

- Use a sturdy ladder and make sure it extends at least 60 to 90 cm above the roof level so that you can hang onto the rails while climbing on and off the roof.
- Secure both sides of the ladder at the top and the bottom.
- Don't lean too far away from the ladder to reach the next section of roof. It is safer to move the ladder.

Finally, some general guidelines:

- Try not to work alone on the roof. If it is necessary to do so, notify someone of your intentions.
- Make sure that no one is standing under the roof where they can be hurt by falling objects.
- Avoid wearing loose-fitting clothing. Do wear rubber-soled shoes (i.e. running shoes) and protective glasses.
- Do not work on a wet roof. Ideally, the weather should be mild, dry, and calm.
- Make sure your ladder or scaffolding is set on a firm, level base that is neither too muddy nor too dry.
- If you are working on a steep roof (slope of 27° or more), it may be necessary to build footholds. This can be easily accomplished using a flat board held in place with steel straps. On very steep slopes, a 5 x 10 cm wood wedge can be placed under the board to provide a level foothold. The board can be moved around the roof as you work.
- Make sure that tools and materials placed on the roof cannot slide off. Don't place heavy piles of shingles in one area - spread the material around the roof to evenly distribute the weight.
- Do not take any unnecessary risks.

1.4

MULTIPLE LAYER INSTALLATION

When trying to decide whether you should apply asphalt shingles over old shingles, use the following checklist to

ensure that you meet the requirements for multiple layer installation:

- If you plan on adding new shingles directly on top of old shingles, check to make sure that you are not overloading the supporting structure and make sure that the deck can support an additional layer of shingles. The question of weight is more critical if the original deck is thinner than current building code standards recommend or if the deck is unsound in any way. In these circumstances, roof failure and consequential damages to the home would not be covered by any warranty. Check your local building code.
- Verify the underside of the deck. Boards that are warped or rotten must be replaced. Boards that are loose must be properly nailed. Decks that are warped or otherwise unsound preclude multiple layer installation.
- Check that the old roof system does not have moisture retention problems and will meet minimum ventilation requirements once an additional layer of shingles has been installed. It may be necessary to increase ventilation of the attic space, especially if the old shingles failed prematurely.
- Check the condition of the old shingles. If the old shingle surface is anything other than smooth and flat, corrective measures must be taken. Cut and nail down buckles, raised tabs, or curled edges and remove or drive in any protruding nails. Defects in the old layer of shingles or roof deck may re-appear in the new layer. NBP will not be responsible for appearance problems related to multiple layer installation, such problems being typical of this type of installation.

NOTE : Compliance with all local safety regulations is the responsibility of the applicator.

S E C T I O N 2

PREPARATION, PROTECTION OF VULNERABLE AREAS AND VENTILATION

2.1 SLOPE

NBP shingles are designed for a minimum slope of 18° For slopes of 9° to 18° use either low slope shingles, or for best results, NBP premium 3-tab Tradition shingles. If you choose to use premium 3-tab shingles you must follow the special application instructions outlined in section 3.8.

2.2 DECK

The deck must be in good condition. It must be dry, clean, smooth and securely nailed. Plywood or OSB decking is recommended. Planks may also be used as long as they are installed in a fashion that limits deck springing. Planks should be dried to a maximum 13% humidity and should be carefully sorted as to thickness to avoid drastic variances. Warped planks should be discarded. For required thickness, refer to your local building codes or consult with your architect and engineer. If local standards do not exist, utilize guides laid out by Canadian Mortgage and Housing Corporation's "Canadian Wood -Frame House Construction". A copy of relevant text may be obtained from your local NBP dealer. (For a summary of the text please refer to Appendix 2)

Failure to use proper decking materials can result in deck movement, which will distort or damage the overlying roofing materials. Distortion of roofing resulting from deck movement is not a manufacturing defect of the roofing product and is not covered by the warranty.

Because moisture content can cause natural movement in wood planks, varying degrees of shingle buckling may occur. In situations where roof leaks occur as a result of this buckling, it is not the fault of the shingle but of the roof deck itself. It is therefore recommended that plywood or OSB be chosen instead of wood planks. Problems related to the deck will render the warranty void. Shingles must not be nailed directly over insulation.

2.3

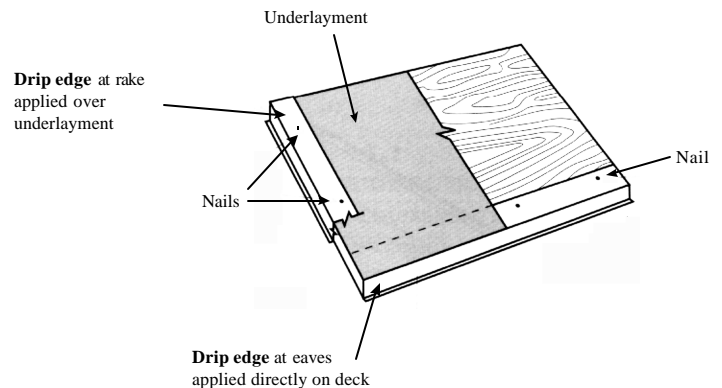
DRIP AND RAKE EDGE

A drip edge of metal (galvanized steel, galvalum, sheet copper, or aluminum) should be applied on the eaves and rake edges. Apply the drip edge at the eaves directly to the wood deck and at the rake over the underlayment. Nail every 20 to 25 cm. (See Diagram 1).

2.4

VENTILATION

The following minimum ventilation requirements must be met. If local recommendations differ from these, use whichever guideline suggests more ventilation. All roof structures must have through ventilation to prevent entrapment of moisture-laden air beneath the deck and to eliminate heat build-up. Minimum requirements are unobstructed vent areas of 1/300 th of the total insulated ceiling area for conventional roofs, and 1/150 for low slope roofs (9° to 18°) and for cathedral

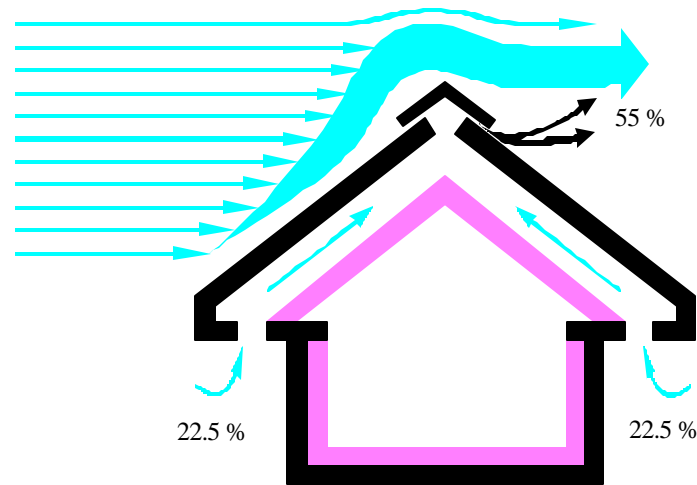


ceilings. Vent holes should be distributed as follows : 55% at the base of the roof (soffits) for air intake and 45% at the ridge for air outflow (see diagram 3). The vents used may be roof-type vents, eave-type vents, or gable-end type vents, and should be uniformly distributed to ventilate each roof space. When calculating the net free area (unobstructed open area), be sure to factor in any obstacle to free air circulation such as screens, grids, louvers, blades, etc.

Ridge vents are, by far, the best way to ventilate (see diagram 2). If you have any doubt as to whether or not roof structure is properly vented, contact your NBP dealer for guidance. A consultation with an engineer may be required.

There must be at least 5 cm of space between the insulation in the attic and the roof deck. If insulation was added without leaving space for air flow, the ventilated soffit might not be able to do the job it was intended to do.

The shingle warranty will only be valid if all structures are provided with proper through ventilation.

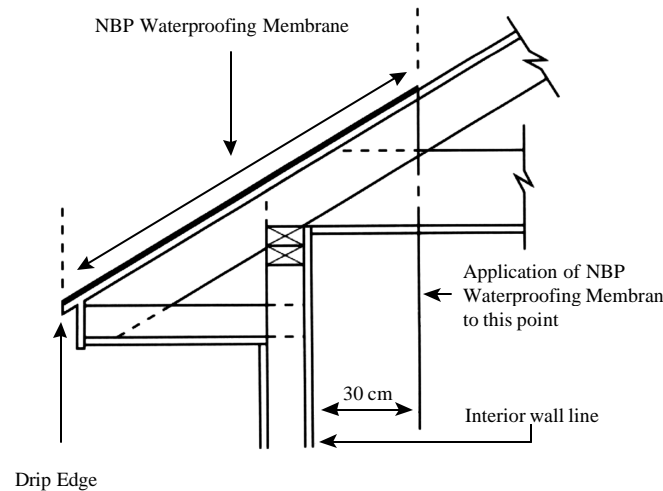


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2.5 EAVE PROTECTION

Apply a non-corroding metal drip edge at the eaves. Best protection consists of one ply of Gripgard self-sealing membrane laid horizontally from the eaves and extending up the roof from the eaves to a point at least 30 cm beyond the interior wall line. See Diagram 3. End laps must be a minimum of 15 cm. When more than one width is required, overlap the second course 10 cm over the first.

