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CSI Section 07310
AIA Section 07315
Natural Slate Shingles

****NOTE TO SPECIFIER****

North Country Slate Natural Slate Roofing Shingles

This section is based on slate roofing shingles as furnished by North Country Slate, which is located at:

42 Anderson Blvd.
Uxbridge, ON
Canada L9P 0C7

Tel: 416-724-4666
Tel: 800-975-2835
Email: info@ncslate.com
Web: www.northcountryslate.com

North Country Slate has developed a reputation for providing top-quality roofing slates at an affordable price. All our products meet the highest North American and European industry standards and are impervious to moisture, heat, fire and freeze-thaw cycles.

Architects, restoration professionals, building owners and contractors can rely on our in-depth knowledge and after-sales support to ensure successful results on all their projects.

They know we have a track record involving hundreds of new and restoration projects behind us – and a team of experienced, caring professionals to draw upon.

North Country Slate roofing contains a pleasing variation in shade, veining, texture and grain. No other product can duplicate these natural characteristics, and the specification of North Country Slate products on fine homes and historic buildings across the continent is a testament to their durability and beauty.



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PART 1 GENERAL

1.1 SECTION INCLUDES

****NOTE TO SPECIFIER** Delete items below not required for project.**

- A. Natural slate roofing shingles.
- B. Moisture shedding underlayment.
- C. Ice dam protection membrane.
- D. Metal roof flashing.
- E. Snow guards.
- F. Roofing cant and nailing strips.
- G. Roofing nails.
- H. Hip and Ridge Cap.

1.2 RELATED SECTIONS

****NOTE TO SPECIFIER** Delete items below not required for project.**

- A. Section 06100 – Rough Carpentry: Framing and Sheathing.
- B. Section 06150 – Wood Decking.
- C. Section 07600 – Flashing and Sheet Metal.
- D. Section 08620 – Unit Skylights.



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1.3 REFERENCES

****NOTE TO SPECIFIER** Delete references from the list below that are not actually required by the text of the edited section.**

- A. ASTM A 167 – Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Sheet and Strip.
- B. ASTM A 666 – Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet and Strip.
- C. ASTM B 101 – Specification for Lead-Coated Copper Sheet and Strip for Building Construction.
- D. ASTM B 370 – Specification for Copper Sheet and Strip for Building Construction.
- E. ASTM B 749 – Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- F. ASTM C 406 – Specification for Roofing Slate.
- G. ASTM C 920 – Specification for Elastomeric Joint Sealants.
- H. ASTM C 1311 – Specification for Solvent Release Sealants.
- I. ASTM D 312 – Specification for Asphalt Used in Roofing.
- J. ASTM D 4586 – Specification for Asphalt Roof Cement, Asbestos-Free.
- K. ASTM D 3019 – Specification for Lap Cement Used with Asphalt Roll Roofing, Non Fibered, Asbestos, Fibered, and Non Asbestos Fibered.
- L. ASTM D 1079 – Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
- M. ASTM D 1970 – Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.



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N. ASTM D 226 – Specification for Asphalt-Saturated and Coated Organic Felt Base Sheet Used in Roofing.

O. ASTM D 4869 – Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.

P. ASTM D 7349 – Standard Test Method for Determining Capability of Roofing and Waterproofing Materials to Seal Around Fasteners.

Q. ASTM F1667 – Standard Specification for Driven Fasteners: Nails, Spikes and Staples

R. DIN 1706 – Specification for Titanium Zinc Sheet.

S. North Country Slate – Slate Roofs: Design & Installation Manual – 2010 Edition – National Slate Association.

T. NRCA – The NRCA Roofing and Waterproofing Manual. Definitions and Roofing Terminology.

U. Sheet Metal & Air Conditioning Contractors National Association – Architectural Sheet Metal Manual.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Details for specially configured metal flashing, jointing methods and locations for flashing, and other roofing system details.



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D. Selection Samples:

1. Pieces of actual slate shingles, illustrating complete range of colors available, for Architect's selection.
2. Pieces of actual metal ridge cap, 12 inches (300 mm) long and full width.
3. Actual snow guard, full size.

