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ROCKFON SPEC NOTE: This master specification is written to include SPEC NOTES to assist designers in their decision-making process. SPEC NOTES precede the text to which they apply. This section should serve as a guideline only and should be edited by a knowledgeable person to meet the requirements of each specific Project.

Text indicated in bold and by square brackets is optional. Make appropriate decisions and delete the optional text as well as the brackets in the final copy of the specification. Delete or hide the SPEC NOTES in the final version of the document.

This specification section is written to follow the recommendations of the Construction Specifications Institute/Construction Specifications Canada (CSI/CSC) such as MasterFormat™, SectionFormat™, and PageFormat™. It is also written with metric and imperial units of measurement.

Rockfon does not practice architecture or engineering. Therefore, the design responsibility remains with the Consultant, engineer, or Consultant. We hope the information given here will be of assistance. It is based upon data considered to be true and accurate and is offered solely for the user's consideration, investigation, and verification. Nothing contained herein is representative of a warranty or guarantee for which Rockfon can be held legally responsible. Rockfon does not assume any responsibility for any misinterpretation or assumptions the reader may formulate.

This specification was developed with the assumption that it will be used with a CCDC standard Contract, as amended by any supplementary instructions. As a result, in keeping with CCDC standard definitions, some words have been capitalized. Please change defined terms and capitalization if this Specification is used with another type of Contract.

This specification specifies: **Tropic – DC (Data Centre) Ceiling Panel** by Rockfon.

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

2. Related Requirements:

    1. Section 095113 "Acoustical Panel Ceilings" for ceilings consisting of acoustical panels and exposed suspension systems for interior ceilings.

1.2 SUMMARY

1. Section Includes: Provide suspended ceiling acoustical ceiling panels including but not limited to:

    1. Acoustical Ceiling Panel.

ROCKFON SPEC NOTE: Revise the list of related requirements to only include specification sections that are applicable to the project.

2. Related Sections: Related requirements provided below are for convenience purposes only.

    1. Section 09 21 16, Gypsum Board Ceilings.
    2. Section 09 52 23, Metal Acoustical Ceiling Suspension Assemblies.
    3. Section 09 54 00, Specialty Ceilings.
    4. Section 09 58 00, Integrated Ceiling Assemblies.
    5. Section 13 48 00, Sound, Vibration, and Seismic Control.
    6. Section 23 50 00, Central Heating Equipment.
    7. Section 26 50 00, Lighting.

1.3 REFERENCES

1. Abbreviations and Acronyms:

    1. ASCE: The American Society of Civil Engineers
    2. ASTM: American Society for Testing and Materials
    3. CISCA: Ceilings & Interior Systems Construction Association; www.cisca.org.
    4. International WELL Building Standard
    5. LEED: Leadership in Energy and Environmental Design (set of rating systems for the design, construction, operation, and maintenance of green buildings)
    6. LBC: Living Building Challenge

2. Reference Standards: Unless otherwise indicated in this Section or the Building Code, the latest published editions of reference standards as of the Project's Bid Closing deadline apply.

1. ASTM C635: Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
2. ASTM C636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
3. ASTM C1338: Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings
4. ASTM D1308: Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems
5. ASTM D3273: Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
6. ASTM D4828: Standard Test Methods for Practical Washability of Organic Coatings
7. ASTM D6329: Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers
8. ASTM E1414/E1414M: Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
9. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
10. ASTM E1264: Standard Classification for Acoustical Ceiling Products
11. ASTM E1111: Standard Test Method for Measuring the Interzone Attenuation of Open Office Components
12. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
13. ASTM E580/E580M: Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions
14. ASTM E795: Practice for Mounting Specimens During Sound Absorption Tests
15. ASTM E1477: Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
16. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.2 2017
17. CAN/ULC S101: Standard Methods of Fire Endurance Tests of Building Construction and Materials
18. CAN/ULC S102: Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
19. Health Product Declaration Standard V2.0
20. ICC ES AC 156: Acceptance Criteria for Seismic Certification by Shake-Table Testing of Non-structural Components
21. ICC-ES / ESR 2631: International Code Council-Evaluation Services -ESR 2631 Rockfon Chicago Metallic Corporation Suspended Ceiling Framing Systems and Suspension Ceiling Systems
22. UL 2818: GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings
23. UL 2821: GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings

24. UL 2824: GREENGUARD Certification Program Method For Measuring Microbial Resistance From Various Sources using Static Environmental Chambers

ROCKFON SPEC NOTE: Depending on scope of work, a preinstallation conference may not be necessary. retain article below and edit accordingly.