Minimum protection consists of one ply of NBP Smooth Surface Roll Roofing, or Slate Surface Roofing, applied as above. (See Diagram 3).



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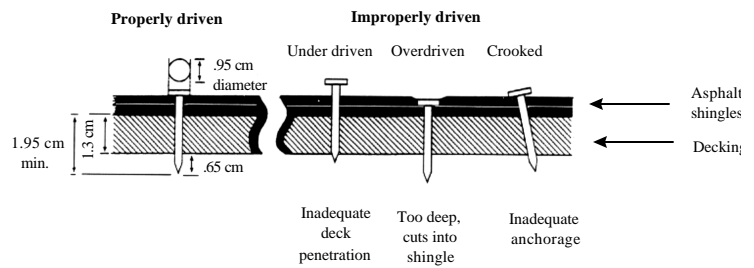
S E C T I O N 3

APPLICATION OF SHINGLES

3.1 GENERAL DIRECTIONS

A) NAIL REQUIREMENTS

Use 10 to 12 gauge (3.5 mm to 4 mm) galvanized roofing nails with a minimum 9.5 mm head for all types of shingles. Nails must be long enough to penetrate a minimum of 20 mm into solid wood deck or just through the plywood deck. Staples are not recommended. Raised nails can result in shingle distortion and may prevent sealing. Drive nails until they are flush with the surface; do not overdrive nails. (See Diagram 4). Do not nail into the sealing strip as nails may prevent proper sealing.



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B) CEMENT

To ensure compatibility, cements must meet CAN / CGSB or ASTM standards. NBP Plastic Cement meets CAN / CGSB-37.5-M89 and ASTM D3019-85. All other NBP cements also meet applicable CGSB and ASTM standards. For the shingle warranty to be valid, only NBP cements or equivalent cements that meet these standards can be used. Over-usage of cement can damage the shingle, so application must be with a comb or notched trowel in a thin, even coating. You may obtain specific instructions with regard to the recommended coverage, quantity to be used, and temperature from your local NBP dealer. Always refer to this document for complete instructions.

Sealing down shingle tabs

Shingles installed under the following conditions require cementing:

- a) in high wind areas;
- b) installation during fall or winter when temperatures are below -5°C;
- c) on a mansard roof;
- d) on a steep sloped roof (greater than 60°); or,
- e) in areas subject to high dust conditions.

Under conditions a) - e) we recommend that shingle tabs be sealed after nailing. Use a small spot of NBP cement no larger than 15 mm wide by 1.5 mm thick under the bottom corners of each tab. Excess cement will damage shingles.

C) SELF-SEAL ADHESIVE

NBP shingles have a factory applied thermosetting adhesive that is activated when exposed to sun and hot temperatures. Application in cold temperatures will not allow shingles to seal and require manual tabbing with NBP Plastic Cement. (see “SEALING DOWN SHINGLE TABS” above)

Cellophane Tape

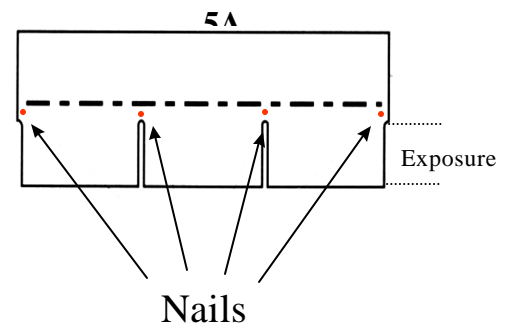
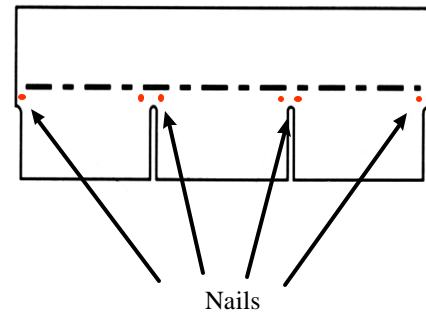
Do not remove parting strip of cellophane tape from the shingle underside. Its purpose is to prevent the shingles from sticking together while in the bundle. It does not affect the application or the effectiveness of the product and, when removed, creates needless waste.

D) APPLICATION ON MANSARD AND STEEP SLOPED ROOFS

The maximum slope considered suitable for normal shingle application is 60°. Nail as shown within 4 cm of the shingle ends, with other nails on either side of the cutouts approximately 1.5 to 2.5 cm above them (See Diagram 5A)

3-TAB SHINGLE

Nail, as shown, within 4 cm. of the shingle ends, with other nails approximately 1.5 to 2.5 cm above the cutouts. (See Diagram 5B).



5B

3.2

UNDERLAYMENT

We strongly recommended the use of underlayment to specification writers, as an additional protection against wind driven rain.

Underlayment consists of NBP No. 15 Asphalt Felt Plain or NBP Standard Asphalt Sheathing laid horizontally over the deck. Underlayment must be applied over the entire roof deck. Where Grippard is installed, underlayment should overlap it by 10 cm. Nail sufficiently to hold in place until shingles are applied. Overlap the succeeding courses 5 cm. (See Diagram 6). End laps should be a minimum of 10 cm. End laps should be at least 15 cm from the hips, ridges or valleys.

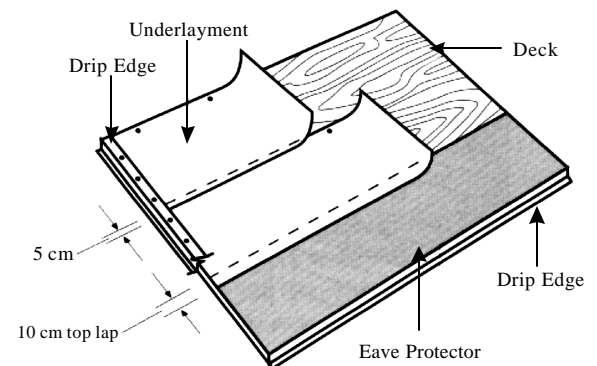
3.3

VALLEY PREPARATION

There are various ways to flash a valley: open, closed, or woven.

A) OPEN VALLEYS

First, lay a 46 cm wide strip of NBP Slate Surface Roll Roofing with the mineral surface side down in the center of the valley, from the eaves to the top of the ridge. Press the sheet firmly into the valley and nail 2.5 cm in from the exterior edges, using only enough nails to hold firmly in place. Cut the



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bottom edge flush to the eaves of the roof. Apply 10 cm wide, 1.5mm thick strips of NBP Plastic Cement to both sides of this strip. If a joint must be made, the upper section should overlap the lower section by 30 cm and should be cemented with NBP Plastic Cement. Next, center a 93 cm wide strip of NBP Slate Surface Roll Roofing (of a color matching the finished roof if possible), surface side up, on top of the previous strip. Press firmly into the cement and nail in the same manner as the first piece. Before applying shingles, snap two chalk lines into the full length of the valley, one on each side. Start the lines 10 cm from each side of the valley. Center at the ridge and open outwards at the rate of 1 cm/m as they approach the eaves, to a maximum of 20 cm.

Non-corroding metal could be used instead of NBP Slate Surface Roll Roofing. Installing a layer of Gripgard Waterproofing Membrane in the valley, beneath the metal or beneath the Slate Surface Roll Roofing, will ensure maximum protection and prevent condensation.

When applying the shingles, lay them down to the edge of these chalk lines and cut to fit. Cut off the top corner of each end shingle at an angle, to prevent water from penetrating between the roofing courses. Cement the shingles at the chalk lines with an 8 cm wide by 1.5 mm thick strip of NBP Plastic Cement to seal them. Nail down (See Diagram 7).

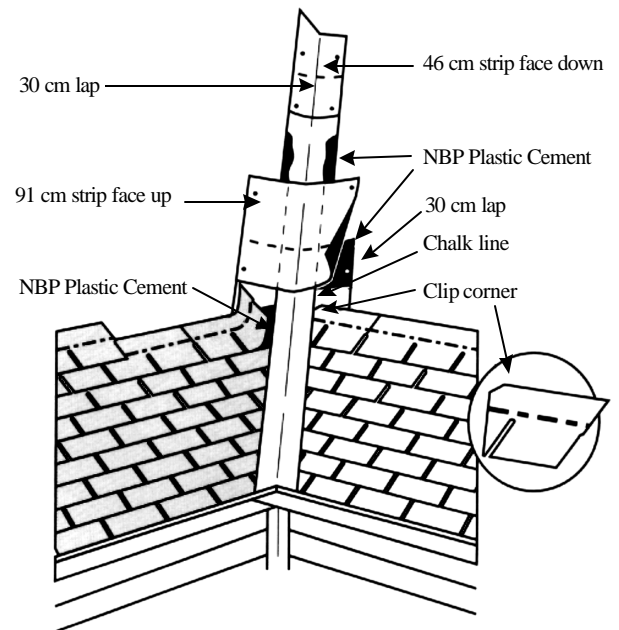
B) CLOSED OR WOVEN VALLEYS

Closed or woven valleys are preferred where slopes are steeper and where shingles are specified. In these valleys, shingles on the adjacent slopes are butted or woven together.

CLOSED VALLEYS

In closed valleys, the valley is completely covered with shingles, but the shingle courses are not woven together. A single 90 cm wide flashing strip of NBP Slate Surface Roll Roofing is laid down the length of the valley before the shingles are applied. Then, snap a chalk line down each side of the valley 15 cm from the valley joint (valley center line). Run each course of shingles from the main roof across the valley and onto the adjoining roof for at least 30 cm. Nail the shingles to the roof, but keep all nails at least 2.5 cm outside the chalk line on each side of the valley. Bring all the shingle courses across from the main roof before completing the courses on the adjoining roof.

Snap a chalk line 5 cm from the valley joint on the adjoining roof. Run each course of shingles from the adjoining roof to the 5 cm chalk line and trim away the excess. Cut a diagonal piece off the upper corner of each shingle ending in the valley



to provide better drainage. Nail the shingles to the roof, but keep all nails at least 2.5 cm outside the chalk line. The ends of each shingle course should be secured to the valley with an 8 cm wide by 1.5 mm thick strip of NBP Plastic Cement (See Diagram 8).

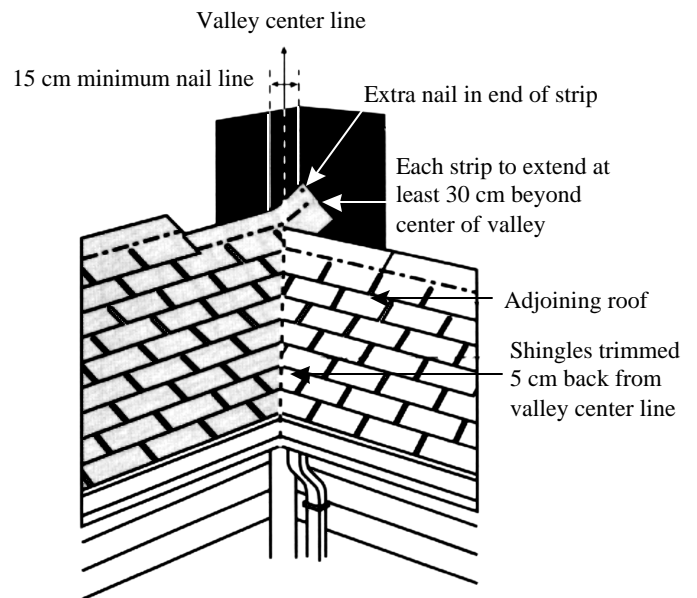
In place of roll roofing, installing a layer of Gripgard Waterproofing Membrane in the valley will ensure maximum protection.

WOVEN VALLEYS

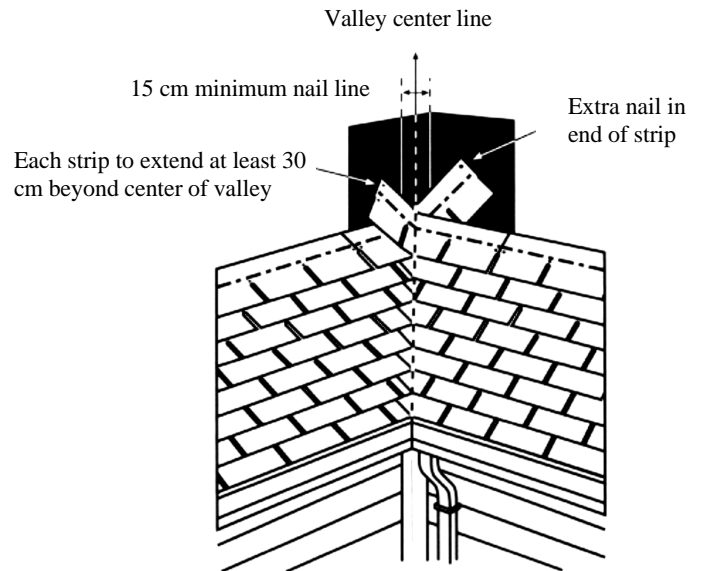
A woven valley is completely covered with shingles. Alternate shingle courses are laid across the valley and woven together. Because of the additional coverage provided by the shingles, it is not necessary to cover the valley joint with a double thickness of roll roofing. Only a single 91 cm wide strip of NBP Slate Surface Roll Roofing is required. The flashing strip is laid over the underlayment.

In woven valleys, the roof shingles are first laid to a point approximately 90 cm from the center of the valley on each roof slope. Snap a chalk line down each side of the valley 15 cm from the valley joint. Run the first course of shingles (from the main roof) across the valley and onto the adjoining roof for at least 30 cm. Nail the shingles down, but keep all nails at least 2.5 cm from the chalk line. Run the first course of shingles from the adjoining roof across the valley and on to the main roof for at least 30 cm and nail it in position. Remember to keep the nails at least 2.5 cm outside the chalk line. Run the remaining shingle courses alternately back and forth across the valley, weaving the shingles together and nailing them in position as described above (See Diagram 9).

In place of roll roofing, installing a layer of Gripgard Waterproofing Membrane in the valley will ensure maximum protection.



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C) VALLEY AT DORMER ROOF

Open valley flashings at a dormer roof are done in exactly the same manner as any open valley flashing except that the slate surface roofing is brought down over the first course of shingles of the main roof to the top of the cutouts and out on to the dormer roof. Do not install valley flashing until the shingle application reaches a point just above the lower end of the valley (See Diagram 10).

In place of roll roofing, installing a layer of Gripgard Waterproofing Membrane in the valley will ensure maximum protection.

3.4

FLASHINGS

A) VERTICAL WALL FLASHING - "STEP FLASHING"

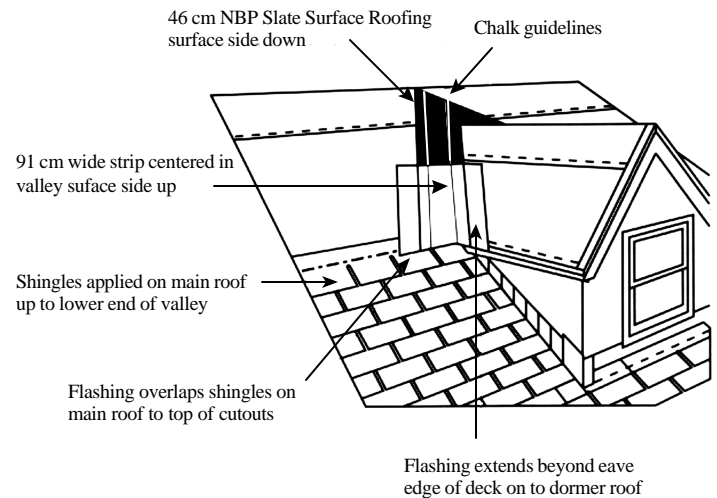
Each piece of metal flashing must be provided with a 7.5 cm overlap. This dimension and the amount of the shingle exposure will determine the width of the metal flashing piece exposure (See Diagram 4 for exposure). For example, a 13 cm shingle exposure will require a piece of metal flashing 20.5 cm wide, 13 cm exposure plus a 7.5 cm side lap. Each flashing strip is placed on top of the shingle, with the lower edge just slightly above the cutouts or above the dragon teeth of laminated shingles (See Diagram 11).

Each metal flashing piece should be long enough to extend 10 cm up the vertical wall, and 7.5 cm onto the roof deck. For the above-mentioned example, taken together, the width and length dimensions require that each metal flashing piece measure 17.5 x 20.5 cm.

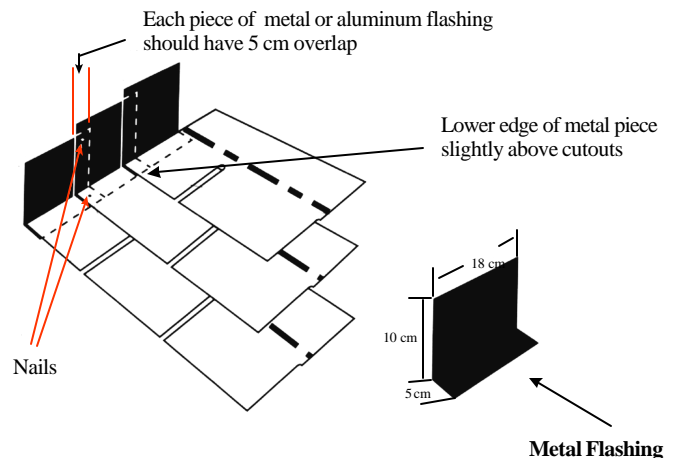
Begin at the eave and nail the first metal flashing piece to the vertical wall sheathing with a single roofing nail placed in the top corner. Use a second roofing nail to nail the 7.5 cm wide portion of the metal flashing piece to the roof deck. Both nails should be placed where they will be covered by the 7.5 cm side lap of the next flashing piece. Coat the head of each nail with NBP Plastic Cement to prevent any possibility of a leak developing.

