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UNIFIED FACILITIES GUIDE SPECIFICATIONS

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ASPHALT SHINGLES

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ASPHALT SHINGLES

shingles, roll roofing, or built-up roofing, see the "Residential Asphalt Roofing Manual," published by Asphalt Roofing Manufacturers Association (ARMA) and "The NRCA Steep Roofing Manual," published by the National Roofing Contractors Association (NRCA). Avoid reroofing with asphalt shingles over more than one layer of existing roofing material.

NOTE: On the drawings, show:

1. Pitch of substrate/shingle roofing
2. Detail of crickets and flashings at chimneys
3. Detail at eave/rake corner of roof including underlayment, drip edge, starter strip, shingle exposure, shingle courses, and fastener placement.

NOTE: Where project involves tear-off of existing asphalt roofing materials and it is desired for the Contractor to salvage roofing materials for milling and recycling, include this requirement in UFGS 02 41 00 [DEMOLITION][AND][DECONSTRUCTION].

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D41/D41M	(2011; R 2023) Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D226/D226M	(2017) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D1970/D1970M	(2021) Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
ASTM D3018/D3018M	(2022) Standard Specification for Class A Asphalt Shingles Surfaced With Mineral Granules
ASTM D3161/D3161M	(2020) Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method)
ASTM D3462/D3462M	(2023) Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules
ASTM D4586/D4586M	(2007; R 2018) Standard Specification for Asphalt Roof Cement, Asbestos-Free
ASTM D4869/D4869M	(2016a) Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing
ASTM D6380/D6380M	(2003; R 2022) Standard Specification for Asphalt Roll Roofing (Organic Felt)
ASTM D7158/D7158M	(2024a) Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method)

UL SOLUTIONS (UL)

UL 790	(2022) UL Standard for Safety Test Methods for Fire Tests of Roof Coverings
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KOREAN INDUSTRIAL STANDARDS (KS)

KS F 4750	(2022) Asphalt Shingles
KS F 4901	(2022) Asphalt Felts (Fiber Base, Saturated Bitumen Felts)
KS M 2201	(2021) Straight Asphalt
KS M 2270	(2020; R 2025) Asphalt Primer Used in Roofing, Dampproofing and Waterproofing

1.2 DEFINITIONS

1.2.1 Top Lap

That portion of shingle overlapping shingle in course below.

1.2.2 Head Lap

The triple coverage portion of top lap which is the shortest distance from the butt edge of an overlapping shingle to the upper edge of a shingle in the second course below.

1.2.3 Exposure

That portion of a shingle exposed to the weather after installation.

1.3 SUBMITTALS

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy and Air Force projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy and Air Force projects, or choose the second bracketed item for Army projects.

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.

Submit the following in accordance with Section 01 33 00 SUBMITTAL
PROCEDURES:

SD-03 Product Data

Shingles

SD-04 Samples

NOTE: Select color according to local practice,
except use light-reflective colors for air
conditioned buildings. Where color is specified in
paragraph entitled "Asphalt Shingles," delete the
requirement for submittal of color charts.

Shingles; G

Full shingle sample and manufacturer's standard size samples of
materials and products requiring color or finish selection.

SD-08 Manufacturer's Instructions

Application

SD-11 Closeout Submittals

Manufacturer's Warranty

Contractor's Warranty

1.4 DELIVERY AND STORAGE

Deliver materials in the manufacturer's unopened bundles and containers
bearing the manufacturer's brand name. Keep materials dry, completely
covered, and protected from the weather. Store according to
manufacturer's written instructions. Store roll goods on end in an
upright position or in accordance with manufacturer's recommendations.
Immediately before laying, store roofing felt for 24 hours in an area
maintained at a temperature not lower than 10 degrees C.

1.5 WARRANTIES

NOTE: The warranty clauses in this guide
specification have been approved by the Government.
The paragraphs may be used without any request for
waiver.

Warranties must begin on the date of Government acceptance of the work.

