# TECTUM<sup>®</sup> Roof Deck Installation Guidelines

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Inspiring Great Spaces®



## Introduction

This manual is designed to provide general assistance for the installation of Tectum<sup>®</sup> roof deck products. As each project is unique, the manual does not cover all possible situations. If you need additional information for a specific challenge, please contact Armstrong Building Solutions technical support at 1 877 276-7876.

# **General Information**

Review of drawings and jobsite planning are essential to lowering your risk of errors and omissions. Tectum decks are relatively easy to install and maintain provided a few basic precautions are taken at the jobsite. The architectural drawing needs to be reviewed before installation to verify that adequate structural support members are provided at perimeters, change of slope, and change of panel direction. If required structural support members are not shown, clarification of who provides these supports is required. Some other elements of a successful project include:

- Verification of acceptable structural support spacings for the specified product
- Support members are wide enough to provide required bearing
- Unsupported overhangs for Tectum composite decks do not exceed 24" in length direction, or 16" in width direction
- Tectum deck panels are cut in a single plane

These issues should be clarified early in the process.

# **Before the Deck Arrives**

To ensure fast, efficient installation, the following steps should precede the arrival of the Tectum roof deck on the jobsite.

- Review Shop Drawings Approved shop drawings are required before the project begins. Clarify questions or omissions with the architect/engineer before you proceed. The cutting list on the shop drawings must be reviewed and verified with the panel layout. The order and delivery dates need to be confirmed with Armstrong Building Solutions.
- Contractor's Meeting Request the general contractor or owner's representative schedule a meeting to coordinate the installation with other trades. Review the scope and responsibilities of the roof deck subcontractors as related to the other trades. Examples of items that must be discussed include access to the work area, restriction of trades working below, spacing of bar joist/purlins to accommodate standard length material when possible, coordination of waterproofing, and availability of equipment to move and locate deck on the roof.
- Jobsite Inspection The area where the material will be stored and staged for installation reserved.
- Building Accessibility The accessibility of the building will determine the hoisting equipment required on the jobsite for unloading the truck and placing materials on the roof.
- Structural Spacing Verify the structural spacing of the purlins and structural steel/wood. Verify if standard lengths are acceptable, or if panels require field cutting or special panel lengths. Verify that support spacing conforms to shop drawings.
- Verify that the supports are in the same plane and correctly spaced and not skewed.
- Delivery Dates Delivery dates should be confirmed a minimum of one week in advance of the requirements. Crews and equipment should be available to unload the trucks in a timely manner. Truckers are independent contractors and the majority will be prompt. Delivery is always subject to weather, breakdown, and other unforeseen circumstances. Do not schedule production until the material is on the jobsite.

## When the Deck Arrives

- Inspect all Tectum<sup>®</sup> roof deck shipments. Any variation from the bill of lading must be noted. Any damage needs to be noted. Check accessories and provide safe storage.
- Tectum roof deck should be unloaded and stored on the site on a stacking platform. The platform is to be raised at least 6" from the ground or floor level. The platform needs to be covered with a moisture-resistant material before the deck is stacked on the platform. Cover the deck with water-shedding material and secure. Ensure that the covering will stay in place in case of wind, rain, or snow. Allow for air circulation under the cover to prevent condensation. The material used to cover Tectum composite decks during storage should also protect the product from UV light. A dark, impervious tarp is recommended.

Waterproofing Membrane	Waterproofing Membrane
Blocking	Blocking
Tectum <sup>®</sup> Panels	Tectum <sup>®</sup> Panels
Tectum <sup>®</sup> Panels	Tectum® Panels
Blocking Minimum 6"	Blocking Minimum 6"

• When stacking material of different lengths, segregate the lengths for easy access to the various lengths. This reduces the time required to search for proper length material for the various spacing of members and speeds installation.

## **Care of Materials**

- Use care when handling Tectum roof deck products to prevent damage. Damage to the edges, corners, and surface can occur from mechanical devices and staining due to exposure from various sources.
- All Tectum roof deck installed in a day should be made watertight at the completion of that day's work, preferably by the application of the roofing, or at the option of the contractor by covering with waterproof film or material, such as polyethylene. If the sidewalls are not erected when the deck is installed, edges and plank ends should be temporarily weatherproofed to safeguard against damage.
- If uncompleted deck gets wet, planks should be placed over it to support any heavy materials which might be stacked on the deck, or to support the weight of wheelbarrows or buggies transporting concentrated loads. If panels have been exposed to rain or have absorbed moisture over a period of time, judgment must be used as to whether wet panels need to be replaced.