Complete the first course of shingles along the roof eave, and secure the end of the last shingle to the metal flashing piece with NBP Plastic Cement. Do not nail through the shingle and metal flashing.

Apply the second metal flashing piece to the vertical wall sheathing and the roof deck using the same method described for the first one. Provide at least a 7.5 cm overlap, but do not allow its edge to extend into the exposure for the first shingle course. On the roof deck, the metal flashing pieces must be completely hidden from view by the shingles (See Diagram



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DO NOT USE SHINGLES TO FLASH UP AGAINST WALLS

11

11). Wall siding serves as cap flashing over step flashing on the vertical wall.

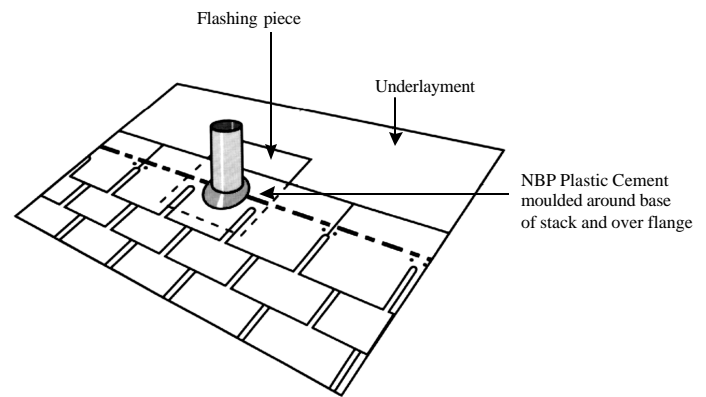
In re-roofing (application over an existing layer of shingles), ensure that the old shingles butting the wall are in good condition. Apply a strip of NBP Smooth Surface Roll Roofing 20 cm wide over the shingles along the wall. Nail 10 cm apart along each edge of the strip. Cover with NBP Plastic Cement and embed the new shingles. Use a caulking gun and draw a bead of NBP Plastic Cement between the ends of the shingles and the siding.

Flashings should always be neatly done and color coordinated.

B) SOIL STACK FLASHING

Use either Gripgard Waterproofing Membrane, NBP Smooth Surface Roll Roofing, or a metal flange to flash a soil stack and lay around the soil stack before shingles are laid. Cut a piece of flashing material with a hole in it to fit just over the pipe and large enough to extend 10 cm below, 20 cm above and 15 cm to each side of the pipe. Slip this flange over the pipe and lay flat on the roof. Form a collar of NBP Plastic Cement around the pipe to plug the gap and work it in properly to obtain good adhesion of the cement to the pipe. Continue laying shingles and cement in all areas that overlap the flange (See Diagram 12).

Flashings should always be neatly done and color coordinated.

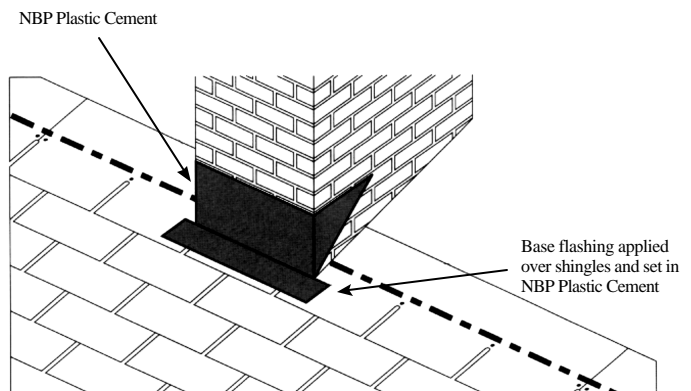


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C) CHIMNEY FLASHING

Chimneys are often built on a separate foundation than the building to avoid uneven settling. To permit movement without damage to the water seal, you must construct base flashings which are secured to the deck and which are covered by cap flashings that are secured to the chimney. Before flashing, shingles are applied up to the lower face of the chimney. A cricket or saddle (See Diagram 15) is built on the upper side of the chimney to prevent the accumulation of water or ice.

Start on the low side of the chimney and apply a strip of NBP Smooth or Slate Surface Roll Roofing, cutting the edges to permit folding up the sides of the chimney. For maximum protection, use Gripgard Waterproofing Membrane as a base for the flashing material. Extend 25 cm up the chimney and onto the roof to the top of the cutouts of the last shingle course. Secure this strip to the shingles with NBP Plastic Cement.



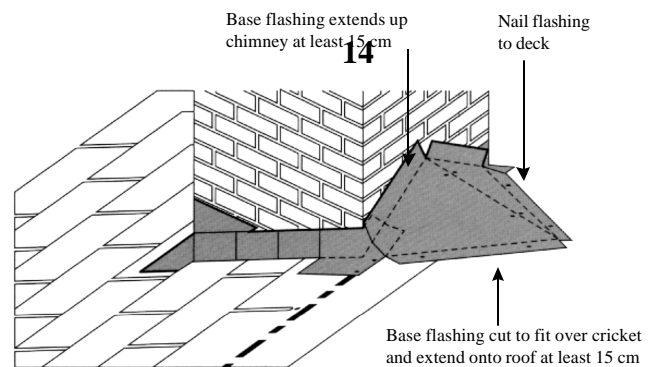
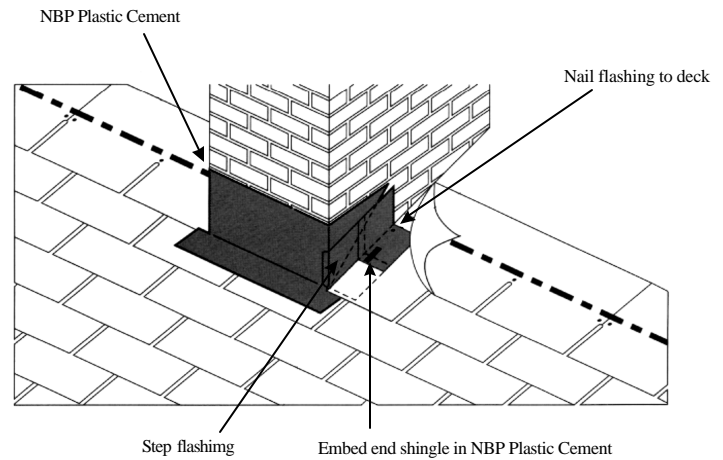
13

Apply the metal base flashing, starting with the front (lower side) of the chimney. Bend the base flashing so that the lower section extends at least 10 cm over the shingles and the upper section extends at least 30 cm up the vertical face of the chimney (See Diagram 13). Secure the metal flashing to the roll roofing using NBP Plastic Cement. Shingle around and / or over the base flashing.

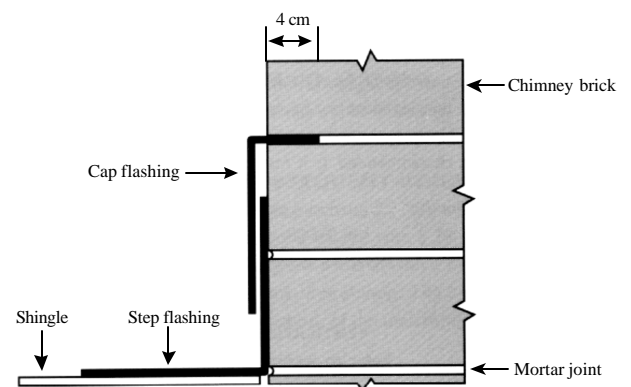
Use metal step flashing for the sides of the chimney, positioning the units in the same manner as flashing a vertical wall. Cut, bend and apply the step flashing as shown in (Diagram 14) and as described in section 3.4-A. Secure each flashing unit to the deck with nails. Embed the end shingles in each course that overlaps the flashing in NBP Plastic Cement.

Next, cut and bend the metal base flashing to cover the cricket and extend onto the roof surface at least 15 cm. It should also extend at least 15 cm up the brickwork and far enough laterally to lap the step flashing on the sides (See Diagram 15). Shingle around and/or over the base flashing.

Cap flashings must now be placed over all base flashings for positive exclusion of water from the joint. Begin by setting the metal cap flashing into the brickwork as shown in (Diagram 16). This is done by raking out a mortar joint to a depth of 4 cm and inserting the bent edge of the flashing into the cleared joint. Refill the joint with mortar or NBP Plastic Cement. Finally, bend the flashing down to cover the base flashing and to lie snugly against the masonry. Don't fasten through the base flashing, as the two must be allowed to move independently.



