

[Inch-Pound]
FED-STD 832
September 1, 2002

FEDERAL STANDARD
CONSTRUCTION METHODS AND MATERIALS FOR VAULTS

The General Services Administration has authorized the use of this federal standard by all federal agencies.

1. **SCOPE.** This document establishes minimum construction requirements for high security vaults for storage of classified information and weapons.

2. **REFERENCED DOCUMENTS.**

2.1 Government publications. The following documents form a part of this Federal Standard to the extent specified herein.

Federal Specifications:

AA-V-2737 – Modular Vault Systems
FF-L-2740 – Locks, Combination
AA-D-600 – Door, Vault, Security

Single copies of this Specification and other Federal Specifications are available from: General Services Administration, Federal Supply Service, Specifications Section (3FP-E), Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Tel - (202)619-8925.

2.2 Other publications. The following document forms a part of this Federal Standard to the extent specified herein.

American Concrete Institute:

Standard ACI 318 – (Building Code Requirement for Reinforced Concrete)

(Application for copies should be addressed to P.O Box 9094; Farmington Hills, MI 48333-9094.)

3. **DEFINITIONS.** Not Applicable.

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any other data which may improve this document should be sent to: General Services Administration, Federal Supply Service, National Furniture Center, Engineering Division (3FNE-CO), Washington, DC 20406.

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4. GENERAL REQUIREMENTS. There are three classes of vaults for the storage of classified material and equipment: A, B and C. Class A vaults offer the maximum protection against tool and torch attack. Class B vaults offer less than maximum protection. A lightweight, portable "modular vault" meeting Federal Specification AA-V-2737 may also be used to store classified material and equipment. The modular vault is equivalent to a Class B vault. Class C vaults offer less than maximum protection and may be used where unique structural circumstances do not permit construction of concrete vault construction. Utilization of any vault class, or the modular vault, is dependent upon the physical location/environment where the vault is to be erected. The minimum construction requirements for each class of vault are described as follows.

5. DETAILED REQUIREMENTS.

5.1 Class A Vaults. Minimum Construction.

5.1.1 Vault Walls. The walls of class A vaults shall be constructed of 8 inch thick (200 mm) reinforced concrete. Concrete reinforcement shall consist of 5/8 inch (16 mm) re-bar, 6 inches on center each way, staggered each frame. The walls are to extend to the underside of the roof slab above. When vault walls are part of the exterior walls, the vault wall must be set back from the exterior part of the exterior wall to allow 4 inches (100 mm) for the normal wall facing to cover the vault wall. Wall reinforcement shall be tied into floors and ceilings.

5.1.2 Vault Floor. The floor of class A vaults shall be constructed of 8 inch thick (200 mm) reinforced concrete. Concrete reinforcement shall consist of 5/8 inch (16 mm) re-bar, 6 inches on center each way, staggered each frame.

5.1.3 Vault Ceiling. The ceiling of class A vaults shall be constructed of monolithic reinforced concrete 8 inch thick (200 mm). Concrete reinforcement shall consist of 5/8 inch (16 mm) re-bar, 6 inches on center each way, staggered each frame.

5.1.4 Vault Door. Vault door and frame shall conform to Federal Specification AA-D-600, Class 5 vault door.

5.1.5 Miscellaneous Openings. Any miscellaneous openings, open ducts, pipes, registers, sewers in excess of 96 square inches (619.2 centimeters) in area and over 6 inches (15.24 centimeters) in its smallest dimension shall be equipped with barriers. Acceptable barriers are 9 gauge expanded metal mesh, or rigid metal (steel) bars at least one-half inch in diameter, welded vertically and horizontally 6 inches on center. The rigid metal bars shall be securely fastened at both ends to preclude removal. Crossbars shall be used to prevent spreading of the bars. Solid caulking shall be used between the sleeve or conduit to give evidence of surreptitious entry attempt. Access for inspection of barriers should be in accordance with agency policies.

5.2 Class B Vaults. Minimum Construction.

5.2.1 Construction. Class B vault shall conform to Federal Specification AA-V-2737.

5.2.2 Vault door. Vault door and frame shall conform to Federal Specification AA-D-600, Class 5 vault door.

5.3 Class C Vaults. Minimum construction for steel-lined vaults.

5.3.1 Vault construction. Where unique structural circumstances do not permit construction of concrete vault, construction will be of steel alloy-type of $\frac{1}{4}$ inch thick, having characteristics of high yield and tensile strength. The metal plates are to be continuously welded to load-bearing steel members of a thickness equal to that of the plates. If the load-bearing steel members are being placed in a continuous floor or ceiling of reinforced concrete, they must be firmly affixed to a depth of one-half the thickness of the floor and ceiling. If the floor and/or ceiling construction is less than six inches of reinforced concrete, a steel liner is to be constructed the same as the walls to form the floor and ceiling of the vault. Seams where the steel plates meet horizontally and vertically are to be welded together.

5.3.2 Vault Ceiling and Floor. If the floor and/or ceiling construction is less than six inches of reinforced concrete, a steel liner is to be constructed the same as the walls to form the floor and ceiling of the vault. Seams where the steel plates meet horizontally and vertically are to be welded together.

5.3.3 Vault Door. Vault door and frame shall conform to Federal Specification AA-D-600, Class 5 vault door.

5.3.4 Miscellaneous Openings. Any miscellaneous openings, open ducts, pipes, registers, sewers in excess of 96 square inches (619.2 centimeters) in area and over 6 inches (15.24 centimeters) in its smallest dimension shall be equipped with barriers. Acceptable barriers are 9 gauge expanded metal mesh, or rigid metal (steel) bars at least one-half inch in diameter, welded vertically and horizontally 6 inches on center. The rigid metal bars shall be securely fastened at both ends to preclude removal. Crossbars shall be used to prevent spreading of the bars. Solid caulking shall be used between the sleeve or conduit to give evidence of surreptitious entry attempt. Access for inspection of barriers should be in accordance with agency policies.

5.4 Concrete compressive strength. Concrete shall have a minimum 28 day compressive strength of 3000 psi. when tested in accordance with the applicable sections of the American Concrete Institute Standard ACI 318 – (Building Code Requirement for Reinforced Concrete).

6. **NOTES.** Not Applicable.

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MILITARY INTERESTS:

Preparing Activity:
GSA-FSS

Military Coordinating Activity:
Navy-YD

Custodians:
DLA-IS
AF-99
Army-AR