



OPENWORKS



# SKYWALL

CAPTURE DRONES – PROTECT ASSETS



## OpenWorks Engineering develops world leading security and counter terrorism products.

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We deliver dynamic engineering solutions. Our specialism is the security and counter terrorism market but we also apply our extensive experience to consultancy programmes.

OpenWorks is capable of supporting all levels of engineering project. We can help with small scale problem solving through to full blown product development, from concept to production.

Much of our experience has been gained through providing equipment for the demanding and challenging defence industry, where only the highest levels of quality and performance are acceptable.

# SKYWALL

## The Front Line of Civil Drone Defence

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The world's only drone defeat system that offers a cost effective and proportionate response to the civil drone threat.



# SKYWALL DEFENDS AGAINST COMMERCIAL DRONES

## Public nuisance – Invasion of Privacy – Security Concern – Terrorist Threat

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Drones have already been used to carry out crimes against individuals and organisations. As the technology becomes cheaper and more widely adopted the number of incidents will inevitably increase. Authorities such as the Police Force, Prison Service and Counter Terrorism Units have already acknowledged drones as a growing threat.

Numerous incidents such as the well-publicised White House crash landing and videos of drones flying over commercial airport runways and large cities have sparked fear, resulting in the requirement for protection against potential terrorist attacks or fatal collisions.

**“WHILE MANY ENCOUNTERS  
ARE NOT MALICIOUS IN  
NATURE, THEY UNDERScore  
THE POTENTIAL SECURITY  
VULNERABILITIES THAT COULD  
BE USED BY ADVERSARIES TO  
LEVERAGE [DRONES] AS PART  
OF AN ATTACK”**

U.S. DEPARTMENT OF HOMELAND SECURITY



# SKYWALL CAPTURES DRONES AND PROTECTS

Recent reports show the security of high profile individuals, such as the Japanese Prime Minister Shinzo Abe and German Chancellor Angela Merkel, has been compromised.

Drones have caused serious disruption at highly populated events such as the Boston Marathon. The Serbia vs Albania international football match in Belgrade had to be abandoned after riots broke out, sparked by a provocative flag hanging from a drone.

Celebrities have been besieged by paparazzi drones and prisons across the UK and America have seen a rise in drone related incidents, both delivering contraband and photographing high profile inmates.

While the world's leading defence contractors are offering high tech, high cost military grade solutions, OpenWorks is focussed on providing civil authorities with a cost effective response to the threat.

## KEY SECTORS

- Prisons
- Private Security Firms
- Police
- Critical Infrastructure Security
- Civilians
- Border Agencies
- Airports and Transport Policing



# SKYWALL

**A NET CAPTURE THAT NEUTRALISES  
ANY TYPE OF SMALL DRONE, OF ANY  
CONSTRUCTION**

## Civil Drone Defence System

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SkyWall offers those exposed to the drone threat with the ability to protect the public, VIPs, crowds, prisons and critical infrastructure.

It is the world's only drone defeat system that offers a cost effective and proportionate response, developed specifically for the civil drone threat. SkyWall allows an operator to capture and bring down a drone at a time and place of their choosing, using a combination of a compressed gas powered launcher and an intelligent projectile. Damage to both it and the surrounding area is minimised by controlling the descent of the captured drone.



**SKYWALL 100**

COMMERCIAL IN CONFIDENCE



# CAPTURING A DRONE

## ENSURING CONTROL OF THE SITUATION IS MAINTAINED

### ADVANTAGES OF PHYSICAL CAPTURE:

- Higher confidence of threat mitigation
- Reduction of potential collateral damage
- Defence against any shape of drone, typically less than 4ft in maximum dimensions
- Defence against any type of construction material
- Safe and controlled landing of the drone in cluttered ground space
- Forensic investigation of the drone - allowing the network behind the threat to be attacked
- The ability to mark the target with tamperproof paint - ensuring quick location of any individual that interacts with a seized drone
- Defence against both commercially-available and custom-made drones
- Defence against both command and autonomous operation
- Interference free operation in RF/GPS dense environments
- individual drone targeting for use in populated airspace





# SKYWALL LAUNCHERS

## A range of launchers to augment your existing security

Modular launcher design combined with the intelligent drone defeat projectiles ensures that the SkyWall system is future proof.

The SkyWall range offers defence in man portable and temporary or permanent installations. Each subsequent system offers additional benefits such as increased levels of protection and ease of integration, depending on the threat scenario being considered.

