STANDARD FF/FL FLOOR TOLERANCE SPECIFICATION

A. **Random Traffic Floor & Slab Designation**: Any floor area that is not part of the Defined Traffic Floor is part of the Random Traffic Floor. Any floor slab that is part of the Random Traffic Floor is a Random Traffic Slab.

B. **Only Areas to Which Specified F-Number Tolerances Apply**

The Overall Values (OAFF- and OAFL-) specified herein shall apply only to the entire project floor when completed and to no sub-division thereof.

The Minimum Local Values (MLFF- and MLFL-) specified herein shall apply only to the rectangular Minimum Local Test Areas bounded either by the building's column and half-column lines, or to the rectangular Minimum Local Test Areas bounded by the slab's construction and saw cut control joints, whichever are the smaller rectangles.

C. Local Flatness/Levelness of Slabs-on-Grade: The slab-on-grade Random Traffic Floor shall conform to the following minimum F-number requirements:

Specified overall values : OAFF- (**G**) / OAFL- (**3G / 5**)
Minimum local values : MLFF- (**3G / 5**) / MLFL- (**9G / 25**)

D. **Local Flatness/Levelness of Elevated Slabs**: Except as set forth in Paragraph F below, the elevated Random Traffic Floor(s) shall conform to the following minimum F-number requirements:

Specified overall values : OAFF- (**E**) / OAFL- (**3E / 5**)
Minimum local values : MLFF- (**3E / 5**) / MLFL- (**9E / 25**)

E. **General Conformity to Design Grade**: Except as set forth in Paragraph F below, both the on-grade and elevated Random Traffic Floors shall fall within a 1½" deep horizontal envelope centered on their specified elevations.

F. **Exceptions**: The OAFL, MLFL, and grade conformity tolerances set forth in Paragraphs C, D, and E above shall not apply to any Random Traffic Slab that is to be inclined or cambered. The OAFL and MLFL tolerances set forth in Paragraphs C and D above shall not apply to any un-shored elevated slab construction. The general conformity to design grade tolerance set forth in Paragraph E above shall apply to un-shored elevated slab constructions, but in all such cases, the horizontal envelope depth shall be increased to 2½".

G. **Testing**: All floor flatness, levelness, and grade conformity tests shall be made (at the Owner's expense) on each newly installed Random Traffic Slab within 8 hours following completion of the final troweling operation.

All flatness and levelness tests shall be made in accordance with the latest revision of ASTM E1155.

Exception: The 320 ft^2 minimum test section area requirement given in paragraph 7.2.1 shall not apply.

If the FF and FL values exhibited by each of the survey lines comprising the initial test of a new Test Section meet or exceed both the specified MLFF and the specified MLFL, respectively, then that new Test Section shall be deemed "acceptable" for MLFF and MLFL compliance.

If the FF and FL values exhibited by one or more of the survey lines comprising the initial test of a new Test Section fail to meet or exceed both the specified MLFF and the specified MLFL, then that new Test Section shall be deemed "questionable" for MLFF and MLFL compliance.

All "questionable" Test Sections shall then be divided into Minimum Local Test Areas per Paragraph B above. Each Minimum Local Test Area crossed by a survey line that exhibited a sub-MLFF and/or sub-MLFL result shall then be tested individually for MLFF and MLFL compliance.

Grade conformity shall be tested either by measuring point elevations at 5-ft intervals in both directions (i.e. on a 5-ft grid) using an optical or laser level, or by translating the FE overall elevation envelope results reported by the F-Meter or D-Meter.

The technician making the floor profile tests shall hold a "Certified F-Number Technician Certificate" issued by Allen Face & Company LLC within the last 10 years.

H. **Reporting**: Initial FF and FL test results shall be reported using the "Daily FF/FL Report" Excel reporting program published by Allen Face & Company of Gilberts, IL at *http://www.allenface.com/projectmgmt.html*.

Minimum Local Test Area results shall be reported in tabular form listing the Minimum Local Test Area identified, the date of the test, and the associated FF and FL results. A plan marked to show each tested Minimum Local Test Area and its MLFF/MLFL compliance status shall accompany each tabulated Minimum Local Test Area report.

All floor tolerance test results - including a formal notice of acceptance or rejection of the work - shall be provided to the Flooring Installer

within 16 hours after data collection.

Failure to adhere to the testing and reporting requirements set forth in this paragraph shall constitute *de facto* acceptance of the work.

I. **Overall Deficiencies**: If the entire Random Traffic Floor, when completed, fails to meet or exceed either the specified OAFF, or the specified OAFL, or both, then the Flooring Installer shall rebate to the Owner the greater of the following two amounts:

either : **$1.00** x A_{FF} x OAFF / FF_{meas}
or : **$1.00** x A_{FL} x OAFL / FL_{meas}

where :
A_{FF} = Total ft^2 measuring below OAFF
A_{FL} = Total ft^2 measuring below OAFL
FF_{meas} = Measured overall FF-number
FL_{meas} = Measured overall FL-number

The defective square footages to be used in the above formulae shall be those calculated by the "Daily FF/FL Report" Excel program described in Paragraph G above.

J. **Minimum Local Deficiencies**: All Minimum Local Test Areas measuring at or above the specified MLFF number, at or above the specified MLFL number, and within the specified conformity to design grade tolerance shall be accepted for tolerance compliance as constructed.

All Minimum Local Test Areas which fail to meet or exceed the specified MLFF, or which fail to meet or exceed the specified MLFL, or which fail to fall within the specified grade conformity tolerance shall be corrected in their entirety.

On elevated slabs, such corrective work may take the form of grinding, skim coating, or depression-and-re-topping.

On slabs-on-grade, such corrective work may take the form of grinding, depression-and-re-topping, or removal-and-replacement.

In all cases, the particular method of correction to be employed shall be determined solely by the Owner.

K. **Incompatibility with Division 9 Floor Tolerances:** With regard to the flatness, levelness, and conformity to design grade of the Random Traffic Floor(s), the concrete flatwork contractor shall be bound solely by the

tolerances set forth herein, and shall in no way be bound by any floor tolerances set forth or implied elsewhere in these specifications.

Division 9 floor finish installers are advised that significant differences may exist between the concrete slab finish tolerances set forth in this section and those required for the installation of subsequent concrete floor coverings (e.g. carpet, tile, terrazzo, etc.), and that **all costs for any concrete floor repairs occasioned by any such floor tolerance differences shall be borne exclusively by the affected follow-on Division 9 floor covering contractor**.

L. **Additional Information**: A complete description of the F-Number System may be found in either the Apr '87 issue of CSI's Construction Specifier or the Jan '89 issue of ACI's Concrete International. More information may also be found at **www.allenface.com**.

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