1.5.1 Manufacturer's Warranty

NOTE: Specify 30-year warranty for projects
remotely located and subject to severe wind
loadings; for example, in Bermuda. Specify the

25-year warranty for other projects. Minimum
warranty period must extend beyond one year.

Furnish the asphalt shingle manufacturer's standard 25 yea warranty for
the asphalt shingles. The warranty must run directly to the Government.

1.5.2 Contractor's Warranty

Provide warranty for 5 years that the asphalt shingle roofing system, as
installed, is free from defects in workmanship. When repairs due to
defective workmanship are required during the Contractor's warranty
period, the Contractor must make such repairs within 72 hours of
notification. When repairs are not performed within the specified time,
emergency repairs performed by others will not void the warranty.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Shingles

NOTE: For structures located adjacent to Air Force
Facilities, high light reflectance colors should not
be used where resultant glare would be objectionable
to pilots.

Edit this paragraph for the correct weight of
shingle required for the project. Heavyweight
inorganic mat type shingles will be used for ARHOC
81 Barracks or similar designs for permanent
construction which utilize shingles. Omit fungus
resistance if not required.

Hip and ridge shingles may be made from the strip
shingle tabs or may be of a separate design.
Generally, hip and ridge shingles cut from
self-sealing individual full shingle tabs perform
best.

NOTE: For projects located in coastal high wind
areas, use the bracketed requirement for 14.2
kilogram shingles. The 290 pounds per 100 square
feet is equivalent to 2.9 pounds per square foot.

NOTE: Specify fungus-resistant shingles for
projects located in climates having high humidity
most of the time.

NOTE: In geographical areas of the United States
prone to severe hail events, specify impact
resistant shingles.

NOTE: Structural aspects for the designer should be addressed in accordance with ASCE 7-22, Minimum Design Loads for Buildings and Other Structures. With respects to the wind resistance class options below, the Class F option is for 110 miles per hour resistance. The Class H option is for 150 miles per hour resistance.

NOTE: Certain roofing products are required to conform to public law (PL) 109-58 - Energy Policy Act of 2005 (EPAct05) by meeting or exceeding Energy Star or FEMP efficiency requirements at "energy-efficient products" at <http://energy.gov/eere/femp/energy-and-water-efficient-products>.

NOTE: Facilities with dominant cooling loads and/or in mild or warm climate zones are required to meet "cool roofing" requirements of FEMP. Cool roof design must follow the requirements in UFC 3-110-03 Roofing, Appendix B and ASHRAE 90.1 Chapter 5, for the design of insulation and energy performance of the building. The roofing system will need to include a top surface layer that meets the Energy Star criteria for Cool Roof Products see <http://www.energystar.gov/products/certified-products/detail/roof-products>.

NOTE: If a cool roof is not selected in ASHRAE zones 1 thru 3, design must meet one of the exception requirements listed in ASHRAE 90.1 Chapter 5 or provide thermal insulation above the deck with an R value of 33 or greater. Coordinate these requirements with insulation design and specifications.

Retain the next to last bracketed note for project with cool roof requirement. Retain the last bracketed sentence for project with sustainable third party certification credit requirement for reduced heat island effect.

NOTE: Do not specify local asphalt shingles conforming to KS F 4750 when designed roof system requires fire resistance and wind resistance features.

Mineral granule-surfaced asphalt shingles, self-sealing, square tab, and strip conforming to [ASTM D3018/D3018M, Type I, and ASTM D3462/D3462M weighing not less than 10.3 kilograms per square meter][KS F 4750]. [Shingles must meet the fire resistance requirements of UL 790 for Class A

and the wind resistance requirements of [ASTM D3161/D3161M, Class F][ASTM D7158/D7158M, Class H].]

2.1.2 Mineral-Surfaced Asphalt Roll Roofing

ASTM D6380/D6380M.

2.1.3 Smooth-Surfaced Asphalt Roll Roofing

ASTM D6380/D6380M, Type II.

2.1.4 Underlayment

NOTE: Choose Type I or Type II from the text below.
Type I is the minimum accepted. Type II is a heavy
duty felt. Edit according to project requirements.

Asphalt-saturated felt conforming to ASTM D4869/D4869M or ASTM D226/D226M, Type I, number 15, or KS F 4901 without perforations or other material specified by the shingle manufacturer for use as underlayment.

2.1.4.1 Leak Barrier Underlayment

Self-adhering leak barrier or ice dam underlayment must comply with ASTM D1970/D1970M for sealability around nails.

2.1.5 Self-Adhering Membrane

Self-adhering rubberized asphaltic membrane, a minimum of 1 mm thick, and recommended by the shingle manufacturer for use as eaves flashing.

2.1.6 Nails for Applying Shingles and Asphalt-Saturated Felt

Aluminum or hot-dipped galvanized steel or equivalent corrosion resistant with sharp points and flat heads 10 to 11 mm in diameter. Shank diameter of nails must be a minimum of 2.67 mm and a maximum of 3.43 mm with garb or otherwise deformed for added pull-out resistance. Nails must be long enough to penetrate completely through or extend a minimum of 20 mm into roof deck, whichever is less, when driven through materials to be fastened.

2.1.7 Asphalt Roof Cement

ASTM D4586/D4586M or KS M 2201, Type II.

2.1.8 Asphalt Primer

ASTM D41/D41M or KS M 2270.

2.1.9 Ventilators

NOTE: Drawings should detail type of ridge vent required. For aluminum ridge vents, see Section 07 60 00 FLASHING AND SHEET METAL.

Ventilation should be required with a total net free ventilating area of not less than 1 to 150 of the

area of the space ventilated. The total area is permitted to be reduced to 1 to 300, provided at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the ventilated space at least 914 mm above eave or cornice vents, with the balance of required ventilation provided by eave or cornice vents. As an alternative, the net free cross-ventilation area may be reduced to 1 to 300 when a vapor barrier having a transmission rate not exceeding 1 perm is located on warm side of the attic insulation.

2.1.9.1 Nailable Plastic Shingle Over Type Ridge Vents

Ridge vents must be constructed of UV stabilized nailable rigid polypropylene material, approximately 0.30 m wide and 25 mm thick, and must be in 1.2 m long interlocking sections with self-aligning ends or corrugated polyethylene rigid roll or rigid strip ridge vent with aluminum wind deflectors on each side. Vents must be designed to prevent infiltration of insects, rain, and snow.

2.1.9.2 Nailable Mesh Shingle Over Type Ridge Vents

Ridge vents must be constructed of UV stabilized nailable polyester mesh material, approximately 0.30 m wide. Vents must be designed to prevent infiltration of insects, rain, and snow.

PART 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

Do not install building construction materials that show visual evidence of biological growth.

Ensure that roof deck is smooth, clean, dry, and without loose knots. Roof surfaces must be firm and free from loose boards, large cracks, and projecting ends that might damage the roofing. Vents and other projections through roofs must be properly flashed and secured in position, and projecting nails must be driven flush with the deck.

3.2 SURFACE PREPARATION

Cover knotholes and cracks with sheet metal nailed securely to sheathing. Flash and secure vents and other roof projections, and drive projecting nails firmly home.

3.3 APPLICATION

Apply roofing materials as specified herein unless specified or recommended otherwise by shingle manufacturer's written instructions.

3.3.1 Underlayment

NOTE: Select the applicable paragraph(s) from the following.

The installation of asphalt strip shingles at maximum exposure is not recommended on roofs having a slope of less than 1:4.

In locations where the January mean temperature is **minus 1 degree C** or less, a leak barrier underlayment membrane should be used. The leak barrier underlayment membrane may consist of: two plies of No. 15 asphalt saturated felt, one nailed to the deck and the second set in Type III or Type IV hot asphalt or asphalt lap cement; a heavyweight coated base sheet nailed to the deck and another felt ply or plysheet set in hot asphalt or asphalt lap cement; or a self adhering modified bitumen membrane.