## Cautions

- Follow all safety instructions provided in the installation guide and/or product SDS. Site specific safety instructions should come from the installation project manager. Follow all generally accepted safety practices for construction sites including the use of gloves, safety glasses and properly functioning equipment with the appropriate safety mechanisms (such as machine guarding).
- Avoid concentrated loading during construction. Loads should be distributed over multiple bar joists.
- Secure all individual panels before allowing traffic or other tradesmen on roof deck.
- Do not install damaged or marred panels.
- Do not expose roof deck to prolonged precipitation. If job conditions do not permit prompt application of the roofing, the Tectum deck should be protected from the weather. Sloped roofs should be covered with underlay paper.
- Tectum roof deck should not be installed over freshly poured, uncured concrete floors. Concrete floors should not be installed after the Tectum deck installation without providing adequate ventilation. See the recommendations of the current ASHRAE Handbook of Fundamentals.

## **General Installation Information**

- A well thought out plan of action will incorporate all the elements needed to complete the project in a timely fashion: work schedule, materials, labor, tools, and hoisting equipment are some of the considerations. A meeting with the crew before the project begins should provide a plan of action, including starting point, job conditions, the type of Tectum<sup>®</sup> deck fastening system, and safety precautions.
- Different Tectum roof deck panels will require special tools to install properly. Most jobs will require cutting, fasteners, and a slide hammer to drive panels tightly together.

Most Tectum I panels can be cut with a standard circular saw for either 7-1/4" or 10" diameter blades. Tectum composite panels are best cut with a beam saw. This is a circular saw base with a 12" chainsaw blade.

A hot wirecutter is recommended for cutting Tectum composite panels where there are unsupported overhangs. This tool allows for clean cutting of the foam without a large amount of foam dust. Dust on a sloped deck can cause a slip hazard.



## Tectum<sup>®</sup> I Plank and Long Span Plank

 Tectum I planks and Long Span planks are composed of Tectum substrate only. They have a tongueand-groove edge with a bevel below the tongue-and-groove joint on the interior exposed surface. The plank span between structural supports and all panel ends must be supported. Long Span plank has a 16-gauge channel that fits into the joint and increases the span. Channel ends must be over supports. Plank ends are square.



· Panel ends are screwed to supports which are typically either wood or steel members. Screw spacing is dependent on uplift resistance and shear capacity. In all conditions, a minimum of two screws per structural bearing is required.

Tectum<sup>®</sup> Roof Deck Over Wood



Tectum<sup>®</sup> I Deck uses Dekfast<sup>™</sup> #14 screws with 2" washer. Minimum length is 1" longer than panel thickness. 1-1/2" penetration preferred.



One row of screws is required

at intermediate supports.

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One row of screws is required at intermediate supports.

Tectum® I Deck uses

Dekfast<sup>™</sup> #14 screws.

A 2" diameter washer

is required.

Note: A 3/8" bead of construction adhesive is required when specified.



Note: A 3/8" bead of construction adhesive is required when specified.

Tectum<sup>®</sup> Roof Deck Over Steel



#### Standard Screw Spacing for Tectum® Plank Systems



Three Screws Per Joist

The location of attachment screws for Tectum® roof deck products is often varied. This drawing shows the Armstrong Building Solutions recommended locations. It should be noted that screws are not placed at the edge of the panels, but are spaced in from the edge, depending on the width of the panels and the number of screws per joist. Special applications may

• Tectum<sup>®</sup> plank and Long Span plank systems are installed with staggered ends. Most installations require construction adhesive on the supports as well as along the tongue-and-groove joint. The construction adhesive, along with the screws and staggered end joints, provides a design diaphragm shear that is adequate for most projects.



• All openings greater than 8" in any direction must be framed. Any opening within 4" of the channel in Long Span plank must be framed. The deck is screwed to the framing. The screw spacing is based on uplift and shear requirements with typical screw spacing being 12" O.C.



• All perimeter and transitions must be fully supported for Tectum<sup>®</sup> I plank and Long Span plank. This is typically a structural angle at the perimeter and a bent plate at hips and valleys. When the change of slope is less than that of 1/2" in 12 from both directions, the tongue-and-groove joint can be installed at the change of slope. If the panel direction is perpendicular to the change of slope, support is required.