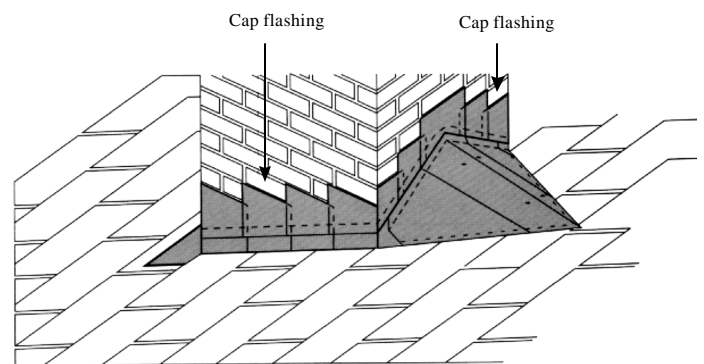
15



16

Use one continuous piece of cap flashing on the front of the chimney. On the sides and back of the chimney, use several pieces of similar-sized flashing, trimming each to fit the particular location of brick joint and roof pitch (See Diagram 17). Start the side units at the lowest point and overlap each at least 8 cm.

Remember that flashings should always be neatly done and color coordinated.



3.6

APPLICATION OF 3-TAB SHINGLES

Tradition, Rampart, Citadel

Deck

Refer to section 2.2.

Drip and Rake Edge

Refer to section 2.3.

Ventilation

Refer to section 2.4.

Eave Protection

Refer to section 2.5.

Underlayment

Refer to section 3.2.

NAILING

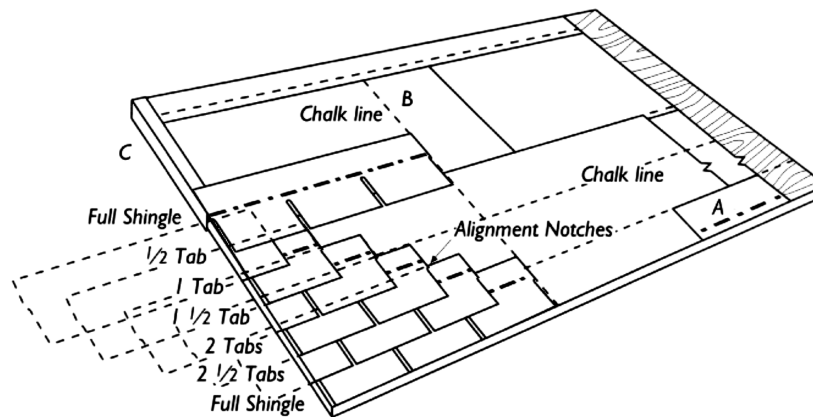
A minimum of 4 nails per shingle is required on most slopes. On Mansard roofs, a minimum of 6 nails is required. Nail (as shown) at 3.8 cm from the shingle ends, with the other nails approximately 1.2 to 2.5 cm above the cut-outs (and below the self-sealing strip). Refer to section 3.1 (A). (See Diagram 5) .

Mansard and Steep Slope Nailing Pattern

Refer to section 3.1 (D).

STARTER COURSE

- 1 On the deck chalk a horizontal line at 18.8 cm from the drip edge (lower edge of the roof).
- 2 Cut away and discard the lower 14.3 cm portion of the shingles and then cut off 15 cm from one end. Do not reverse shingle.
3. Starting at the rake edge, align top edge of the trimmed shingles with the chalk line. If the shingles are not below the eave by 5 mm, adjust your horizontal chalk line accordingly (See Diagram 18A).
4. Continue shingle course by butting (placing, just touching end - to - end) shingles along entire roof length. Check alignment against vertical chalk lines regularly. If necessary trim shingles or open space to correct.



FIRST COURSE

Draw a vertical line at 95 cm from the rake edge of the roof if the sloping side has a valley (See Diagram 18B). Otherwise,

draw in the middle of the roof. Align this first course horizontally with the starter course, and vertically with the line draw. Cut the shingles to overhang rake 5 mm. (Trim last shingle at opposite end to overhang 5 mm as well)

SUCCEEDING COURSES

Offset each shingle row by half a tab. At the 7th row, go back to the vertical line and repeat the sequence. For optimum alignment, draw reference vertical lines every 2 m to check and adjust your tab vertical alignment. This practice is essential on large (wide) roofs to maintain alignment. It is unwise to rely on human touch to apply absolutely equal pressure in butting each shingle. Furthermore shingle width may vary slightly as may quantity of asphalt on each edge. Draw a horizontal line every 28.6 cm in order to check and adjust your horizontal alignment. If you have used NBP felt this is not necessary as lines are factory applied (See Diagram 18).

SHINGLES IN VALLEY

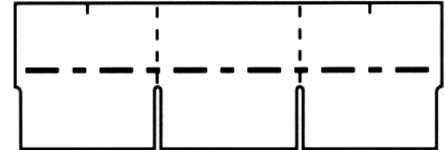
When a course of shingles is applied, trim it off flush with the chalk line. Cut off the top corner of each end-shingle at an angle, to prevent water from penetrating between the roofing courses. Cement shingles to the valley flashing with plastic cement and nail in the normal fashion.

RIDGE TREATMENT

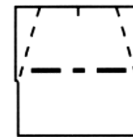
The last course of shingles applied must have the exposed granular surface to within 14.3 cm (or less) of the ridge. The headlap of the shingle is turned over the ridge and nailed on the opposite slope. (If using NBP Ridge Vent, please refer to Ridge Vent installation instructions). When both slopes have been completed in this fashion, the ridge capping can be applied. To make capping, cut full-size shingles into 3 equal parts (See Diagram 19). Cut off both corners of each section at an angle (See Diagram 20).

Apply ridge caps as follows:

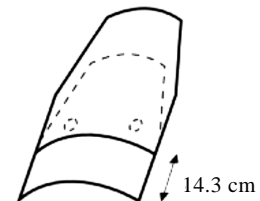
- Bend the cap down the center so as to have equal exposure of the granules on each side of the ridge. In cold weather, warm the cap before bending.
- Begin at bottom of a hip or at end of ridge opposite to the prevailing wind and apply caps, overlapping to give a 14.3 cm exposure (See Diagrams 21 & 22).
- Nail cap with one nail on each side, 15.3 cm from the exposed end and 2.5 cm from each side.



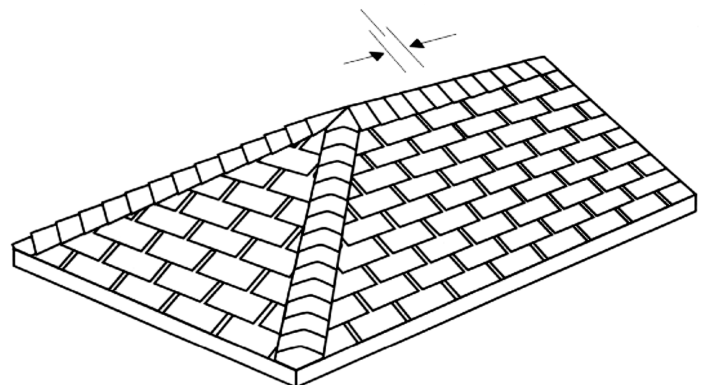
19



20



14.3 cm



ROOFMASTER

GENERAL DIRECTIONS

Do not butt these shingles tightly together, especially during cool or cold weather application.

Deck

Refer to section 2.2.

Drip edge and rake

Refer to section 2.3.

Ventilation

Refer to section 2.4.

Eave Protection

Refer to section 2.5.

Underlayment

Refer to section 3.2.

NAILING

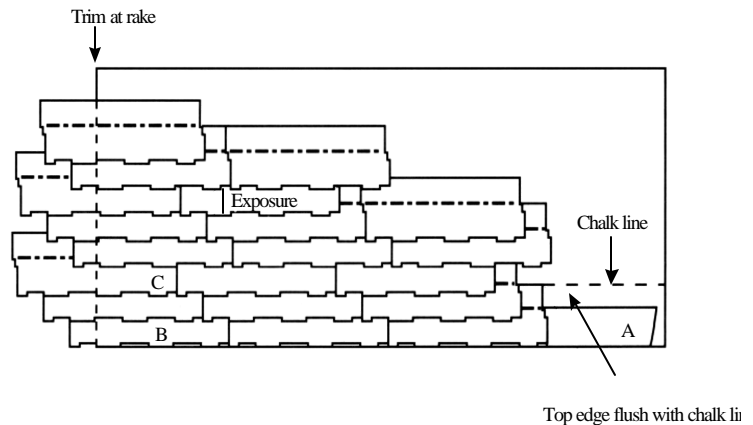
Secure with (4) nails placed 4 cm to 33 cm in from each end of shingle and directly below the self-sealing strip. Refer to section 3.1 (A).

STARTER COURSE

Cut away and discard the lower 15 cm portion of the shingle. Apply the top portion, granule side up, extending it 5 mm beyond the edge of the eaves. Do not reverse shingles. This will ensure that the shadow band runs along the eaves. Continue with full length trimmed shingles, gently butting the ends of shingles (See Diagram 23-A).

