

Wake County Public School System
Cary High School Security Improvements

SECTION 095110 - ACOUSTICAL LAY - IN CEILINGS

PART 1 - GENERAL

SUMMARY

Section Includes:

- Exposed suspension system.
- Trim and accessories.
- Acoustical lay-in panels.
- Fire rated assemblies.

Products Furnished but Not Installed Under This Section:

- Metal deck hanger clips.

Related Sections:

- Mechanical (Air Supply and Return Devices): Division 23.
- Electrical (Light Fixtures): Division 26.

REFERENCES

ASTM A 641 -- Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.

ASTM C 423 -- Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

ASTM C 635 -- Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

ASTM C 636 -- Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

ASTM E 84 -- Standard Test Method for Surface Burning Characteristics of Building Materials.

ASTM E 119 -- Standard Test Methods for Fire Tests of Building Construction and Materials.

ASTM E 413 -- Standard Classification for Rating Sound Insulation.

ASTM E 795 -- Standard Practices for Mounting Test Specimens during Sound Absorption Tests.

ASTM E 1264 -- Standard Classification for Acoustical Ceiling Products.

ASTM E 1414 -- Standard Test Method for Airborne Sound Attenuation between Rooms Sharing a Common Ceiling Plenum.

Ceiling Systems Handbook, Ceilings & Interior Systems Contractors Association (CISCA); latest edition.

Fire Resistance Directory; Underwriters Laboratories Inc. (UL); latest edition.

Wake County Public School System

Cary High School Security Improvements

DEFINITIONS

NRC (Noise Reduction Coefficient): The weighted average sound absorption coefficient of the ceiling materials when tested in accordance with ASTM C 423, with mounting No. E-400 (ASTM E 795).

CAC (Ceiling Attenuation Class): The numerical rating of sound attenuation for the ceiling system between two rooms when installed over a barrier with a common plenum above and tested in accordance with ASTM E 1414 and calculated in accordance with ASTM E 413.

LR (Light Reflectance Coefficient): As determined by ASTM E 1264.

SUBMITTALS

Product Data: Submit data for each distinct suspension system and acoustical unit type indicated.

Samples: Submit the following:

Selection samples:

Acoustical units: Minimum 6-inch-square samples of acoustical units meeting the requirements of the specification for each type specified.

Exposed suspension and trim elements: Manufacturer's standard color and texture selection samples of finishes, on minimum 6-inch-long pieces of specified substrate.

QUALITY ASSURANCE

Fire Performance Characteristics:

Surface burning characteristics: Provide products having the following characteristics when tested in accordance with ASTM E 84:

Maximum flame spread: 25.

Maximum smoke developed: 50.

Fire-resistant (time-rated) assemblies: Provide acoustical ceiling products and installation accessories labeled and listed by UL (Underwriters Laboratories Inc.) for assemblies indicated, by reference to the Fire Resistance Directory design numbers.

PROJECT CONDITIONS

In a timely manner, furnish to affected installers, attachment devices for incorporation into other work.

Coordination Data: Prepare and distribute to affected installers, data necessary for coordination with related work. Include setting diagrams showing placement of attachment devices for acoustical ceiling hangers.

Coordinate ceiling system installation with work of other sections as required, including the following:

Light fixtures.

HVAC equipment.

Within each space to receive specified products, do not begin installation until the following conditions are met:

Work above ceilings has been finished, tested, and approved.

Space to receive ceiling system is properly enclosed and protected from weather.

Any wet work within the space is dry.

Do not begin installation of ceiling system until building's normal operating temperature and humidity levels have been reached and will be maintained.

Wake County Public School System

Cary High School Security Improvements

MAINTENANCE

Extra Materials: After ceiling installation has been completed, deliver to the owner replacement materials for materials installed. Furnish products which precisely match installed products. Protect with appropriate packaging and provide clear, legible labels.

Acoustical lay-in panels: Furnish full-sized panels in quantities not less than 2 percent of quantity of panels installed.

Elements of exposed suspension members: For each distinct type of exposed element, furnish quantities not less than 2 percent of quantity installed.

WARRANTY

Provide lifetime system warranty against visible sag to withstand temperature and humidity conditions up to 104 °F and 95% relative humidity.

PART 2 – PRODUCTS

MANUFACTURERS

Products manufactured by USG Interiors, Inc. are indicated as basis of design only. Products of the following manufacturers, provided they comply with requirements of the contract documents, will be among those considered acceptable:

Armstrong World Industries, Inc.

Celotex Corporation

USG Interiors, Inc.

ACOUSTICAL CEILING UNITS - GENERAL

Standard for Acoustical Ceiling Units: Provide units conforming to applicable requirements of ASTM E 1264 for Class A materials.

CEILING SUSPENSION SYSTEMS - GENERAL

Provide suspension systems conforming to specified requirements and to requirements of ASTM C 635.

Colors: Provide indicated colors. Where color is not indicated, provide colors as selected by the architect from manufacturer's complete set of standard colors.

Finishes: Manufacturer's standard shop-applied finishes.

Attachment Devices for Suspension System:

Anchors and intermediate support members: Provide sizes capable of sustaining 5 times the load-carrying capabilities shown in ASTM C 635, Table 1, "Direct Hung" column.

Deck inserts and hanger clips: Fabricate from hot-dip galvanized steel.

Hanger wire: Zinc-coated (galvanized) carbon steel wire, ASTM A 641, soft temper, with Class 1 coating, minimum 12 gage (0.106 inch diameter).

