Recommended Specifications for

Stravifloor Channel



Section 13 48 00 Sound Control

This document is for specification writers' reference in the drafting process. CDM Stravitec will not be held responsible for the use or unauthorized modification of any information contained herein.

Specification notes are identified in the document as follows “**SPEC NOTE**” – these notes must be removed from final documents. Where multiple options may be available, these are identified in the corres hlighted in yellow indicates text that should be coordinated with the entire spec book or represents ponding spec note.

Text hig sections that are options not found on every installation.

This document specification has been specifically written for the Stravifloor Channel system. Below is a schematic indication of the construction process from start to end as described in this specification.

|  |  |  |  |  |  |
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1. GENERAL
   1. Summary
      1. Section Includes:
         1. The Scope of Work includes for Products and/or Systems to isolate concrete based floating floor from building structure (Floating Floor Assembly) by means of discrete acoustical isolators under continuous lost formwork (i.e. plywood) panels and separated from perimeter by acoustical isolation board.
   2. Related SECTIONS
      1. The work under this section must consider the following sections :
         1. Submittal Procedures: Section 01 33 00
         2. Quality Control: Section 01 45 00.
         3. Close-Out Procedures: Section 01 77 00
         4. Cast-In-Place Concrete: Section 03 30 00
         5. Subflooring: Section 06 16 23
         6. Joint Sealants:  Section 07 92 00

***SPEC NOTE:***

1. *Stravifloor Channel systems require a flat and level structural floor to be specified. (Note to Specifier: FF 25 as minimum – meaning a single ¼’’ (6 mm) defect across 10-feet (3 m)).*
2. *Caulking: to be coordinated with appropriate specification or specified herein. Care should be taken to identify the proper acoustical caulking if in separate spec section.*
   1. Administrative Requirements
      1. Coordination:
         1. Closely coordinate and carry out jointly this Work with the placing of the secondary concrete slab.
         2. Place only sufficient isolation modules to permit placing formwork and concrete without disturbing isolation materials.
         3. Do not wheel concrete buggies over mesh.
      2. Conduct pre-installation readiness site reviews:
         1. Manufacturer or its representative shall attend a pre-installation readiness site review meeting to ascertain conditions prior to installation.
      3. Conduct post-installation site review:
         1. Manufacturer or its representative shall attend a post-installation site review meeting and confirm that installation has been conducted as per its instruction manuals prior to pour of concrete.
         2. Identified non-conformities must be rectified prior to pour of concrete.
   2. Submittals
      1. Submit required submittals in accordance with Section 01 33 00.
      2. Product data sheets:
         1. Submit manufacturer’s Product data sheets for Products and/or Systems proposed for use in the Scope of Work, including installation requirements, setting drawings, templates, installation requirements, and directions for installation of proposed solutions.
      3. Shop Drawings:
         1. Submit engineered Shop Drawings.
         2. In addition to the requirements of Section 01 33 00, Shop Drawings shall include the following information:
            1. Identification of project load conditions – Dead (DL), Live (LL), Superimposed (SiDL) loads.
            2. If concentrated loads are imposed on the System, then indicate Concentred Loads and type of load – i.e. point, linear and/or area.
            3. Identification of project Acoustic Design Load (ADL) and Serviceability Limit State (SLS) for all different load scenarios.

***SPEC NOTE:***

*Unless stated otherwise the Acoustic Design Load (ADL) and Serviceability Limit State (SLS) shall be calculated as follows:*

*ADL = DL + 100% SiDL + 25 % LL*

*and*

*SLS = DL + 100% SiDL + 100 % LL*

* + - 1. Shop Drawings shall also include Drawings indicating:
         1. Include a floor plan layout with all Loads indicated.
         2. Include a floor plan layout presenting all penetrations.
         3. Include a floor plan layout of all isolators to be installed on site, including identification of additional isolators needed to support concentrated loads.
         4. Include information regarding the size of all isolators on all plans.
         5. Include information related to spacing of all isolators.
         6. Include information related to the size, type, elevation and spacing of concrete reinforcement.
         7. [OPTION] Include an Assembly Plan with all “off-site” prefabricated panels numbered and the sequence of assembly on-site