SkyWall100 is a highly mobile handheld system that allows rapid response to an incoming threat. The ruggedised design and SmartScope ensure minimal training is required.

SkyWall200 is a semi-permanent installation well suited to organised events. It can be carried by two operators to allow for planned mobility and offers increased range.

SkyWall300 is a permanent installation for use with critical or sensitive infrastructure. It is environmentally protected, semi-automatic and has the greatest operational range of any SkyWall system. Detection and target tracking is integrated, facilitating remote operation.

**SKYWALL100**   **SKYWALL200**   **SKYWALL300**



**SKYWALL200**



**SKYWALL100**



**SKYWALL300**

# DRONE DEFEAT PROJECTILES

Pneumatically launched intelligent drone defeat projectiles



# THE SP RANGE OF INTELLIGENT SKYWALL PROJECTILES

- SP01 – TRAINING PROJECTILE**
- SP10 – NET DEPLOYMENT**
- SP40 – NET WITH PARACHUTE**
- SP80 – NET WITH ECM**

The core technology in the SkyWall system is a pneumatically launched intelligent drone defeat projectile, the SP range.

The SP range of intelligent projectiles delivers a range of counter measures to incapacitate a drone and bring it to a controlled landing. This allows an operator to actively protect a designated air space, in response to an intelligence alert or threat level, and ensure that should a threat arise, action can be taken.

The SP range of intelligent projectiles is designed to be refurbished to ensure that the through life cost to the operator and the environment is minimised.



# SKYWALL100

The most cost effective way  
to protect your infrastructure,  
personnel and events



## SKYWALL100 KEY ATTRIBUTES:

- Man portable - highly mobile
- Cost effective
- Minimal training required
- Near silent operation
- Rapid response
- Does not affect adjacent aircraft
- Minimises collateral damage
- Allows for examination of drone after capture

# PROVEN THROUGH OPERATIONAL DEPLOYMENT

The launcher is combined with the SP range of projectiles to allow a single operator to protect against multiple drone threats.

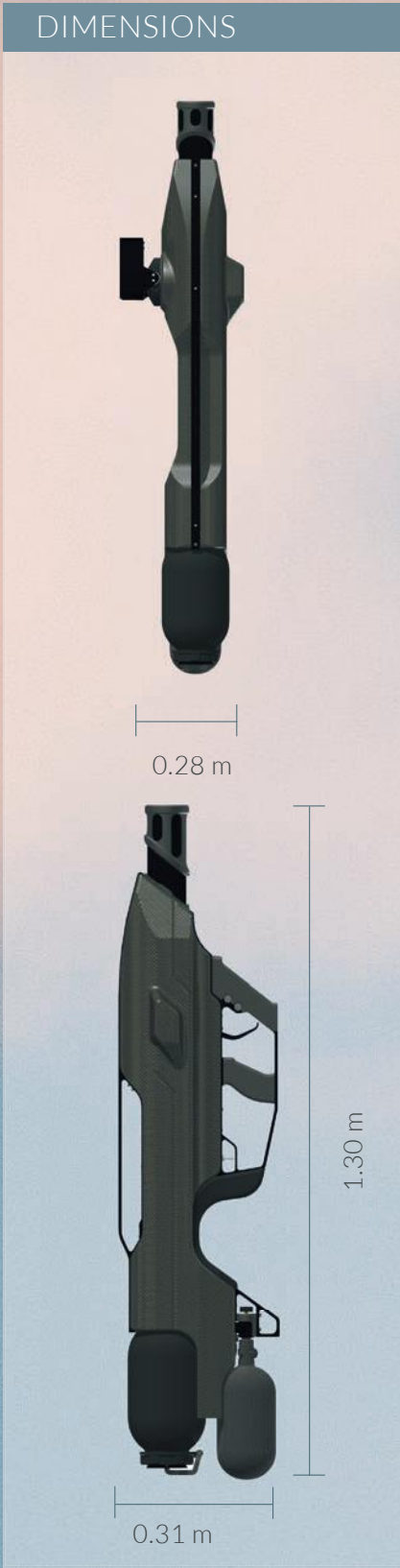
Conventional weapons often fail to incapacitate a drone and do not offer a proportionate response to the civil drone threat, often escalating a situation when used in the vicinity of large crowds.

Military grade drone defeat systems can be prohibitively expensive for homeland security applications. SkyWall100 offers not only a low upfront cost but also a reduced through life cost, due to its minimal training requirements and low impact maintenance schedule.



