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The complete AESS Document Series is available through the Australian Steel Institute and Steel Construction New Zealand.

AESS A Guide for Specifying Architecturally Exposed Structural Steel (for Architects)

AESS E Sample Specification (for Engineers)

AESS F ASI Code of Practice (for Fabricators) / NZS 3404.1:2009

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1 The Challenge

What is AESS?

Architecturally Exposed Structural Steel, AESS, is steel that must be designed to be both structurally sufficient to support the primary needs of the structure of the building, canopies, ancillary structures or pedestrian scale bridges, while at the same time be exposed to view, and therefore is a significant part of the architectural language of the building or structure. The design, detailing and finish requirements of AESS will typically exceed that of standard structural steel that is normally concealed by other finishes. AESS must be durable and maintainable. It must be able to resist corrosion if placed in a hostile environment and the design and finishes must also be resistant to urban pollution and general wear.

About the Guide

The Guide was developed to facilitate better communication amongst Architect, Engineer and Fabricator. It was felt that visual references would help all parties to understand the detailed intentions of the new Architecturally Exposed Structural Steel Specifications as these would be applied to the design of structures.

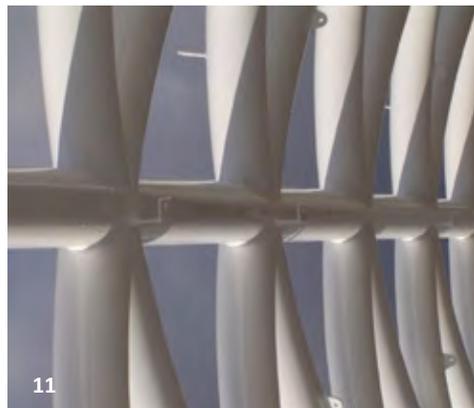
The Guide serves as a companion to two other AESS documents:

AESS E Sample Specification (for Engineers)

AESS F ASI Code of Practice (for Fabricators) / NZS 3404.1:2009

Both include the AESS Matrix.

The Guide was created primarily for Architects but is also intended for all design professionals interested in AESS applications. In terms of the relationship between the new AESS documents and specific areas of practice, Engineers and Fabricators have role related specifications, Architects have the Guide, and all are linked by the Matrix of Categories and Characteristics. The Matrix sits at the centre of the suite and provides the connection that links all of the documents.



This Guide has been written to help you to more fully understand the Specification of AESS material. It provides you with visual references to help you to better understand the terms of reference. The buildings and connections included in this document are meant to be representative and to provide helpful visual references that support the key facts that are being explained by the Guide. It is also hoped that the range of projects illustrated will inspire you by highlighting the wide range of possibilities available when designing with Architecturally Exposed Structural Steel.

It is not the intention that the included details should be replicated or necessarily represent “best practices”. They are presented only to allow for a better understanding of the visual intentions of the practices and procedures outlined in the Guide and related specification documents. Understanding that “a picture might be worth a thousand words”.

The Evolution of Architecturally Exposed Structural Steel:

The basic understanding of steel construction lies in its roots as an “assembled”, largely prefabricated methodology. Steel construction is “elemental” in nature, and its artistry reliant on not only the appropriate choice of members (shapes versus tubes), but also heavily on the method of attachment. AESS steel design requires detailing that can approach “industrial design standards” when creating joints between members. The structural requirements of shear and moment resistance must be accommodated, along with tighter dimensional tolerances, along with “other” considerations such as balance, form, symmetry and economy. If the creation of connections requires an excessive degree of unique fabrication details, the designer can price the project out of existence. The method of preparation and finishing of the connections can also radically increase costs. Specialised welds and unnecessary ground and filled surfaces will increase fabrication and erection expenses.

Much of the architectural “enjoyment” as well as “challenge” in designing with AESS is in the creation of the key details and connections that give the structure its distinctive character. After the primary choice of member type and “system” (shape vs. tube), the challenge lies in determining the method of connection – welding vs. bolting, and ultimately the “Design” of the joint itself. Whereas designers tend not to be involved in connection issues for concealed structural systems, exposed systems become the architectural trademark of the building, hence requiring much involvement. Compositional issues usually necessitate the addition of “extra” steel at the joints to create a “beautiful” connection. Unfortunately not all designers are adequately informed either to choosing appropriate methods of attachment or to the cost implications of their choices.