Terne II® – Specifications

1.1 GENERAL

A. Performance Requirements

Provide a custom sheet metal roofing system capable of withstanding structural movement, thermally induced movement, and a complete watertight enclosure fabricated from Terne II sheets to the configuration and details described herein and depicted on the architectural drawings accompanying these specifications. The system includes all custom formed sheet metal roofing pans, solder, and rosin paper.

B. Submit the Following

1) Product Data: Include Follansbee's product data, general specifications, standard details, wind uplift test results.

2) Shop drawings: Show plan of Terne II panel layout and how, if needed, expansion and contraction of material is provided using stationary cleats or expansions cleats.

3) Show direction of roof expansion and contraction.

4) All penetrations through Terne II panels.

5) Details at eave, ridge, hip, valley, rake, cricket, flashings, and penetrations and any special details.

6) Show all cross seams locations and type depending on roof pitch.

7) Sufficient technical data to demonstrate compliance with these specific requirements.

8) Fastener, cleat and attachment layout, with load carrying capacity to meet these specifications and how the cleat and fastener will hold into the substrate.

9) A description of installation procedures which, when approved by the architect, will become the basis for accepting or rejecting the work.

1.2 QUALITY ASSURANCE

A. Installer Qualifications

Installer must be proven, experienced applicator who has completed several custom projects using SMACNA or Follansbee Specifications and details along with owner, architect and general contractor contacts. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work.

B. Guarantee

Roofing contractor to provide standard two year material and workmanship for a watertight installation. This warranty does not cover damages caused by acts of God, ordinary wear and tear or unusual abuse or neglect or acts and omissions of parties other than the sheet metal roofing manufacturer or installer.

Warranty

Provide Follansbee's standard warranties covering products to be free from perforation resulting from corrosion.

C. Referencing Specifications and Standards

Follansbee Steel Specifications and Data Manual Sheet Metal and Air Conditioning Contractors National Association (SMACNA) American Society for Testing and Materials (ASTM).

1.3 PERFORMANCE AND TESTING

A. Provisions for Thermal Movement

Metal roofing systems shall be fabricated and installed so that they provide for expansion and contraction of the component materials without buckling, hole elongation, fastener failure or excess stress loading situations developing at any time during the temperature cycle. Cleats shall be installed to resist rotation (2 fasteners per cleat) and to avoid stress when roofing expands and contracts. Any continuous panel run exceeding 30 feet must involve expansion cleats. Follow Follansbee Specifications and Data Manual or SMACNA for all recommendations to design details.

"Oil Canning"

The Architect should be aware that minor surface deflections known as oil canning are inherent in thin sheet metal skins. Factors such as reflectivity will amplify the oil canning appearance until painted. Also wide flat surfaces will show deflections readily. Oil canning does not affect the finish or structural integrity of the panel and is, therefore, not cause for rejection.

Oil canning induced from buckling stresses however, should not be allowed. These are normally a result of improper application.

B. Uplift Resistance

Metal roofing systems shall be fabricated to resist the negative pressure and uplift loads as shown in the SMACNA Manual – 5th edition, appendix A-4. If necessary a separate independent test can be performed to determine the actual pullout of the particular fastener in the particular substrate. Most fastener manufacturers have tested their parts in different substrates. It is recommended that a safety factor be used with all fastener applications.

1.4 PRODUCT

A. ZT® Alloy Coated Steel (Terne II)

ASTM.625-85 single reduced black plate coated both sides with a minimum alloy (50% Zinc/50% Tin) to a thickness of 20 microns and a mill applied shop coat.

B. Standing Seam Roof Panels

Standing seam system shall be designed for concealed mechanical attachment of roofing panels to substrate.

C. Cleats

Use Follansbee preformed cleats or fabricate from Terne II flat stock sheet product to Follansbee's Specifications.

D. Slip Sheet

Rosin sized paper should be applied as the only underlayment for Terne II.

E. Fasteners

Minimum 7/8" Series 300 stainless steel or galvanized ring shank nail or equal screw type fastener.