E. Verification Samples:

1. Actual slate shingles in color selected, illustrating full range of color variation to be expected in finished work.
2. Underlayment 12 inches (300 mm) square.

F. Material Test Reports: For each slate type, performed by a qualified testing laboratory as approved by North Country Slate, per ASTM C406.

G. Certificate of Country of Origin: For each type of slate, identifying the country in which the slate shingles were quarried and fabricated.

H. Distributor's Warranties: Distributors warranty for slate shingles specified.

I. Installer's Warranties: Installers warranty for work specified.

J. Installer's Qualifications: Installer's natural roofing slate project references; not fewer than four.

1.5 QUALITY ASSURANCE

****NOTE TO SPECIFIER** Increase to ten years of experience if required by project complexity or scope.**

A. Installer Qualifications: Company experienced in installing natural slate roofing of the type and scope specified in this section and employing persons with no fewer than five years of documented experience. Company shall provide skilled workers, thoroughly trained and



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experienced in the necessary crafts of natural slate roof systems and who are familiar with this specification and methods required for a warrantable roof.

****NOTE TO SPECIFIER** Delete mock-ups if not required.**

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
2. Install in area and of size designated by Architect.
3. Do not proceed with remaining work until finish color, texture, pattern, joint sizes, and installation workmanship are approved by Architect.
4. Correct mock-up area as required to produce acceptable work.
5. Mock-up may be incorporated into final construction upon Owners approval.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver shingles to project site in distributor's crates/pallets, labeled with data indicating source.

B. Handle shingles to prevent chipping, breakage, soiling, or other damage. Protect edges with wood or other rigid material.

C. Place and stack crates/pallets to distribute weight evenly and to prevent breakage or cracking.

D. Store underlayment rolls on end, on pallets or other raised surfaces. Do not double stack rolls.

E. Protect unused underlayment from weather, sunlight and moisture when left overnight or when roofing work is not in progress.

F. Stage roofing materials on the building in a manner to avoid significant or permanent damage to the roof deck or structural supporting members.



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1.7 WARRANTY

A. Slate Shingle Distributors Warranty: Submit slate shingle distributors warranty, signed by the distributor and covering the slate shingles described in this section, in which the distributor agrees to replace slate shingles that fail in materials. The duration of this warranty shall be established by ASTM C406 and grade indicated in this specification.

B. Roofing Installer's Warranty: Submit roofing installer's warranty, signed by roofing Installer and covering Work of this Section, in which roofing Installer agrees to repair or replace slate roofing that fails in materials or workmanship within the following warranty period:

****NOTE TO SPECIFIER** Delete one of the following warranty periods.**

1. Warranty Period: Two years from date of Substantial Completion.
2. Warranty Period: Five years from date of Substantial Completion.

1.8 EXTRA MATERIALS

****NOTE TO SPECIFIER** Delete all but one of the following extra materials.**

- A. Provide an additional 3 percent of installed field slates, but not less than one full crate/pallet, for Owners use in roof maintenance.
- B. Provide an additional 3 percent of installed field slates for Owners use in roof maintenance.
- C. Provide an additional one square of installed field slates for Owners use in roof maintenance.
- D. Provide an additional 1 percent of installed field slates for Owners use in roof maintenance.

PART 2 PRODUCTS

2.1 MANUFACTURES

A. Subject to compliance with requirements, provides slate as furnished by North Country Slate, 42 Anderson Blvd., Uxbridge, ON, Canada L9P 0C7. Tel: (416) 724-4666. Toll Free Tel: (800) 975-2835. Email: info@ncslate.com. Web: www.northcountryslate.com.



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****NOTE TO SPECIFIER** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.**

B. Substitutions: Not permitted.

C. Substitutions: Not permitted without written approval from architect prior to bid. Subject to compliance with requirements, substitutions of North American origin will be considered in accordance with provisions of Section 01600. Certificate of origin required.