NOTE: In locations where the average daily January temperature is **minus 4 degrees C** or below, use the second optional paragraph instead of the first optional paragraph.

[Provide for roof slopes **1 in 3** and greater. Apply one layer of shingle underlayment to roof deck. Lay underlayment parallel to roof eaves, starting at eaves. Provide minimum **50 mm** head laps, **100 mm** end laps, and **150 mm** laps from both sides over hips and ridges. Nail sufficiently to hold until shingles are applied. Turn up vertical surfaces a minimum of **100 mm**.
]

NOTE: These requirements are intended primarily for roof slopes between **1 in 6** and **1 in 3**. They should not be specified for roof slopes **1 in 3** and greater unless the condition of the note above is met. Delete bracketed sentence unless eave flashing is required.

[Provide for roof slopes [between **1 in 6** and **1 in 3**] [**1 in 3** and greater]. Apply two layers to roof deck. Provide a **480 mm** wide strip as starter sheet to maintain specified number of layers throughout roof. Lay parallel to eaves, starting at eaves. Provide minimum **480 mm** head laps, **150 mm** laps from both sides over hips and ridges, and **300 mm** end laps in the field of the roof. Nail sufficiently to hold until shingles are applied. Turn up vertical surfaces a minimum of **100 mm**. [When a self-adhering membrane is used for eave flashing, start underlayment from upper edge of eave flashing.]

13.3.2 Drip Edges

NOTE: Specify **100 mm** spacing for nails for roofs in high wind areas.

Provide metal drip edges as specified in Section **07 60 00 FLASHING AND SHEET METAL** applied directly on the wood deck at eaves and over the

underlayment at rakes. Extend back from edge of deck a minimum of 75 mm, and secure with nails spaced a maximum of [100] [250] millimeters o.c. along inner edge.

3.3.3 Starter Strip

NOTE: Delete the first bracketed phrase unless eave flashing is specified. Otherwise, delete the second bracketed phrase.

NOTE: Include the next to last bracketed sentence and delete the last bracketed sentence unless the project is located in Bermuda.

Apply starter strip at eaves, using 225 mm wide strip of mineral-surfaced roll roofing of a color to match shingles. Optionally, use a row of shingles with tabs removed and trimmed to ensure that joints are not exposed at shingle cutouts. Apply starter strip along eaves, [overlying and finishing even with lower edge of eave flashing strip] [overhanging the metal drip edge at eaves and rake edges 6 to 10 mm]; fasten in a line parallel to and 75 to 100 mm above eave edge. Place nails so top of nail is not exposed in cutouts of first course of shingles. [When roll roofing is provided, seal tabs of first course of shingles with asphalt roof cement.] [Fasten with 6 nails per strip of shingles or space nails at 150 mm o.c. for roll roofing. Seal tabs of first course of shingles with asphalt roof cement as specified below.]

3.3.4 Shingle Courses

NOTE: Shingles with the correct recommended exposure must be applied in accordance with the manufacturer's printed instructions as they appear on the bundle wrapping.

Start first course with full shingle, and apply succeeding courses with joints staggered at thirds or halves. Butt-end joints of shingles must not align vertically more often than every fourth course. Apply shingle courses as follows:

- a. Fastening: Do not drive fasteners into or above the factory-applied adhesive unless adhesive is located 16 mm or closer to top of cutouts. Place fasteners so they are concealed by shingle top lap and penetrate the head lap.

NOTE: At the text below, for application of shingles on mansard roofs and other steep roofs with slopes more than 1.75 in 1, require that tabs be cemented with asphalt roof cement.

NOTE: Delete item "b" and include items "c" and "d"

for projects located in Bermuda and where:

1. Basic wind speed is 161 kilometers per hour (kph)
and eave is 6100 mm or higher above grade; or

2. Basic wind speed is 177 kph.

- b. Shingles applied with nails: Nominal 125 mm exposure. Apply each shingle with minimum of four nails. Place one nail 25 mm from each end, and evenly space nails on a horizontal line a minimum of 16 mm above top of cutouts.

