

**Topperfo Panels – All areas in blue are to be modified per your individual project**

Guide Specification for 09 84 13/09 84 33/09 84 36/09 51 26/09 54 26

PART 1 – GENERAL

* 1. Description of Scope
		1. Acoustic wood panels, with prforation on face and perforation on rear, with either wood veneer, melamine, or paint finish
		2. Mounting system as described
		3. Trim and accessories
	2. Related Work by Other
		1. Ceiling structure, including any substrates or supporting structure
		2. Electrical fixtures, Lighting fixtures, and mechanical fixtures
		3. Fiberglass or mineral wool behind acoustic wood
		4. Custom trim or hardware not provided by Topakustik
	3. Related Sections
		1. Section 06 40 00 – Architectural Woodwork
		2. Section 09 20 00 – Plaster and Gypsum Board
		3. Section 09 51 00 – Acoustical Ceilings
		4. Section 09 53 00 – Acoustical Ceiling Suspension Assemblies
		5. Section 09 82 00 – Acoustical Treatment
		6. Division 15 Sections – Mechanical
		7. Division 16 Sections – Electrical
		8. Division 17 Sections – AV
		9. Division 21 Sections – Fire
	4. Alternates
		1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.
		2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.
	5. References
		1. ASTM A 641: Standard Specification for Zinc Coated (Galvanized) Carbon Steel Wire; 1992.
		2. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 1990.
		3. ASTM C 635: Standard Specifications for Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
		4. ASTM C 636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 1992.
		5. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials; 1991.
		6. ASTM E 580: Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 1991.
		7. AWI (QSI): Architectural Woodwork Quality Standards Illustrated; 2003.
		8. CISCA: Ceiling Systems Handbook.
	6. System Description
		1. Dual method sound absorption through tuned resonant absorption and open area transmission of sound to fiberglass behind. Additional low frequency absorption can be provided through specification below by means of a dual diameter rear perforation (T hole).
	7. Performance Requirements
		1. Material must meet performance data as indicated below and measured according to ASTM C423 or ISO 354. Typical patterns of Topperfo materials are listed with the vertical spacing (in mm) / horizontal spacing (in mm) / Hole diameter (in mm), and are followed with either the letter M (single diameter hole), T (dual diameter hole) or R (no rear perforation). Random incidence absorption data in third-octave bands for all typical Topperfo patterns are as follows:

|  |  |  |
| --- | --- | --- |
| **Topperfo (Surface Mount – 2” total system depth)** | **Octave Band (Hz) Absorption Coefficients** | **NRC** |
| **Perforation ⌀ (in mm)** | **O.C. spacing** | **Hole Style** | **Open** | **125** | **250** | **500** | **1000** | **2000** | **4000** |  |
| 10 | 20 / 20 | M | 19% | 0.16 | 0.63 | 0.96 | 0.94 | 0.75 | 0.68 | 0.80 |
| 8 | 20 / 20 | M | 12% | 0.18 | 0.64 | 0.87 | 0.76 | 0.57 | 0.49 | 0.70 |
| 6 | 20 / 20 | M | 7% | 0.20 | 0.61 | 0.70 | 0.55 | 0.39 | 0.33 | 0.55 |
| 8 | 16 / 16 | M | 19% | 0.18 | 0.43 | 0.93 | 1.08 | 0.75 | 0.62 | 0.80 |
| 6 | 16 / 16 | M | 11% | 0.18 | 0.50 | 0.98 | 0.93 | 0.51 | 0.35 | 0.75 |
| 5-10 (face-rear) | 16 / 16 | T |  | 0.15 | 0.63 | 1.06 | 0.93 | 0.66 | 0.53 | 0.80 |
| 4-10 | 16 / 16 | T |  | 0.15 | 0.66 | 1.08 | 0.82 | 0.51 | 0.35 | 0.75 |
| 3-10 | 16 / 16 | T |  | 0.15 | 0.72 | 1.03 | 0.59 | 0.32 | 0.21 | 0.65 |
| 2-10 | 16 / 16 | T |  | 0.19 | 0.83 | 0.72 | 0.30 | 0.16 | 0.13 | 0.50 |
| 2 | 8 / 8 | T |  | 0.12 | 0.63 | 1.13 | 0.77 | 0.43 | 0.27 | 0.75 |
| 1.2 | 8 / 8 | T |  | 0.15 | 0.83 | 0.79 | 0.34 | 0.17 | 0.13 | 0.55 |
| 1.2 | 5.33 / 5.33 | T |  | 0.21 | 0.86 | 1.09 | 0.67 | 0.39 | 0.29 | 0.75 |
| 1.2 | 4 / 4 | T |  | 0.11 | 0.64 | 1.12 | 0.84 | 0.54 | 0.44 | 0.80 |