2.2 SHINGLES

A. Slate Shingles: Hard, dense, sound rock, with chamfered edges, punched or drilled for two nails each. Slate shingles shall be punched or drilled back to front, and on the thinner end when there is variation in thickness along the length of the shingle.

B. No slate shingles with broken corners shall be installed when either the base or leg of the right triangle piece broken off is greater than 1-1/2 inches (38 mm). No broken corners on covered ends which sacrifice nailing strength or laying a watertight roof. Broken corners are acceptable for cutting stock. Not more than 2 percent of broken slates, including those having cracks materially precluding ringing when sounded, shall be accepted.

C. Slate shall be free of any visible inclusions of oxidizable iron pyrite.

D. Curvature or twist in slate shingles shall not exceed 1/8 inch in 12 inches (3 mm in 100 mm). Curved slate shingles shall be trimmed and punched to permit them to be laid with convex side up. Knots, knurls and cramps are acceptable on the exposed slate shingle face. Knots, knurls and cramps on the back or covered portion of slate shingles, which prevent close contact of slate shingles or the laying of a watertight roof, will not be accepted.

E. Slate shingles shall be trimmed with 90-degree square corners. Face dimensions of slate shingles shall not differ from those specified by more than 1/8 inch (3 mm).

1. Source: Obtain slate required for the project from a single quarry, with consistent color range, physical properties and texture throughout.



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****NOTE TO SPECIFIER**** **Slate grades are determined under ASTM C 406 by measuring the water absorption, depth of softening and breaking load of actual slates under test conditions. These tests are an indicator of the expected life span of the material on the roof. Delete all but one grade description below. Be sure the slate color, size and thickness selected are available in the grade specified.**

2. Grade: ASTM C 406 Grade S1: Expected service life in excess of 75 years.
3. Grade: ASTM C 406 Grade S2: Expected service life 40-75 years.
4. Grade: ASTM C 406 Grade S3: Expected service life 20-40 years.
5. Thickness: Standards; Nominal 3/16 inch (5 mm).
6. Thickness: Standards; Nominal 3/16 inch (5 mm) to 1/4 inch (7 mm).
7. Thickness: Quarters; Nominal 1/4 inch (7 mm).
8. Thickness: Quarters; Nominal 1/4 inch (7 mm) to 3/8 inch (10 mm).
9. Thickness: Heavies; Nominal 3/8 inch (10 mm) to 1/2 inch (13 mm).
10. Thickness: Extra Heavies; Nominal 1/2 inch (13 mm) to 3/4 inch (19 mm).
11. Thickness: _____ inch (_____ mm).
12. Thickness: Graduated Thickness of _____ inch (_____ mm), _____ inch (_____ mm), _____ inch (_____ mm) and _____ inch (_____ mm).
13. Thickness: To match existing.

****NOTE TO SPECIFIER**** **Standard slate sizes are listed below, see North Country Slate's website at www.northcountryslate.com. Delete all sizes not required.**

14. Size: 24 inches (610 mm) length by 12 inches (305 mm) width.
15. Size: 22 inches (559 mm) length by 12 inches (305 mm) width.



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16. Size: 22 inches (559 mm) length by 11 inches (279 mm) width.
17. Size: 20 inches (508 mm) length by 14 inches (356 mm) width.
18. Size: 20 inches (508 mm) length by 12 inches (305 mm) width.
19. Size: 20 inches (508 mm) length by 11 inches (279 mm) width.
20. Size: 20 inches (508 mm) length by 10 inches (254 mm) width.
21. Size: 18 inches (457 mm) length by 14 inches (356 mm) width.
22. Size: 18 inches (457 mm) length by 12 inches (305 mm) width.
23. Size: 18 inches (457 mm) length by 11 inches (279 mm) width.
24. Size: 18 inches (457 mm) length by 10 inches (254 mm) width.
25. Size: 18 inches (457 mm) length by 9 inches (229 mm) width.
26. Size: 16 inches (406 mm) length by 14 inches (356 mm) width.
27. Size: 16 inches (406 mm) length by 12 inches (305 mm) width.
28. Size: 16 inches (406 mm) length by 11 inches (279 mm) width.
29. Size: 16 inches (406 mm) length by 10 inches (254 mm) width.
30. Size: 16 inches (406 mm) length by 9 inches (229 mm) width.
31. Size: 16 inches (406 mm) length by 8 inches (203 mm) width.
32. Size: 14 inches (356 mm) length by 10 inches (254 mm) width.
33. Size: 14 inches (356 mm) length by 9 inches (229 mm) width.