Parapet Details - Joist Parallel to Wall

Parapet Flashing Cant Recoting Tectum® Bar Joist Wall Angle 1/2" TYP

Tectum® I Flush Eave – Joist Parallel to Wall



Parapet Details - Joist Right Angle to Wall



Tectum® I Flush Eave – Joist Right Angle to Wall



Note: Panel can be screwed to masonry wall instead of angle. It is not practical to screw through a plate into masonry.

#### Tectum® I Flush Eave – Wood Joist Parallel to Wall



Note: Panel can be screwed to masonry or wood wall system instead of edge support. It is not practical to screw through a plate into masonry.

#### Tectum<sup>®</sup> I Flush Eave – Wood Joist Right Angle



Note: Panel can be screwed to masonry or wood wall system instead of edge support. It is not practical to screw through a plate into masonry.

Tectum<sup>®</sup> I Parapet – Wood Joist Parallel to Wall







# Tectum<sup>®</sup> I Roof Tile

# Positioning and Attaching Tees

- Bulb tees (218 bulb tee is the only available size) should be spaced according to the specifications (± 1/16") and securely positioned by means of templates. Tee ends must fall over supports and have a minimum 1" bearing. A fillet weld of a minimum of 3/4" on each side at the tee ends is required. The same 3/4" weld is required at intermediate supports on alternate sides for spans of 84" or less and on both sides for spans greater than 84". Tees are typically spaced at 24" or 32" O.C.
- Where tee ends fall on masonry, they must be secured by a suitable means. Typically a welding plate is attached to the masonry.
- When laying tees on wood purlins, welding plates are screwed to purlins at 24" or 32" centers. The tees are welded to the plates or punched to accept screws. Two screws per tee end and two at each intermediate support are required. Screws need to be a minimum of 14-gauge with a minimum 1-1/2" penetration.

# Laying Tectum® Tile Between Bulb Tees

- Tectum<sup>®</sup> roof tile is laid with the long dimension parallel to the bulb tee subpurlins. Each tile should be spaced evenly between the bulb tees and shall have a minimum 1/2" edge bearing.
- When tongue-and-groove ends are used, the ends should be staggered by half the panel length.
- On sloped decks, when tees are placed parallel to the ridge, the tile spacing must be carefully checked since the Tectum deck will naturally bear more on the lower bulb tee. Temporary shimming may be required to maintain equal bearing and grout on both sides of the tile.
- The roof tile is cut to fit at perimeters and transitions. Continuous support is required at transitions. A saw with a carbide-tipped blade is typically used for cutting the roof tile.

## **Anchoring Tectum Tiles**

- The open joints between the roof tile and the bulb tee are filled with Tectum grout prior to the application of insulation or roofing.
- After grout is poured it should be leveled.
- Filler strips may be required for thicker Tectum tile. A special hoe or trowel should be used to level the grout and provide the proper depth for the filler strip.
- When square-end panels are used, roof tile ends must fall over the bulb tee supports. Roof tile ends are screwed to the bulb tee supports. When tongue-and-groove roof tile is used, the tongue-and-groove is adhered together with a 3/8" bead of construction adhesive. Tiles are to be screwed to the bulb tee supports at each crossing. A bead of adhesive over the structural supports may be required before the tile is placed and screwed.
- Grout should fill the entire space between the bulb tee and the roof tile. Scrape off the excess to form a flush joint with the top surface of the joint.



#### Bulb Tee Template

#### **Bulb Tee Attachment**



When Bulb Tee Overhangs the Wall, Attach an Angle to the Bulb Tee Ends. Panels Would Be Screwed to Angles, as Shown, in Perimeter Attachment.



Angle at Overhang Welded to Tee

If Tectum<sup>®</sup> Composite Panels Are Used as Tile, Foam Filler Strips Are Required.



# Tectum® Composite Panels: Tectum III/IIIP, E/EN and NS Roof Deck Systems

- Tectum<sup>®</sup> composite planks are composed of a Tectum substrate with a minimum thickness of 1-1/2", a foam core of Styrofoam<sup>™</sup> brand insulation for Tectum III deck, EPS for Tectum E and NS decks, and a topsurface of 7/16" OSB. These panels have square ends with a tongue-and-groove joint along the long edge. Depending on the thickness of the Tectum panel specified, spans of up to 96" are acceptable.
- Panel ends are screwed to supports with a 3/8" bead of construction adhesive meeting the requirements of AFG-01. Panel edges are adhered together with a 3/8" bead of construction adhesive. Where panels are continuous over a support, one row of screws is used.





• Screw attachment for 47" wide panels is 3 or 4 screws per bearing. Additional screws may be required depending on specifications. Screw attachment for 23" wide panels is two or three screws per bearing. Additional screws may be required depending on specifications.