|  |  |  |
| --- | --- | --- |
| **Topperfo (Cavity/Suspended Mount – 8.5” total system depth)** | **Octave Band (Hz) Absorption Coefficients** | **NRC** |
| **Perforation ⌀ (in mm)** | **O.C. spacing** | **Hole Style** | **Open** | **125** | **250** | **500** | **1000** | **2000** | **4000** |  |
| 10 | 20 / 20 | M | 19% | 0.36 | 0.79 | 0.87 | 0.85 | 0.75 | 0.67 | 0.80 |
| 8 | 20 / 20 | M | 12% | 0.38 | 0.72 | 0.76 | 0.72 | 0.56 | 0.47 | 0.70 |
| 6 | 20 / 20 | M | 7% | 0.38 | 0.60 | 0.61 | 0.54 | 0.39 | 0.30 | 0.55 |
| 8 | 16 / 16 | M | 19% | 0.58 | 0.92 | 1.04 | 0.89 | 0.75 | 0.61 | 0.90 |
| 6 | 16 / 16 | M | 11% | 0.52 | 0.90 | 0.96 | 0.72 | 0.51 | 0.37 | 0.75 |
| 5-10 (face-rear) | 16 / 16 | T |  | 0.42 | 0.84 | 0.91 | 0.86 | 0.72 | 0.54 | 0.85 |
| 4-10 | 16 / 16 | T |  | 0.42 | 0.84 | 0.86 | 0.78 | 0.56 | 0.39 | 0.75 |
| 3-10 | 16 / 16 | T |  | 0.43 | 0.82 | 0.77 | 0.61 | 0.37 | 0.24 | 0.65 |
| 2-10 | 16 / 16 | T |  | 0.49 | 0.73 | 0.53 | 0.33 | 0.19 | 0.15 | 0.45 |
| 2 | 8 / 8 | T |  | 0.32 | 0.88 | 0.93 | 0.79 | 0.46 | 0.29 | 0.75 |
| 1.2 | 8 / 8 | T |  | 0.41 | 0.76 | 0.60 | 0.36 | 0.18 | 0.10 | 0.50 |
| 1.2 | 5.33 / 5.33 | T |  | 0.48 | 0.89 | 0.86 | 0.69 | 0.42 | 0.31 | 0.70 |
| 1.2 | 4 / 4 | T |  | 0.33 | 0.87 | 0.94 | 0.84 | 0.59 | 0.46 | 0.80 |