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34. Size: 14 inches (356 mm) length by 8 inches (203 mm) width.

35. Size: 14 inches (356 mm) length by 7 inches (178 mm) width.

36. Size: 12 inches (305 mm) length by 10 inches (254 mm) width.

37. Size: 12 inches (305 mm) length by 9 inches (229 mm) width.

38. Size: 12 inches (305 mm) length by 8 inches (203 mm) width.

39. Size: 12 inches (305 mm) length by 7 inches (178 mm) width.

40. Size: 12 inches (305 mm) length by 6 inches (152 mm) width.

41. Size: __ inches (___ mm) length by __ inches (___ mm) width.

42. Size: __ inches (___ mm) length by random width, but not less than one-half length.

43. Size: Graduated sizes of __ inches (___ mm) length by __ inches (___ mm) width, __ inches (___ mm) length by __ inches (___ mm) width, __ inches (___ mm) length by __ inches (___ mm) width and __ inches (___ mm) length by __ inches (___ mm) width, inches approximate equal quantities. Width not to be less than one-half length.

44. Size: To match existing.

45. Unit of Measurement: The number of pieces per square for metric dimension slates, not exact dimensional equals to inch dimension slates, shall be adjusted upward for their smaller coverage per square

****NOTE TO SPECIFIER** Delete one cut butt shape below if not required.**

46. Cut Butt Shape: Standard square cut.

47. Cut Butt Shape: Special; Pattern to be supplied by Owner/Architect



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48. Starter Slate Size: Length of starter slates to be the exposure of the field slates plus the specified headlap and rounded up to the nearest full inch. Starter slates are to be front-side punched and installed chamfered edge down.

****NOTE TO SPECIFIER** Delete color(s) below not required.**

49. Color: North Country Unfading Black.

50. Color: North Country Semi-Weathering Vermont Black.

51. Color: North Country Semi-Weathering Gray/Black (Strata Gray).

52. Color: North Country Unfading Gray.

53. Color: North Country Semi-Weathering Gray.

54. Color: North Country Unfading Purple.

55. Color: North Country Semi-Weathering Purple.

56. Color: North Country Unfading Mottled Purple and Green.

57. Color: North Country Unfading Green.

58. Color: North Country Semi-Weathering Gray/Green (Sea Green).

59. Color: North Country Unfading Red.

60. Color: North Country Custom blend of slate colors consisting of ____ percent ____ color, ____ percent ____ color, ____ percent ____ color, ____ percent ____ color and ____ percent ____ color.

61. Color: North Country Slate to match existing.

62. Natural Cleft: Smooth Texture.

63. Natural Cleft: Medium Texture.



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64. Natural Cleft: Rough Texture.

2.3 UNDERLayment

****NOTE TO SPECIFIER** Delete all but one of the underlays below for roofs pitched at least 4 inches per foot. Slate roofing is not recommended for roofs with less than a 4 in 12 slope.**

- A. Saturated Felt Underlayment: ASTM D 4869, Type IV, asphalt-saturated organic felt, unperforated, No. 26.
- B. Coated Felt Underlayment: ASTM D 2626, asphalt-saturated and coated organic felt, mineral surfaced, unperforated, No. 40.
- C. C. Self-Adhering Underlayment: ASTM D 1970, rubberized asphalt membrane, internal reinforcement, and back plastic release film to meet the fastener seal requirements of ASTM D7349.
- D. D. Underlayment To Be: _____

****NOTE TO SPECIFIER** Delete all but one of the ice dam protection membranes below or delete all if ice dam protection is not required.**

