

# codes & standards

## The Unknown ASCE Standard

### Have You Ever Heard Of SEI/ASCE 30?

By Carl A. Baumert, Jr. PE

SEI/ASCE 30, *Guideline for Condition Assessment of the Building Envelope*, was published in 2000 as a companion to SEI/ASCE 11-99, *Guideline for Structural Condition Assessment of Existing Buildings*. The two standards share the same basic format. Both were produced by the Standards Committee for Structural Condition Assessment and Rehabilitation of Buildings.

All sections of the Building Envelope Guideline were written by practitioners active in that field. Considerable input was received from many individuals, agencies, professional and trade associations prior to and during balloting in accordance with the ANSI consensus process. Approval and preparation for publication followed the public ballot.

The synopsis of the Standard presented here will acquaint you with its content. There is much information that may aid you in your practice.

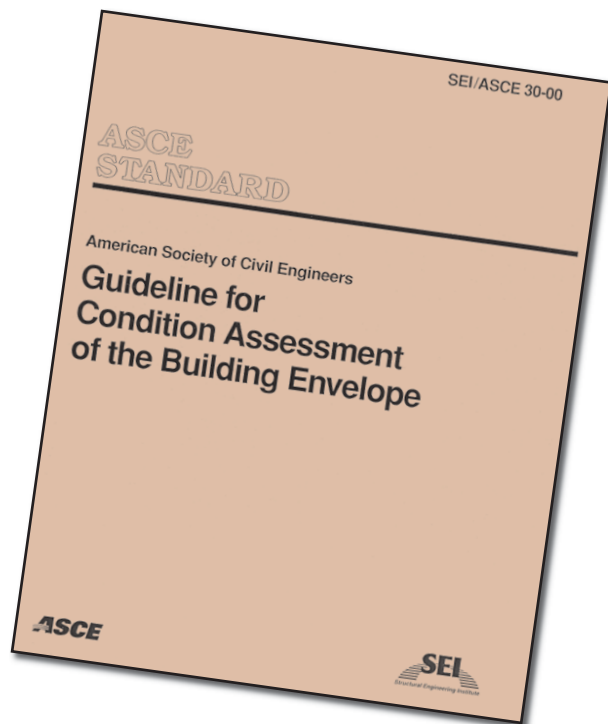
### 1.0 General

As adaptive reuse, rehabilitation, and improvements of existing buildings moved into the forefront, accurate condition assessment of the building became more critical. The condition of the building envelope is most important since failures can result in safety and health problems, as well as structural damage.

Proper evaluation of the building envelope is often the initial step toward stabilization and rehabilitation of the building.

Much information is available for various materials, components, and systems from manufacturers, organizations, and practitioners; however, such information often has not been integrated into a rational approach to condition assessment. The committee compiled basic information, procedures, and references into this Guideline and subjected it to a consensus review. The Guideline was prepared for use by qualified design professionals and regulatory officials.

The Standard is intended to provide a guideline and methodology for assessing the condition and performance of extant building envelope systems and components and identification of problem areas and dysfunctional elements. It is equally valid whether the building



envelope serves solely as cladding, or is load bearing as well. Either system will transmit lateral forces to the building structure.

Although written primarily for a consultant-client relationship, modifications may be made for condition assessments performed by staff personnel of public agencies and multi-building owners for facilities management.

The Guideline presents an assessment procedure including investigation, testing methods, and a format for the report of the assessment. It will assist the investigator in developing a logical approach to the assessment of the building envelope to focus on basic defects rather than their outward symptoms.

Reasons for condition assessment of the building envelope may include life safety, code compliance, performance report, planning for maintenance and repair, establishing serviceability, or other special purposes.

The emphasis of the condition assessment of the building envelope may be on its performance as a separation between the interior and exterior environments. In other cases, it may be directed toward the performance of the materials and assemblies of the envelope itself. Prevention of water and air intrusion must be considered in either event.

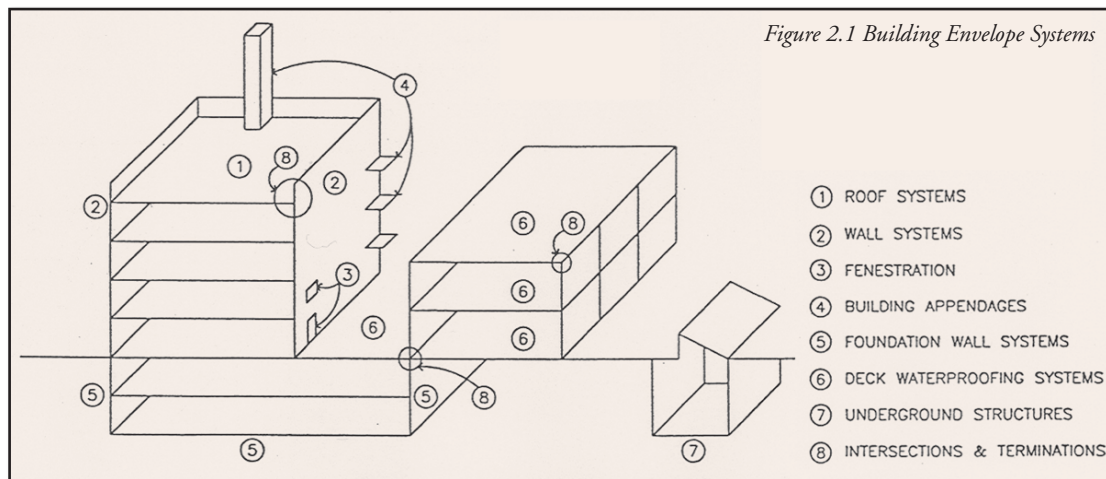


Figure 2.1 Building Envelope Systems

## 2.0 Building Envelope Systems, Component Features and Materials

Chapter 2.0 of the Standard describes Building Envelope Systems, Component Features and Materials in some detail. A building envelope system may be comprised of similar or dissimilar elements and components, sometimes with disparate physical properties. An understanding of the properties and behavior of individual materials, as well as of the system, is essential in the assessment of the performance of the building envelope.

Building envelope system categories were taken as roof systems, wall systems, fenestration, building appendages, foundation systems, plaza deck systems and underground structures. Intersections and terminations of the various systems are usually critical areas of concern. (Figure 2.1)

- Roof Systems-Low slope and steep slope components and various coverings are discussed in this section.

- Wall Systems-Wall systems may be load bearing or non load bearing, and may serve as a shear wall to resist in-plane lateral forces. All systems will transfer out-of-plane lateral forces to the building structure. Basic design methods to resist water penetration are the barrier wall, drainage wall, surface sealed wall and rain screen/pressure equalization wall. (Figure 2.2)

Various load bearing and non load bearing wall systems and components are described and summarized in Table 2.1

- Fenestration Systems, Foundation Wall Systems, Deck Waterproofing Systems, Underground Structures, Intersections and Terminations are also described and discussed.

- System Component Features range from acoustical resistance to wildlife resistance and are shown schematically in Figure 2.3. These relate to performance of the envelope system and must be considered as part of the condition assessment.

*Continued on next page*

Wall Construction	Load Bearing		Barrier Wall System	Drainage Wall System	Surface Sealed System	Rainscreen/Pressure Equalization Wall System
	Yes	No				
2.4.5 Unreinforced concrete	x		x			
2.4.6 Reinforced concrete	x		x			
2.4.7 Precast concrete	x		x			x (at panel joints)
2.4.8 Unreinforced masonry	x		x			
2.4.9 Reinforced masonry	x		x			
2.4.10 Unreinforced masonry cavity wall	x			x		x
2.4.11 Reinforced masonry cavity wall	x			x		x
2.4.12 Masonry veneer with wood or steel stud back-up	x			x		x
2.4.13 Siding systems with wood or steel stud back-up	x		x		x	x
2.4.14 Architectural precast concrete	x	x	x			x (at panel joints)
2.4.15 Glass fiber reinforced concrete panel	x	x	x			x (at panel joints)
2.4.16 Aluminum frame curtain wall		x			x	x
2.4.17 Interlocking metal panel wall		x	x		x	x
2.4.18 Thin stone veneer panel		x	x		x	x
2.4.19 Prefabricated masonry panels		x	x	x		x

### 3.0 Condition Assessment Procedure

The intent of the procedure presented is to understand the functional behavior of the building envelope, analyze its performance, and identify differences between its intended behavior and actual performance. A two phase approach is recommended, where the second phase expands upon the first if deemed to be necessary by the client and the investigator. The scope for each phase should be clearly defined and agreed to by the client before beginning work on either phase.

- Preliminary Condition Assessment will include general observations, document review, interview of involved parties, and identification of problem areas. The preliminary report will include the preliminary findings, legal or code compliance issues, preliminary conclusions and recommendations.

- Detailed Condition Assessment, as implied, is a more thorough review of field conditions, documents, and testing. Other consultants may be engaged for specific issues outside the investigator's purview. The final report will cover all office and field work, analysis, and recommendations.

- Flow Chart. (Figure 3.1)

### 4.0 Evaluation

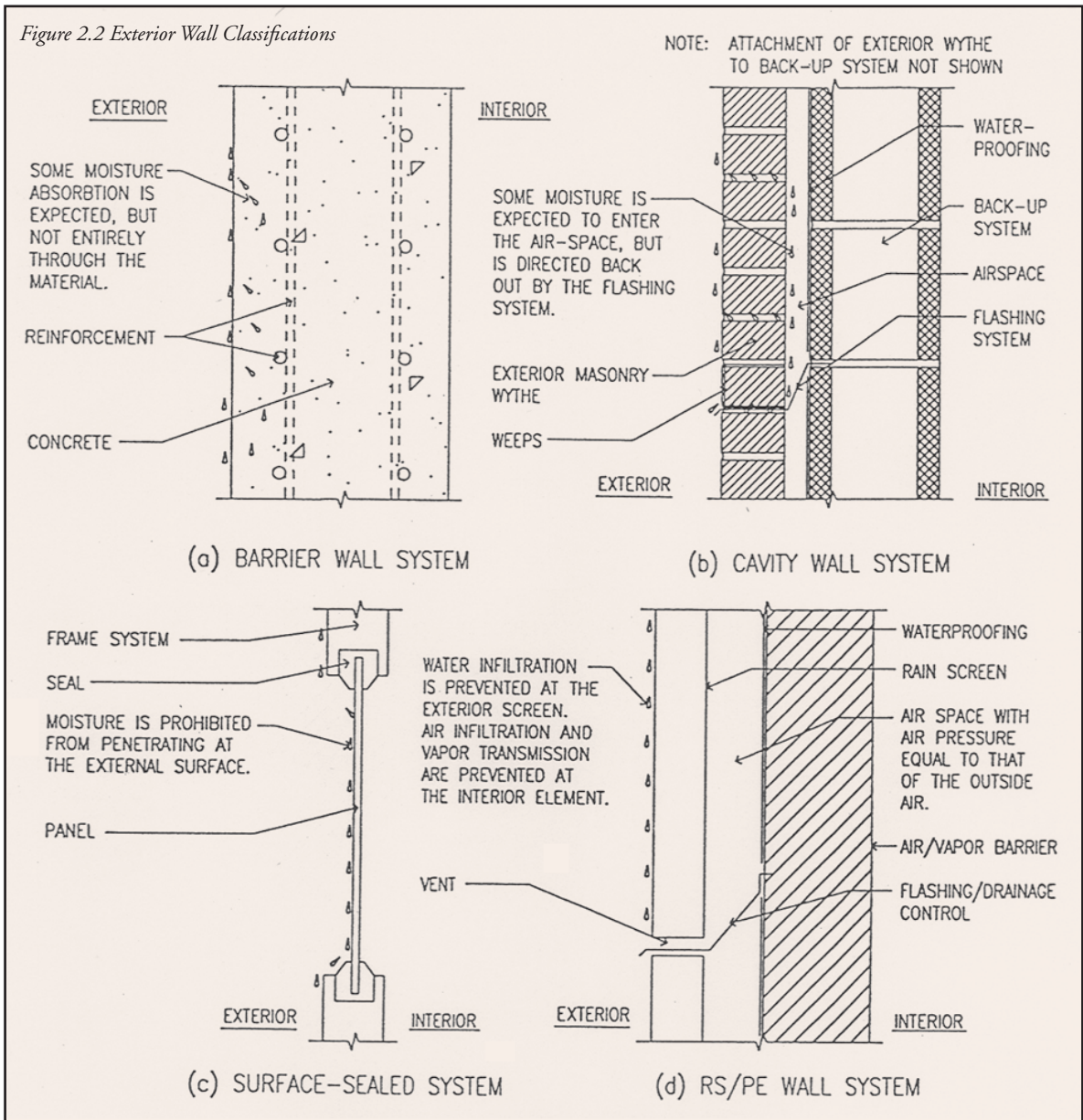
Evaluation is the process of determining the adequacy of the building envelope or components for their intended use, considering compiled data, field condition assessment, test results, and acceptance criteria.

Items discussed in this chapter include methods, acceptance criteria, performance attributes, objectives, and analysis. Priorities will always be life safety on the exterior and health and welfare of the occupants on the interior.

### 5.0 Report of the Condition Assessment

The scope and content of the report should be consistent with the scope of the assignment. A check list may suffice for a cursory Assessment, a letter report for a Preliminary Assessment, and a full report for the Detailed Condition Assessment.

This chapter discusses many items to be considered for the full report, based upon the preceding chapters and the investigation.





APPENDIX A is an outline of the Report of Condition Assessment. It may be used as a check list during the investigation and preparation of the report.

APPENDIX B includes Building Exteriors Performance References.