# SKYWALL100

The man portable drone defeat system



SkyWall100 is fast to deploy, man portable, easy to integrate with existing security systems

PERFORMANCE		
Range:	Minimum	10m (32ft) LOS
	Maximum	100m + (320ft) LOS
Max Target Speed:	Approaching	15m/s + (34mph)
	Crossing	12.5m/s + (28mph)
Environmental:	IP54	
	-5°C to +50°C	
Weight:	12kg (26lb)	
SmartScope:	Reflex scope with integrated range display (daylight only)	
	Laser with integrated gyroscope and atmospheric sensor package	
	Audio feedback during reload and targeting	
Silent Operation:	Compressed air power minimises sound released	
Re-Useable Air Tank:	Can be refilled locally around the world	
Rapid Reloading:	Breach loading allows for quick reloads by a single operator	
Safety:	A range of sensors ensure safety during operation, reloading and storage. Energy is only released when an SP40 projectile is recognised by the onboard computer	
	Designed to comply with the Pressure Equipment Directive 97/23/EC	

The SkyWall100 launcher is designed to be rapidly deployed by a single operator with only minimal training required. It has an array of in-built technology to ensure the user can capture multiple drones reliably and with minimal cognitive loading.



# SKYWALL100 OPERATION

## Minimal Skill Required Due to On-Board Technology

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The operator uses the SmartScope to sight the target drone. A laser range finder and Inertial Measurement Unit allow the launcher's on board computer to calculate the launch vector and muzzle velocity required to intercept the drone.

Single button operation commands the SmartScope to scan for a target.

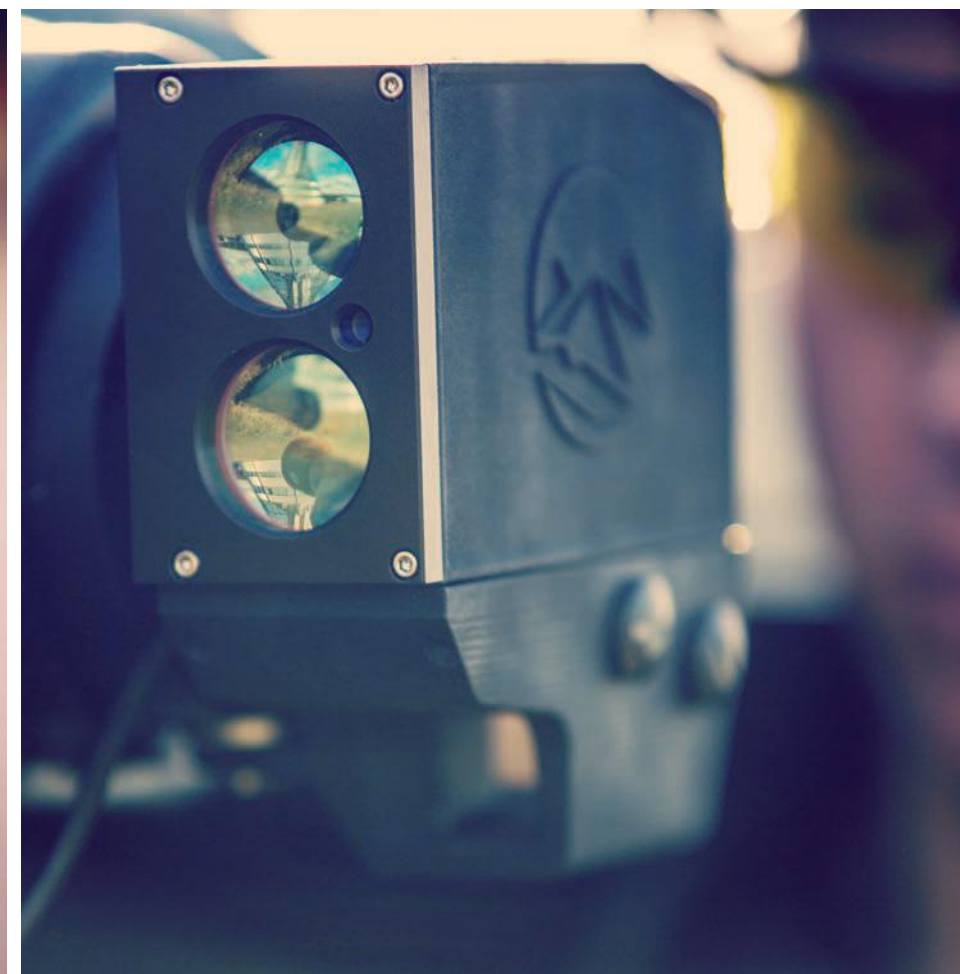
The operator receives constant feedback, illustrating when the laser is targeting from the drone.