F. Solder

Remove shop coat around edges to be soldered with lacquer thinner. To facilitate soldering, it is recommended that the edges of the sheet be pre-tinned. Use pure tin solder with rosin flux. Flux residues must be neutralized with soda water and removed. Use soldering irons only. Do not use abrasives in preparing the surface for solder.

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Terne II® – Specifications

1.5 FABRICATION

A. Shop Fabricate to the Maximum Extent Possible.

1. Custom fabricate all flashings by obtaining field dimensions for accurate fit.
2. Layout so cross seams, when required, will be made in the direction of flow with higher pans overlapping the lower pans. Keep field cutting to a minimum.
3. Cross Seams: Provide staggered transverse seams.
4. Provide expansion cleats on standing seam pans 30 feet or more in length.
5. Provide expansion joints as required.
6. Penetrations through the roof are to be fabricated and installed to allow for expansion and contraction of the roof sheet without buckling.

1.6 STORAGE AND HANDLING OF TERNE II

A. Materials stored at a project site must be covered and sloped for moisture to drain from the surfaces.

B. Terne II in coil form must not be exposed to weather and should be in a climate controlled environment.

C. Materials stored on site must be vented to allow condensation to escape.

D. Handling: The Architectural Sheet Metal Contractor shall no be required to move his materials except as needed to install the roof.

1.7 INSTALLATION

1.7.1 Surface Conditions

A. Pre-roofing conference after substrate is installed; with all related trades, architect, general contractor and owners representative. Conference should agree that surface is ready for installation of finished custom metal roofing.

B. Examine the areas and conditions under which work of this Section will be performed. Do not proceed until unsatisfactory conditions are corrected.

C. Verify that the substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provisions have been made for roof drains, scuppers, flashings, and all other interface items attaching to or penetrating through the work of this Section.

D. Terne II to be applied to wood deck. Treated lumber, such as ACQ (Alkaline Copper Quaternary), should NOT be used. Minimum 1/2" plywood to be specified. If sheathing boards are specified, maximum 2" spacing between boards.

1.7.2 General

A. The installed work of this Section will not be used as a storage space for other materials.

B. Do not permit unnecessary walking on the finished roof. Require all personnel to wear rubber-soled shoes when installing or walking on a finished roof.

1.2.1 Installation of Roofing

A. Procedures

1. Air space must be provided under roof deck to facilitate ventilation and eliminate condensation. Terne II must only be applied on a wood deck. Apply rosin paper. Prevent moisture from damaging substrate prior to installation of final metal skin.
2. Install roofing sheets and flashings in strict accordance with original design, pertinent regulations of governmental agencies having jurisdiction, and the recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under the anticipated weather conditions. Initially layout and locate all lines and panel terminations. For batten seam roofs, layout all battens accurately onto the substrate prior to installation of the sheets.
3. Install clips to hold sheet into position. Use two fasteners per clip to prevent rotation.
4. Installation performed by qualified trained personnel experienced in the installation of metal roofing and employed by the metal roofing contractor.
5. Installation to have seams and lines as established by the approved shop erection drawings.
6. Metal roofing to be installed per approved drawings with fixed points determined by direction of expansion.
7. Nail cleats a maximum of 12" (305 mm) on center; turn tabs over nail or use appropriate stainless steel fasteners. For battens, preinstalled clips, anchor battens to substrate using compatible fasteners spaced as required to hold design uplift but at no times greater than 18 inches (460 mm) apart. Clips should be centered no more than 12" (305 mm) on center on the battens.
8. Complete seaming of standing seam panel by automatic seaming machine or other accepted and approved method designed to obtain the proper seam dimension and height.
9. Minimize all exposed fasteners, utilize cleated seams whenever possible.
10. Protect against dissimilar metal contact.
11. Details should be per SMACNA ARCHITECTURAL SHEET METAL MANUAL recommended details.
12. Terne II must be painted. Refer to Follansbee Steel's painting specifications. Terne II must be painted as soon as proper painting conditions prevail.

1.3 ACCEPTANCE AND CLEANUP

Remove and properly dispose of all foreign material and debris from roof and gutters. Be sure no dissimilar metal or other materials are left on roof surface. Clean and neutralize all flux materials. Clean off all excess solder and sealants. Wipe off all hand prints, smudges and other superficial stains that were placed on the custom metal roofing and flashings during fabrication and installation. Remove and replace all dented and damaged materials.

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Terne II® – Flat Locked Seam Specifications

FLAT LOCKED SEAM SPECIFICATIONS

Maximum Pitch for Flat Lock Installation is 3” Per Foot.

DECK AND UNDERLAY REQUIREMENTS

Terne II to be applied on a wood deck. Wood treatments that are hygroscopic or chemically treated must not be used for decking under Terne II. Minimum 1/2” plywood to be specified. If sheathing boards are specified, maximum 2” spacing between boards. Roof deck must be smooth, clean, dry and must remain dry after application. Rosin sized paper is the only permissible underlay on a Terne II application. Do not apply roofing felts under Terne II.

GAGE AND FORMING RECOMMENDATIONS

Specify either .012 (30 ga.) or .015 (28 ga.). For flat locked applications, Terne II is available in sheets 14” x 20” and 20" x 28". Maximum sheet size is 20” x 28”. Form sheets on brake.

ADHERENCE OF METAL ROOFING TO DECK

The flat locked seam Terne II roof is firmly attached to the deck with cleats. Cleats are 2” wide. For best results, specify Follansbee preformed cleats. Cleats are installed (2) in each of the longitudinal and transverse seams. Install with 2 fasteners per cleat.

APPLICATION

Flat locked seam roofing to be installed using maximum sheet size of 20” x 28”. Notch corner of the sheet and turn 3/4” edges (top and one end turned up and bottom and one end turned under) to form 3/4" flat seam. Paint one side and dry well before applying to roof with painted side down. Do not nail through sheets; attach with cleats.

Hook one end of cleat into the 3/4” edge formed on pan. Then nail cleat to wood deck and bend the other end of cleat over the nail heads. Lay pans according to the flow, i.e., placing the pan higher on the roof over the upper edge of the lower adjoining pan. Sufficient roof pitch must be provided for proper drainage to prevent any water from standing on the roof surface.

Stagger all joints. Seams to be malleted down to form flat overlapping surface. Carefully mallet the seams to avoid buckling.

Expansion seams must be provided on runs (roofs or gutters) exceeding 30' where both ends are free to move (15’ maximum where ends are securely fastened). Underside of Terne II roofing to have adequate ventilation.

SOLDERING

All seams must be soldered. The shop coat should be removed around the edges that are to be soldered. Lacquer thinner is best for removing the shop coat prior to soldering. To facilitate soldering, it is recommended that the edges of sheets to be joined be pre-tinned. Use pure tin to solder Terne II. Rosin flux is the only flux permitted for use on Terne II. Flux residues should be removed after soldering. Use soldering irons only (3 lb. minimum each). Do not use abrasives in preparing the Terne II surfaces for soldering. All valleys and gutters shall be applied flat locked. For proper drainage, all roofs must have drip edges. All roof perimeters shall be anchored to the Follansbee preformed drip edge.

Drainage should be controlled so as not damage vertical walls.

SPECIAL PRECAUTIONS

Roofer shall wear rubber soled shoes. No unnecessary walking on the roof. Do not use roof as storage area for other materials. Applicator to guarantee his workmanship.

To avoid injury and minimize surface handling marks, protective gloves should be worn by those handling Terne II or any other sheet metal product.

VENTILATION (Important)

Air space must be provided under roof deck to facilitate ventilation and eliminate condensation.

PAINTING

TERNE II MUST BE PAINTED

Follow Follansbee's published painting instructions. Roof surfaces less than 3” per 12” must be painted on the bottom side with Rapidri® primer prior to laying the pans down. Paint as soon as proper painting conditions prevail.