BIBLIOGRAPHY contains an extensive list of references to pertinent papers over many years.

SEI/ASCE 30.00 is a valuable resource for use by the practitioner and may be of benefit for building owners and facility managers.

The Standard is presently being updated by the committee. Comments and suggestions would be welcomed, and may be sent to [Dderess@wje.com](mailto:Dderess@wje.com) or [cab@keast-and-hood.com](mailto:cab@keast-and-hood.com).

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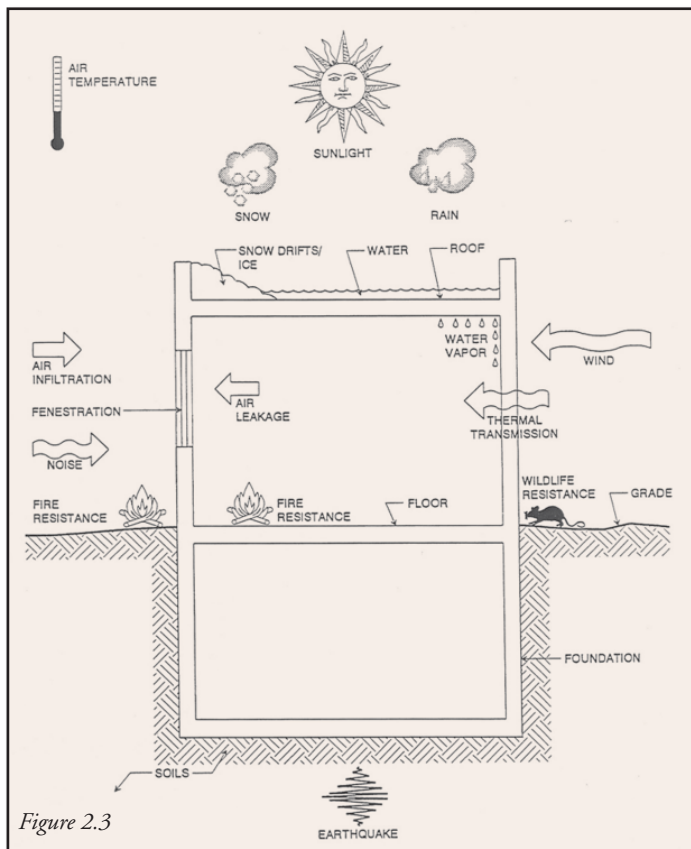


Figure 2.3

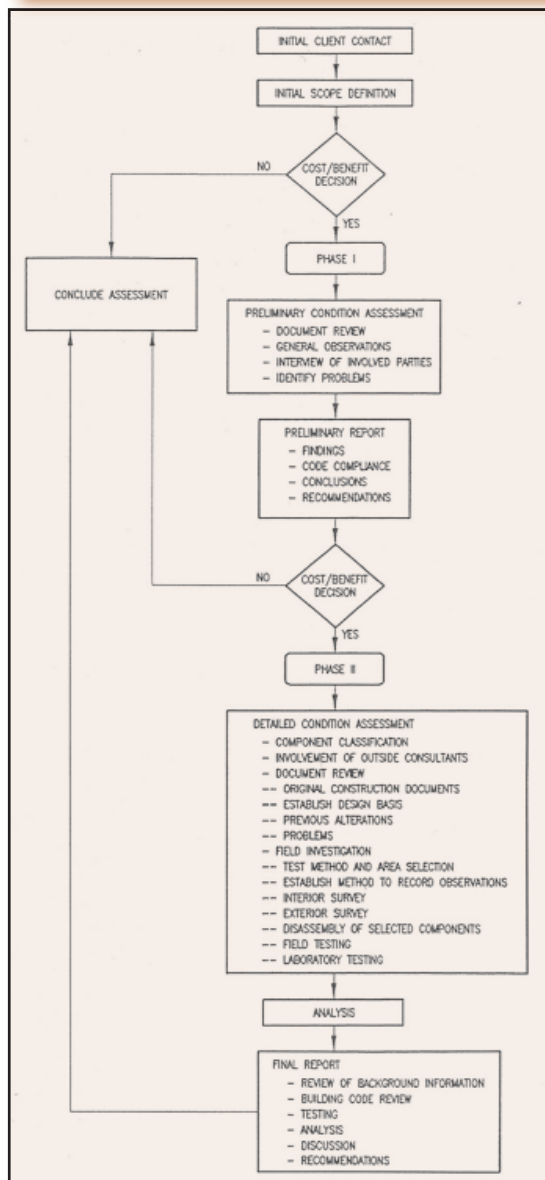


Figure 3.1 Condition Assessment, Single Building Envelope

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