 All openings greater than 8" in any direction must be framed. The deck is screwed to the framing. The screw spacing is based on uplift and shear requirements with typical screw spacing being 12" O.C. Opening details are the same as those shown for Tectum I plank.

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• All perimeter and transitions must be fully supported for Tectum<sup>®</sup> composite plank. This is typically a structural angle or wood member at the perimeter, and a bent plate or wood member at hips, valleys, and ridge. When the change of slope is less than that of 1/2" in 12 from both directions, the tongue-and-groove joint can be installed at the change of slope. If the panel direction is perpendicular to the change of slope, support is required. Overhangs at the perimeter (Tectum III/E plank 5" or thicker) of up to 24" in the panel length direction when the panel is 72" or greater in length and up to 16" in the panel width direction when the panel width is 47" are permitted.



Note: Overhang detail for Tectum<sup>®</sup> composite panels. Maximum overhang for 5" or thicker panels is 24". The overhang is also limited to 1/3 of the panel length or width extending over the wall to the inside. Maximum overhang along panel width is 16" when a full width panel is at the edge.

#### Ridge and Hip Detail (Valley Detail Similar Support)



## **Tectum® IIIP Roof Panels**

- Tectum<sup>®</sup> IIIP roof panels are designed for use in high humidity areas during the heating season. These areas include, but are not limited to, swimming pools, aquatic centers, and ice rinks.
- The difference between Tectum III and Tectum IIIP roof panels is the panel perimeter details as shown below.



Tectum® IIIP - Tongue-and-Groove

3/8" Bead of MasterWeld® 948 to Seal

Tectum<sup>®</sup> IIIP – Over Support



Note: Contact Armstrong Building Solutions for High Moisture Installations.

- The slots in the panels are filled with foam fillers that are provided with the panels. These are sealed in place with a bead of MasterWeld<sup>®</sup> 948 adhesive.
- The perimeter of the building details below show (1) stopping at the wall and (2) an overhang condition that must be supported by others. If the panel ends at the wall, the requirement for insulation beyond the panel still exists.



Tectum<sup>®</sup> IIIP – Over Exterior Wall

• Insulate the panels at openings and seal the panels at the ridge.



#### Tectum<sup>®</sup> IIIP – Ridge Detail

# Tectum<sup>®</sup> IIIW

Tectum IIIW composite planks are composed of a Tectum substrate with a minimum thickness of 1-1/2", a foam core of Styrofoam<sup>™</sup> brand insulation with a minimum thickness of 3" and a top surface of 19/32" plywood for Tectum IIIW deck.

These panels have square ends with a tongue-and-groove joint along the long edge. Depending on the thickness of the Tectum panel specified, spans of up to 60" are acceptable. Panel ends are screwed to supports with a 3/8" bead of construction adhesive meeting the requirements of AFG-01. Panel edges are adhered together with a 3/8" bead of construction adhesive. Where panels are continuous over a support, one row of screws is used.



• Screw attachment for 47" wide panels is 4 screws per bearing. Typical screw spacing is 12" O.C.



Four Screws per Joist

## Tectum<sup>®</sup> V

• The Tectum V roof deck panel is a composite of a 1-1/2" Tectum substrate,1/2" Neopor<sup>®</sup> GPS (Graphite Enhanced Polystyrene) insulation, 7/16" OSB sheathing, 6" Neopor GPS insulation, and 7/16" OSB sheathing with a slip-resistant surface. Components are bonded with code-listed structural adhesives. The Neopor GPS core exceeds the requirements of ASTM C-578 Type I and bears the UL classification mark. Tectum V can span up to 12'.



End joints must fall over supporting members. Minimum bearing is 2" per panel.





Continuous perimeter support by other required. Minimum bearing is 3". Screw panels @ 6" O.C. along perimeter.

## **Panel Joints**

**Overhang Details** 

 Panel ends are screwed to supports with a 3/8" bead of MasterWeld® 948 adhesive. Panel edges are adhered together with a 3/8" bead of MasterWeld 948 adhesive. Where panels are continuous over a support, one row of screws is used. Screw attachment for 47" wide panels is 7 screws per bearing. Typical screw spacing is 6" O.C. Opening details are the same as those shown for Tectum I plank.



Seven Screws per Joist

#### Tectum<sup>®</sup> V – Overhang Square Cut



Tectum<sup>®</sup> V – Overhang Rake

Note: Overhang detail for Tectum<sup>®</sup> composite panels. Maximum overhang for 5" or thicker panels is 24". The overhang is also limited to 1/3 of the panel length or width extending over the wall to the inside. Maximum overhang along panel width is 16" when a full-width panel is at the edge.



