



FINE ROOF TILES
Ironstone Guide Specification

SECTION 07320
ROOF TILE

This section is based on products manufactured by Ironstone Strong, Ltd. located at the following address:

1250 NE Loop 410, Ste. 800

San Antonio, TX 78209

Tel: 210-878-0080

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Ironstone® is an engineered porcelain tile that is harder than steel. Rich, organic earth tones are fired into the tiles resulting in a roof that will never scratch or fade guaranteed.

Beautiful, lightweight and guaranteed to last, Ironstone® adds warmth, character and charm to any architectural style. Our proprietary process duplicates the beauty and elegance of genuine slate and wood in exacting detail at a fraction of the cost. To assist with technical questions (210-878-0080). For more information visit www.ironstonestrong.com.

PART 1 GENERAL

1.01 SECTION INCLUDES

- A Porcelain/Ceramic roof tile
- B Fasteners
- C Underlayment
- D Waterproofing Membrane
- E Ice Dam Protection
- G Flashings and Counterflashings

1.02 RELATED SECTIONS

- A Section 06100 – Rough Carpentry
- B Section 06200 – Finish Carpentry
- C Section 07600 – Flashing and Sheet Metal
- D Section 07710 – Manufactured Roof specialties: Snow Guards

1.03 REFERENCES

- A ANSI-137-1 - *Dynamic Coefficient of Friction*
- B ASTM-650 - *Chemical Resistance*
- C ASTM-C1026 - *Resistance to Freeze*
- D ASTM-C1027 - *Surface Abrasion*
- E ASTM-C1378 - *Stain Resistance*
- F ASTM-C373 - *Water Absorption*
- G ASTM-C648 - *Breaking Strength*
- H MOHS ≥ 8 - *Scratch Hardness*
- I UL-790/E108 - *Fire Resistance of Roof Covering Materials*
- J E330 - *Wind Uplift*
- K RC 595 - *Texas Department of Insurance*
- L ASTM-C1549 -C1371, E903, E1980, CRRC-1 - *California Title 24 Building Energy Efficiency Standards*
- M FM 4473 - *Hail Impact Resistance for Rigid Roofing Materials – Class 4*
- N ASTM-1167-11 - *Physical Properties*
- O ESR-4251 - *ICC ESR*
- P Tile Council of North America (TCNA)
- Q National Roofing contractors Association (NRCA)

1.04 SUBMITTALS

Submit copies of Ironstone® product data sheets, installation instructions, detail drawings and samples.

1.05 QUALITY ASSURANCE

- A Manufacturer Qualifications: Provide all roofing products, including the tile system, tile liner, leak barrier, and ventilation.
- B Installer Qualifications:

1. Installer must be approved for installation of all roofing products to be installed under this section.

C Installers should review the website video and all printed installation instructions. The Ironstone® Technical Services Department is available for assistance with technical questions (210) 878-0080.

1.06 REGULATORY REQUIREMENTS

A GAF® VersaShield Fire-Resistant Roof Deck Protection can be used to achieve Underwriters Laboratories (UL) Class A fire classification.

B Install all roofing products in accordance with all federal, state and local building codes.

C All work shall be performed in a manner consistent with current OSHA guidelines.

1.07 PREINSTALLATION MEETING

A General: For all projects a pre-installation meeting is strongly recommended.

B Timing: The meeting shall take place before the start of the roofing installation.

C Attendees: Meeting to be called for by Ironstone® certified artisan contractor. Meeting mandatory attendees shall include the certified artisan contractor and the manufacturer representative. Non-mandatory attendees shall include the owner representative, architect or engineer representative and the general contractor representative.

D Topics: Certified contractor and manufacturer representative shall review all pertinent requirements for the project, including but not limited to material delivery, scheduling, and staging.

1.08 DELIVERY, STORAGE AND HANDLING

A Store all products in manufacturer unopened, labeled packaging until they are ready for installation. Materials should remain in their boxes until ready for installation.

B Store products in a covered, ventilated area, at temperature not more than 110° F (43° C) in direct sunlight.

C Store pallets on a flat surface. Maximum stacking height shall not exceed Ironstone® recommendations. Store all rolls of HDPE tile liner on end.

D Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

1.09 WEATHER CONDITIONS

A Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with OSHA recommendations.

