

InQuikDefense



More than 200 robust and resilient bridges have been built across USA, Australia & The Pacific, with our modular patented InQuik system.

The InQuik Solution



1 Pre-fabricated components manufactured in controlled environment



2 Modular units are easily stacked and stored for quick delivery



3 Lightweight components, easily transported by small trucks



4 And handled by small cranes or excavators

The InQuik Solution



1 Abutment placed into position and filled with concrete



2 Decks placed and tied together to create one large mass



3 Concrete installed



4 Complete

The InQuik Solution

- Semi-modular system
- Integrated steel formwork and reinforcing components prefabricated off-site
- Completion on-site with concrete pouring
- Forms a single homogeneous mass
- Self-supporting Panels and sacrificial formwork
- Beneath steel form, a conventional in-situ poured reinforced concrete bridge
- Combines the advantages of both construction methods

Product Range

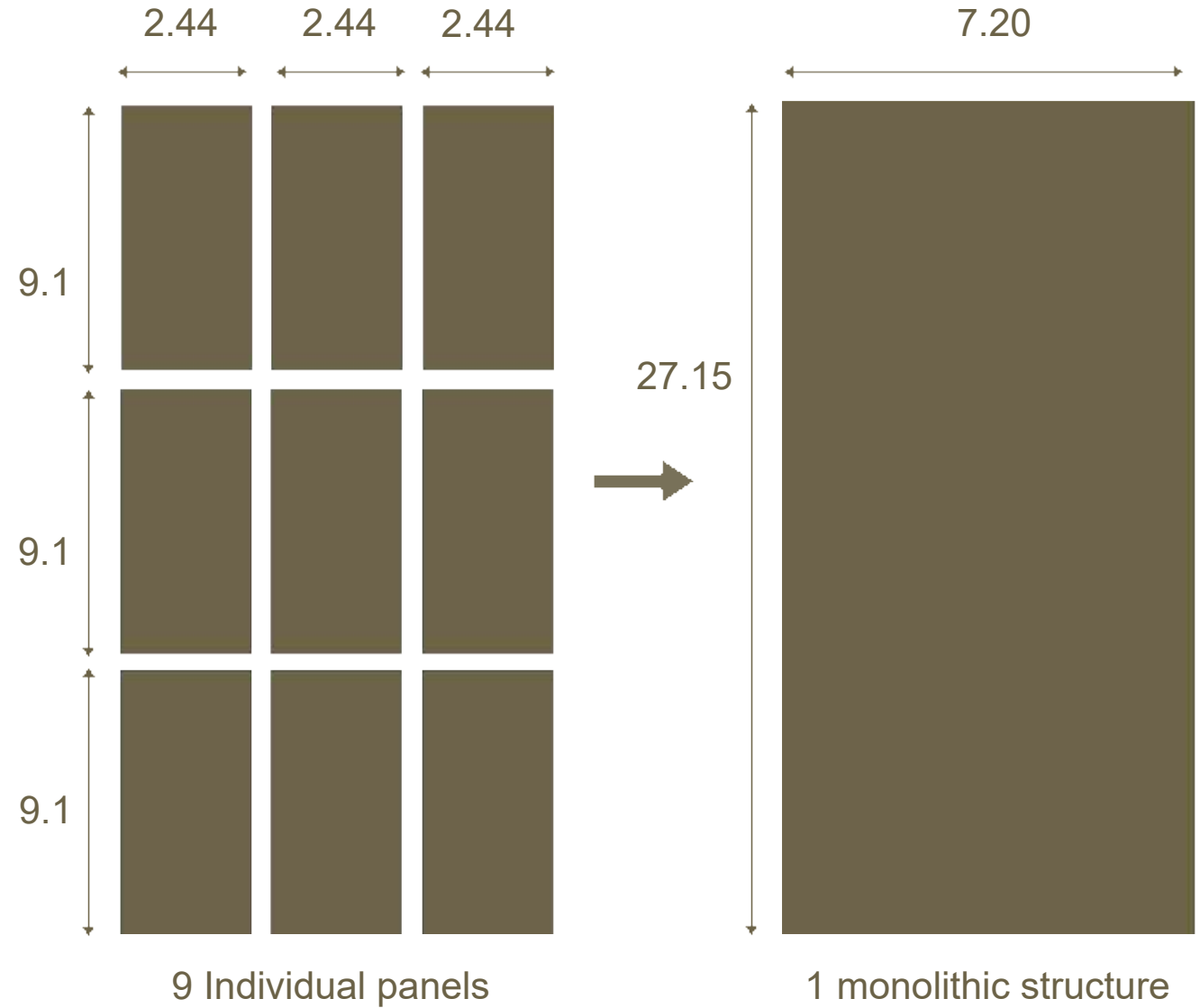
Abutments, wing walls, headstocks, blade piers and deck panels.