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The SmartScope is actuated and adjusts its bearing to force the operator to redirect their aim, accounting for gravity drop. The on board computer will also calculate the required lead for a moving target.

The intelligent projectile is continually updated with flight data which is used to actuate the net and parachute deployments.

At this point compressed gas is released onto the back of the projectile. When the operator pulls the trigger the data is stored on the projectile control circuitry and the mechanisms holding the projectile are released.





# SP40

The SP40 is an intelligent projectile that contains a large specifically designed net and is configured by the laser-equipped SmartScope.

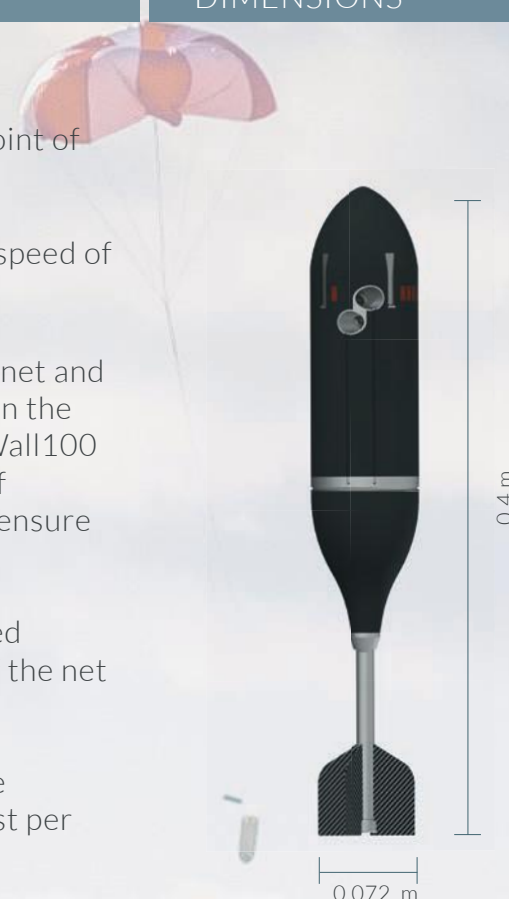
The use of a large net, accurately deployed, gives a very high confidence level that a drone will be captured.

The SP40 also carries a parachute, which controls the descent of the now captured drone. This minimises the risk of collateral damage and ensures the drone does not breach the defended perimeter. When collected, the drone can be examined for forensic evidence. Other options to suit a specific scenario are also available, such as audible and visual alarms and tamper proof marking systems.

If the drone eludes capture, the parachute deploys regardless and controls the safe descent of the tethered projectile components.

# SP40 NET



PERFORMANCE		DIMENSIONS	
Weight:	760g (1.7lbs)		
Composite drone capture net:	8 sq.m (85 sq.ft) coverage at point of capture		
Parachute descent control:	Example: DJI Phantom 3 drop speed of 3.3m/s (7.4mph)		
Safety:	<p>The energy used to deploy the net and parachute is only received when the projectile is loaded into a SkyWall100 launcher. It dissipates quickly if removed from the launcher to ensure safe handling and transport</p> <p>All components remain tethered together during deployment of the net and parachute.</p>		
Cost:	<p>The projectile is designed to be Re-useable to ensure a low 'cost per capture'</p>		



# SKYWALL CONCEPT OF OPERATION

SkyWall systems can provide a safe perimeter to ensure drones do not disrupt

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SkyWall could have prevented the premature abandonment and subsequent riots at the Serbia vs Albania international football match in 2014. It would mitigate such risks during global sporting events, such as the Olympic opening ceremony or the 100m sprint final, which are viewed by over 100 million people worldwide.