1.10 WARRANTY

- A Provide to the owner the Ironstone® Limited Warranty.

PART 2 PRODUCTS

2.01 DISTRIBUTOR

- A Acceptable Distributor: Ironstone Strong, Ltd., 1250 NE Loop 410, Suite 800, San Antonio, TX 78209, (210) 878-0080.

2.02 PORCELAIN TILE SYSTEM

- A Certified Porcelain Tile having a porosity of equal to or less than 0.50 percent making this material practically nonabsorbent. Approximately 9-11cm thick, 12 inch by 12 inch size with a 9.5 to 10 inch installed exposure.

- 1. Color: As selected from Ironstone® current color options:
 - a. Antique Slate
 - b. Charcoal Grey
 - c. Dark Grey
 - d. English Grey

- B High density polyethylene (HDPE) Tile Liner protects against UV, moisture and weather infiltration. Approximately 250 sq. ft. of coverage per roll.

- C Corrosion resistant 4 foot batten strips pre-assembled with stainless steel hangers. Hangers and battens assembly covers approximately 250 sq. ft. (2.5 squares) per box.

- D Layout tape used as a guide for installing the battens and hangers system on a roof. Each roll contains approximately 200 linear feet.

2.03 HIP AND RIDGE SYSTEM

- A Certified porcelain tile approximately 6" x 12." Each box covers approximately 10 lineal feet.

- B 16 oz. copper trim saddles.

- C Corrugated plastic pieces used as a fastening base for installing trim tile at hip and ridge areas, sized at 1/2" x 5" x 48." Each piece covers approximately 4 lineal feet.

2.04 ROOF DECK PROTECTION

- A Premium, water repellant, breather-type synthetic underlayment. UV stabilized polypropylene construction. Meets or exceeds ASTM D226 and D4869. Each roll contains approximately 1,000 sq. ft. of material and is 54" x 223 ft.

- B For Class A Fire Rating, VersaShield® Fire-Resistant Roof Deck Protection by GAF® non-asphaltic water and fire resistant underlayment which meets or exceeds ASTM D226, ASTM D4869 and ASTM D6757 type I and II. Approved by Underwriters Laboratory. Each roll contains 350 gross sq. Ft. of material and 42" x 100 ft. (1.07m x 30.48m).

2.05 RIDGE VENTILATION SYSTEM

- A Use Ironstone® approved ridge vent in accordance with Ironstone® installation guides.

2.06 ROOFING CEMENT

- A Asphalt plastic roofing cement meeting the requirements of ASTM D4586 Type I or II.

2.07 NAILS AND FASTENERS

- A Ironstone® Roof tiles are attached to the roof deck with a batten and hanger system. No screws or nails go directly through the Ironstone® tiles.
- B Each batten and hanger strip will be nailed to the roof using corrosion resistant fasteners at a minimum of 11 gauge shank and 5/16" head. Ironstone® recommends ring shank roofing nails at 1-1/4" in length.
- C Corrosion resistant screws with a minimum of 5/16" head may also be used to fasten batten and hanger strips. For upgraded stainless steel battens and hangers, 1-1/4" stainless steel nails are required to fasten the stainless steel battens to the roof deck.
- D Trim pieces are fastened to the hip and ridge of the roof with a copper "Saddle." The saddle is screwed directly into the trim spacer and roof deck using four #8-1-5/8" pan head stainless steel screws provided by Ironstone.® No screws or nails go directly through the Ironstone® trim tiles.

2.08 METAL FLASHINGS

- A Where a roof intersects another roof, adjoins a vertical wall, chimney, vent, plumbing stack, or other structural protrusions, flashing metals are required. Proper flashing installations are critical for a water-tight roof. Always refer to and follow applicable building codes and standards and best roofing practices.
- B Roof flashings shall be new and not be less than 0.019 inch No. 26 gauge corrosion-resistant metal or 16 oz. copper. All flashings should be separated from contact with battens using self-adhered leak barrier to avoid corrosion.
- C The valley flashing shall extend at least 10 inches from the centerline of each way and have a splash diverter rib not less than 1 inch high at the flow line formed as part of the flashing. Also, the valley flashing shall have a 36 inch wide underlayment of self-adhered leak barrier complying with ASTM D 1970, in addition to other required underlayment.
- D Sections of valley flashings shall have an end of lap of not less than 4 inches.
Be sure to cover fastener heads on the gable/rake edge metal with self-adhered leak barrier.