Modular Components



The panels are all placed in situ, then connected to each other, and then also linked into the abutments before the concrete is cast.

- **Monolithic structure with no joints.**
- **No bearings or tie downs are required.**



Defence Benefits

- Fast fabrication and easy installation
- Lightweight, high-quality modular components for easy transport
- Meets 160-ton load capacity, designed for a 100-year lifespan
- Upgradable to military standards; serves as an emergency defensive shelter
- Extra protection against artillery shells, addressing cone cracking and penetration

Proven Disaster Resilience



The InQuik 5-span 300' Silo Farm Bridge is over-topped during flooding events including large debris flows, yet the structure has survived each event unscathed.

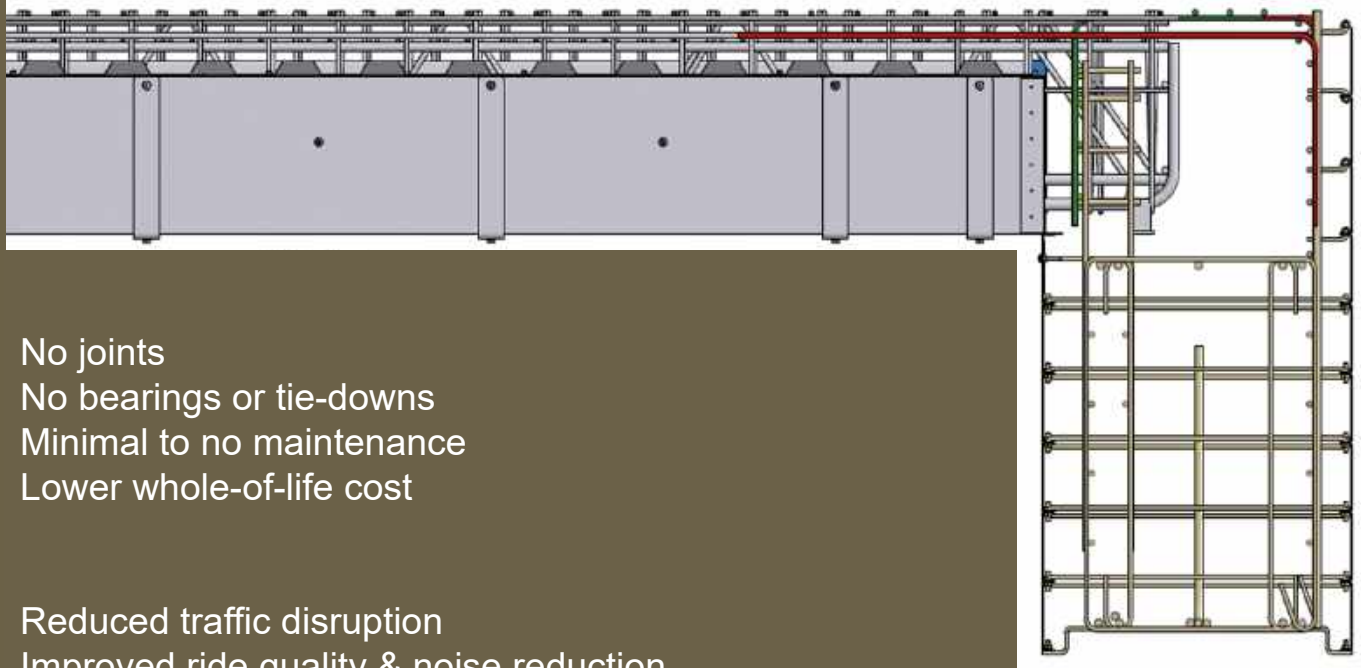


After flooding event



After removing debris

One Mass – Integral Structure



- ❖ No joints
- ❖ No bearings or tie-downs
- ❖ Minimal to no maintenance
- ❖ Lower whole-of-life cost

- ❖ Reduced traffic disruption
- ❖ Improved ride quality & noise reduction

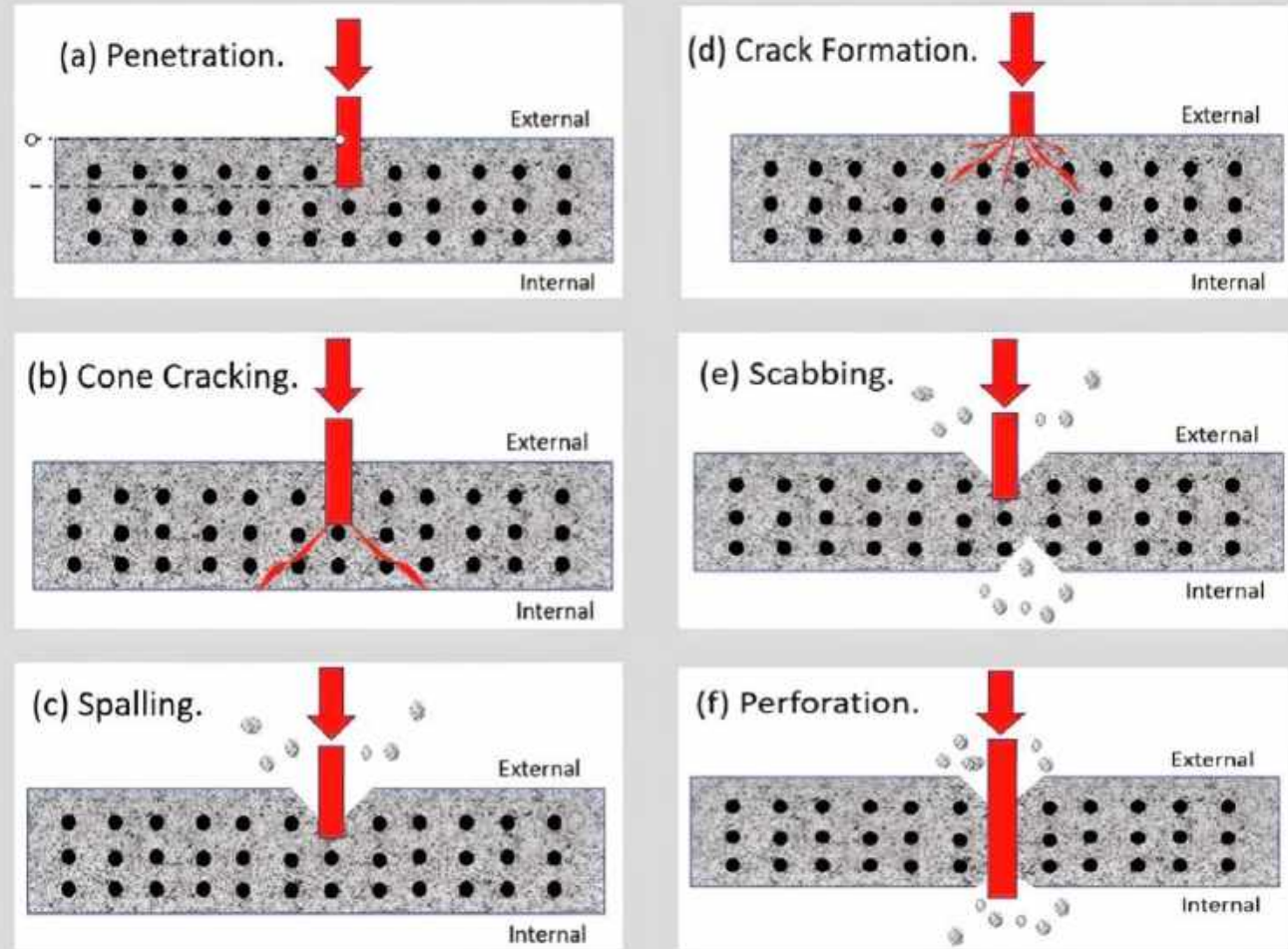
- ❖ InQuik provides on-site technical support during construction



