



CERAMIC TILE INSTITUTE OF AMERICA, INC.
12061 Jefferson Blvd., Culver City, CA 90230-6219

CTI FIELD REPORT 70-1-5 (R-85)

SUBJECT: METAL STUD CONSTRUCTION AND THE ONE FLOAT COAT METHOD

I. INTRODUCTION

- A. We all know that trends in construction are toward labor-saving methods and this certainly is true in the non-bearing partitions in modern buildings. Many of these are going up with pre-fabricated solid gypsum board and the other predominant type construction is steel studs.
- B. There are many different kinds, sizes and weights of metal stud and all of them are being used in modern structures. They may consist of 3/4 by 1/2 inch furring channels placed horizontally for runners with 3/4 by 1/2 inch furring channels tied to the runners for studs. In addition to these small members, we find metal studs 1 5/8 inch, 2 1/1 inch, 3 3/4 inch, 3 5/8 inch, 4 inches and 6 inches in width. It is not uncommon to find ceiling heights of 18 feet and metal studs are usually used in such construction.
- C. There are comparatively new light metal studs of 25 gauge metal, these also come in the same widths as noted above with the exception of the 3/4 by 1/2 inch channels. Placement for spacing these light gauge studs vary from 8 inches on center to up to 24 inches on center depending on many items that must be considered in the design. Included in the items to be considered would be the weight of a tile installation that may be placed on one or both sides of the partition.

II. DISCUSSION

- A. Using the One Float Coat System that the Ceramic Tile Institute has distributed to architects in the form of line drawings on a velum sheet, the walls were tiled on the toilet room at CBS Studios. After the surfaces were prepared for tile and before the tile was installed, the Ceramic Tile Institute was asked to go and look at the Prepared work. Although the work was successfully installed, our letter to the tile contracting firm outlines some of the problems that were encountered and may be encountered in other jobs using this type of construction.

July 10, 1969

Re: CBS Studio Center Office Building.

Dear Gi:

As discussed with you on the telephone I went to the site of the above-captioned project and inspected the tile walls that have been prepared by the lather using our one float coat system. I would like to list my findings and some observations that I am going to bring to the attention of our Job Problem and Technical CoCommittee regarding this installation:

- 1. I must agree with you that the Aqua K-Lath as installed leaves a lot to be desired and it is doubtful as to whether or not the tile could be adhered to the one coat of setting bed while that setting bed is in a plastic condition.*

Enclosed you will find a copy of the research recommendations of ICBO on our one float coat system. You will notice that it calls for a separate application of paper and wire.

It is believed that one of the problems with the installation is the use of the paper backed K-Lath and that if the paper and wire had been applied in two operations, a better installation would have resulted.

- 2. Again, referring to the research card, you will note that paragraph #7 gives an alternate which calls for the pre floating of the coat of mortar and the installation of the tile with a 118 inch thickness of thin set portland cement mortar. This is the installation you felt may be needed and we cannot quarrel with this method as long as the tile setters do the pre floating.*
- 3. The installation has 2-5/8 x 1-1/4 screw on type steel studs 24 inches on center; it is felt that this is an additional problem in getting the wire tight enough to set the tile while the float coat is in a plastic state. We never anticipated 24 inches on center studs because we felt that most steel studs would be 16 inches on center.*
- 4. 5/8 inch gypsum wall board has been screwed to the metal studs.*
- 5. The Aqua K-Lath has been screwed on through the gypsum board into the steel studs with 1 1/4 inch screws, with a 5/8 inch washer.*
- 6. I have examined the code and can find no requirements for fastening the wire between the 24 inch on center steel studs. It is felt that if large headed nails, slanted on penetration, or staples were used on the furring wire between the studs, this would fasten the wire down tightly.*
- 7. After much observation of our tile installation over steel studs, it is my belief that this type of installation may be what the tile*

diaphragm that give us all of the virtues we need for our tile installation.