Metal flashings shall be in accordance with IBC Section 1503.2 or 1507.3.9 or IRC Section R903.2 or IRC Section R905.3.8 as applicable.

All flashings should be separated from contact with battens using self-adhered leak barrier to avoid corrosion.

PART 3 EXECUTION

3.01 EXAMINATION

- A Do not begin installation until the roof deck has been properly prepared.
- B The deck preparation is the responsibility of another party. Notify the architect or building owner of unsatisfactory preparation before proceeding.
- C Minimum roof deck slope must be 4:12.

3.02 PREPARATION

- A Remove all existing roofing down to the roof deck. Note: roof deck should be a minimum 7/16 in. OSB or 15/32 in. plywood.
- B Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves, and projections. Cover with sheet metal, all holes over 1 inch in diameter, cracks over ½ inch in width, loose knots and excessively resinous areas.
- C Replace damaged deck with new materials.
- D Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.03 PREPARATION

- A Roof deck should be a minimum 3/8 in. APA – The Engineered Wood Association rated exterior grade plywood or 7/16 in. APA – The Engineered Wood Association rated exterior grade oriented strand board, commonly known as OSB.

3.04 UNDERLAYMENT APPLICATION

- A General:
 - 1. Install in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
- B Leak Barrier:
 - 1. Install a full deck of leak barrier protection on roofs with a minimum slope of 4/12 up to and including 5/12. Install leak barrier at all vulnerable areas on roof slopes greater than 5/12.
- C Eaves:
 - 1. Install approved eave edge metal flashing tight with fascia boards; lap joints 2 inches and seal with plastic cement.
 - 2. Install leak barrier membrane up the slope over the approved drip edge metal up to ¼ inch.
 - 3. Install eave protection membrane at least 24 inches beyond the interior warm wall. Lap ends 6 inches and bond.

4. For roof slopes greater than 5/12, apply self-adhering underlayment over the deck extending from the eave edge to a point at least 24 inches beyond the inside wall of the living space below to meet ASTM D1970 standard.

D Valleys – Metal

1. Install eave protection membrane at least 36 inches wide and centered on the valley. Overlap all side laps with minimum 6 inches.
2. Install approved valley metal on top valley underlayment. Nail 1 inch from edge of metal 16 inches on center.
3. Install 10 in. wide strips of self-adhering membrane over valley metal edges 3 in. from valley center. Make sure underlayment covers all fasteners.

E Roof Deck:

1. Install one layer of roof deck underlayment over the entire area not protected by eaves or valley membrane. Install sheets horizontally so water sheds and nail in place with minimum 2 in. head lap and 6 in. side lap. (4 in. head lap in wet or snow areas)
2. Vertical walls: Install eave protection membrane extending at least 6 inches up the wall and 12 inches on to the roof surface. Lap the membrane over the roof deck underlayment.
3. Skylights and roof hatches: Install eaves protection membrane from under the built-in counter flashing and 12 inches on to the roof surface lapping over roof deck underlayment.
4. Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches up the wall and 12 inches on to the roof surface. Lap the membrane over the roof deck underlayment.
5. Rake Edges: Install approved metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches and seal with plastic cement; secure with nails.
6. Hips and Ridges: Install leak barrier along entire lengths. If ridge vents are to be installed, position the leak barrier so that the ridge slots will not be covered.

3.05 INSTALLATION OF TILES

A General:

1. Install in accordance with Ironstone® instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
2. Minimize breakage of tiles by avoiding dropping boxes or individual tiles.
3. Cull out any tiles with surface defects, stains or “milk spots” before installing on the roof.

B Battens Placement (Bottom-Up Method):

1. Start bottom batten row at drip edge, 5 in. from eave edge. Hangers along bottom batten should not extend beyond drip edge.
2. Chalk a line every 10 in. up the roof to the ridge spacer or ridge vent, or use Ironstone® layout tape.
3. Install battens every 10 in. on-center, four courses at a time starting from the ridge spacer or ridge vent. (Do NOT install all battens at once)
4. Batten spacing may be increased or decreased to accommodate fraction spacing.
5. Stop battens ½ in. from hip spacers.