Artillery/Missile Effects

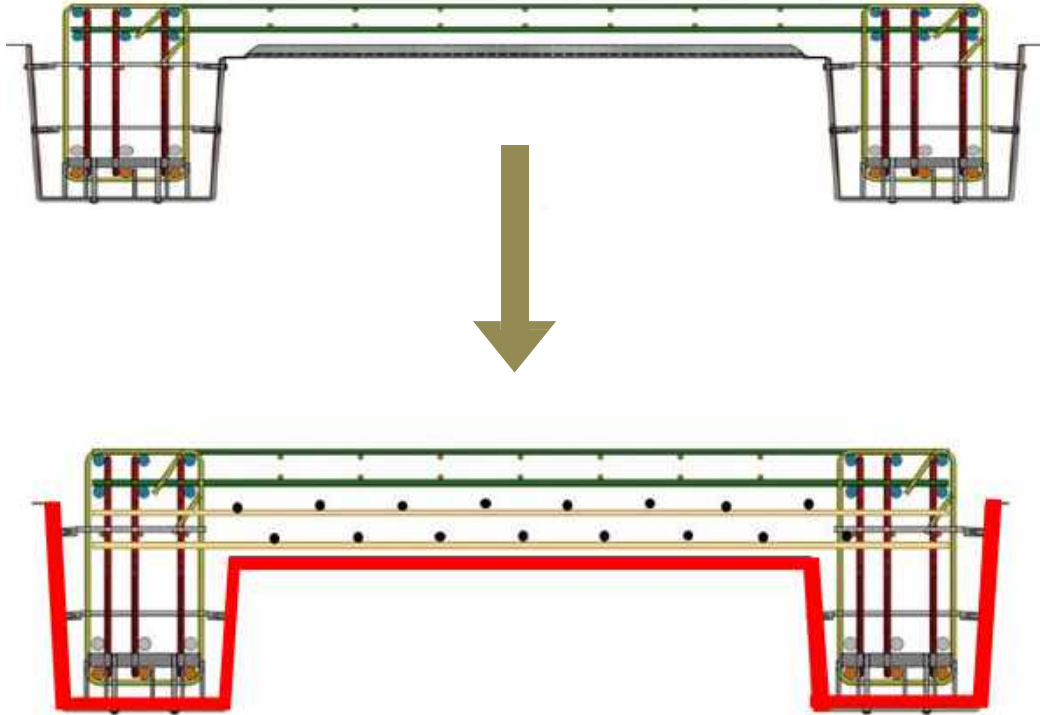


Bridge damage by artillery - Ukraine



Effects of missile impact on concrete target

Artillery Resistance



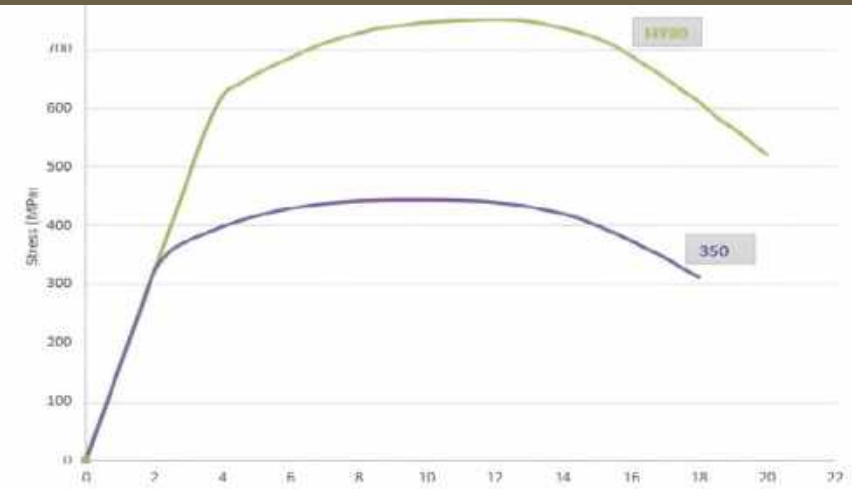
Deck Modification:

- Increased depth between girders, doubling concrete thickness.
- Added extra rebar layers, upgraded to 500E for toughness.