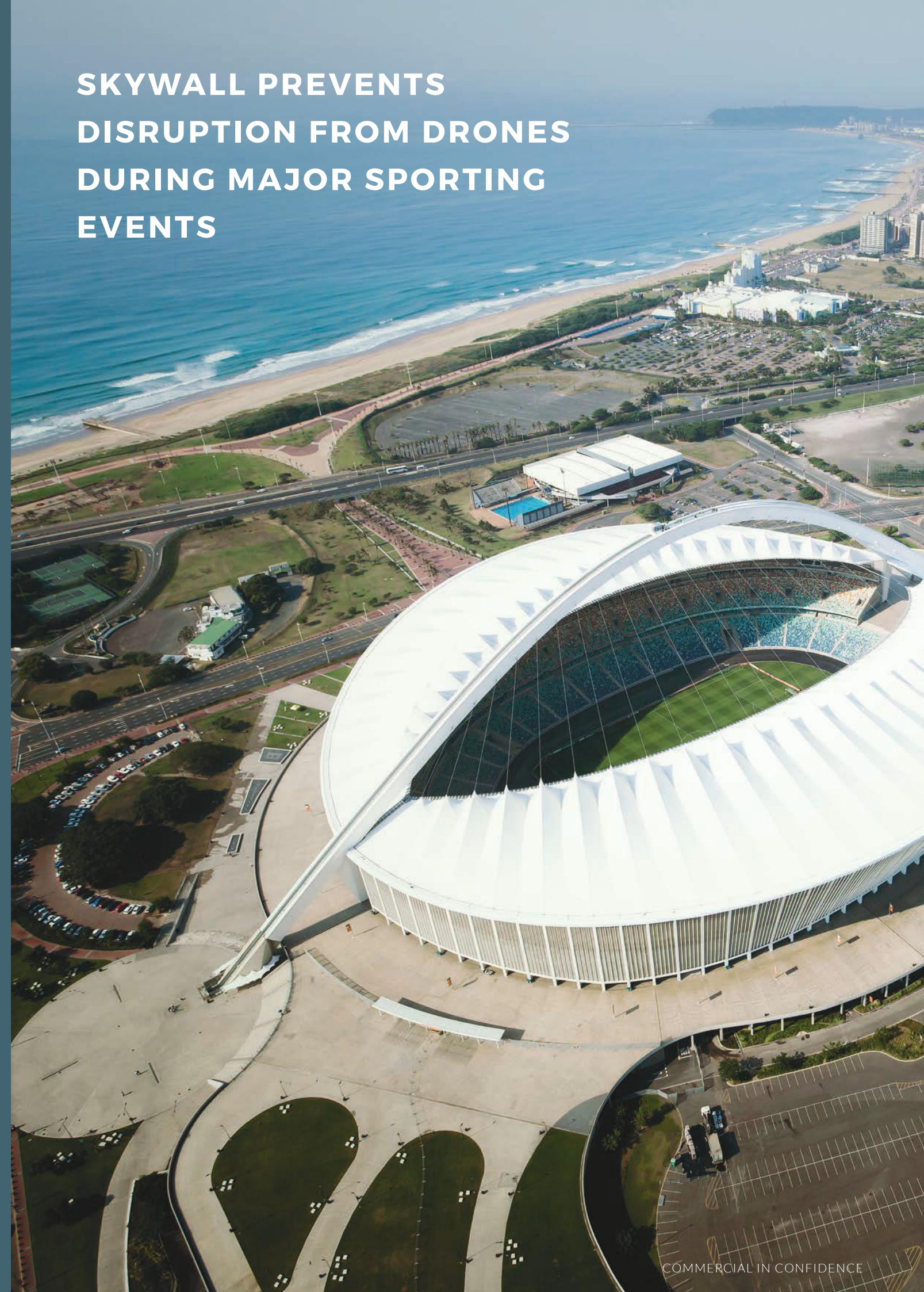
Prisons have already seen a rise in the use of drones to deliver contraband to recreational yards and take photos of high profile inmates. SkyWall can ensure that when a drone is detected, it can be brought down before it breaches the secure boundary.

The security of VIPs during open air events can be enhanced by the presence of SkyWall, providing a visible deterrent and a effective barrier in the sky.

Airports have recorded an alarming number of incidents involving drones in restricted airspace. In April 2015 Manchester Airport shut the main runway for 20 minutes due to the presence of a drone. SkyWall offers airports a way of capturing a drone without compromising passenger safety.

Critical Infrastructure is at risk from drone attack, threats range from industrial espionage to terrorism. SkyWall is the most effective way to ensure protection, without investment in complex, high cost systems.

SKYWALL PREVENTS  
DISRUPTION FROM DRONES  
DURING MAJOR SPORTING  
EVENTS






Technology demonstrations are available by appointment only, For more information or to arrange a meeting please contact our sales team:

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