

# 1 RCNY §15-06

## CHAPTER 15 FIRE PROTECTION

### §15-06 Design of Composite Construction with Metal Decks or Lightweight Concrete.

(a) Metal deck construction is to be approved strictly in accordance with Board of Standards and Appeals or MEA approval in all respects, with no interchangeability or equivalent materials authorized except as noted in these rules.

(b) When metal decks have been approved for use where a fire resistive floor or roof is required, equivalent materials may be authorized or interchanged for any of the components of the assembly by borough superintendents pursuant to §27-107 of the Administrative Code based on; [*sic*]

(1) Similar full scale tests conforming with A.S.T.M. E119-1988; or,

(2) A combination of small scale and/or half scale tests and engineering evaluation acceptable to the commissioner in conjunction with evaluation of full scale tests conforming with ASTM E119-1988 for a variety of assemblies of combination of materials, or

(3) A combination of small scale, half scale or full size tests representative of the actual fire exposure of the occupancy and engineering evaluations, all acceptable to the commissioner.

(c) When metal decks have been approved for use where a fire resistive floor or roof is required without any fire protection below the metal deck, they shall not be authorized in connection with composite beam design unless the approval specifies that the decks have been tested in accordance with both floor and beam requirements; or, alternately, fire protection is applied below the metal deck having the same thickness as that applied to the beam, for that width of slab acting as part of the composite beam, except that no such fire protection need be applied below the metal deck when the floor or roof slab and deck have a fire resistive rating at least equal to that of the supporting beams, e'c of the concrete fill-in is equal to or greater than 3000 p.s.i..

(d) Where the structural design is in accordance with load tests referred to in a board approval, the load carrying capacity can be accepted provided that design criteria for all structural elements are specified in the resolution of the board. Where the approval of the board simply makes general reference to other criteria, the following structural guidelines are to be adhered to, with respect to composite construction:

(1) Concrete in the ribs of metal decks is to be completely excluded in flexural computations, in the composite T-beam design. However, it may be included for bond calculations (which is to be based on allowable stresses of 20 p.s.i.) as well as shear stresses for slab action exclusively.

(2) Slab designs shall be required to comply with all applicable requirements of Reference Standards RS 10-3, and RS 10-5A with structural calculations submitted in all cases in regard to n ratios (see §1102(b) of RS 10-3), fiber [*sic*] stresses, shear stresses, bond stresses, length-deep and/or deflection limitations, and shear connection loads.

(3) The capacity of shear connectors in lightweight concrete shall only be rated at 80 percent of the values specified in Table 1.11.4 of Reference Standard RS 10-5 for normal weight aggregate. When metal decks with ribs not exceeding 1 and 1/2 inches in depth are used, the capacity of the shear connectors is to be further reduced by 15 percent, so as to have a total rated capacity of 65 percent of the values stated in Table 1.11.4 when lightweight concrete is used in composite construction with metal decks, and 85 percent when normal aggregate is used in such construction, unless prequalified load tests pursuant to §27-599 warrant higher values. Shear connectors not listed in Table 1.11.4, or differing on length or size may not be used without specific Board Approval for specific loads.

(4) When metal decks having ribs exceeding 1 and 1/2 inches in height are employed with composite construction, prequalified load tests of the slab and beam, pursuant to §27-599, shall be required before any approval is granted.

(5) All welding on [*sic*] shear connectors shall be performed by licensed welders, except as otherwise authorized in an intradepartmental memorandum dated June 6, 1967.