- Offset rebar layers for improved penetration resilience.

Formwork Upgrade:

- Replaced 3mm 250-grade steel with 6mm ballistic-grade HY80 or similar.
- Enhances protection, preventing penetration into the secure space below.

Material Properties



Typical HY80 vs 350 grades tensile curves

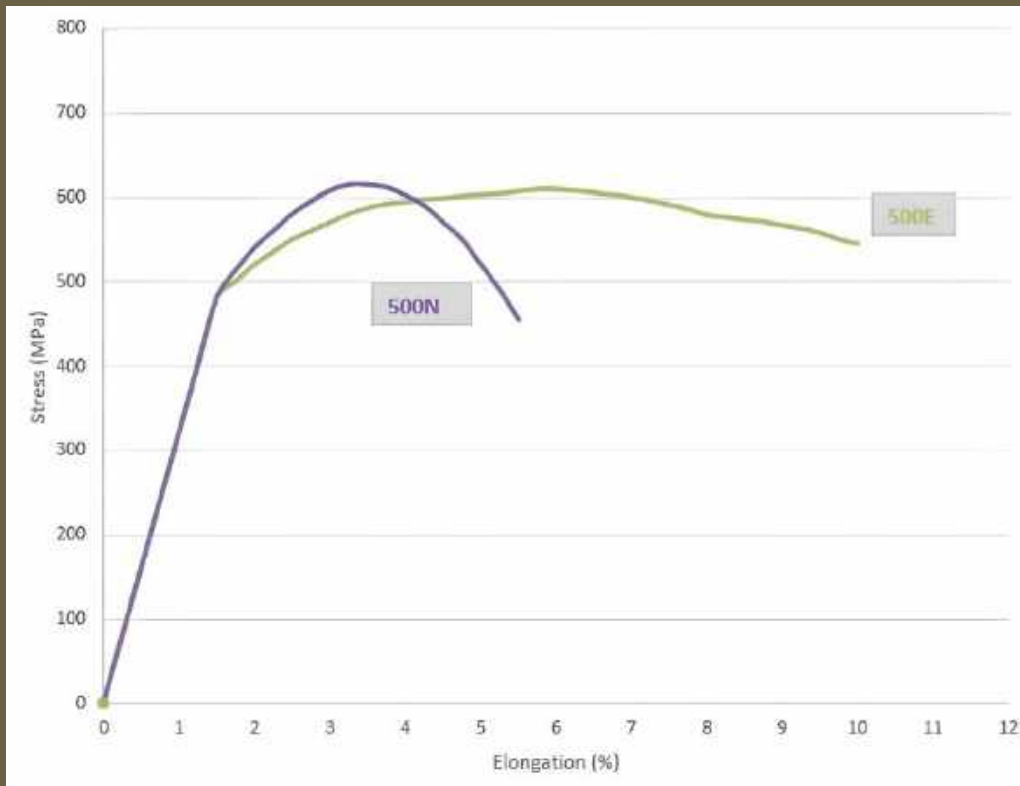
Explosive blast test

Deformed ballistic plate – no rupture.