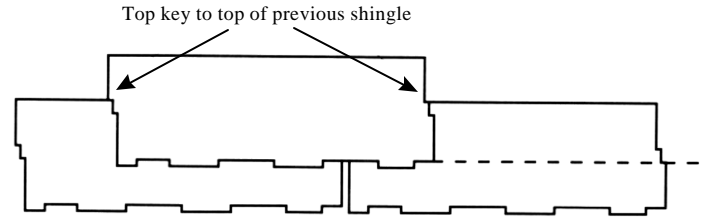
FIRST COURSE

Mark a horizontal line (string or chalk) along the roof 34.3 cm from the lower edge of the starter strip. Cut from 13 to 25 cm off the end of the first shingle at the rake edge. Lay shingle over the starter course, top edge flush with the chalk line. Continue applying full shingles, butting them together so the alignment keys fit into each other (See Diagram 23-B). Do not install shingles using vertical stacking.



SUCCEEDING COURSES

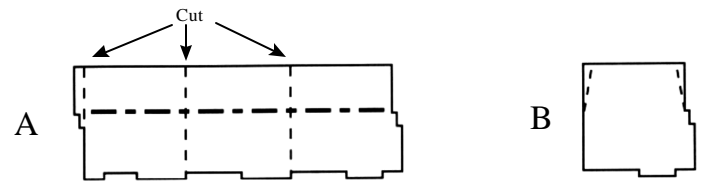
Offset each succeeding course by 13 to 25 cm from the previous one so that joints are not superimposed and nail heads do not appear in shingle joints (See Diagram 23-C). The top keys are laid flush with the top of the preceding course of shingles. The top of the cutout would then align with the lower key of the preceding shingles. These self-aligning features ensure correct exposure of the shingle and perfect horizontal alignment (See Diagram 24).



24

HIP AND RIDGE TREATMENT

Cut full shingles into three equal parts (See Diagram 25-A). Cut off both corners of each section at an angle (See Diagram 25-B). Use a straight edge to ensure an accurate cut. Hip and ridge shingles are overlapped with 14.3 cm exposure. Nail 2.5 cm in from each side directly below the sealing strip.



25

3.7

APPLICATION OF INTERLOCKING SHINGLES TITE-LOK, TITE-ON

NOTE

The interlocking tabs of these shingles give them exceptional wind-resistance, making them the best choice for high-wind areas. If used, planks should not exceed 15.2 cm in width. Plywood should be a minimum of 1.3 cm thick or as specified by local building codes. Attic space must be adequately ventilated. On re-roofing, split and securely nail all buckles, raised tabs, or curled shingles. Replace shingles if necessary.

Deck

Refer to section 2.2.

Drip and Rake Edge

Refer to section 2.3.

Ventilation

Refer to section 2.4.

Eave Protection

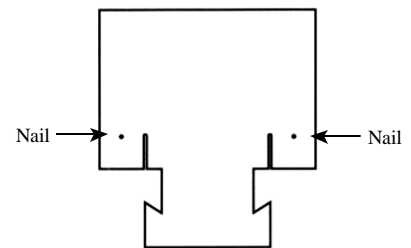
Refer to section 2.5.

Underlayment

Refer to section 3.2.

NAILING

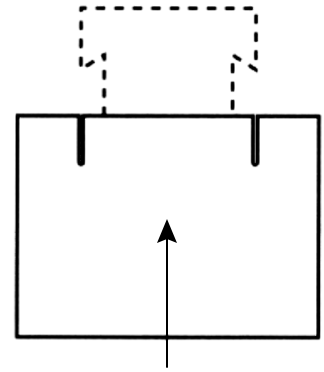
Nail size and type should follow specifications outlined in the section on nail requirements, section 3.1 (A). Nails should be placed as shown on (Diagram 26), which is midway between slots and sides of shingle and about 9 cm above the bottom edge.



26

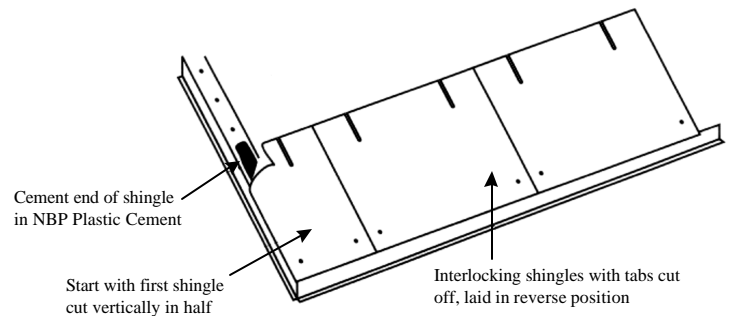
STARTER COURSE

On a plain, gable-type roof, begin at a vertical chalk line drawn from the center of the eaves to the center of the ridge. Cut away the bottom portion of the shingle (see Diagram 27) and apply a row of shingles, reversed top to bottom, with the first shingle centered on the chalk line. Nail just above the drip edge. As an alternate, 3-tab shingles may be used as the starter course by removing the bottom portion (tabs) of the shingles. In this case, do not reverse shingles.



Use this piece for starting shingle at eaves

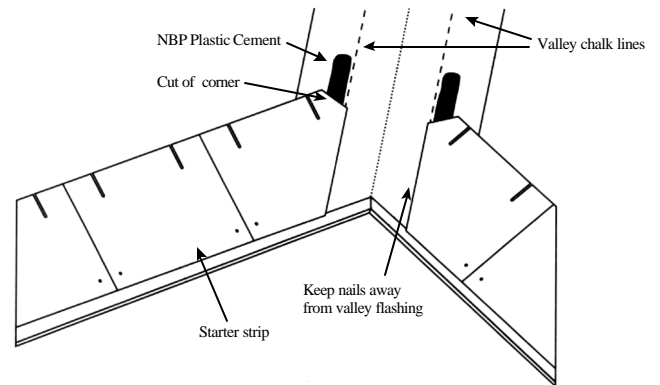
Where there is a valley at one end of the roof, start laying shingles at the rake edge, with the first shingle cut vertically in half (See Diagram 28). Cement the end of the shingle at the rake edge with an 8 cm width of NBP Plastic Cement. Lay shingle to the chalk line and trim along the line, cementing the end of the last shingles with a 8 cm width of NBP Plastic Cement (See Diagram 29). For valley preparation please refer to section for open valley instructions.



28

FIRST COURSE

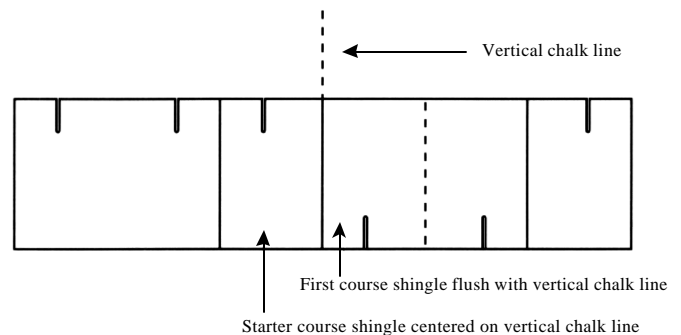
Cut away the bottom portion of the shingle (you can retain piece for use as capping at the ridge). Do not reverse shingles. Lay shingle right on the edge of the vertical chalk line (to the right or left) and flush with the edge of the drip (See Diagram 30). Nail as shown. At the rake edge, cement the end of the last shingle with an 8 cm wide, 1.5 mm bead of NBP Plastic Cement. When commencing at the rake edge, start with a full length trimmed shingle.



29

SECOND COURSE

Start with a full shingle, fitting it as close to the rake as possible. Then, apply a partial shingle to fit at the rake edge (See Diagram 31). Cement the end of the shingle at the rake edge with an 8 cm width of NBP Plastic Cement. Lock the tabs of the second course into the slots of the first course, as shown in (Diagram 32-A). Once both sides are interlocked, gently pull up the top of the shingle (See Diagram 32-B). Leave a little slack to enable you to correct the position of the shingle easily by raising or lowering a corner. Nail as shown.