- a. It eliminates the free standing tile installation that is subject to cracking, with the gypsum board providing a shear surface as a base for our installation.*
- b. It gives us a straight and true wall, removing the thick and thin areas in a conventional installation over steel studs.*
- c. It results in a comparatively uniform thickness of mortar throughout the installation.*
- d. It removes much of the shrinkage that is prevalent in the heavy applications of mortar in our conventional installations over steel studs.*

May I repeat again that this may be the answer to our problems over steel stud construction and would like to have your comments or the comments from anyone at your company regarding this item. Trust this will provide an evaluation of the conditions on this site. If you have any questions, please call.

Yours truly,

*G. N. Lavenberg
Managing Director*

GNL:M

Encl. (Research Recommendation)

- B. Robert N. Gulick, Executive Director, California Drywall Industry Trust Fund, has written a report on metal studs in housing. His article is on the use of 'the light metal 25 gauge studs which can be used up to 24 inches on center with single ply applications of gypsum wall board on each side. He built up an excellent case of why metal stud construction is desirable in housing and finished his article off saying, "Realize, we are not talking about a system soon to be released; on the contrary, this system is available and has proven itself in the commercial and high rise market. This plus factors we have reviewed - availability, cost control, quality control, compatibility and the fact that the system is functional are reasons enough to check out the cost factors with your drywall contractor".

III. A DRAPHRAGM

- A. It is believed that items 7 a, b, c and in the letter dated July 10, 1969 in the discussion section of this Field Report outlines a type of construction that should be given serious consideration by the tile industry. It does work and seemingly makes an excellent installation.
- B. The problem is to make the tile industry understand that we are promoting it and that the system will work if they do their work right.

IV. PREPARATION

- A. Again referring to the July 10, 1969 letter, some of the problems dealing with paper backed wire are outlined. Also, the type of fasteners that were used to penetrate into and fasten to the metal

- B. It is believed that much of the preparatory work in the One Float Coat system will be done by the tile industry. Tile contractors and tile mechanics must understand that the rough-in work is controlled by the building code every step of the way. Materials must be as per code and the installation must be as per code. This means that the fasteners must be one of those that is listed in certain tables listed in the building code. The building codes in the Los Angeles area do not allow installations to be fastened with small staples. Fasteners must be adequate and must penetrate a sufficient distance into the stud and button down tight.

ICBO Research Report
Wall Covering
Report No. 1920

International Conference of Building Officials

Report No. 1920

RESEARCH REPORT

Filing Category: WALL COVERING

**CERAMIC TILE INSTALLATION
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- I. **Subject:** Ceramic Tile Installation over materials adversely affected by moisture.
- II. **Description:** The following method of installation is used for ceramic tile application over backing materials of water-resistant gypsum wallboard, vinyl-faced gypsum wallboard, gypsum plaster, plywood, wood particleboard and similar materials in areas regulated by Section 1711 of the code:
1. The backing materials specified above are attached to the studs as required. by the Uniform Building Code.
 2. Asphalt-saturated felt, free from holes and breaks and weighing not less than 14 pounds per 100 square feet, is applied over the backing material The felt is lapped not less than 2 inches at horizontal joints and not less than 6 inches at vertical joints. Where vinyl-faced gypsum wallboard is used as the backing mater, the asphalt-saturated felt may be omitted.
 3. Metal reinforcement is applied over the asphalt-saturated felt and is furred out from the backing at least 1/4 inch by an approved furring method and shall be nailed with galvanized nails having a sufficient length to penetrate the studs at least % inch with nail spacing conforming to code requirements. Horizontal and vertical laps of the reinforcing metal are 2 inches for metal lath and one full mesh for wire fabric.

4. A 1/2-inch-thick coat of Portland cement mortar is applied over the metal lath.
 5. A thin coat of neat portland cement is applied to a thickness of A inch to A inch over the still plastic portland cement mortar.
 6. Ceramic tile is applied over the thin coat of cement to complete the installation.
 7. An alternate to paragraphs 4 and 5 is to allow the mortar bed to cure a minimum of 48 hours and bond the tile with a 3/8-inch thickness of thin set portland cement mortar.
- III. **Evidence Submitted:** Recommended ceramic tile installation procedures are submitted.

Findings

- IV. **Findings: That the application procedure described in this report is an alternate method of construction to that specified in the 1982 Uniform Building Code for ceramic tile installation in shower and bath areas.**
This report is subject to re-examination in two years.

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