1.4 ADMINISTRATIVE REQUIREMENTS

1. Pre-installation Conference: Conduct conference at **[Project site]**. Agenda includes Project conditions, coordination with work of other trades, and layout of items which penetrate ceilings.

1.5 SUBMITTALS

1. Product Data: Submit manufacturer's Product Data, including maintenance data.

2. Sustainable Design Submittals:
    1. Product Data: For recycled content, indicating pre-consumer recycled content and cost
    2. Product Certificates: For indigenous materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project, means of transportation, and cost for each indigenous material.
    3. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.
    4. Third-Party Verified Environmental Product Declaration (3PV EPD) Certifications: For each product.
    5. Health Product Declaration (HPD) Certification: For each product.
    6. Laboratory Test Reports: For ceiling products, indicating compliance with requirements for low-emitting materials UL GREENGUARD GOLD in both school and office scenarios.
    7. Mould and mildew resistance per ASTM D3273 **[Level 10 – No Mould Growth]** and ASTM C1338 **[Pass – No Fungal Growth]**.
    8. Declare Label: The end use product has a published Declare label by the International Living Future Institute with disclosure of 100 ppm with a designation of Red List Approved (less than 1 percent proprietary ingredients).
    9. Samples: For each exposed product and for each colour and texture specified, **[150 by 150 mm (6 by 6 inches)]** in size.

3. Samples for Initial Selection: For components with factory-applied finishes.
    1. Verification Samples: Submit verification samples confirming colour and finish selections in minimum 150 by 150 mm (6 by 6 in.) size.

4. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below
    1. Acoustical Panels: Set of **[full-size] [150 by 150 mm (6 by 6 inches)]** Inches Samples of each type, colour, pattern, and texture.
    2. Exposed Suspension-System Members, Moldings, and Trim: Set of **[150-mm- (6-inch-)]** long Samples of each type, finish, and colour.

3. Clips: Full-size **[hold-down] [impact] [and] [seismic]** clips

1.6 INFORMATIONAL SUBMITTALS

1. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items
    1. Ceiling suspension-system members.
    2. Structural members to which suspension systems will be attached.
    3. Method of attaching hangers to building structure.
    4. Supply layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
    5. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
    6. Size and location of initial access modules for acoustical panels.
    7. Items penetrating finished ceiling and ceiling-mounted items including the following
        1. Lighting fixtures.
        2. Diffusers.
        3. Grilles.
        4. Speakers.
        5. Sprinklers.
        6. Access panels.
        7. Perimeter moldings.
        8. Other items as required
    8. Show operation of hinged and sliding components covered by or adjacent to acoustical panels.
    9. Minimum Drawing Scale: **[1:48 (1/4 inch = 1 foot)] [1:96 (1/8 inch = 1 foot)] [1:50] [1:100]**
2. Qualification Data: For testing agency.
3. Product Test Reports: For each acoustical panel ceiling, for tests performed by **[manufacturer and witnessed by a qualified testing agency] [a qualified testing agency]**.
4. Evaluation Reports: For each acoustical panel ceiling suspension system**[and anchor and fastener type]**, from ICC-ES.
5. Field quality-control reports

1.7 CLOSEOUT SUBMITTALS

1. Operational and Maintenance Data: Submit maintenance instructions to Owner for recommended cleaning materials and methods for panels and trim. Include precautions for use of and composition of cleaning materials detrimental to acoustic panels and trim.

1.8 MAINTENANCE MATERIAL SUBMITTALS

1. Supply extra materials **[from the same product run]** that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
    1. Acoustical Panels: Full-size panels equal to percent of quantity installed.
    2. Suspension-System Components: Quantity of each exposed component equal to percent of quantity installed.
    3. Hold-Down Clips: Equal to percent of quantity installed.
    4. Impact Clips: Equal to percent of quantity installed.

1.9 QUALITY ASSURANCE

1. Single-source responsibility: Provide acoustical panel units and grid components by a single manufacturer.

2. Mock-ups: Build mock-ups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
    1. Build mock-up of typical ceiling area as indicated on Drawings.

3. Approval of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Consultant specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Performance of the Work.