- E. E. Ice Dam Protection Membrane: ASTM D 4869, one layer Type IV, asphalt-saturated organic felt, unperforated, No. 26 nailed and one layer set in hot Type III or Type IV asphalt or asphalt lap cement.
- F. F. Ice Dam Protection Membrane: ASTM D2626 and ASTM D4869, one layer coated felt, unperforated, No. 40 nailed, and one layer Type IV, asphalt-saturated organic felt, unperforated No. 26, set in hot Type III or Type IV asphalt or asphalt lap cement.
- G. G. Ice Dam Protection Membrane: ASTM D 1970, self-adhering rubberized asphalt membrane, internal reinforcement, and back plastic release film to meet the fastener seal requirements of ASTM D7349.



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2.4 SHEET METAL FLASHINGS

****NOTE TO SPECIFIER** Delete all following flashing materials that do not apply, unless you intend to leave all types for Installers selection.**

- A. Flashing: ASTM A 666 Type 304 stainless steel, soft annealed 2D finish (unless harder temper is required for forming or performance), 0.0156 inch (0.4 mm) thick.
- B. Flashing: ASTM A 167 Type 304 Terne coated stainless steel, 0.015 inch (0.38 mm) thick stainless steel core material, coated with 0.092 lb./sq ft (450 g/sq m) Terne alloy on both sides.
- C. Flashing: ASTM B 370 copper, cold rolled, 16 oz/sq ft (0.56 mm thick), natural finish.
- D. Flashing: ASTM B 370 copper, cold rolled, 20 oz/sq ft (0.69 mm thick), natural finish.
- E. Flashing: ASTM B 101 lead-coated copper, cold rolled Type 1, Grade 2 (unless Grade 2 soft temper is required for forming). Class A lead weight, 16 oz/sq ft (0.56 mm thick) bare copper for total 17.1 oz/sq ft (0.60 mm thick) lead-coated copper.
- F. Flashing: ASTM B 749 lead sheet, 2.5 lb./sq ft (1.00 mm thick).
- G. Flashing: ASTM B 749 lead sheet, 4.0 lb./sq ft (1.57 mm thick).
- H. Flashing: DIN 1706 titanium zinc, pre-weathered type with a 99.995 percent Zn degree of purity and alloying additives of 1 percent copper and 1 percent titanium; (0.80 mm thick).

2.5 ACCESSORIES

****NOTE TO SPECIFIER** Delete items below if not required.**

- A. Snow Guards: Fabricated from non-ferrous metal, designed to be installed without penetrating slate shingles, and complete with predrilled holes or hooks for anchoring.
- B. Slating Nails for Non-Preservative Treated Plank or Plywood Deck and Nailers: Slater's copper smooth shank nails, 0.120 inch (3 mm) or No. 11 gauge Stubs, not less than twice the nominal slate thickness plus 1 inch in length, with 3/8 inch (9 mm) head. Point should penetrate through underside of deck except where the underside of roof deck is exposed to view, where shorter nails are acceptable. Nails 1/2 inch (13 mm) or longer than field slate nails for slate hip and ridge installation.



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C. Slating Nails for Non-Preservative Treated Plank or Plywood Deck and Nailers: Slater's copper ring shank nails, 0.120 inch (3 mm) or No. 11 gauge Stubs, not less than twice the nominal slate thickness plus 1 inch (254 mm) in length, with 3/8 inch (9 mm) head. Point should penetrate through underside of deck except where the underside of roof deck is exposed to view, where shorter nails are acceptable. Nails 1/2 inch (13 mm) or longer than field slate nails for slate hip and ridge installation.

D. Slating Nails for Non-Preservative, or Preservative Treated Plank or Plywood Deck and Nailers: Slater's stainless steel ring shank nails, 0.120 inch (3 mm) or No. 11 gauge Stubs, not less than twice the nominal slate thickness plus 1 inch (25.4 mm) in length, with 3/8 inch (9 mm) head. Point should penetrate through underside of deck except where the underside of roof deck is exposed to view, where shorter nails are acceptable. Nails 1/2 inch (13 mm) or longer than field slate nails for slate hip and ridge installation.