C Hanger Placement:

1. Hangers can be relocated on the batten as needed and placing where needed.
2. Each tile must have a minimum of two hangers supporting the bottom of the tile.
3. Position each batten so hangers are aligned vertically to ensure a uniform tile pattern and provide the necessary support.
4. Hangers for field tiles should maintain 6 in. spacing.

D High Wind Installation Requirements: Hanger Placement:

1. Each hanger must have a ring shank nail put in center of each slot containing hangers.

E HDPE Tile Liner:

1. Install HDPE Tile Liner dull finish up and shiny side down.
2. Install along rows of battens not exceeding 12 ft. long lengths with side laps overlapping a minimum 12 in.
3. Fasten HDPE Tile Liner with one roofing nail at the center of each 12 ft. length @ ½ inch from the top of Tile liner.

F Tile Installation:

1. Begin installation at hips and valley leaving the field clear to walk.
2. Place tiles on hangers being careful to keep hangers centered on tiles and evenly spaced from each side. On full tiles, hangers should be approximately 3 in. from each side edge.
3. Start every other course with a half tile for offset appearance. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the butt of the tiles in order to avoid breakage.

4. Tile pieces must not overhang the eave edge. The bottom edge of the tiles must be flush to the drip edge at the eave.

G High Wind Installation Requirements: Tile Installation

1. Tiles must not overhang the eave edge. The bottom edge of the tiles must be flush to the eave edge.

H Valleys:

1. Prepare the valley with approved metal flashings.
2. The hangers on the vertical batten should extend into the valley to the first chalk line.
3. Install horizontal field battens during the installation of the slope. Each tile will have two hangers on the bottom edge.

I Penetrations

1. All Penetrations are to be flashed according to Ironstone® and NRCA application instructions and constructions details

J Skylights and Roof Hatches

1. Consult the manufacturer of the skylight or roof hatch for specific installation recommendations.
2. Skylights and roof hatches shall be installed with pre-fabricated approved metal flashings specifically designed for the application of the unit.

3.06 VENTILATION

A General

1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

B Ridge/Soffit Ventilation

1. Calculate the total length of Ridge Vent needed. This will determine the necessary slot opening required.
2. For roofs without a ridge board, cut a 7/8 in. opening along the ridge on each side.
3. For roofs with a ridge board, cut a 1-5/8 in. opening along the ridge on each side.
4. Note: The total maximum slot opening is 3-1/4 in. wide.
5. Mark off and cut the slot opening. Ensure that the ends of the opening stop at least 12 in. from hip and ridge intersections or chimneys.

6. Where short ridges (dormers, ridge intersections) are used, mark and cut the slot and ensure that the end of the opening stops at least 12 in. from the ridge intersection.
7. Install ridge vent material along the entire length of ridge, including uncut areas. Cover exposed fastener heads with exterior grade caulk.
8. Butt ends of ridge vent material together and cover joints with 6 in. strip of self-adhering leak barrier. Leave a 1/8 in. gap between ridge vent sections for installations in cold climates.
9. Install under eave vents with sufficient quantity of Net Free Area (NFA) to equal or exceed the ridge vent Net Free Area (NFA).
10. Install hip and ridge saddles and tiles over ridge vent material using Ironstone® steel screws.

C Roof Vent:

1. Cut vent hole through sheathing as specified by the manufacturer for the type of vent to be installed.
2. Install a 36 inch square of leak barrier; centered around the hole.
3. Install according to manufacturer's instructions for flashing vent penetrations.
4. Install eave vents in sufficient quantity of Net Free Area (NFA) to equal or exceed the exhaust vent Net Free Area (NFA), calculated as specified by manufacturer.

D Powered Ventilators:

1. Cut vent hole through sheathing as specified by the manufacturer for the type of vent to be installed.
2. On rooftop applications, install a 36 inch square of leak barrier, centered around the hold.
3. Install according to manufacturer's instructions for flashing vent penetrations.
4. Install eave vents in sufficient quantity to equal or exceed the exhaust vent area calculated as specified by manufacturer.

3.07 PROTECTION

- A Protect installed products from foot traffic until completion of the project.
- B Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.