***SPEC NOTE:***

*Item above should be removed if Item 2.5 of this spec section is removed.*

* + - 1. Shop Drawings shall also include Calculations indicating:
         1. All design assumptions regarding loading designs, at a minimum ADL and SLS shall be presented for all load areas.
         2. Provide design loads (DL and ADL) and Serviceability Limit State (SLS) for all isolators used on the project.
         3. Provide deflection and resonance frequency for each isolator indicated in the drawings and for all load conditions.
         4. [OPTION] If large horizontal loads are present, provide calculations for Acoustic Lateral Load Bearing Restrain Isolator Pads to restrain Acoustical Isolated Floating Floor.
         5. Calculations shall be presented in a clear and comprehensive manner so that they can be easily reviewed. Incomplete or haphazard calculations will not be reviewed and lead to Shop Drawing being rejected.
      2. Shop Drawings shall also include the following additional information:

***SPEC NOTE:***

*Item above should be removed if Item 2.4 .6 of this spec section is removed.*

* + - * 1. Dynamic (resonance frequency with load curves) and Static (deflection with load curves) property curves for all isolators used on the plan view.
        2. Acoustical test data from an independent laboratory showing required STC and IIC ratings for the floating floor assembly, with tests conducted within the last 10 years.
        3. Material datasheet for all other materials used in the design of the Floating Floor Assembly.

***SPEC NOTE:***

*Item above relative to Acoustical test data references a requirement for “tests conducted within the last 10 years”. It should be noted that this is different from the test report as it is common practise for laboratories to re-issue reports with new test report dates for testing that occurred outside of a 10-year test date.*

* 1. Closeout Submittals
     1. Submit closeout documentation in accordance with Section 01 77 00.
     2. Operation and maintenance data:
        1. If applicable, submit Manufacturer’s operation and maintenance instructions for inclusion in the operation and maintenance manuals~

1. PRODUCTS
   1. Acceptable Floor Isolation Systems
      1. Stravifloor Channel by CDM Stravitec

***SPEC NOTE:***

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* 1. Performance/Design Requirements:
     1. Intent:
        1. Isolated floating floor system shall consist of minimum 100 mm (4”) thick concrete slab, supported on 19 mm (3/4") lost formwork (i.e. plywood) and 50 mm (2”) vibration isolators.
        2. The air cavity between the isolated floating floor system and base structural floor shall be minimum 50 mm (2”).

***SPEC NOTE:***

*A standard Isolated Floating Floor Isolator is 50 mm (2’’) in height for most system manufacturers. This is the most common air cavity.*

*However, in order to reduce air stiffness in the cavity a higher cavity may be required per Acoustic Design.*

*Higher air cavity depths can be achieved by using over-heights (a.k.a. shims).*

*Additional information on over-heights is provided as a spec note on the Materials part of this section.*

* + - 1. Isolated floating floor shall be isolated from adjacent structures (e.g. walls, columns and/or curbs) by means of perimeter isolation board material.
      2. Floor penetrations such as piping, conduits and drains shall be isolated from the isolated floating floor by use of adequate isolation materials such as the perimeter isolation board material.
      3. Floor drains to be used on the isolated floating floor shall consist of two-piece isolated drains.
      4. Equipment on top of the isolated floating floor shall be mounted as indicated on drawings and/or acoustical report.
    1. Performance Requirements:
       1. Isolated floating floor system shall have the following minimum acoustic ratings:
          1. STC-67
          2. IIC-70
          3. Testing to be conducted by an independent laboratory.
          4. All testing to be conducted in the last 10-years.

***Stravi-dB:***

*CDM Stravitec provides various acoustic tests for different floor setups on* [*www.stravi-dB.com*](http://www.stravi-dB.com)*. In addition to the test reports, editable .csv files with data and typical cross-sections are also available.*

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* + - 1. Vibration isolation material to achieve a minimum 8 Hz resonance frequency at the Acoustic Design Load.

***SPEC NOTE:***

*A standard Isolated Floating Floor Isolator of 50 mm (2’’) in height is capable of achieve 8 Hz resonance frequency.*

*A smaller isolator (less than 50 mm (2’’)) can be provided; for instance, a 30 mm (1-3/16’’) thick isolator would result in a resonance frequency of approximately 10 Hz.*

*Lower resonance frequencies can be achieved with elastomeric isolators and steel springs. For the Stravifloor Channel the preferred use is with only elastomeric isolators. For a design with lower resonance frequency, modifications should be done to:*

*1. Thickness and type of flooring panels (i.e., higher density panel systems to be used as interlayers)*

*2. Type of isolator (i.e., moving to a steel spring system)*

*Please contact CDM Stravitec for assistance with the design of special floating floors with low resonance frequency.*

* 1. Concrete Slab:
     1. Conform to Division 3: Concrete (concrete slab, strength, reinforcement, construction and control joints, edge treatment, finish, and the like).
  2. Materials
     1. Formwork panels:
        1. Plywood: 19 mm (3/4”) thick exterior grade Douglas Fir plywood, solid 2 sides to CSA O121-08.
        2. Plywood edge splines or clips: designed to ensure panel edges and corners are securely joined and aligned in level plane without deflection.
        3. [ALTERNATE WORDING]: Formwork should be designed to achieve a deflection criterion of L/240 based on dead load and live load during the construction phase when concrete is being poured and isolator spacing requirements unless noted otherwise.