Note: Overhang detail for Tectum<sup>®</sup> composite panels. Maximum overhang for 5" or thicker panels is 24". The overhang is also limited to 1/3 of the panel length or width extending over the wall to the inside. Maximum overhang along panel width is 16" when a full-width panel is at the edge.

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## **Ridge Details**



# **Field Painting and Special Requirements**

#### **Specification Recommendation**

Sherwin-Williams<sup>®</sup> Product: Waterborne Acrylic Dry Fall (B42W1) 50-gallon drums MPI# 118 (or substitute alkali-based, flat latex paints with similar properties).

Tests have shown six coats of spray-applied paint have no negative impact on the acoustical and fire properties of Tectum<sup>®</sup> panels.

#### **Recommended Spread Rate per Coat**

Wet Mils: 3.5–5.0, Dry Mils: 1.5–2.0, Coverage: 336–450 sq. ft./gallon approximate (based on flat surface).

If necessary, cross spray at a right angle.

#### **Surface Preparation**

Surface must be clean, dry, and in sound condition. Remove all oil, dirt, grease, and other foreign material to ensure adequate adhesion.

#### **Application Condition**

Temperature: 50° F minimum, 110° F maximum (air, surface, and material); At least 5° F above dew point

Relative Humidity: 75% maximum, Dry Time: 20 minutes, Recoat: 1 hour.

During the early stages of drying, the coating is sensitive to rain, dew, high humidity, and moisture condensation. Plan painting schedules to avoid these influences during the first 16-24 hours of curing.

Dry fall characteristics will be adversely affected at temperatures below 77° F or above 50% relative humidity.

## **Application Equipment**

The following is a guide. Changes in pressure and tip sizes may be needed for proper spray characteristics.

#### **Airless Spray**

Pressure: 2800, Hose: 1/4" ID, Tip: 0.013", Reduction: As needed up to 10% by volume.

#### **Conventional Spray**

Gun: Binks 95, Fluid Nozzle: 63C, Air Nozzle: 63PB, Atomization Pressure: 60 psi, Fluid Pressure: 50 psi, Reduction: As needed up to 20% by volume.

## Field Painting and Special Requirements (continued)

**Brush and Roller** 

Not recommended

Field Touch Up and Color Match

Standard White Color Match: Sherwin-Williams® #SW7005

Standard Natural Color Match: Sherwin-Williams #SW6126

Tectum<sup>®</sup> panels should be fastened in place prior to field painting.

## Sound Transmission

Where sound transmission over walls is undesirable and privacy is an issue, a 2" thick piece of wood, grout, or other dense, non-porous material is installed at the middle of the wall. Attachment of the deck on both sides of the sound block is required. This is typically accomplished with an angle by others installed on both sides of the wall.

## Wind Seals

In some instances, a wind seal may be required at the exterior wall. A wind seal may be any non-porous material. Attachment of the deck to both sides of the wind seal is required. This is typically accomplished with an angle by others installed on both side of the exterior wall. A wind seal cannot be installed if there is an unsupported overhang.

# **Daily Cleanup at Jobsite**

Protect cutoffs that are required for other areas. Dispose of all other cutoffs, dunnage and waste materials at the end of each work day.

# Inspection/Acceptance

The job foreman for the installation of the roof deck should inspect the job in progress at various intervals to ensure the following:

- The deck surface is suitable to accept roofing.
- The deck is protected against rain/snow at the end of the work day.
- Heavy concentrated loads are not being applied to the deck.
- Any pieces that are found unsuitable due to damage from handling and installation are removed and replaced.
- All pieces are properly secured with screws.
- All joints, both side and ends, are driven tight.
- Good ventilation is provided for closed in buildings during construction.
- For roof tile all joints are properly grouted.

# **Final Inspection**

A final inspection by the erection crew foreman and the job superintendent is recommended to verify the deck is acceptable in all respects. The final inspection should be confirmed in writing and if possible, signed by both, and filed with the permanent job records.

## MORE INFORMATION

For more information, or for an Armstrong Building Solutions representative, call 1 877 276-7876. For complete technical information, detail drawings, CAD design assistance, installation information, and many other technical services, call TechLine customer support at 1 877 276-7876 or FAX 1 800 572 8324. For the latest product selection and specification data, visit armstrongbuildingsolutions.com/tectum.

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