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Reclaiming and reusing steel products provides a strong environmental option not available with many other construction materials.

18'-6"

T.O.1



Ideally mill test reports will be available for the reclaimed steel. As this often is not the case, Appendix 5, "Evaluation of Existing Structures," in the 2005 AISC *Specification for Structural Steel Buildings*, is a great starting point for evaluating salvaged steel. While geared toward renovation projects, the guidelines in the appendix can easily be applied to use of salvaged structural steel.

Section 5.2 outlines the testing that is required to determine unknown properties of steel, including tests per ASTM A370 to determine yield strength, tensile strength, and percent elongation. Note that the yield and tensile strength of salvaged material might differ from what is used with today's common material specifications. Also, a chemical composition test per ASTM A751 is used to determine the weldability of the material and provide information needed for the preparation of appropriate Welding Procedure Specifications (WPS). As stated in the appendix, the EOR ultimately must determine what tests are necessary, and upon how many different samples these tests must be performed.

The use of salvaged structural steel on a project requires open communication between the steel fabricator and the EOR. In many cases, salvaged structural steel may require more shop labor than virgin steel because of the previous fabrication

and erection operations that have been performed on it. For example, existing bolt holes, in-place welds and connection material, and previous painting might require design consideration and affect current fabrication and/or erection plans.

In general, welded connection material may be left in place for statically loaded members (the norm in buildings). The presence of bolt holes can be evaluated according to the net section provisions in Chapters D (for tension) and F (for flexure) of the 2005 AISC *Specification for Structural Steel Buildings*. Fabrication and erection considerations also may affect whether welds and holes can remain or must be treated. Extra unfiled bolt holes are not necessarily detrimental to a beam, but depending upon the final in-place application of the beam, the architect or engineer may want existing unused bolt holes filled with bolts.

Another question must be answered if the salvaged steel has been painted: Can it remain or must it be removed? This is especially important to address if the steel was recovered from a building built in the 1970s or before, which means there is a good chance that the existing paint is lead-based.

The production process (including