* 1. Quality Assurance
		1. Manufacturer Qualifications
			1. Manufacturers other than those listed in Paragraph 2.1 are required to submit for approval prior to bidding per Section One
		2. Installer Qualifications
			1. Installer for material must be an experienced installer approved by the wood acoustical product manufacturer. It is preferred that the installer be certified by manufacturer.
			2. Installer must have completed similar projects in design and extent to that indicated for this project with a record of successful in-service performance
			3. Installer must have at least 3 years of experience in similar project work
		3. Inspection
			1. All work must past local codes and regulations or authorities that have jurisdiction over the project as well as inspection and approval of the architect.
		4. Single-Source Responsibility
			1. All wood acoustic materials must be sourced from a single fabricator with in-house shop drawing capabilities, in-house finishing and assembly, and with resources to provide products of consistent quality in appearance and physical properties without delaying the project.
		5. Standards
			1. Manufacturer shall conform to Architectural Woodworking Institute quality standards.
		6. Fire Performance Characteristics
			1. Panels provided must have surface burning characteristics as determined by testing panel components in accordance with ASTM E84 test procedures. Depending on material core specified they must comply with the following:
				1. Class A (or 1) – Fire rated medium density fiberboard (MDF) B1 core with maximum flame spread rating: 25 and maximum smoke developed: 450
				2. Class C (or 3) – Normally flammable MDF B2 core
		7. Coordination of Work
			1. Coordinate installation of acoustical material with installers of related work including, but not limited to, building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
	2. Submittals
		1. Product Data – Submit manufacturer’s technical data circling all applicable components for the specified product. For each unique item or type of material specified in this section a separate sheet shall be submitted.
		2. Samples – Submit physical samples of product to be supplied on the project that are typical of the veneer, finish, cut, and type specified. Sample shall be at least 6” x 6” in size.
		3. Shop Drawings – Submit drawings for all areas that contain the material including floor plans, elevations and RCPs where applicable. Drawings will be created from architect supplied base drawings that are provided electronically. The drawings should show overall layout with dimensions, panel identification, and should define all attachments and perimeter circumstances. Coordinate drawings with any other trades that interact with the specified material. Field verify site conditions as required with dimensions on drawings.
		4. Certifications – Submit certifications from independent laboratories to prove that material is meeting the specification.
	3. Project Conditions
		1. Prior to opening original packaging or installing material, ensure that the spaces are enclosed and completely weatherproof, all wet-work is complete and dry, all other trades above or behind wood acoustic materials is complete, and the building temperature and humidity conditions are consistently maintained at the levels indicated for the building once occupied.
		2. Project occupied humidity must be between 35%-60%. Do NOT install products if humidity exceeds 65%.
		3. Project occupied temperature must be maintained between 64° and 85°F
	4. Delivery, Storage, and Handling
		1. Coordinate crate sizes, weights, unloading options and delivery schedule with manufacturer prior to fabrication.
		2. Deliver material to site in the original, unopened packages and protect unopened packaging in a fully enclosed space from damage, moisture, direct sunlight, surface contamination, and any other mistreatment. Do not handle or unpack finished products until the material is ready to be installed and the project environmental requirements have been fully met.
		3. Before installing, product must acclimate in intended installation area and must be done at the intended operational temperature and humidity. This procedure of acclimatization is a length of at least 72 hours.
		4. Handle products with proper care to avoid chipping edges, scratching the surface, scuffing the material, denting the material, or damaging the units in any way.
		5. Protect installed product from any other trade work that must be completed in or around the area of installation.
	5. Warranty
		1. Provide owner with manufacturer’s written warranty covering the products supplied against defects in material and workmanship of the product and manufacturer detailed installation instructions under normal operating conditions for a period of one (1) year from the date of shipment.
		2. Contractor shall warrant all work for one (1) year from final acceptance of completed work.
		3. Components used in the system that are not provided by manufacturer are not included in the manufacturer’s warranty. If material is installed in any method other than that which is suggested and required by manufacturer, warranty will not apply.
	6. Maintenance
		1. Extra material is not included unless explicitly stated in quotation. If provided, materials must remain in original packaging and supplied to owner upon completion of project.