E. Slating Nails for Non-Preservative, or Preservative Treated Plank or Plywood Deck and Nailers: Slater's stainless steel smooth shank nails, 0.120 inch (3 mm) or No. 11 gauge Stubs, not less than twice the nominal slate shingle thickness plus 1 inch (25.4 mm) in length, with 3/8 inch (9 mm) head. Point should penetrate through underside of deck except where the underside of roof deck is exposed to view, where shorter nails are acceptable. Nails 1/2 inch (13 mm) or longer than field slate nails for hip and ridge installation.

F. Wood Nailers and Cant Strips: Non-preservative treated wood as specified in Section 06100 – Rough Carpentry, attached with hot-dip galvanized steel nails.

G. Wood Nailers and Cant Strips: Preservative-treated wood, as specified in Section 06100 – Rough Carpentry, attached with Type 304 or 316 stainless steel nails.

H. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire nails with low-profile capped heads or disc caps, 1 inch (25 mm) minimum diameter.

I. Felt Underlayment Attachment: Roofing asphalt ASTM D 312, Type III or IV as recommended by slate installer for application.



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J. Butyl Rubber Sealant: ASTM C 1311, single-component, solvent-release; polyisobutylene plasticized; heavy bodied.

K. Polymer Sealant: ASTM C 920 silicone sealant of type, grade, class, and use classification required to seal joints in slate-shingle roofing and remain watertight.

2.6 FLASHING FABRICATION

A. Form flashing to profiles indicated on drawings and as required to protect roofing materials from physical damage and shed water.

B. Form sections square and accurate in profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that roofing penetrations and plumbing stacks are in place and properly flashed to deck surface.

B. Verify that roof openings are correctly framed.

C. Verify that deck surfaces are sound, smooth, properly secured; and free of ridges, depressions and voids; properly sloped and dry.

D. Proceed with installation only after unsatisfactory conditions have been corrected.



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3.2 PREPARATION

****NOTE TO SPECIFIER** A minimum deck of 5/8 inch (15mm) APA approved plywood roof decking or 1-inch (25mm) nominal thickness, well-seasoned tongue and groove wood sheathing boards should be used for slate roofing. A ¾ inch (19mm) thick APA approved plywood deck is recommended by NRCA.**

****NOTE TO SPECIFIER** If sheathing boards are used, they must not be less than 6 inches (150mm) in width and must be fastened to each rafter with not less than two 8d nails. Delete one of the following warranty periods.**

- A. Comply with slate shingle distributor's recommendations on preparation of acceptable roof deck.
- B. Broom clean deck surfaces prior to installation of underlayment.

3.3 INSTALLATION

A. Proceed with installation only after written approval and acceptance of all materials and accessories has been issued by the architect.

B. Underlayment:

****NOTE TO SPECIFIER** Delete roof slopes not applicable.**

1. For roof slopes greater than 20 inches per foot (167 percent), install a minimum of one layer of No. 26 asphalt-saturated felt with standard-sized slate, as long as the slate is laid with a 2 inch (50 mm) head lap.
2. For roof slopes 8 inches per foot (67 percent) to 20 inches per foot (167 percent), install a minimum of one layer of No. 26 asphalt-saturated felt or one layer of No. 40 asphalt-saturated and coated felt with standard-sized slate, as long as the slate is laid with a 3 inch (75 mm) minimum head lap.



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3. For roof slopes less than 8 inches per foot (67 percent) down to 4 inches per foot (33 percent), install a minimum of two layers of No. 26 asphalt-saturated felt or one layer of No. 40 asphalt-saturated and coated felt with standard-size slate, as long as the slate is laid with a 4 inch (100 mm) minimum head lap.
4. Install underlayment over entire deck surface. At hips, valleys, and ridges, install additional 36 inch (915 mm) width of underlayment, centered on the valley or ridge.
5. On overhanging eaves that require more than a single 36-inch (915 mm) width of underlayment, overlap not less than 6 inches (150 mm), assuring that overlapped area is located on overhang, outside wall line.
6. Ice Dam Protection:

****NOTE TO SPECIFIER** Delete two of the following three paragraphs; coordinate with materials listed under Part 2.**

- a. Install two layers of No. 26 asphalt-saturated organic felt, one nailed to the deck and the second set in hot Type IV (steep) or Type IV (Special Steep) asphalt or asphalt lap cement. Apply from roof edge to a line that when projected to the horizontal is not less than 24 inches (610 mm) inside of interior wall line.
- b. Install a combination or a No. 40 coated base sheet nailed to the deck, and a ply of No. 26 asphalt-saturated organic felt set in hot Type III (steep) or Type IV (Special Steep) asphalt or asphalt lap cement. Apply from roof edge to a line that when projected to the horizontal is not less than 24 inches (610 mm) inside of interior wall line.
- c. Install self-adhering sheet underlayment wrinkle free. Apply from roof edge to a line that when projected to the horizontal is not less than 24 inches (610 mm) inside of interior wall line. Install lapped in direction to shed water. Lap sides not less than 3 1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm), staggered 24 inches (600 mm) between courses. Roll laps with roller. Proceed with installation only within the range of ambient and substrate temperatures recommended by manufacturer.



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d. Sheet Metal Flashing: Install as indicated and in compliance with details and recommendations as published in the North Country Slate: Slate Roofs: Design and Installation Manual – 2010 Edition – National Slate Association.

1. Install flashing at all locations where roof intersects other roofs, sidewall or parapet walls, chimneys, ventilators, and similar projections, and at gable edges. Ensure that dissimilar sheet and fastener metals are galvanically separated.

****NOTE TO SPECIFIER** Delete type of valley construction not used, or delete both if roof has no valleys.**

2. Open Valley: Install minimum 18 inch (450 mm) wide open valley sheet metal flashing over 36 inch (915 mm) wide underlayment, with field underlayment lapped over edges of flashing not less than 4 inches (100 mm). Fasten metal with cleats. Overlap metal a minimum of 8 inches (200 mm).

3. Closed Valley: Install closed valley metal flashing over 36-inch (915 mm) wide underlayment by interweaving shingles with minimum 18-inch (450 mm) wide prepared metal flashing sheets. Overlap metal a minimum of 8 inches (200 mm). Attach shingles using copper wires to copper straps nailed beyond the top edge of the metal flashing.

D. Wood Nailer and Cant Strips:

****NOTE TO SPECIFIER** Delete type of cant strip and nailing installation not required.**

1. Cant Strip: Install minimum 3 inch (75 mm) wide by 48 inch (1220 mm) long wood cant strips at eaves. Nominal thickness of cant strip shall be equal to the slate thickness specified. Attach with hot-dip galvanized steel nails. Apply eave flashing and underlayment over cant strip.

2. Cant Strip: Install minimum 3 inch (75 mm) wide by 48 inch (1220 mm) long preservative treated wood cant strips directly over underlayment at eaves, spacing 1 inch (25 mm) apart for drainage. Nominal thickness of cant strip shall be equal to the slate thickness specified. Attach with Type 304 or 316 stainless steel nails.

3. Nailers: Install minimum 2 inch (50 mm) wide by 48 inch (1220 mm) long wood nailers as detailed at ridge and hips, directly over underlayment. Nominal thickness of ridge nailing shall be equal to two times the slate thickness specified. Attach with hot-dip galvanized steel nails. Protect with additional layer of underlayment before installing hip and ridge accessory.



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E. Slate Grading:

****NOTE TO SPECIFIER** Delete one of the following slate grading.**

1. Slate Grading: Sort slates according to thickness into a minimum of three grades. Install thickest slates beginning at the eaves and introduce consecutive thickness grades as installation proceeds up the roof slope, creating a smooth overall appearance. Blend slates from all crates/pallets together to achieve a uniform color and texture to the roof.
2. Slate Grading: Do not sort slates according to thickness. Install slates randomly selected, beginning at the eaves and progressing up the roof slope, creating a textured overall appearance. Slate thickness variations preventing the laying of a weather tight roof will not to be permitted. Blend slates from all crates/pallets together to achieve a uniform color and texture to the roof.