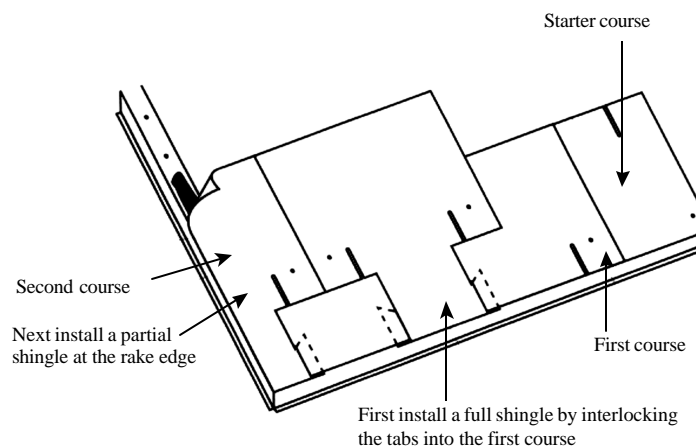
30

SUCCEEDING COURSES

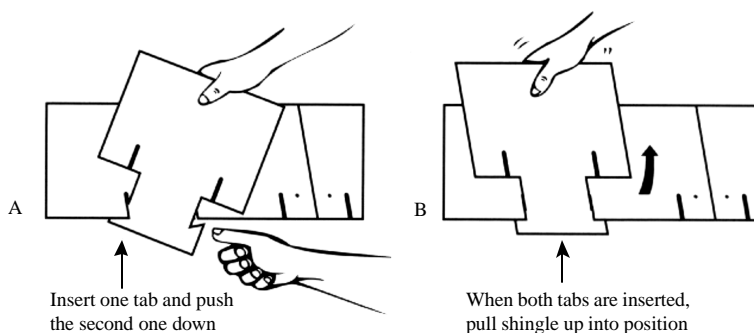
Continue applying shingles as per the second course. Always check horizontal alignment when pulling the shingles into their final position, in order to create a very regular basket-weave pattern (see Diagram 33). Bend shingles over hips and ridges and nail on the opposite side.

HIP AND RIDGE TREATMENT

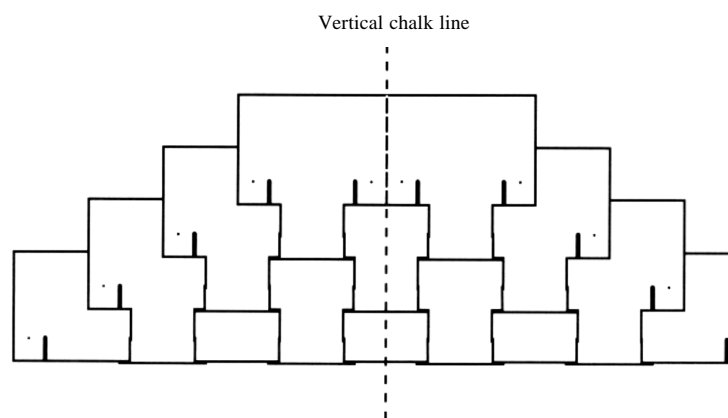
Cover with pieces of 3-tab shingles (1/3 of a shingle) or trim pieces of Tite-Lok or Tite-On of about 24 x 30 cm. Bend the pieces in half longitudinally and apply them over the ridge, directing the butts away from the prevailing winds. Expose 13 cm to the weather and fasten with two nails placed 14 cm above the butt and 2.5 cm in from each side.



31



32



33

3.8 APPLICATION OF 3-TAB SHINGLES ON LOW-SLOPE ROOFS

NBP's Rampart and Tradition shingles can be applied on decks having a slope between 9° to 18° . The installation procedure is the same as for standard slopes (slopes greater than 18°) but the following requirements must be met:

- Upgrade eave protection and underlayment using one of the three methods described below; and,
- If shingles are applied between October 1 and March 31, or in areas subject to high dust conditions, they will be more vulnerable to wind uplift. Under those conditions, shingle tabs should be sealed down with a small spot of cement, no more than 20 mm large and 1.5mm thick, under the bottom corners of each tab.

A) EAVE PROTECTION AND UNDERLAYMENT

For Maximum Protection

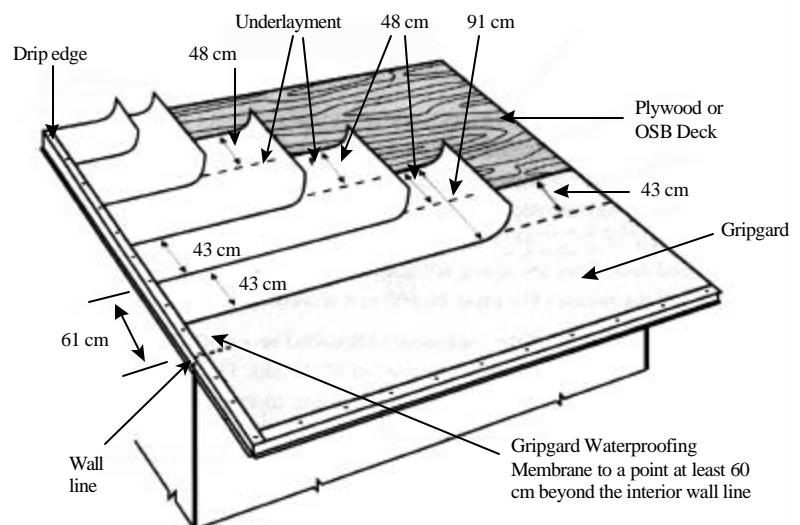
As described for normal slopes, for optimal protection against water penetration, use a single ply of GRIPGARD Waterproofing Membrane over the entire wood deck. This is a strong, self-adhesive, roofing membrane which is applied by peeling off the film paper backing as it is unrolled.

Starting at the low point of the roof, apply GRIPGARD by laying the roll horizontally. End laps must be a minimum of 15 cm. Each succeeding course should be lapped 10 cm over the preceding, lower course. Felt underlayment is not required when Gripgard is installed over the whole roof.

For Better Protection

Eave protection consists of a single ply of GRIPGARD Waterproofing Membrane laid horizontally and extending up the roof, from the eaves to a point at least 61 cm beyond the interior wall line. End laps must be a minimum of 15 cm. If more than one width is required, overlap the second course 10 cm over the first.

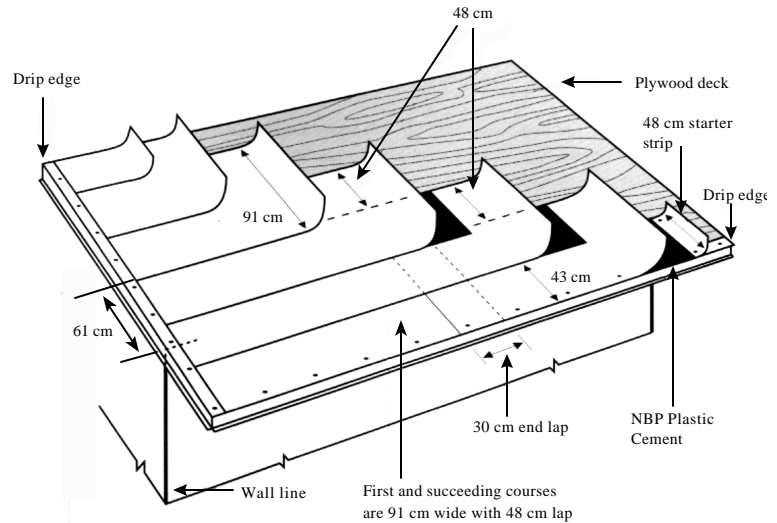
Next, install the underlayment. This calls for a double layer of NBP No.15 Asphalt Felt Plain or NBP Standard Asphalt Sheathing laid horizontally over the rest of the roof. Underlayment must be applied over the entire roof deck. Start with a 91 cm wide sheet overlapping GRIPGARD by 43 cm. Apply a second 91 cm sheet, overlapping the first one by 48 cm, leaving 43 cm exposed. Thereafter, 91 cm sheets are laid, each overlapping the upper 48 cm of the preceding course, until the rest of the roof deck has been covered. Each course of felt is nailed close to



its upper edge with only enough nails to hold it in place until the shingles are applied. See Diagram 34.

For Good Protection

This special procedure calls for an eave protection made up of a double layer of NBP No.15 Asphalt Felt Plain which is both cemented and nailed in the eaves and nailed only over the rest of the roof. Begin application with a 48 cm wide starter course of felt, laid along the eaves flush with the edge of the roof. The underlayment must be cemented from the edge of the roof up to a point at least 61 cm inside the interior wall line. Continue with a full width of felt (91 cm) over the starter course and flush with the edge of the roof, completely covering the 48 cm starter course. Each course of felt along the eaves is cemented to the preceding course using NBP Plastic Cement, applied at the rate of 1 L/m². A 4 kg container of NBP Plastic Cement will cover approximately 2.3 m², with an application thickness of 1.5 mm. Cement must be applied uniformly with a comb, putty knife or notched trowel so that at no point will dry felt come into contact with other dry felt. Special care must be taken to ensure that the proper amount of cement is applied - refer to the label. Press felt firmly into the cement to ensure proper bonding. Nail sufficiently to hold it in place until the shingles are applied. Continue applying NBP cement and felt this way up to a point at least 61 cm inside the interior wall line. Beyond this point, lay 91 cm sheets, but without cement, lapping each course 48 cm over the preceding one. Each course of felt should be nailed sufficiently to hold it in place until the shingles are applied. (see diagram 35)



35

B) VENTILATION

The following minimum vent requirements must be met. If local recommendations differ from these, use whichever guideline suggests more ventilation. All roof structures must be provided with through ventilation to prevent entrapment of moisture-laden air beneath the deck and to eliminate heat build-up. In general, as specified in most building codes, for a low-slope roof or one with cathedral ceilings, every roof space or attic above an insulated ceiling must be ventilated with openings to the exterior to provide an unobstructed vent area of not less than 1m² / 150 m² of the insulated ceiling area. The vents used may be roof-type vents, eave-type vents, gable-end type vents or any combination, and should be uniformly distributed to ventilate each roof space. When calculating the net free area (unobstructed open area), be sure to factor in any obstacle to free air circulation such as screens, grids, louvers, blades, etc. NBP Ridge Vents are by far the best way to ventilate.