PART 2 – PRODUCTS

* 1. Manufacturer
		1. Topperfo as manufactured by Topakustik®, NH Akustik + Design AG, 410-849-4333, [www.topakustik.com](http://www.topakustik.com)
	2. Product Type
		1. Topperfo Panel
		2. Face profile to be selected from below:
			1. Standard options: 20/20/10, 20/20/8, 20/20/6, 16/16/8, 16/16/6, 16/16/10-5, 16/16/10-4, 16/16/10-3, 16/16/10-2, 8/8/2, 8/8/1.2, 5.33/5.33/1.2, 4/4/1.2
				1. Where the first two numbers describe the distance between holes vertically and horizontally and the third number describes the diameter of the perforation. Where two numbers are listed with a dash, the first number describes the rear hole and the second number describes the face hole.
		3. Rear perforation as selected from below:
			1. M-hole perforation – single hole diameter from face to rear of panel
			2. T-hole perforation – dual diameter holes on panel, smaller diameter hole at the face of the panel meeting the larger diameter hole at rear of panel. This option will serve to increase low frequency absorption performance.
			3. Reflective – No rear perforations. This option can be either with face “blind” holes for similar aesthetic, or with no holes at all. This option will have no acoustical absorption properties.
		4. Core to be selected from below:
			1. Class A fire rated medium density fiberboard (MDF) core (when tested according to ASTM E-84 procedures)
			2. Normally flammable MDF core (without fire retardant agents) meeting Class C (when tested according to ASTM E-84 procedures)
			3. Noncombustible Recycled Gypsum core identified as Resap®
		5. Additional Core options:
			1. The substrate material shall or shall not be made with no-added urea formaldehyde
			2. The core material will or will not be FSC Mix Credit. If FSC is chosen, the Chain of Custody certificate will or will not be required.
			3. Core shall have Formaldehyde Emission Standard of E0 (European Standard) such that formaldehyde emissions must be equal to or less than 0.07 ppm.
			4. The core shall be Programme for the Endorsement of Forest Certification (PEFC) Certified
		6. Surface:
			1. Veneer shall be as follows:
				1. Wood species – as selected by architect (please indicate FSC or not)
				2. Grain cut – (e.g. quartered, plain, rift, rotary, etc.)
				3. Matching within panel – (e.g. slip, book, pleasing, random, etc.)
				4. Matching between panels / Sequencing – as required by architect (may result in higher cost), if none specified a random matching will be applied with colors mixed for the most consistent appearance possible.
			2. Melamine shall be as follows:
				1. Standard Beech (xxx), Maple (xxx), or White (xxx)
				2. Standard metallic (xxx)
				3. Custom laminate as selected by architect (subject to additional cost)
			3. Paint finish shall be as follows:
				1. RAL # as selected by architect
				2. Custom paint color as selected by architect
				3. Optional clear coat protective varnish over paint finish as specified by architect (recommended for wall areas)
		7. Finish:
			1. If veneer, choose from the following:
				1. Natural lacquer with matt finish
				2. Clear coat with gloss as specified by architect
				3. Stain color as specified by architect and defined with control sample
				4. Tinted varnish as specified by architect and defined with control sample
				5. Or unfinished.
		8. Material size shall be xx” length (xx mm) and xx” width (xx mm), or as shown on drawings, consult factory for maximum sizes for core boards, maximum dimension in either direction is 1280 mm (50.39”)
		9. Edge conditions to be as follows:
			1. Unfinished edges on all sides of panels
			2. Edgebanding on all sides of panels
			3. Spline joint, including spline member, between panels on all sides
			4. Tongue and groove joint in direction with panel veneer grain
			5. Tegular edge for lay-in to T-bar grid system (see section 2.4)
			6. Custom rabbeted edges for concealed grid lay-in to T-bar grid system (see section 2.4)
			7. Custom rabbeted edges for Z-grid system (see section 2.4)
			8. Custom rabbeted edges for G-grid system (see section 2.4)
		10. Border:
			1. Perforations on panel face stop short of panel edge by xx” (xx mm)
		11. Backing: Black, nonwoven glass fiber matt (60 g/m2 density) shall be adhered to rear of panel
		12. Acoustic insulation to be included behind panels as specified by architect and provided by installer (typically 1” thick 6 lb/ft3 density fiberglass)
	3. Accessories
		1. Edge molding
			1. Type 1 – T-shaped molding dimensions 13 mm x 44 mm, includes wood blocking
			2. Type 2 – Thick block edge molding dimensions 50 mm x 30 mm, includes wood blocking
			3. Type 3 – Rounded edge molding dimensions 50 mm x 30 mm, includes wood blocking
			4. Type 21 – Aluminum corner trim (single blade protrusion) 35 mm x 3 mm
			5. Type 22 – Aluminum corner trim (arrow shaped unit) 10 mm face dimension
			6. Type 23 – Aluminum corner trim (inside L-shape) 12 mm face dimension
			7. Type 24 – Wood corner trim (solid block design) 30 mm x 30 mm face dimension
			8. Type 25 – Wood end trim (rectangular design) 50 mm x 16 mm
			9. Type 26 – Aluminum end trim (L-shape) 20 mm x 3 mm
			10. Type 27 – Wood corner trim (L-shaped design) 30 mm x 30 mm