***SPEC NOTE:***

*Typical thickness and type of formwork boards, considering 4’’ (100 mm) of concrete poured without motorized carts:*

*Deflection criteria L/240:*

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*The bearing spacing will directly affect the performance of the overall system.*

*Deflection criteria:*

* *due to uniform loads, loading parallel to supports and considering normal weight concrete.*
* *following ACI committee 347 recommendations (formwork designed for a minimum LL of 2.4 kN/m² (50 psf) to provide for weight of workmen, runways, screeds and other equipment and minimum design load for combined dead and live loads not less than 4.8 kN/m² (100.25 psf)).*
* *Following ACI 318-14 (table 24.2.2 - maximum permissible calculated deflections,* [*http://aghababaie.usc.ac.ir/files/1506505203365.pdf*](http://aghababaie.usc.ac.ir/files/1506505203365.pdf)*), which references L/240 for roofs and floors supported or attached to non-structural elements, not likely to be damaged by large deflections.*

*Valid for multi-span systems (panel across three or more supports), normal duration of load an panels 24 inches (610 mm) or wider, following APA’s Panel Design Specification.*

*Deflection criteria related with other punctual loads to be checked by SEOR formwork/floating floor design.*

*Same type of table for other concrete thickness and/or slabs when motorized carts are used (minimum LL of 3.6 kN/m² (75.2 psf) and minimum design load for combined dead and live loads should not be less than 6.0 kN/m² (125.3 psf)), available upon request.*

* + 1. Vibration Isolators:
       1. Vibration Isolators shall be spaced taking into consideration the loads imposed and formwork type and thickness selected.
       2. Vibration Isolators shall be chosen by the manufacturer to ensure that the performance requirements set in this section.
       3. The Vibration Isolators shall have a creep rate < 1.5% (dec./min.) at maximum static load.

***SPEC NOTE:***

*In the text above no indication is made to the spacing of isolators. In previous specification sections standard maximum distances of 600 mm (~24”) are mentioned.*

*CDM Stravitec does not recommend using this as a base as it may provide an erroneous guidance to the distribution of isolators. Isolators spacing including maximum spacing between isolators should be defined based on both loads imposed on the formwork (including loads during construction) and the type and thickness of the formwork used.*

* + 1. Bond breaker material: 0.15 mm (6 mil) polyethylene sheeting.
    2. Bond breaker tape at joints and perimeter: waterproof adhesive tape as recommended by Isolated Floating Floor system Manufacturer.
    3. Perimeter Isolation Board: glass fiber performed boards with a minimum 20 mm (3/4”) thick, with an apparent density of 96 kg/m3 (6 lbs/ft3). *[OPTION] Perimeter Isolation Board shall be Formaldehyde-Free.*

***SPEC NOTE:***

*CDM Stravitec recommends one of two potential Perimeter Board:*

*1. Standard Item: Johns Manville Whispertone Wallboard - fine, rotary-process, borosilicate glass fibers bonded with a special thermosetting resin to produce a structurally rigid board-type insulation.*

*2. Formaldehyde-Free Item: Knauf Acoustical Smooth Board with ECOSE® Technology - inorganic glass fibers preformed into boards with ECOSE Technology. W/ UL Environment: GREENGUARD Certified, GREENGUARD Gold Certified, Validated to be Formaldehyde-Free and EUCEB Certified*

*Alternatively, use of a 3/8’’ (10 mm) resilient perimeter isolation strip with a minimum density of 20 lbs/cu-ft (320 kg/m3) in areas where seismic loading is considered is recommended.*

* + 1. [IF REQUIRED] Acoustic Lateral Load Bearing Isolator Pads: In order to isolate the Acoustical Floating Floor from horizontal movements due to large horizontal forces (e.g. seismic loads), Acoustic Lateral Load Bearing Isolator Pads shall be installed at the perimeter of the Acoustical Floating Floor. The Isolator Pad shall be designed to transfer the lateral forces without compromising the resonance frequency of the Acoustical Floating Floor.