Provide ceiling system manufacturer's hold down tension clips. Spacing of clips shall be as recommended by the manufacturer.

Edge Moldings and Trim: Extruded metal; provide molding for edges and ceiling penetrations indicated. Provide profiles suited to edge profiles of acoustical units and suspension members.

Wake County Public School System
Cary High School Security Improvements

ACOUSTICAL TILE CEILING SYSTEM

Ceiling System Fire Resistance:

Provide acoustical ceiling system consisting of panels, suspension system, duct accessories, light fixture accessories, and necessary appurtenances, which has been tested in accordance with ASTM E 119 in conjunction with the floor or roof structural assembly to be used for the project area requiring fire resistance rating.

System rating: 1 hour rated ceiling – roof assembly.

Acoustical Panels: Nodular, cast or molded rigid mineral fiber boards:

Comply with the requirements of ASTM E 1264, Type III, Form 2, Pattern CE, manufacturer's standard thickness, but not less than 3/4 inch thick.

UL Type: FR-83

Size: 24 by 24 inches.

Noise reduction coefficient: Minimum NRC 0.70.

Ceiling Attenuation Class: Minimum CAC 35.

Edge profile: Square.

Finish: Manufacturer's standard washable latex paint.

Color: White.

Light reflectance coefficient: Minimum LR 0.80.

Water resistance: Less than 0.3 grams per square meter per two minutes per Cobb test.

Acceptable Product: "Radar, High NRC, Item No. 22111"; USG Interiors, Inc.

Exposed Grid: Formed steel with painted finish.

Profile: Double-web tee, 15/16 inch wide.

Structural classification (ASTM C 635): Heavy-Duty System.

Color and texture: White color to match ceiling panels; standard smooth texture.

Acceptable product: "Donn DXL Acoustical Suspension System, Item No. DXL26 Heavy Duty Main Tees and Item No. DXL216 Cross Tees"; USG Interiors, Inc.

Wall Moulding:

Acceptable product: "Donn M7, wall angle"; USG Interiors, Inc.

MISCELLANEOUS MATERIALS

Acoustical Sealer: Resilient type, nonshrinking, nonstaining, nondrying, nonhardening, nonsag. Provide sealer which is suitable for application indicated.

Wake County Public School System

Cary High School Security Improvements

PART 3 - EXECUTION

EXAMINATION

Examine substrates and conditions under which products of this section are to be installed and verify that the work properly may commence.

Verify that products furnished as work of this section, but not installed under this section, have been properly installed by the entity performing the installation.

PREPARATION

Layout: Position ceiling components to maximize use of full-sized acoustical units and to provide border units which are equal in size and shape at opposing ceiling edges. Use of acoustical units which are smaller than 1/2 full-width is prohibited at ceiling perimeters. Conform to reflected ceiling plans to greatest extent possible.

SUSPENSION SYSTEM INSTALLATION

General:

Conform to the requirements of ASTM C 636, manufacturer's installation instructions, and governing regulations.

Install hangers plumb and supported solely by building structure or carrying channels. Do not allow hangers to contact any objects or materials in ceiling plenum, which are not actual components of ceiling system.

Splay hangers only where necessary to avoid obstacles. Provide counter splaying, bracing, or other acceptable devices to compensate for lateral stresses caused by splayed hangers.

Do not attach hangers to piping, conduit, or duct. Provide carrying channel trapeze support where obstruction cannot be avoided by splaying hanger 45 degrees from vertical or less.

Space hangers at not more than 48 inches on center and within 6 inches of ends of each direct-hung runner or carrying channel, unless indicated otherwise.

Loop and tie wire hangers securely to building's structural members; to attachment devices indicated; or, where not indicated, to devices suitable for substrate and capable of permanently supporting ceiling weight without failure or deterioration.

Level ceiling suspension system to tolerance of 1/8 inch in 12 feet, with cumulative tolerance not to exceed 1/4 inch. Bending or kinking of hangers is not allowed.

Indirect-Hung Suspension: Install carrying channels at 48 inches on center unless indicated otherwise. Use channels larger than minimum size (1-1/2 inch) or double channels to maintain deflection limitation of 1/360 of span or less for loading indicated.

Exposed (Lay-in) Grid Installation: Install grid members square, with ends of members securely interlocked. Remove and replace dented, bent, or kinked members.

TRIM INSTALLATION

Install edge moldings and trim units at acoustical ceiling borders, at locations indicated, and where required to cover acoustical unit edges.

Molding and trim attachment: Space screws not more than 16 inches on center and within 3 inches of ends of each trim-piece being installed. Install moldings and trim level with suspension system and within tolerance specified for suspension system.

Wake County Public School System

Cary High School Security Improvements

Edge moldings: Before installing molding, apply acoustical sealer in uniform bead to vertical molding edge, which will be concealed after installation.

Miter corners and align butt joints carefully to form tight hairline joints.

Face-riveting of trim and moldings is not allowed.

LAY-IN PANEL INSTALLATION

Panel Installation: Install acoustical panels for accurate fit with suspension system and trim members. Scribe and cut panels at ceiling perimeter and at obstructions to provide neat, precise fit.

Square-edge panel installation: Provide installation with panel edges, which are hidden from view, by suspension members or trim.

ADJUST AND CLEAN

Use ceiling manufacturer's recommended methods and materials to clean and touch-up exposed components of ceiling system.

Replace ceiling system components, which are discolored or damaged in any way, in a manner, which results in the ceiling system showing no evidence of replacement work.

END OF SECTION