Material Properties

- Formwork upgrade includes an additional layer for extra protection.
- A 6 mm ballistic plate, like HY80, shapes the formwork to prevent concrete splinters from ejecting.
- Ballistic steel deforms under projectile impact but doesn't fail.
- Ensures no material ejection into the sheltered area during projectile impact.





**Typical 500E vs 500N
rebar tensile curves**

- Research emphasizes impact energy as the primary cause of concrete damage.
- Rebar, upgraded to 500 E, enhances ductility for impact resistance.
- 500 E rebar offers double the elongation, indicating superior energy absorption.
- High elongation signifies better ductility, essential for absorbing energy through plastic deformation.

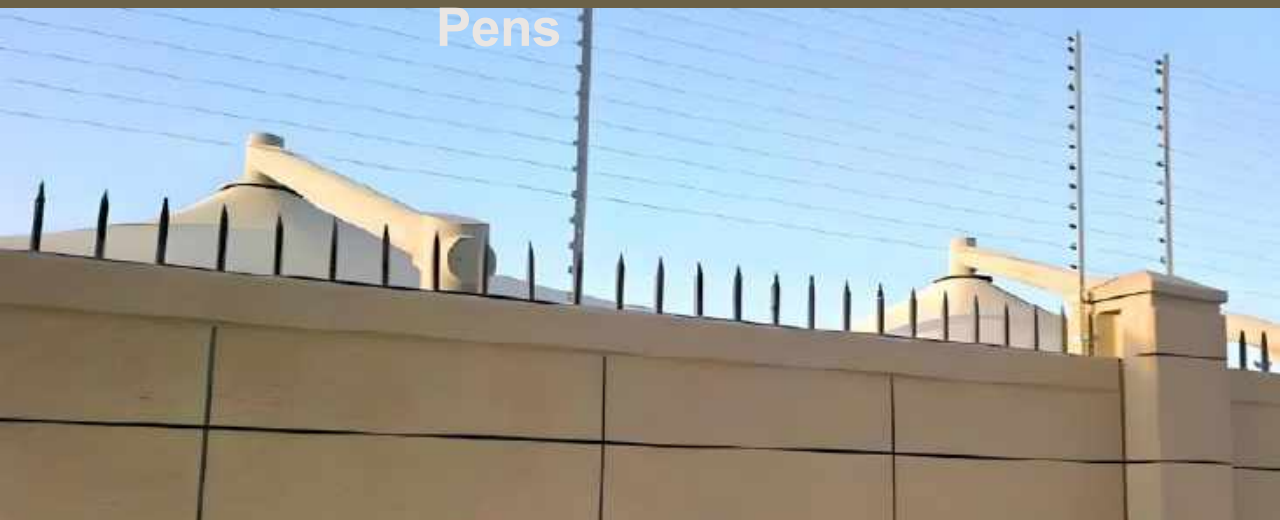
Other Defense Applications



**Submarine
Pens**



Individual Fighter Shelters



**Blast Proof Fencing
UAE**



Military Vehicle Bunker

