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Guideline for Condition Assessment of the Building Envelope

This document uses both the International System of Units (SI) and customary units

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STANDARDS

In 2006, the Board of Direction approved the revision to the ASCE Rules for Standards Committees to govern the writing and maintenance of standards developed by the Society. All such standards are developed by a consensus standards process managed by the Society's Codes and Standards Committee (CSC). The consensus process includes balloting by a balanced standards committee made up of Society members and nonmembers, balloting by the membership of the Society as a whole, and balloting by the public. All standards are updated or reaffirmed by the same process at intervals not exceeding five years.

The following standards have been issued:

ANSI/ASCE 1-82 N-725 Guideline for Design and Analysis of Nuclear Safety Related Earth Structures
ASCE/EWRI 2-06 Measurement of Oxygen Transfer in Clean Water
ANSI/ASCE 3-91 Standard for the Structural Design of Composite Slabs and ANSI/ASCE 9-91 Standard Practice for the Construction and Inspection of Composite Slabs
ASCE 4-98 Seismic Analysis of Safety-Related Nuclear Structures
Building Code Requirements for Masonry Structures (ACI 530-13/ASCE 5-13/TMS 402-13) and Specifications for Masonry Structures (ACI 530.1-13/ASCE 6-13/TMS 602-13)
ASCE/SEI 7-10 Minimum Design Loads for Buildings and Other Structures
SEI/ASCE 8-02 Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members
ANSI/ASCE 9-91 listed with ASCE 3-91
ASCE 10-97 Design of Latticed Steel Transmission Structures
SEI/ASCE 11-99 Guideline for Structural Condition Assessment of Existing Buildings
ASCE/EWRI 12-13 Standard Guidelines for the Design of Urban Subsurface Drainage
ASCE/EWRI 13-13 Standard Guidelines for the Installation of Urban Subsurface Drainage
ASCE/EWRI 14-13 Standard Guidelines for the Operation and Maintenance of Urban Subsurface Drainage
ASCE 15-98 Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)
ASCE 16-95 Standard for Load Resistance Factor Design (LRFD) of Engineered Wood Construction
ASCE 17-96 Air-Supported Structures
ASCE 18-96 Standard Guidelines for In-Process Oxygen Transfer Testing
ASCE 19-10 Structural Applications of Steel Cables for Buildings
ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations
ANSI/ASCE/T&DI 21-13 Automated People Mover Standards
SEI/ASCE 23-97 Specification for Structural Steel Beams with Web Openings
ASCE/SEI 24-05 Flood Resistant Design and Construction
ASCE/SEI 25-06 Earthquake-Actuated Automatic Gas Shutoff Devices
ASCE 26-97 Standard Practice for Design of Buried Precast Concrete Box Sections
ASCE 27-00 Standard Practice for Direct Design of Precast Concrete Pipe for Jacking in Trenchless Construction
ASCE 28-00 Standard Practice for Direct Design of Precast Concrete Box Sections for Jacking in Trenchless Construction
ASCE/SEI/SFPE 29-05 Standard Calculation Methods for Structural Fire Protection
SEI/ASCE 30-14 Guideline for Condition Assessment of the Building Envelope
SEI/ASCE 31-03 Seismic Evaluation of Existing Buildings
SEI/ASCE 32-01 Design and Construction of Frost-Protected Shallow Foundations
EWRI/ASCE 33-09 Comprehensive Transboundary International Water Quality Management Agreement
EWRI/ASCE 34-01 Standard Guidelines for Artificial Recharge of Ground Water
EWRI/ASCE 35-01 Guidelines for Quality Assurance of Installed Fine-Pore Aeration Equipment
CI/ASCE 36-01 Standard Construction Guidelines for Microtunneling
SEI/ASCE 37-02 Design Loads on Structures during Construction
CI/ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data
EWRI/ASCE 39-03 Standard Practice for the Design and Operation of Hail Suppression Projects
ASCE/EWRI 40-03 Regulated Riparian Model Water Code
ASCE/SEI 41-06 Seismic Rehabilitation of Existing Buildings
ASCE/EWRI 42-04 Standard Practice for the Design and Operation of Precipitation Enhancement Projects
ASCE/SEI 43-05 Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities
ASCE/EWRI 44-05 Standard Practice for the Design and Operation of Supercooled Fog Dispersal Projects
ASCE/EWRI 45-05 Standard Guidelines for the Design of Urban Stormwater Systems
ASCE/EWRI 46-05 Standard Guidelines for the Installation of Urban Stormwater Systems
ASCE/EWRI 47-05 Standard Guidelines for the Operation and Maintenance of Urban Stormwater Systems
ASCE/SEI 48-11 Design of Steel Transmission Pole Structures
ASCE/SEI 49-12 Wind Tunnel Testing for Buildings and Other Structures
ASCE/EWRI 50-08 Standard Guideline for Fitting Saturated Hydraulic Conductivity Using Probability Density Functions
ASCE/EWRI 51-08 Standard Guideline for Calculating the Effective Saturated Hydraulic Conductivity
ASCE/SEI 52-10 Design of Fiberglass-Reinforced Plastic (FRP) Stacks
ASCE/G-I 53-10 Compaction Grouting Consensus Guide
ASCE/EWRI 54-10 Standard Guideline for Geostatistical Estimation and Block-Averaging of Homogeneous and Isotropic Saturated Hydraulic Conductivity
ASCE/SEI 55-10 Tensile Membrane Structures
ANSI/ASCE/EWRI 56-10 Guidelines for the Physical Security of Water Utilities
ANSI/ASCE/EWRI 57-10 Guidelines for the Physical Security of Wastewater/Stormwater Utilities
ASCE/T&DI/ICPI 58-10 Structural Design of Interlocking Concrete Pavement for Municipal Streets and Roadways
ASCE/SEI 59-11 Blast Protection of Buildings
ASCE/EWRI 60-12 Guidelines for Development of Effective Water Sharing Agreement