There must be at least 5 cm of space between the insulation in the attic and the deck. If insulation were added to the deck without leaving space for air flow, the ventilated soffit might not be able to do the job which it was intended to do.

If you have any doubt as to whether or not roof structure is properly vented, contact your NBP dealer for guidance. A consultation with an engineer may be required.

The shingle warranty will only be valid if all roof structures are provided with proper through ventilation.

CARING FOR YOUR NEW ROOF

Your properly installed new roof will provide you with many years of reliable service while at the same time enhancing the value and appearance of your home. Here are a few tips to ensure that you get the best possible long-term performance from your new NBP roof:

- Clean out the gutter occasionally, especially if there are trees nearby. Don't let dead leaves, seeds, petals, and other debris plug up your gutter.
- Don't let rainwater from down pipes spill directly onto a shingle roof. Connect downpipes from upper roofs to a gutter or to a lower downpipe.
- Try to avoid walking on the roof. If it is necessary to do so, protect the shingles by wearing soft-sole shoes (running shoes) or by walking on boards or other appropriate material.
- If it is necessary to clear accumulations of snow or ice from the roof, avoid damaging the shingles with a shovel. Use a broom to clear away the last 5-10 centimeters. **DO NOT** bring the shovel in contact with the shingles as you may scrape off some protective granules. Remember: the roof can be very treacherous in winter, so be extra careful!

NBP International
For Help contact us at:
Fax: + 1 514 935 9823
E-Mail: sales@nbpintl.com

APPENDIX

Appendix 1

Timber Utilization Guide

The following table is a summary of the Canadian Standards for timber. Please refer to footnote for reference. Use of sub-standard lumber will result in structural failure even if standards are followed.

Roof Joists - (Design Roof Snow Loads 2.0 and 2.5 kPa)							
Loads are based on an average of a variety of species and grades of wood DO NOT USE SUB-STANDARD WOOD	Member size mm	2.0 kPa Joint spacing			2.5 kPa Joint spacing		
		300 mm	400 mm	600 mm	300 mm	400 mm	600 mm
		m	m	m	m	m	m
		m	m	m	m	m	m
	38 x 89	1.96	1.78	1.56	1.82	1.65	1.44
	38 x 140	3.08	2.80	2.45	2.86	2.60	2.27
	38 x 184	4.05	3.68	3.22	3.76	3.42	2.99
	38 x 235	5.18	4.70	4.11	4.81	4.37	3.82
	38 x 286	6.30	5.73	5.00	5.85	5.31	4.64

Roof Joists - (Design Roof Snow Loads 1.0 and 1.5 kPa)							
Loads are based on an average of a variety of species and grades of wood DO NOT USE SUB-STANDARD WOOD	Member size mm	1.0 kPa Joint spacing			1.5 kPa Joint spacing		
		300 mm	400 mm	600 mm	300 mm	400 mm	600 mm
		m	m	m	m	m	m
		m	m	m	m	m	m
	38 x 89	2.47	2.24	1.96	2.16	1.96	1.71
	38 x 140	3.89	3.53	3.08	3.40	3.08	2.69
	38 x 184	5.11	4.64	4.05	4.46	4.05	3.54
	38 x 235	6.52	5.93	5.18	5.70	5.18	4.52
	38 x 286	7.94	7.21	6.30	6.94	6.30	5.50

Roof Rafters - (Design Roof Snow Loads 1.0 and 1.5 kPa)							
Loads are based on an average of a variety of species and grades of wood DO NOT USE SUB-STANDARD WOOD	Member size mm	1.0 kPa Rafter spacing			1.5 kPa Rafter spacing		
		300 mm	400 mm	600 mm	300 mm	400 mm	600 mm
		m	m	m	m	m	m
		m	m	m	m	m	m
	38 x 89	3.11	2.83	2.47	2.72	2.47	2.16
	38 x 140	4.9	4.45	3.89	4.28	3.89	3.40
	38 x 184	6.44	5.85	5.11	5.62	5.11	4.41
	38 x 235	8.22	7.47	6.38	7.18	6.52	5.39
	38 x 286	10.00	9.06	7.40	8.74	7.66	6.25

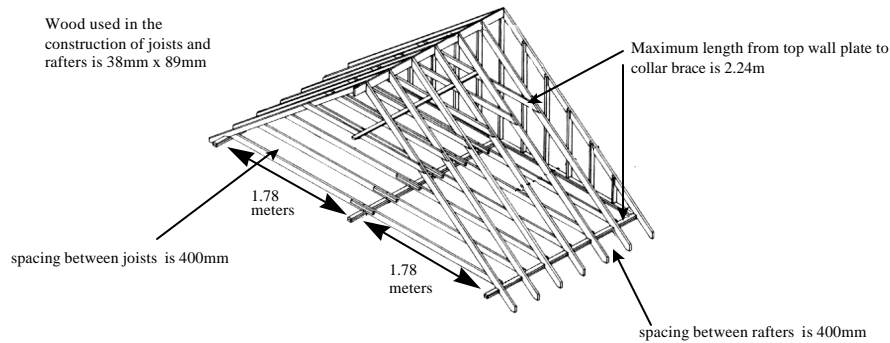
Roof Rafters - (Design Roof Snow Loads 2.0 and 2.5 kPa)							
Loads are based on an average of a variety of species and grades of wood DO NOT USE SUB-STANDARD WOOD	Member size mm	2.0 kPa Rafter spacing			2.5 kPa Rafter spacing		
		300 mm	400 mm	600 mm	300 mm	400 mm	600 mm
		m	m	m	m	m	m
		m	m	m	m	m	m
	38 x 89	2.47	2.24	1.96	2.16	1.96	1.71
	38 x 140	3.89	3.53	3.08	3.40	3.08	2.69
	38 x 184	5.11	4.64	4.05	4.46	4.05	3.54
	38 x 235	6.52	5.93	5.18	5.70	5.18	4.52
	38 x 286	7.94	7.21	6.30	6.94	6.30	5.50

¹ Canada Wood-Frame House Construction, First Metric Ed., Canada Mortgage and Housing Corporation, 1984, pp.187-195

Timber Utilization Sample

As a sample calculation we will use a timber size of 38mm x 89mm. We will assume that we are designing a roof to meet the snow load standard of 2.0 kPa. We are going to space the rafters and the joists 400mm apart. If you check on the above charts (under timber utilization guide) you will see the required installation dimensions, please refer to the following diagram.

Design to meet the Roof snow load of 2.0



Glossary

Base Flashing - That portion of the flashing attached to or resting on the deck to direct the flow of water onto the roof covering.

Cap flashing - That portion of the flashing attached to a vertical surface to prevent water from migrating behind the base flashing.

Cellophane strip - Tape that is placed on the shingle underside. Its purpose is to prevent the shingles from sticking together while in the bundle. It should not have to be removed, it will not affect the application or the effectiveness of the product.

Course - A row of shingles or roll roofing running the length of the roof.

Cricket - A peaked saddle construction at the back of a chimney to prevent accumulation of snow and ice and to deflect water around the chimney.

Cutouts - The open portions of a strip shingle between the tabs.

Drip edge - A non-corrosive, non-staining material used along the eaves and rakes to allow water run-off to drip clear of underlying construction.

Eave - The horizontal, lower edge of a sloped roof.

Exposure - That portion of the roofing exposed to the weather after installation.

Flashing - Pieces of metal or roll roofing used to prevent seepage of water into a building around any intersection or projection in a roof such as vent pipes, chimneys, adjoining walls, dormers and valley.

Gutter - The trough that channels water from the eaves to the downspouts.

Hip - The inclined external angle formed by the intersection of two sloping roof planes. Runs from the ridge to the eaves.

Mansard - A type of roof containing two sloping planes of different pitch on each of four sides. The lower plane has a much steeper pitch than the upper, often approaching vertical. Contains no gables.

Rake - The inclined edge of a sloped roof over a wall.

Ridge - The uppermost, horizontal external angle formed by the intersection of two sloping roof planes.

Sealing strip - Factory applied adhesive strip that bonds shingle courses together when exposed to the heat of the sun after application.

Step Flashing - Flashing application method used where a vertical surface meets a sloping roof plane.

Valley - The internal angle formed by the intersection of two sloping planes.

Vertical stacking - Roofing application method in which shingle courses are applied vertically up the roof rather than across and up. This is not a recommended method of installation.