***SPEC NOTE:***

*Load bearing lateral isolation restraints, as well as for projects in seismic zones which require edge restraint.*

*The restrain system itself can be composed of systems like concrete curbs or steel angles (not limited to these examples) and its design and implementation is not included in this section.*

* + 1. Acoustical Batt Insulation: Mineral wood batt insulation with a minimum 38 mm (1-1/2”) thick, with an apparent density of 40 kg/m3 (2.5 lbs/ft3). *[OPTION] Acoustical Batt Insulation shall be Formaldehyde-Free.*

***SPEC NOTE:***

*As a reference the thickness of the Acoustical Batt Insulation should be at least 75% of the cavity depth. So, for a 50 mm (2’’) air cavity a 37.5 mm (1-1/2”) Acoustical Batt Insulation is recommended.*

*CDM Stravitec recommends one of two potential Acoustical Batt Insulation:*

*1. Standard Item: Rockwool Acoustical Fire Batt (AFB) - lightweight, acoustical fire batt stone wool insulation specifically designed for steel stud and wood stud interior wall and floor applications – OR EQUIVALENT. This will depend on supply chain at time of project delivery.*

*2. Formaldehyde-Free Item: Knauf KN Series with ECOSE® Technology - flexible to semi-rigid blankets made from inorganic glass fibers bonded with ECOSE Technology. W/ UL Environment: GREENGUARD Certified, GREENGUARD Gold Certified, Validated to be Formaldehyde-Free and EUCEB Certified*

* + 1. Perimeter Sealant Compound: Non-hardening, drying or bleeding, trowel or pour grade sealant.

***SPEC NOTE:***

*CDM Stravitec recommends the use of Tremco Acoustical Sealant or equivalent.*

* + 1. [IF REQUIRED] Over-heights: When applicable to create larger air cavities Over-heights (or shims) can be used. Over-heights shall comply with the following conditions:
       1. Be made of rigid materials that can withstand the pressures imposed on the Vibration Isolators. Materials like concrete blocks, metal shims or wood shims/sleepers are appropriate. Material choice should take into consideration the potential presence of moisture or water.
       2. Be at least 25 mm (1”) larger than the isolator dimensions on all directions.
       3. Isolators shall be adhered to the shims.
       4. No limits are imposed in terms of maximum height, but an interconnection system should be considered to make the overall system stable if too height. The interconnected system should secure the formwork to the Over-height/Vibration Isolation assembly.

1. EXECUTION
   1. Installation

***SPEC NOTE:***

*Select & keep items #1. to #12. for systems to be assembled on-site*

* + 1. Setting of Isolated Floating Floor materials shall be performed by or under supervision of isolation manufacturer and/or its representatives.
    2. Set and waterproof drains and lower pipe seals.
    3. Install perimeter isolation board around walls, columns, curbs, and vertical penetrations.
    4. If concentrated loads are identified on the Shop Drawings identify the location of the loads in advance of placement of vibration isolators.
    5. Set gridline for isolators on structural slab.
    6. Place individual isolated channel with vibration isolators [OPTION: with designed Over-heights] on top of structural slab in accordance with reviewed and approved Shop Drawings.
    7. Place Acoustical Batt Insulation in cavity.
    8. Place formwork (i.e. plywood) on top of isolated channels and ensure that different panels are set tight against each other and secured with tie-plates. Joints should be staggered in one of the directions of the panels.
    9. Cover formwork (i.e. plywood) with bond breaking material and overlap and seal joints.
    10. Perimeter isolation board on walls, columns, curbs, and vertical penetrations shall be also covered with bond breaking material.
    11. Place reinforcing as shown on the drawings and pour floor monolithically.
    12. After concrete has cured, apply sealant over perimeter isolation board.
  1. Field Quality Control
     1. Manufacturer shall have established a Quality Control plan in accordance with Section 01 45 00.
     2. Manufacturer’s field review to be in accordance with Section 01 45 00.
     3. Upon completion, Manufacturer or it’s representative to submit a report attesting the proper installation of the Acoustically Isolated Floating floor.
  2. Protection
     1. Ensure that sound isolation is not disturbed or damaged during placing of formwork or concrete.
     2. Ensure that waterproofing membrane is not disturbed or damaged during placing of Sound Isolated Floating floor.

END OF SECTION