3.3.5 Hips and Ridges

Form with 225 by 300 mm individual shingles or with 300 by 300 mm shingles cut from 300 by 900 mm strip shingles. Bend shingles lengthwise down center with equal exposure on each side of hip or ridge. Lap shingles to provide a maximum 125 mm exposure, and nail each side in unexposed area 140 mm from butt and 25 mm in from edge.

3.3.6 Valleys

NOTE: Closed cut and woven valleys are preferred method for strip shingles, but open roll roofing and open sheet metal valleys may also be specified as Contractor options.

Provide either closed cut, woven, open roll roofing, or open sheet metal valleys.

3.3.6.1 Closed Cut Valleys

Provide 900 mm wide valley lining of single layer of smooth-surfaced or mineral-surfaced roll roofing, with mineral-surface facing down, for full length of valley as follows:

- a. Center lining in valley over underlayment. Provide minimum 300 mm end laps in the lining and seal laps with asphalt roof cement. Fasten lining to hold it in place until shingles are applied.
- b. Apply first regular course of shingles along eaves of one of the intersecting roof planes and across valley. Extend course at least 300 mm onto adjoining roof.
- c. Apply succeeding courses in same manner as first course, extending across valley and onto adjoining roof.
- d. Press shingles tightly into valley and nail in normal manner, except apply nails not closer than 150 mm to valley centerline, and apply additional nail in top corner of each shingle crossing valley.
- e. Apply shingles on the adjoining roof plane, starting along eaves and across valley onto previously applied shingles. Trim overlapping courses back to a line parallel to and a minimum of 50 mm back from valley centerline.

- f. Trim 25 mm on a 45 degree angle from upper corner of each end shingle. Embed end shingles in a 75 mm wide band of asphalt roof cement.

3.3.6.2 Woven Valleys

Provide valley lining as specified for closed cut valley. Lay valley shingles over lining by either of the following methods:

- a. Method I: Apply regular shingles on both roofs simultaneously. Weave each course in turn over the valley. Lay the first regular course of shingles along eaves of roof up to and over valley. Extend course along adjoining roof deck at least 300 mm. Carry first regular course of shingles of adjoining roof over valley on top of previously applied shingles. Lay succeeding courses alternately, weaving valley shingles over each other for full length of valley.
- b. Method II: Apply regular shingles on each roof surface separately to a line about 900 mm from center of valley, and weave valley shingles in place later, as specified for Method I.

In following either method, press shingles tightly into valley, and fasten in normal manner; except apply nails not closer than 150 mm to valley centerline, and apply additional nail in top corner of terminal shingle on both sides of valley.

3.3.6.3 Open Roll Roofing Valleys

Provide 450 mm wide strip of mineral-surfaced asphalt roll roofing, of a color to blend with asphalt shingles, and with granular surface facing down, for the full length of valley as follows:

- a. Center roll roofing strip in valley over underlayment. Lay centered in valley over felt underlayment and with granular face down. Nail strip only enough to hold in place. Apply nails in rows 25 mm from each edge. As fastening along second side proceeds, press strip firmly into valley.
- b. Center second strip 900 mm wide in valley and lay it over first strip with granular face exposed and nail as specified for 450 mm strip.
- c. Before applying roofing shingles, snap two chalk lines for full length of valley. Locate each line 75 mm from centerline of valley at top, and increase width between lines by 25 mm for each 2440 mm of valley length, continuing to eaves.
- d. Apply a 50 mm band of asphalt roof cement along each edge of 900 mm strip from edge to chalk line. Cut regular shingle courses true along valley chalk lines, and nail in normal manner.