		2. EPM Hardware for fixed ceiling mount, z-profile metal piece screwed to rear of panel in the field, wood batten with custom rabbet to accept metal piece provided to be attached to substrate.
		3. Cutout options for panels:
			1. If required cutouts can be factory completed with unfinished edges and perforations not held back
			2. Cutouts factory completed with perforations held back from edge of cutout
			3. Cutouts factory completed with full finished edges at cut
	4. Suspension Grid options
		1. Metal T-Grid Suspension System: Provide standard interior Metal Heavy Duty 15/16” suspension T-Grid system using Main Runners, Cross-tees, Wall Angle or Shadow Moldings of types, structural classifications, and <black/standard> finishes indicated and that comply with applicable ASTM C 635 requirements. Comply with all applicable <seismic> codes and ordinances.
			1. Attachment Devices: Size for 3 times the design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
			2. Wire, Braces, Ties, Hanger Rods, Flat Hangers and Angle Hangers: Provide wires, rods and hangers that comply with applicable ASTM specifications.
		2. Z-grid Suspension System
			1. Partial accessibility suspension grid system consisting of a primary U-profile grid member, and secondary Z-profile grid members attached to fixed panels. Removable panels are supported by fixed panels through a custom edge profile. Attachment to structure is the responsibility of the installing contractor to meet all local codes and regulations. It is recommended that the attachment be achieved with a threaded rod supplied by the installing contractor.
			2. Hardware included in this system consists of the U-profile main runner, mounting Z-profiles, connection brackets to the U-profile, transverse panel stiffening, screws to attach hardware to rear perforations, and stiffening rail between fixed panels in the z-profile to register the panels to one another.
			3. Removable panels are able to be taken down with a gentle lift and shift motion. Secure with wire rope as necessary for local codes and ordinances.
			4. Recommended maximum panel width in this system is 640 mm (25.2”)
			5. Refer to the Topakustik® Installation Manual for further details and instructions.
		3. G-grid Suspension System
			1. Full accessibility suspension grid system consisting of a primary U-profile grid member, and a secondary G-profile grid member that supports the weight of the panels. Panels are fitted with a custom edge profile to hang on the G-profile runner. Attachment to structure is the responsibility of the installing contractor to meet all local codes and regulations. It is recommended that the attachment be achieved with a threaded rod supplied by the installing contractor.
			2. Hardware included in this system consists of the U-profile main runner, G-profile secondary grid, connection brackets to the U-profile, transverse panel stiffening, screws to attach hardware to rear perforations, and any wall connection profiles.
			3. Panels are able to be taken down with a gentle lift and shift motion. Secure with wire rope as necessary for local codes and ordinances.
			4. Recommended maximum panel width in this system is 500 mm (19.69”)
			5. Refer to the Topakustik® Installation Manual for further details and instructions.
		4. S-11 (Torsion Spring) Suspension System
			1. Full accessibility suspension grid system consisting of a primary U-profile grid member, a secondary Omega (Ω) Profile, spring bar, and torsion springs to support the weight of the panels. The panel edge profile can be dictated by design and returns or trim are possible with this system as the panels are downwardly accessible. Attachment to structure is the responsibility of the installing contractor to meet all local codes and regulations. It is recommended that the attachment be achieved with a threaded rod supplied by the installing contractor.
			2. Hardware included in this system consists of the U-profile main runner, Omega profile secondary runner with slots to accept springs, spring bar mounted to panels with custom profile to allow sliding of springs as necessary to fit Omega profile slots, torsion springs, special screws to attach hardware to rear perforations, transverse panel stiffening hardware, and any wall connection profiles required.
			3. Panels remove with a special tool provided with material that allows for a simple downward release of the spring from the grid. Panels can then be fully removed from the grid by pressing the springs to release from the Omega profile slot.
			4. Recommended maximum panel width in this system is 900 mm (35.43”), and panels must be a width of a multiple of 16 mm
			5. Refer to the Topakustik® Installation Manual for further details and instructions.
		5. Hook-in Suspension System
			1. Full accessibility grid system consisting of wood battens and steel hook profiles.
	5. Manufacturing Quality Control
		1. Manufacturing facility for planks shall be ISO 9001 certified and provide certification documentation upon request by Architect.
	6. Tolerance
		1. Manufactured units will be fabricated with a tolerance of – 0.10 mm (for perforations); 0.50 mm (for final product dimensions)

