

DDESB-KT

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MEMORANDUM FOR ALTERNATE ARMY BOARD MEMBER, MR. GARY ABRISZ  
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AIR FORCE BOARD MEMBER, MR. PAUL PRICE  
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SUBJECT: Guidance on 12-inch Thick Substantial Dividing Walls

This memorandum establishes guidance on the application and criteria of 12-inch thick Substantial Dividing Walls (SDW) to:

- a. Prevent simultaneous detonation for high explosives (HE) (Hazard Division (HD) 1.1 and HD 1.2) and propagation of reaction (burning) for HD 1.3 between adjacent bays and
- b. Provide personnel protection for Remotely Controlled Operations.

The guidance below will be in effect until further notice. The Naval Facilities Engineering Services Center is presently conducting an explosives test program to further define and finalize the guidance and expect results by year 2002.

a. Definition. A 12-inch thick SDW is a reinforced concrete wall having the following characteristics:

- (1) Minimum thickness of 12 inches,
- (2) Steel reinforcing bars (rebar) on both faces of the wall,
- (3) #4 (1/2-inch in diameter) vertical and horizontal rebar,
- (4) Vertical and horizontal rebar spaced not more than 12 inches apart,
- (5) Position of bars on one face staggered with the bars on the opposite face,
- (6) Two inches of concrete cover over the reinforcing bars, and
- (7) Minimum concrete compressive strength of 2,500 pounds per square inch (psi).

(Note: The main steel must be continuous into supports. The 12-inch SDW must be supported at the floor and at any adjacent 12-inch SDWs.)

b. Applicability. This guidance applies to 12-inch thick SDW with the explosives located at least three feet from the SDW between the bays. When used as a firewall for HD 1.3 ammunition and explosives (AE), the 12-inch thick SDW must be continuous from the floor to the roofline to mitigate thermal effects unless otherwise required by local fire codes

to extend above the roof. When used for personnel protection, the 12-inch thick SDW must be adequately supported on at least two sides.

(Note: Existing 12-inch thick reinforced concrete walls constructed for explosives operations, explosives storage, or remotely controlled explosives operations at Department of Defense (DoD) facilities are considered adequate for this application.)

c. Use.

(1) To prevent simultaneous detonation for HE and propagation of reaction (burning) for HD 1.3 between adjacent bays:

(a) Each bay containing HE (to include any HD 1.3 contributions) shall be limited to a maximum credible event (MCE) of no more than 425 pounds explosive weight of Sensitivity Groups (SG) 1, 2, 3 and/or 4 munitions. (Note: See the Joint Hazard Classification System listing for the SG of HD 1.1 and HD 1.2 items and, for additional information, the attached table of corresponding ordnance groups and critical acceptors.) Test data do not currently support the use of a 12-inch thick SDW to prevent the simultaneous detonation of SG 5 munitions. Therefore, when establishing the MCE, the explosive weight of all munitions in a bay that contains any SG 5 munitions must be combined with the MCE for any adjacent bays that contain either greater than 8 pounds of HD 1.1 or greater than 300 pounds of HD 1.3. HD 1.4 AE does not contribute to the MCE.

(b) Bays containing only packaged HD 1.3 AE should be limited to an explosive weight of no more than 5,000 pounds and bays containing unpackaged HD 1.3 AE should be limited to an explosive weight of no more than 300 pounds; otherwise, the explosive weights of those bays must be combined with the MCEs for all adjacent bays. Those bays containing only HD 1.3 AE must have adequate venting area; that is, a frangible wall or roof.

(2) To provide personnel protection for remotely controlled operations:

(a) Operations involving HE (to include any HD 1.3 contributions) shall be separated either by the shorter K24 separation distance when measured over or around the 12-inch thick SDW or by the shortest distance that provides 2.3 psi level of protection to personnel.

(b) Operations involving only HD 1.3 AE, where mass fire is assessed to be the response during an accident, shall be separated by the shorter K8 separation distance when measured over or around the SDW or by the shortest distance that limits the thermal flux to personnel to  $0.3 \text{ calories/cm}^2/\text{sec}$ . Guidance in paragraph c.(2)(a) applies when the expected response during an accident is an explosion or detonation.

(c) Personnel shall be protected from fragments and debris having energies of 58-foot-pounds or greater (hazardous fragments). A 12-inch thick SDW that is properly supported on two sides (such as a reinforced concrete floor and another 12-inch thick

SDW) defeats and does not generate hazardous fragments for an MCE of up to 300 pounds of HD 1.3 AE or for up to 8 pounds of HE (to include any HD 1.3 contribution) of SG 1, 2, 3, 4 and/or 5 in the operating bay. HD 1.4 AE does not contribute to the MCE.

(Note: More recently, questions have surfaced about whether intraline distance (ILD) level of protection for personnel is also provided by 12-inch thick SDW for concurrent operations in adjacent bays. The ILD level of protection issue is not addressed by this guidance. The requirement remains K18 for HD 1.1 and the ILD requirement in Table C9.T10, DoD 6055.9-STD for HD 1.3. Presently, there is no consideration that a 12-inch thick SDW or any type of wall provides an equivalent ILD level of protection.)

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/s/Col. Michael L. Conrad USA for  
DANIEL T. TOMPKINS  
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Attachment  
As stated

cc:

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## Ordnance Groups and Critical Acceptors.

Sensitivity Groups		Compatibility Group (CG)	Ordnance Description	Critical Acceptor Ordnance		
#	Description					
1	Robust	C, D, E	Bombs, Projectiles, Thick-Case Munitions	MK82, MK83, MK84 Bombs M107-155mm Projectile WALLEYE <sup>1</sup>		
		J	Ammunition with both Explosives & Flammable Liquids	HARPOON TOMAHAWK		
2	Non-Robust	D, E	Thin-Case Items: Most Missiles, Rockets Underwater Mines & Torpedoes	MK103/ MK10 Torpedo Warheads MK55 Underwater Mine		
			Fragmenting Missile Warheads	WAU17 Sparrow Warhead		
3	Fragmenting	D, E	Cluster Bombs, Dispenser Munitions	M483 Bomblet, M864 Proj Gator Bomblet		
				J	Ammunition with both Explosives & Flammable Liquids	TOMAHAWK
5	SD Sensitive	B	Detonators and Initiating Devices	#8 Blasting Cap		
		F, G	Fireworks, Incendiary, Illuminating, Smoke or Tear Producing Munitions; Ammunition with Initiation Devices	M106 Grenade M61 Grenade		
			C, D, E	Demolition Explosives, Very Thin-case items; Sheet Explosives, Sensitive Non-Robust	M118 PETN & Mk36 H6 Demo Blocks TOWII / HELLFIRE <sup>1</sup>	

<sup>1</sup> Directed Energy Weapon. Stowage plan must orient directed energy jet away from NPW.