3.3.6.4 Open Sheet Metal Valleys

Sheet metal flashing for valleys is specified in Section 07 60 00 FLASHING AND SHEET METAL. Before installing and fastening flashing in place with metal cleats:

- a. Install single layer of 900 mm wide, asphalt-saturated felt, centered on valley and extending entire length of valley over felt underlayment.

- b. Cut regular shingle courses on each roof on true line 50 mm from valley centerline at top of valley, and increase width between lines by 25 mm for each 2440 mm of valley length, continuing to eaves.
- c. Apply 50 mm band of asphalt roof cement over flashing, along and under side of shingles adjoining valley.
- d. Press shingles tightly into cement, and nail in normal manner, except apply nails not closer than 125 mm to valley centerline. Do not drive nails through valley flashing.
- e. Provide a 100 mm band of asphalt roof cement for fastening shingle tabs down along open metal gutters.

3.3.7 Flashing

3.3.7.1 Eave Flashing

NOTE: Select the applicable paragraph(s) from the following.

NOTE: Where the average daily January temperature is minus 4 degrees C or below or where there is the chance of ice dams forming along the eaves, use the second optional paragraph instead of the first optional paragraph. In areas where the architect/engineer has determined that eave flashing is not commonly provided, do not include either paragraph.

NOTE: The requirements below are intended primarily for roof slopes between 1 in 6 and 1 in 3. They should not be specified for roof slopes 1 in 3 and greater unless the condition of note above is met.

Provide for roof slopes [between 1 in 6 and 1 in 3] [1 in 3 and greater].
Provide either of the following types of eave flashing:

- a. From the eaves to a point 600 mm inside interior wall line, apply solid coating of asphalt roof cement between overlapping layers of underlayment. Spread cement to a uniform thickness at rate of 7.5 liters per 10 square meters of cemented roof area.
- b. From the eaves to a point 600 mm inside interior wall line, apply one layer of self-adhering membrane. Follow membrane manufacturer's printed installation instructions.

3.3.7.2 Stepped Flashing

For sloping roofs which abut vertical surfaces, provide stepped metal flashing as specified in Section 07 60 00 FLASHING AND SHEET METAL.

3.3.7.3 Vent and Stack Flashing

Apply shingles up to point where vent or stack pipe projects through roof, and cut nearest shingle to fit around pipe. Before applying shingles beyond pipe, prepare flange of metal pipe vent flashing as specified in Section 07 60 00 FLASHING AND SHEET METAL, by applying a 3 mm thick coating of asphalt roof cement on bottom side of flashing flange. Slip flashing collar and flange over pipe, and set coated flange in 2 mm coating of asphalt roof cement. After applying flashing flange, continue shingling up roof. Lap lower part of flange over shingles. Overlap flange with side and upper shingles. Fit shingles around pipe, and embed in 2 mm thick coating of asphalt roof cement where shingles overlay flange.

[3.3.7.4 Chimney Flashing

NOTE: Delete this paragraph unless a chimney is indicated on the project drawings. Coordinate with Sections 06 10 00 ROUGH CARPENTRY and 07 60 00 FLASHING AND SHEET METAL to ensure that crickets and metal chimney flashing are specified.

Provide treated wood crickets as specified in Section 06 10 00 ROUGH CARPENTRY. Provide metal base and counterflashing as specified in Section 07 60 00 FLASHING AND SHEET METAL. Uniformly coat masonry surfaces which are to receive flashing with asphalt primer applied at rate of 4 liters per 10 square meters. Apply shingles over underlayment up to front face of chimney. Apply metal front base flashing with lower section extending at least 100 mm over shingles. Set base flashing in a 2 mm coating of asphalt roof cement on shingles and chimney face. Apply metal step flashing at sides in a coating of asphalt roof cement. Embed end shingles in each course that overlaps step flashing with asphalt roof cement. Apply metal rear base flashing over cricket and back of chimney in coating of asphalt roof cement. Apply end shingles in each course up to cricket, and cement in place. Lap base flashing minimum of 75 mm with metal counterflashing.

] -- End of Section --