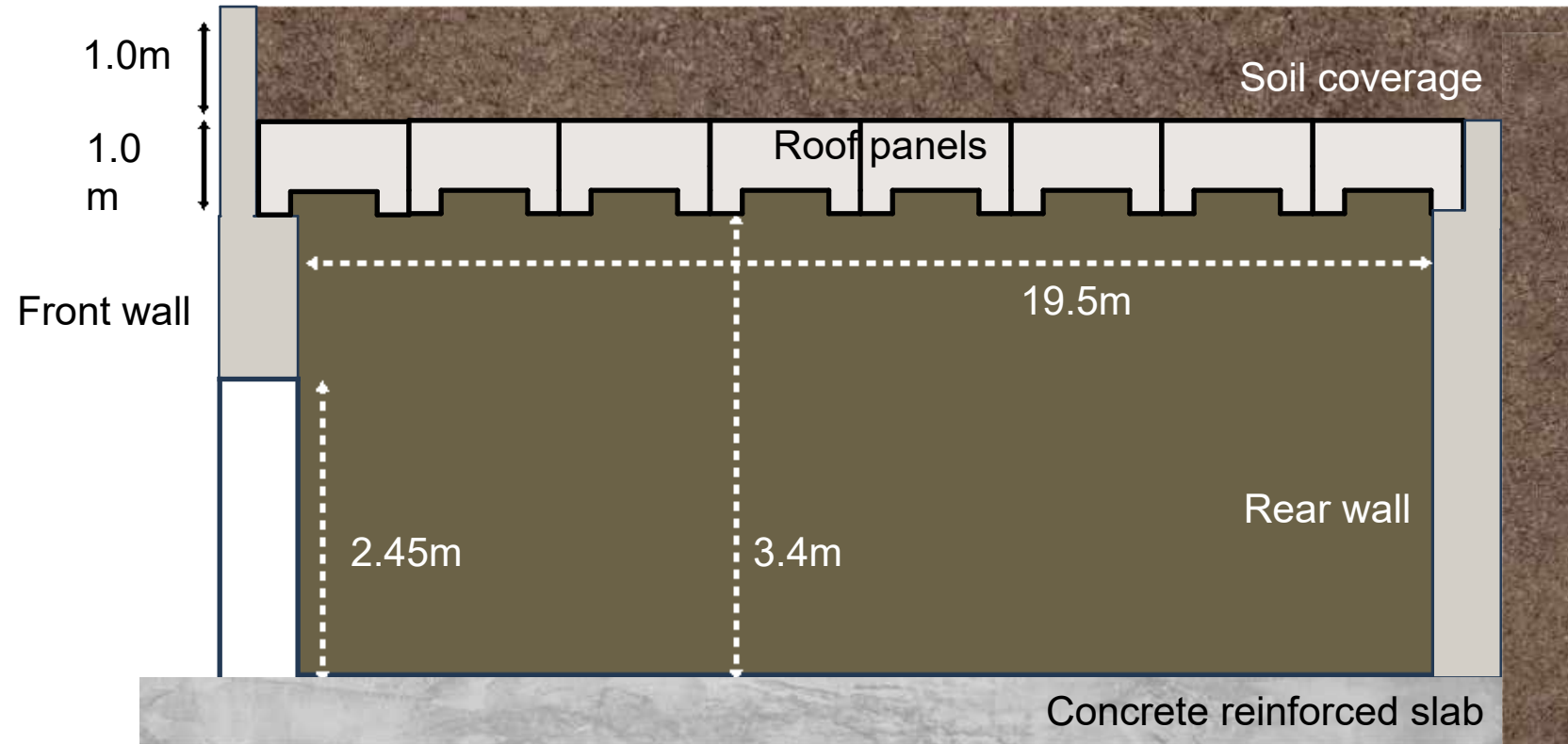
Bunker – Top View



Bunker Details

Abutments	Four abutments form bunker walls.		
Roof Structure	Eight 18.5m x 2.44m deck panels.	0.50m thick reinforced concrete.	Inner surface: 8mm ballistic plate.
Walls	0.50m thick reinforced concrete.		
Headwall	0.25m thick reinforced concrete.		
Wingwalls	Integrated with abutments.		
Construction	Delivered as fabricated steel.	Concrete poured in-situ.	
Security	Military Engineers for installation.	Maintains site confidentiality	

Bunker – Side Section View



To penetrate the bunker, the projectile would need to pass through:

- 1m of soil
- 0.5 m of reinforced concrete
- 8mm thick ballistic steel plate

Dimensions Internally	Details
3.4m high	Walls 0.50 thick
19m deep	Soil cover 1m deep
18m wide	Blast door 2.45m high

Protective Structures



Easy Transportation



Quick Installation





InQuikDefense



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