PART 3 - EXECUTION

* 1. Examination
		1. General – Examine installation areas for compliance with all manufacturer and project environmental requirements. Ensure that uninstalled products have been handled correctly and have acclimated to the final environmental conditions. Review all substrates and structural framing to watch planks will attach or that will be adjacent to panels, with installer present, for compliance and adherence to project requirements, specifications, and manufacturer suggestions. Inspect installation areas to confirm that all surfaces are dry, clean, level, plumb, and constructed according to contract documents. Do not proceed with installation until unsatisfactory conditions are corrected and approved.
		2. Coordination – Coordinate with other trades in the vicinity of installation for Topakustik materials. All wet work must complete and dry. Coordinate with all other trades to verify that components that will integrate with Topakustik system have been addressed and clarified prior to installation of material.
	2. Preparation
		1. Layout – If necessary take field dimension measurements prior to fabrication of acoustical material and coordinate information with manufacturer. Contractor shall measure applicable areas to confirm location of panel supports in accordance with installation instructions.
		2. Protection – Protect all adjacent surfaces from possible damage during installation of material.
	3. Installation
		1. General – Install wood planks as per manufacturer’s guidelines, industry standards, and as they are shown in the architectural contract drawings.
		2. Expansion and Contraction – Panels must be installed such that all joints allow for the material to expand and contract with temperature and humidity changes. Failure to follow this guideline will result in panels that buckle or warp over time.
	4. Coordination
		1. Coordinate all other work that interacts with wood panel system with general contractor and site superintendents. Contractor shall not use wood paneling to support the weight of any other building element or component.
	5. Adjustment
		1. Adjust panels during installation and after to ensure that all surfaces, joints, and perforations are aligned, and that all units are flush, level and plumb. Adjust any access panels to ensure that all hardware is secure and that all panels are operable.
		2. Installation labor for removal and replacement of product deemed to be improperly installed and/or not conforming to specified installation instruction, shall be the responsibility of the installing contractor.
	6. Cleaning
		1. Clean exposed surfaces of planks after installation is complete. Comply with manufacturer’s cleaning and maintenance instructions. Remove all dust with vacuuming and do not scratch exposed surfaces with any metal components to vacuums or other cleaning appliances. Do not use abrasive cleaners or cloths that can scratch wood finishes. Remove any dirt, dust, grease, oils and fingerprints.
		2. Upon completion of work, all exposed surfaces must be covered and protected from any damage or soiling until project substantial completion and owner occupancy.
	7. Repair
		1. Remove and replace at no additional charge any materials that cannot be repaired or cleaned to the Owner’s and Architect’s satisfaction.
		2. Panels with veneered surface are real wood products. Should replacement for any reason be required, the manufacturer cannot guarantee the exact matching of grain, pattern, and color. Every effort will be made to maintain the overall appearance, however, natural variations in grain, texture, shade, and aging may occur in varying site conditions.

END OF SECTION