FOREWORD

The Board of Direction approved revisions to the ASCE Rules for Standards Committees to govern the writing and maintenance of standards developed by ASCE. All such standards are developed by a consensus standards process managed by the ASCE Codes and Standards Committee (CSC). The consensus process includes balloting by a balanced standards committee and reviewing during a public comment period. All standards are updated or reaffirmed by the same process at intervals of five years.

This standard has been prepared in accordance with recognized engineering principles and should not be used without the user's competent knowledge for a given application. The publication of this standard by ASCE is not intended to warrant that the information contained therein is suitable for any general or specific use, and ASCE takes no position respecting the validity of patent rights. The user is advised that the determination of patent rights or risk of infringement is entirely their own responsibility.

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This revision of the standard began in 2001 and incorporates information as described in the commentary.

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CHAPTER 1
GENERAL

1.1 SCOPE AND INTENT

The intent of this standard is to provide a guideline and methodology for assessing the condition and performance of existing building envelope systems and components and identifying problematic and dysfunctional elements. It applies equally to a building's envelope or portion whose primary purpose may be to serve as the supporting structural system of the building. The reader may also wish to refer to ASCE Standard 11—*Guideline for Structural Condition Assessment of Existing Buildings*. This standard may be a source of comprehensive information for clients such as building owners, prospective purchasers, tenants, regulatory officials, and others.

This standard is primarily directed toward a consultant–client relationship; modifications may be made to the content for condition assessments performed by staff personnel of public agencies and multibuilding owners for management of facilities.

This standard establishes an assessment procedure including investigation, testing methods, and a form for the report of the condition assessment. It assists the investigator in developing a logical approach to the assessment of the building envelope to focus on fundamental defects rather than outward symptoms. The possibility of encountering hazardous materials, such as lead-based paint and asbestos-containing materials, should be considered.

Because any evaluation involves "professional judgment" and contains factors that cannot be readily defined and standardized, a section providing guidance is also included. This section must be used by the design professional as part of the evaluation.

1.2 PURPOSE OF ASSESSMENT

Condition assessment of an existing building envelope may be undertaken for a number of purposes. These purposes may include developing a performance report, establishing building serviceability, planning for maintenance or repair, code compliance, life safety, durability, historic preservation, or a number of special purposes based on the specific building and its current or proposed occupancy or function.

1.3 TYPES OF ASSESSMENT

1.3.1 Cursory Assessment. This is a visual overview of the general condition of the building envelope. It is often used for screening multiple buildings to establish priorities for maintenance and repair or further study.

1.3.2 Preliminary Assessment. A preliminary condition assessment is usually limited in scope. It consists of a site visit for familiarization and to identify problem areas, a review of available documents, an interview of involved parties, and a preliminary report of findings and recommendations.

1.3.3 Detailed Assessment. This is an expansion of the preliminary assessment. It includes a review of documentation, component classification, field investigation, testing, analysis, and report.

1.4 SAFETY

Numerous types of circumstances present a potential hazard to the safety of the personnel involved. Considerations regarding the fieldwork must also allow for the safety of the building occupants and the general public. The responsibility for safety falls upon those involved in the assessment. Structures being assessed may be dangerous and must be made stable to at least an extent to allow inspection access before conducting the assessment in accordance with OSHA and state and local requirements.

1.5 QUALIFICATIONS AND EQUIPMENT

1.5.1 Personnel Qualifications. All personnel involved in the assessment shall possess the technical qualifications, including practical experience, education, and professional judgment required to perform the individual technical tasks assigned. Interpretation of results and conclusions shall be performed by a design professional qualified in the appropriate discipline.

1.5.2 Equipment. Equipment shall be obtained as appropriate to accomplish or perform the various tests and inspection methods specified in the standard. Whenever necessary, equipment shall include items needed to provide a safe work environment for all those involved, building occupants, and the general public. All equipment shall be in good working order. For equipment that should be calibrated for proper use in the given application, reports of calibration shall be available and the results provided if requested.

1.6 AGREEMENTS

1.6.1 Services. The scope of services for the condition assessment, including any limitations, shall be defined by the design professional, and all conditions, applicable codes and standards, and services shall be mutually agreed upon by the client and design professional. Services may include one or more of the identified purposes of the assessment and may involve one or more specific building envelope components or systems covered in the subsections of this standard. A complete and thorough quantifiable understanding of the attributes of some building assemblies or components may not be possible during the assessment. The scope should be established and a written agreement obtained before commencing the condition assessment or