

Providing compete construction specifications documentation, systems and performance descriptions, and risk and quality advisory services.

Conspectus's Tech Tips received the national Communications Award from the Construction Specifications Institute.

ABSTRACT:

Glazed door assemblies can be rigorously tested to determine their specific levels of resistance to forced entry, but how resistant should they be? There are several test standards, but which is the most reliable and appropriate?

FILING:

UniFormat™
B2050 – Exterior Doors
MasterFormat®
08 34 53 – Security Doors and Frames

KEYWORDS:

Forced Entry, Security, vandalism, ASTM, HP White

REFERENCES:

ASTM F1233 "Standard Test Method for Security Glazing Materials And Systems"
ASTM F1915 "Standard Test Methods for Glazing for Detention Facilities"
HP White-TP-0500.03 Test Procedure Transparent Materials for Use in Forced Entry or Containment Barriers
F. Walker, McGough, Foltz and Lyeria (WMFL) Ballistics and Forced Entry Test Procedure
SD-STD-01.01 – Certification Standard – Forced Entry and Ballistic Resistance of Structural Systems

Resistance to Forced Entry

By David Stutzman, AIA, CSI, CCS, SCIP, LEED AP

Background

In preparing specifications for a courthouse not too long ago, our client asked what could be done to make the entrances resistant to forced entry. Ballistic testing is usually what immediately comes to mind, but there are other testing methodologies which apply specifically to forced entry of a non-ballistic nature. Fortunately, there are some excellent sources for guidance in designing and specifying entrances that must resist forced entry.

Applications

What type of building might require resistance to forced entry? Actually there are some fairly mundane, yet prolific examples of building types that must resist forced entry. Buildings in public parks, for example, are subject to vandalism virtually all night long. The NYC Department of Parks & Recreation goes to great lengths to render the hundreds of comfort stations in NYC parks resistant to forced entry. Institutional buildings such as embassies, museums and schools also must resist break-ins. Banks and jewelry stores are other obvious examples.

Reference Standards

ASTM publishes standards governing resistance to forced entry, but a good source for the actual testing protocols is Insulgard's website, where you'll find [charts](#) showing the four primary



testing protocols. Each test standard has its own rating scale and rejection criteria, and each must be evaluated based on the program of the facility being designed. This article addresses the non-ballistic methodologies and does not address ballistic testing.

ASTM Standards

The ASTM F1233 tests determine the "Class" of resistance to forced entry through impact testing with blunt and sharp tools, thermal stress (torch and extinguisher) and exposure to the chemicals gasoline and acetone. The test is progressive; tests on the chart are repeated in particular sequences until failure. Entries are classified using Roman numerals I through V. To attain a Class V designation, entries must withstand 41 assaults including 50 impacts with a fire axe. Two levels of failure are defined by this standard: the first is a hole allowing passage of a 1/8 inch diameter solid shape (contraband), and the second is any hole allowing passage of a 5 by 8 by 8 inch solid body. This standard also includes an appendix that gives guidance on recommended protection classes for

both forced entry and ballistic resistance based on the type of asset and the threat class.

ASTM F1915 determines “Security Grade” classifications from 1 through 4 to grade an entry for its resistance in time (10, 20, 40 and 60 minutes) to forced entry.

Clearly there are marked differences between these two standards in their potential applications. Owners of facilities subject to vandalism over long periods of time would probably prefer a Level V designation to 60 minutes of resistance, and so would favor referencing ASTM F1233 as their basis-of-design standard.

H.P. White

[H.P. White](#) is responsible for developing the standards we use today, and they continue to develop new and better ways of testing for forced entry. The current HP White test procedures exceed the procedures dictated by ASTM F1233, with two notable additions of a hack saw and an acetylene torch. To reach Level V on the HP White scale, an entry must withstand 54 assault sequences, including 375 impacts by a sledgehammer and five minutes of exposure to an acetylene torch. H.P. White also offers live streaming [video witness services](#) online to its clients who want to witness actual testing but can't physically travel to the lab.

WMFL Test Procedures

The major difference between the F. Walker, McGough, Foltz and Lyeria (WMFL) test procedures and the other three standards is the inclusion of twenty-five .44 magnum, 240 grain

rounds fired at the entry to attain the highest level of forced entry resistance in their scale. Another difference is the counter-intuitive arrangement of the levels such that Level I provides greater resistance than Level III. This test also does not stipulate the number of impacts but a period of time for each test in the sequence, making the test more subjective depending on who is doing the testing.

Specification Guidance

The website for the Whole Buildings Design Guide, a program of the National Institute of Building Sciences, includes links to [SpecsIntact](#) and the Unified Facilities Guide Specifications (UFGS) used by federal agencies to specify construction for the military.

There you will find sample specifications for entries requiring a forced entry rating. As you review the samples, you will note that the specifications must be tailored for the given program and level of need for resistance to forced entry. In this sample (see Article 1.3 “Quality Assurance” beginning on page 9), the writer is instructed to first identify the threat level of the project and then select an appropriate level in a chart from five choices of very low, low, medium, high and very high threat levels. Medium and high levels are apparently not addressed in the sample. The column for very high resistance is also not shown. The chart references both ASTM F1233 and H.P. White and indicates which tests are required to comply with the programmed level of resistance to forced entry. The instructions go on to reference National Institute of Justice and Department of State standards for prescriptive requirements for windows

and doors. The State Department requires that testing be performed on the most vulnerable location in the assembly.

Conclusion

When designing and specifying for resistance to forced entry, inform the owner that there is no single standard for forced entry resistance. Verify that the test standard being applied is appropriate for the design. Use the available resources online to be familiar with the various testing procedures, and be prepared to explain them to your client.

Some manufacturers have products that have already been tested and can be selected from a catalogue, but a custom design will require very costly testing to receive certification of its performance in resisting forced entry.

Add Your Comments

We invite your comments. Visit our blog and add your comments.

Like it? Share it!

[Tweet](#) or [Email](#) your friends

The information contained in this document is offered for educational purposes, only, and not as technical advice suitable for any particular project or specific condition. Technical consulting is unique to the facts of a particular condition, and Conspectus recommends that a specialist be consulted to determine solutions for each specific condition.