1.10 DELIVERY, STORAGE AND HANDLING

1. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

1.11 WARRANTY

1. Warranty Period:
    1. Acoustical Panels Manufacturer Warranty: Submit a written warranty executed by manufacturer for a period of **30 years** from date of Substantial Performance of the Work, agreeing to repair or replace acoustical tile that fails or is compromised within the specified warranty period. The warranty does not cover any damage or change to the Products resulting from improper material handling or storage, water, moisture, fire, chemical fumes, bacteria, mould, fungi, wind, accident, disaster, non-intended use, improper installation, abuse, or failure of other system components or modification.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

1. Source Limitations for Ceiling System: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

ROCKFON SPEC NOTE: Include the 'Seismic Performance' paragraph for projects that require design for seismic loads according to the National Building Code of Canada, Division B, Section 4.1.8 or as required by local codes. Remove this paragraph if seismic design details are provided on Structural Drawings. Consult with the project's structural engineer to ensure coordination of these requirements.

1. [Acoustical panels to comply with the requirements of UL GREENGUARD GOLD Certification for both school and office scenarios and the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers

2. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design seismic restraints for suspended ceiling systems.

3. Seismic Performance: Suspended ceiling systems to withstand the effects of earthquake motions determined in accordance with **[ASTM E580/E580M]**.

4. Surface-Burning Characteristics: Comply with **[CAN/ULC S102][ASTM E842]**; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    1. Flame-Spread Index: **[no higher than 5]** Class A in accordance with **[CAN/ULC S102][ASTM E84]** .
    2. Smoke-Developed Index: **[no higher than 5]** Class A in accordance with **[CAN/ULC S102][ASTM E84]**.

5. Fire-Resistance Ratings (where required): Comply with CAN/ULC S101; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency
    1. Indicate design designations from UL or from the listings of another qualified testing agency.

6. Humidity Resistance: Ensure that acoustical panels are dimensionally stable at up to 100 percent relative humidity at temperatures ranging from 0 to 40 deg. C (32 to 104 deg. F) without having to acclimatize panels and tested to ASTM C367.

ROCKFON SPEC NOTE: From the list of paragraphs below, delete the acoustical panels that do not apply to your project.

2.3 ACOUSTICAL PANELS

1. Manufacturer**:** Rockfon 4849 South Austin Avenue, Chicago, IL 60638. 1-800-323-7164; www.rockfon.com.

2. Basis-of-Design Product: Subject to compliance with requirements, provide **Rockfon Tropic®** - **Data Centre (DC)** Stone Wool ceiling tiles.

    1. Material: Stone Wool
    2. ASTM E1264 Classification: ASTM E1264 (2022) : Type IV, Form 3, Pattern G
       ASTM E1264 (2023): Type A, Form A2.3, Pattern G
    3. Panel Size: [23-7/32" x 23-7/32"] [23-7/32" x 47-7/32"]
    4. Panel Thickness: [5/8 inch (15 mm)]
    5. Edge/Joint Detail: [Square Lay In Data Center SQDC]
    6. Colour: White
    7. Light Reflectance (LR): Not less than 0.85
    8. Noise Reduction Coefficient (NRC): [0.85]
    9. Fire Class: Class A in accordance with [CAN/ULC S102] [UL 723 ASTM E84]:
       Flame Spread Index: [not more than 5]
       Smoke Developed Index: [not more than 5]
    10. GWP (A1-A3): [25 mm (1 inch)]: 0.190 kg CO_2-eq/ft^2/ 2.04 kg CO_2-eq/m^2
    11. Thermal Resistance: R 2.17 hr.ft².°F/Btu for 5/8 inch (I-P), R 0.38 m².K/W for 15.9 mm (SI)
    12. Recycled Content: 46%
    13. Sustainability Design Certification: Meeting UL GREENGUARD GOLD for classroom and office scenarios for VOC emissions, HDPs, EPDs, and DECLARE
    14. Provide acoustical panels without any added antimicrobial treatments. Panels that are inherently resistant to fungus, mould, mildew, and gram-positive and gram-negative bacteria with a rating of 10; and that show no mould, mildew, or bacterial growth after 28-days of exposure when tested in accordance with ASTM D3273 [Level 10 – No Mould Growth] and ASTM C1338 [Pass – No Fungal Growth].
    15. Sag and warp resistant in 100% RH (Relative Humidity) and tested to ASTM C367.

PART 3 - EXECUTION

3.1 EXAMINATION

1. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

2. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mould damaged.

3. Proceed with installation only after unsatisfactory conditions have been corrected

3.2 PREPRATION

1. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated and comply with layout shown on reflected ceiling plans.

2. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF ACCOUSTICAL PANEL CEILINGS

1. Install acoustical panel ceilings in accordance with ASTM C636/C636M **[seismic design requirements]** manufacturer's written instructions and CISCA's "Ceiling System Handbook"

3.4 CLEANING AND WASTE MANAGEMENT

1. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touch up of minor finish damage.

2. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION