

THE METALITH™

Anti-Blast



Anti-Crash



ANTI-TERRORISM BARRIERS

Perimeter Security System • Blast Mitigation • U.S. Department of State Certified (K12)

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Overview

Infrastructure Defense Technologies proudly introduces the Metalith, a twenty-first century perimeter security system, designed to protect critical infrastructure from terrorist attacks involving the use of explosives and/or speeding vehicles.

Originally used by the United States Armed Forces for force and critical equipment protection in forward areas, the Metalith has been modified to accommodate the growing demand for the protection of commercial, industrial, and governmental sites against various types of attacks.

The Metalith is a prefabricated steel wall structure which offers superior blast mitigation, anti-ram vehicle protection, cost efficiency, and ease of installation. The product is available in multiple sizes and configurations to meet the custom requirements of any site in need of physical perimeter protection.

Architects will prefer the Metalith because of the availability of the product in varying paint finishes, metal substrate types, and modification options to enhance aesthetics.

If you are serious about protecting assets against vehicle-borne improvised explosive devices (VBIEDs), or perimeter security penetrations by unauthorized vehicles, the Metalith is the perfect solution for your physical perimeter security requirements.

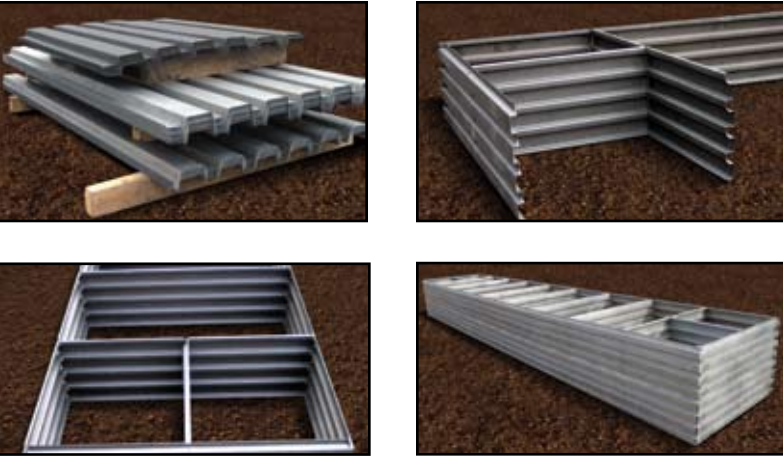


What is the Metalith?

General Product Information

The Metalith is a prefabricated steel wall unit constructed from corrugated metal panels that are connected with stainless steel pins, formed into multiple course assemblies of varying heights, thickness, and shapes. The table below shows the standard barrier wall sizes (custom sizes are available upon request). The Metalith can be manufactured from a variety of different metals, including galvanized steel, stainless steel, Cor-Ten™ steel, aluminum or electrogalvanized steel.

The Metalith is offered in a variety of paint colors and systems to accommodate architectural applications or operational requirements.



Easy Assembly

The photos on the right show how the courses are assembled, filled, and prepared for the assembly of the next course.



Metalith Perimeter Security Barrier Wall Standard Sizes

(Custom sizes available upon request)

Width In Feet	6' Tall	Gauge	8' Tall	Gauge	10' Tall	Gauge	12' Tall	Gauge	16' Tall	Gauge
3	Yes	18	No	-	No	-	No	-	No	-
4	Yes	18	Yes	18	No	-	No	-	No	-
5	Yes	18	Yes	18	No	-	No	-	No	-
6	Yes	18	Yes	18	Yes	18	Yes	18	No	-
7	Yes	18	Yes	18	Yes	18	Yes	18	Yes	16/18
8	Yes	18	Yes	18	Yes	16/18	Yes	18	Yes	16/18



Benefits

Below are the major benefits of using the Metalith Perimeter Security System...

Blast Mitigation

The Metalith barrier walls provide excellent blast mitigation. Recent independent tests conducted at the Energetic Materials Research and Testing Center (EMRTC) in Socorro, New Mexico on February 3, 2004 registered attenuation values up to nearly 99% for a High Order Detonation. *(See pages 9-10 for more detailed information.)*

Anti-Ram Protection

Our Metalith barriers are Department of State K12 certified based on independent testing conducted at Karco Engineering in Adelanto, California on April 20, 2004. *(See page 11 for more detailed information.)*

Appearance

Unlike other blast mitigation and crash protection barriers, the Metalith is aesthetically pleasing and can be modified for a wide variety of architectural applications.

Cost Efficient

The Metalith, manufactured by Infrastructure Defense Technologies, is significantly less expensive than comparably sized concrete walls and far more effective for perimeter protection.

Strength

Metalith blast mitigation and crash protection barriers are made from 16 and 18-gauge steel. Engineering tests indicate they can withstand 150 mph hurricane winds, 100 psi of snow load, and head pressure of 480 psf.

Space Efficient

System components are shipped on pallets, require minimal warehousing space, and once erected, provide a small footprint making them practical to use for many applications.

Ease of Installation

The product requires minimal installation training, is installed quickly, and requires no tools, instructions, or hardware other than what is shipped with each system kit.

Shipping Ease

The Metalith perimeter security system panels can be easily shipped by flat bed truck, railcar, ocean container, or air cargo making them easy to transport – anywhere.

Rapid Deployment Capability

The Metalith perimeter security system barriers can be shipped on standard military 463L pallets and are designed to be easily erected in forward areas with no special training or tools required.

Standard and Custom Sizes

Infrastructure Defense Technologies manufactures the Metalith barrier wall system in a variety of standard sizes to meet nearly any application's requirements. We also fabricate custom sizes for sites with special requirements. *(See our standard size matrix on page 3 for further details.)*

Applications

Typical Users...

Facilities or organizations that can best benefit by using our perimeter security barrier systems include:

- | | |
|-------------------------------------|--|
| • Airports | • Oil and Gas Storage and Pipelines |
| • Border Security Operations | • Chemical/Petrochemical Plants |
| • Consulates/Embassies | • Power Generation Plants |
| • Federal Buildings | • Public Water Supply Facilities |
| • Industrial/Corporate Facilities | • Rail Terminals |
| • Liquid Natural Gas Infrastructure | • Seaports/Port Authorities |
| • Military Operations and Bases | • Other Critical Infrastructure Facilities |

Infrastructure Defense Technologies has fabricated metals for over 100 years to meet the demands of our marketplace. We now have created and designed the Metalith, a line of high quality, high strength, physical perimeter security barriers.

The demand for these perimeter security barriers is a direct result of the recent overseas conflicts involving the U.S. and other major world governments' war on international terrorism.

The best description of our primary perimeter security barriers would be two-fold:

1. Anti-ram vehicle barriers.
2. Blast mitigation barriers.

Facilities can best use our Metalith barrier wall systems as protection from intruders attempting to penetrate perimeter security using a vehicle intended to ram through a gate or security post and those intending to set off explosive devices.

Options

Anti-Climb Feature

The Metalith is offered with an anti-climb feature, which provides additional security as well as aesthetics. The anti-climb feature consists of vertically corrugated sheets which are fastened to the structural substrate. The product is available in a variety of metals, paint systems, and colors. The Metalith anti-climb feature keeps intruders out.



Protective Roof Unit

The Metalith is offered with an easily installed roof feature for weather protection. The roof option prevents moisture absorption by interior ballast materials, and therefore prevents increased hydrostatic pressure on the structural members. The roof option is recommended in areas with significant amounts of annual rainfall. Contact Infrastructure Defense Technologies today for additional details.



Architectural Options

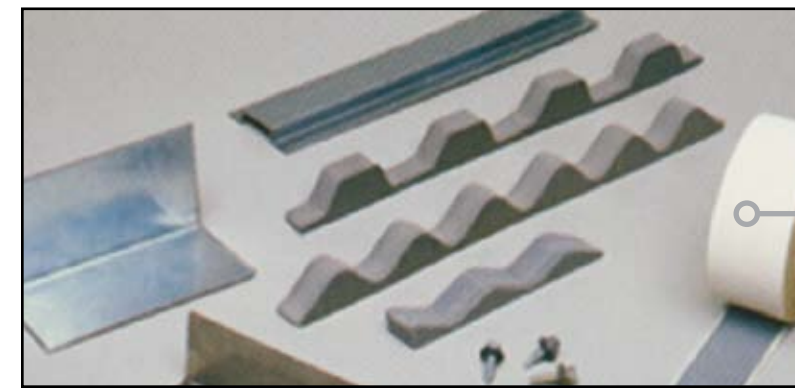
In addition to the strength, security, and cost features of the Metalith, architects will appreciate the pleasing physical appearance of the product.

While other physical perimeter security systems give the appearance of a military installation, the Metalith can be manufactured to maximize aesthetics. The anti-climb feature consists of vertically corrugated sheets designed to provide a sleek, modern look with distinctive shadow lines.

Infrastructure Defense Technologies offers the Metalith with its exclusive CORANAR™ system, a Kynar-based paint known for its excellent color permanence. CORANAR coatings can be matched to any architect specified color and can be manufactured in lead times as short as three weeks. Furthermore, CORANAR coatings are environmentally safe, factory applied to ensure field cost savings, provide top adhesion quality, and are offered with a twenty-year manufacturer's warranty.

The Metalith is also offered in multiple material types including, but not limited to, aluminum, Cor-Ten™ steel, stainless steel, aluminized, anodized, and hot dip galvanized steel.

All architectural applications for the Metalith are supplied with a full complement of corner and roof flashings to provide a seamless, aesthetically appealing appearance on the outer wall.





Technical Data

Load Table

Width	Height	# of Courses		Wind Speed*	Ground Snow	Pressure	Ground Acceleration
		16 Ga.	18 Ga.				
3'	6'	-	2	75 psf @ 170 mph	280 psf	180 psf	0.89g
4'	8'	1	2	100 psf @ 200 mph	155 psf	240 psf	0.89g
5'	10'	2	2	125 psf @ 220 mph	170 psf	300 psf	0.89g
6'	12'	0	4	150 psf @ 240 mph	115 psf	360 psf	0.89g
8'	10'	2	2	200 psf @ 280 mph	45 psf	480 psf	0.89g
8'	16'	2	4	200 psf @ 280 mph	45 psf	480 psf	0.89g

Metal Specifications

Metalith steel panels conform to ASTM A653. Their protective finish is achieved by using a hot dip galvanized process in accordance with ASTM A525-G90 coating. (Other material types available upon request.) The pin connectors are fabricated from stainless steel.

Installation Data

Each Metalith wall is shipped with a full complement of drawings, instructions, assembly tools, and accessories.

Paint Specifications

Test	Results
1. Weatherometer - ASTM G23-81 minimum	No cracking, peeling, blistering or flaking when scraped with a metal blade
a. Fading - ASTM D2244 minimum 2,000 hours	Exterior coating shall not exceed a 5 NBS Unit change.
b. Chalking - ASTM D569 minimum 2,000 hours	Exterior coating shall not chalk greater than 8.
2. Humidity Test - ASTM D2247-68 1,000 hours in 100% humidity @ 100° F in Humidity Chamber Test	Less than 5% No. 8 blisters-aluminum. Less than 5% No. 8 blisters-galvanized.
3. Salt Spray Test - ASTM B117-73 1,000 hours in Salt Fog Cabinet Test 5% Fog @ 95° F	No blistering greater than a No. 8 rating according to schedule No. 2 ASTM D1654.
4. Abrasion Test - ASTM D968-81 Falling Sand Test	Coating will withstand a minimum of 65 liters of sand before appearance of base metal.
5. Pollution Resistance Test-30 cycles of Kesternich Pollution Resistance Test	No blistering, cracking loss of adhesion or appearance of any significant corrosion.
6. Impact Resistance-ASTM D2794-84	Panels will withstand a minimum of 80 inch-lbs. for Galvanized or 1.5x metal thickness on Aluminum, with no loss of adhesion, cracking or peeling.

* Denotes Exposure C₁I=1.15
Load Criteria Based on 2000 International Building Code

Labor Estimates*

Barrier Type	Width	Construction Man-hours
Metalith (no options)	8 ft.	115 cu. ft. per man hour
Anti-climb/roof systems/flashing installation	8 ft.	35.5 sq. ft. per man hour

*Source: CMI Installation Data

Blast Mitigation

The Energetic Materials Research and Testing Center (EMRTC), affiliated with the New Mexico Institute of Mining and Technology, is internationally recognized and has over fifty years of expertise in explosives research and testing. EMRTC specializes in the research, development, and analysis of energetic materials for both corporate and government clients.

EMRTC is one of several research divisions of New Mexico Institute of Mining and Technology, and has access to university faculty with experience in a wide variety of scientific and technical disciplines. EMRTC's 40-square-mile field laboratory is located in the mountains adjacent to the Institute campus in Socorro, New Mexico. The field laboratory contains over 30 test sites, gun ranges, storage sites, and other research facilities, allowing for a complete array of research and testing activities.

On February 3, 2004 Infrastructure Defense Technologies utilized the EMRTC to explode two high order detonations near five previously erected sections of the Metalith barrier wall systems to obtain blast pressure attenuation data and observe the physical results of the explosions at various standoff distances from ground zero.



- Computer Simulations
- DOT and UN Hazards Classification
- Environmental Assessments
- Insensitive Munitions Testing
- Light Gas Gun Experiments
- Mine Detection Evaluation
- Non-Ideal Explosives Research



- Ordnance Testing
- Reusable Blast Test Fixture Programs
- Rocket Engine Testing
- Sled Track Experiments
- Vulnerability/Survivability Analysis
- Warhead Characterization
- Warhead Development

Metalith barrier sections were placed 20 feet, 40 feet, 50 feet, 80 feet, and 160 feet from ground zero of the test's first high order detonation, a 15-passenger van filled with explosives.

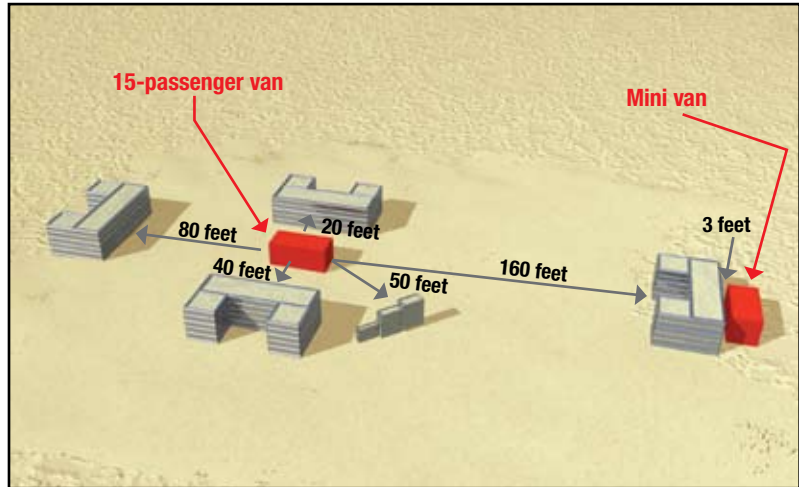
During the second test, a mini van packed with explosives was detonated 3 feet from the barrier wall that was located 160 feet from the first high order detonation.

Specific information from these tests is available to personnel with the necessary clearances. Please call Infrastructure Defense Technologies at (800) 379-1822 to obtain more information.



Blast Test Results

Energetic Materials Research and Testing Center (New Mexico Institute of Mining and Technology • Socorro, New Mexico)
Layout For High Order Detonation Tests Conducted February 3, 2004



Back side pressure readings were taken 12 feet from the backs of the walls.

Blast Attenuation Data

The table below shows the direct blast data developed for Infrastructure Defense Technologies by the EMRTC. The blast data recorded by the test sensors indicated that most backside blast pressures were **attenuated by over 96%**.

Test	Distance	Attenuation %
1	20 Feet	90.4%
1	40 Feet	98.2%
1	80 Feet	96.1%
1	160 Feet	*
2	3 Feet	98.7%

Source: EMRTC Test Data obtained 2/3/2004.
* Incomplete sensor reading. Attenuation percentage not calculable.

Metalith Barrier Performance

20-Foot Standoff - Blast 1

Wall center buckled with sand spilling ~35 feet out the rear. Wall absorbed a tremendous explosive wave yet there was no thru penetration of shrapnel. Attenuation was 90.4%.

40-Foot Standoff - Blast 1

Wall center buckled with sand spilling ~20 feet out the rear. There was no thru penetration of shrapnel. Attenuation was 98.2%.

80-Foot Standoff - Blast 1

Wall received multiple severe shrapnel strikes with no adverse structural damage and no thru penetration of shrapnel. Attenuation was 96.1%.

160-Foot Standoff - Blast 1

Wall received multiple lesser strikes and the wall was totally intact with minor penetrations and no thru penetration of shrapnel. No attenuation readings were recorded due to failed sensors.

3-Foot Standoff - Blast 2

The front of the Metalith steel wall immediately adjacent to the mini van buckled and some sand spilled into the crater formed by the mini van explosion. A small portion of the back wall slowly split opposite the mini van location with sand thrown 12 feet from the back wall. There was no thru penetration of shrapnel and the mini van was completely destroyed. Attenuation was 98.7%.

Who is Karco Engineering?

Karco Engineering is an independent test laboratory and automotive research center devoted to providing:

- research and development
- design evaluation data
- compliance
- certification
- dummy calibration services
- accident recreation
- custom testing of motor vehicles and mechanical systems.

Clients include the National Highway Traffic Safety Administration (NHTSA), foreign and domestic vehicle manufacturers, equipment suppliers, insurance companies, and firms involved in personal injury and product liability.

The research center also provides testing services for evaluation of recreational vehicles, trucks, buses, specialty vehicles, and motor driven cycles to acquire safety and performance data.

K12 Crash Test Results



For certification, accident recreation, research and development it is necessary to provide independent testing and evaluation to guarantee the integrity of test results.

Karco routinely performs crash testing for certification by the U.S. Department of State.

Metalith Crash Test



On April 20, 2004 Infrastructure Defense Technologies utilized Karco Engineering's expertise to crash test a 15,000 pound truck into a standard 40' long, 10' high, and 8' thick Metalith barrier wall at 50 mph at a 90° angle.

The truck was flattened, the wall stayed in place, and penetration of the front edge of the cargo bed was negative 48".

* "Vehicle was completely arrested by the Metalith perimeter security wall system. (Negative penetration.) See photo for comment."

Subsequent to the testing performed by Karco Engineering, Infrastructure Defense Technologies' Metalith barrier wall has been certified as a K12 product by the U.S. Department of State.

*Source Karco Test Report April 20, 2004





APPLICATIONS

- Airports
- Border Security Operations
- Chemical and Petrochemical Plants
- Consulates and Embassies
- Federal Courthouses / Federal Buildings
- Food Production, Processing, and Distribution Facilities
- Government Prime Military Contractors
- Industrial Facilities
- Military Operations, Bases, and Arsenals
- National Laboratories
- Oil And Gas Pipeline Terminations
- Oil and Gas Storage Facilities
- Petroleum Refineries
- Power Plants and Power Grids
- Rail Terminals – Passenger and Freight
- Seaports and Port Terminals
- Water Reservoirs, Systems, and Dams
- Other Critical Infrastructure

"Homeland security is a national strategy. It is and must always be a priority in every city, every neighborhood, and every home across America. More than anything, keeping America safe and free in the 21st century is about the integration of a nation, and nations, led by citizens and freedom loving people everywhere."

– Tom Ridge, U.S. Secretary of Homeland Security, March 25th, 2004

Infrastructure Defense Technologies

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www.themetalith.com

www.infrastructure-defense.com

Metalith Perimeter Security Systems – "Ain't nothing coming through!"