When fire resistant assemblies are the point of discussion with architects, building inspectors or fire service personnel, gypsum or masonry block units are the materials most often debated and detailed. They are the materials most often advertised, while little new material has been offered to advance the excellent fire protection features of Portland cement-based plaster assemblies. The effort to promote the use of Portland cement stucco for fire resistance has been left to local or state-wide contractor association personnel. Up to this point, these dedicated people have been doing a pretty good job with very little support.

**Foundation Takes Action**

Recognizing the superior qualities of fire resistant Portland cement assemblies, The Foundation of the Wall and Ceiling Industry made the commitment to gather as many fire-rated assemblies as possible in which Portland cement stucco/plaster provided the fire protection. Qualifying assemblies included walls, partitions, floor or roof/ceiling assemblies, and membrane protection for beams, trusses and columns. All had been tested and/or accepted by building and fire officials as meeting the requirements to provide a certain degree of fire protection.

The results of this research have been published in a new book entitled *Single Source Document on Fire-Rated Portland Cement-Based Plaster Assemblies*.

This publication was created through the efforts of a large number of interested individuals who contributed their time and willingly shared their knowledge of the subject. Over 70 assemblies have been detailed—complete with drawings—and classified by the assigned hourly fire resistance rating. The introductory section by itself is a valuable educational treatise on Portland cement-based plaster, while the body of the document holds the potential for profits to all who take advantage of these competitive fire resistive assemblies.

**Valuable Tool for Rehab Evaluations**

Using the *Single Source Document* as a guide to the inspection of inplace assemblies, the knowledgeable
Contractor can find the rating assigned, the materials used and the method of application to make the best evaluation possible. Because many of these assemblies were developed, tested and used several decades ago, some of the materials used are no longer available. Although these assemblies may not be able to be built today, they may be very useful when in-place construction must be evaluated for either maintenance, removal or replacement. For example, asbestos fiber was used in a few of the assemblies, and certain steel wire studs are no longer being manufactured. Some assemblies require that steel studs be manufactured on the job by using angles back-to-back.

Competing with Other Products

Portland cement-based plaster can compete with other materials which the contractor does not normally provide, such as concrete block. Under the Standard Building Code published by the Southern Building Code Congress International (SBCCI), a fire wall must have a four-hour fire resistance rating. There are only a few multilayered gypsum board assemblies listed in the current edition of the Gypsum Association’s Fire Resistance Design Manual that meet this four-hour requirement. This might appear to leave the market wide open for masonry units (cement block), but the Single Source Document details several assemblies which meet the four hour requirement. As a bonus, these assemblies take up less floor space than gypsum board or block and can be installed with continuous spray-on application. This is truly a competitive tool which needs to be added to the contractor’s arsenal of profitable assemblies.

Format: Complete Information at a Glance

The assembly description pages of the document are arranged in three columns: assembly identification; assembly descriptions; and assembly drawings with call-outs.

Assembly Identification

The first column lists (1) the assigned hourly rating; (2) the agency issuing the rating; (3) the assembly’s load-bearing ability; and (4) appropriate company code letters.

1. Assigned Hourly Rating: The assemblies are arranged in descending order of hourly rating, beginning with four hours.

2. Test Source or Agency: These agencies include the American Insurance Services Group, Factory Mutual, the National Bureau of Standards, Ohio State University, Underwriters Laboratories, Inc.’s 1990 Fire Resistance Directory, the ICBO Uniform Building Code and the University of California. Mailing addresses and phone numbers are listed in supplemental appendices located in the back of the document.

It should be noted that when the Uniform Building Code Tables 43A, B and C, are quoted as the source for an
assembly, the International Conference of Building Officials (ICBO) should be contacted for additional detailed information.

3. **Load-bearing Ability:** Most of the assemblies are listed as Non-Load Bearing (NLB). When using one of the Load-Bearing (LB) assemblies, the design criteria must be examined to ascertain the load limit allowed by the fire test assembly. Loads imposed must not exceed those limits set by the testing agency.

4. **Company Code Letters:** These code letters refer to manufacturers who have sponsored tests of assemblies incorporating their own proprietary products. These manufacturer’s have taken the time and money to research and test marketable assemblies utilizing Portland-cement plaster, and as users, contractors can profit from their research and development efforts.

   Where company code letters appear in the Single Source Document the assembly must be built with the same materials and in the same manner as that which was fire tested. Their proprietary products should be used in every case except where the product is no longer available and in such cases, only with the concurrence of the testing agency can a substitute be offered.

   A good many assemblies were designed for use in exterior locations and, as such, were tested from the interior side in keeping with building code requirements. A notation in the first column indicates when an assembly was tested from the exterior side. In these cases, the interior side must be shown to have a greater fire resistance and thus, the weaker fire resistant side was exposed to the fire.

**Assembly Description**

   The detailed descriptions in the center column take the reader from the exterior side through the construction to the interior. Of course, this is not the way the assembly was built. However, this method of describing the assembly helps inspectors determine exactly what components were used for the construction even though it may have been built many years ago. It also allows the educated observer to more easily ascertain what fire resistance rating might have been assigned to the assembly.

   The interior side of the assembly may be detailed or it may simply state, “Finish as required.” The latter indicates that the fire rating was established without an interior finish in place, thereby allowing the designer to choose any interior finish which meets code requirements.

**Assembly Drawings**

   The third column shows a cross sectional drawing of each assembly. The “call-outs” are offered as an aid to the reader to better identify the materials and their locations in the construction. Each material used has its own graphic symbol, and the detailed description should be checked if there is question about a product.
Reference Guide

It cannot be over-emphasized that this *Single Source Document* is a reference guide and should be used as such. When an assembly listed in the book is offered for use in the construction of a new building, it should be established that it meets the requirements of the design intent as well as the local building code. All necessary parties must understand and concur with the selection. If at all possible, a copy of the fire test should be obtained so that the details of the materials and mixes used as well as the application procedures can be duplicated as closely as possible to that which was fire tested.

It is hoped that this *Single Source Document* will assist the wall and ceiling industry in the manner envisioned by those who saw the need for this publication. Not every fire rated portland cement-based stucco plaster assembly has been included in the listing. If you have been using a properly tested and approved assembly not found in our document, please submit it to the Foundation for consideration to be included in a future edition. If you have suggestions for improving the document, send them along to the Foundation office. Your comments will be most appreciated.

About the Author

David E. Brackett has served the gypsum industry for over 30 years, including 22 years with the Gypsum Association. Operating as consultants to the wall and ceiling industry, his firm, David E. Brackett & Associates, Gypsum Consultants, offers services specializing in building codes, product and application standards, fire and sound testing and ratings, litigation and marketing of gypsum related products.