F. Head Lap:

****NOTE TO SPECIFIER** Delete headlap not applicable from below.**

1. Slate to be installed at special 2 inches (50 mm) headlap.
2. Slate to be installed at standard 3 inches (75 mm) headlap.
3. Slate to be installed at special 4 inches (100 mm) headlap.

G. Shingles:

Install as indicated and in compliance with details and recommendations as published in the North Country Slate: Slate Roofs: Design and Installation Manual – 2010 Edition – National Slate Association.

1. Double shingles at eaves and cornice line. Beginning at eaves, project shingle 2 inches (50 mm) beyond perimeter with no gutters or troughs, or 1 1/2 inch (38 mm) with gutters or troughs. Lay shingles in horizontal courses. Provide at least the specified head lap between succeeding courses of shingles and stagger joints between courses a minimum of 3 inches (75 mm). Provide 1 inch (25 mm) minimum projection of shingles at gable and rake edges.



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****NOTE TO SPECIFIER** Delete one of the following joint spacing.**

2. Joint Spacing: Slate shingles in each course to be installed with no joint spacing (butted together).
3. Joint Spacing: Slate shingles in each course to be installed with 1/16 – 1/8 inch (1.6 – 3.2 mm) joint spacing.
4. Cut and fit shingles neatly around vents, pipes, ventilators, and other roof projections.
5. Slate shingles overlapping sheet metal shall have nails placed so as to avoid penetrating the sheet metal.
6. Nail slate shingles so nail heads touch shingle lightly, without producing strain on the slate.

H. Hips:

****NOTE TO SPECIFIER** Delete hips not applicable below, or delete all if there are no hips.**

1. Install slate shingles at hips in saddle pattern. Lay hip shingles in plastic cement spread generously over unexposed portions of lower courses and nail in place. Only where heads of nails are exposed, cover with plastic cement.
2. Install slate shingles at hips in mitered pattern. Lay hip shingles in plastic cement spread generously over unexposed portions of lower courses and nail in place. Only where heads of nails are exposed, cover with plastic cement.
3. Install slate shingles at hips in fantail pattern. Lay hip shingles in plastic cement spread generously over uncovered portions of lower courses and nail in place. Only where heads of nails are exposed, cover with plastic cement.
4. Install slate shingles at hips in pattern as indicated on drawings and nail in place. Only where



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heads of nails are exposed, cover with plastic cement.

5. Install approved metal hip caps per manufacturers installation instructions.

I. Ridges:

****NOTE TO SPECIFIER** Delete ridges not applicable below, or delete all if there are no ridges.**

1. Install slate shingles at ridges in saddle pattern. Lay ridge slates in plastic cement spread generously over unexposed lower courses and nail in place. Only where nail heads are exposed, cover with plastic cement.

2. Install slate shingles at ridges in strip saddle pattern. Lay ridge slates in plastic cement spread generously over unexposed lower courses and nail in place. Only where nail heads are exposed, cover with plastic cement.

3. Install slate at ridges in combing pattern. Lay ridge slates in plastic cement spread generously over unexposed lower courses and nail in place. Only where nail heads are exposed, cover with plastic cement.

4. Install slate shingles at ridges in pattern as indicated on drawings and nail in place. Only where nail heads are exposed, cover with plastic cement.

5. Install approved metal ridge caps as per manufacturers installation instructions.

****NOTE TO SPECIFIER** Delete snow guard installation if none are specified.**

J. Snow Guard Installation: Install snow guards in rows at locations indicated according to manufacturer's written installation instructions. Space snow guards in each row, offsetting by half this dimension between succeeding rows.



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K. Adjusting and Clean Up:

1. Remove and replace damaged or broken slates using slate repair hooks or nail and bib repair procedure where standard nailing is not possible.
2. Remove excess materials and debris from the Project site.

3.4 PROTECTION

A. Lay out progression of work to prevent other trades from working on or above completed roofing.

B. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the 'butt' of the shingles in order to avoid breakage.

END OF SECTION

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