Protect the Player. Protect the Planet.

POWERBASE/YSR®
BY BROCK

# Understanding surface impacts:

**3** | **Three unique parts of the body produce different impact levels when contacting the surface, so 3 different test devices are used, each designed for a specific impact quality.**

| Testing Units | Impact Areas: Head / Body / Foot |
|---|---|

## HIC (Head Impacts)

**ASTM F355 E Missile**

HIC is the only internationally recognized test standard for head injuries. It drops a 10 lb hemispherical impacter from increasing heights to determine Critical Fall Height. It's the same test used in playgrounds, automotive crashes, wall padding, pole vault, and the WR Reg22 standard for artificial turf. The higher the Critical Fall Height, the more protective the surface is for head injuries.

1

## GMAX (Body Impacts)

**ASTM F355 A Missile**

This test method covers the measurement of certain shock-absorbing characteristics, like during body impacts. It's applicable to natural and artificial playing surface systems. It does not correlate to head injury. It drops a 20 lb flat missile from 24". GMax is a good measurement when used in conjunction with HIC above, but as a stand alone test is not a total measure of field safety.

2

## VERTICAL DEFORMATION (Firmness Under Foot)

**EN14809 Vertical Deformation**

This test simulates the heel strike of an adult running athlete in stride. This is the softness or hardness under foot during play. A great natural grass field hits the "sweet spot" of being firm under foot while producing very low gmax and high Critical Fall Height. Which is why quality natural turf is the benchmark for quality artificial turf.

3

# Let's start with the brain.

## 1 in 5

**concussions involves the head hitting the surface.**

**Source** – Concussion Legacy Foundation

**The brain is more susceptible to injury until**

## Age 25

**Source** – Dr Robert Cantu, Neurosurgeon, Boston University School of Medicine

## 80 G's

**Point at which concussions occur in *pro* athletes**

**Source** – Journal of Neurosurgery, 2006

## 2 Years

**The length of time it can take a youth brain to recover from concussion.**

**Source** – York University, 2016

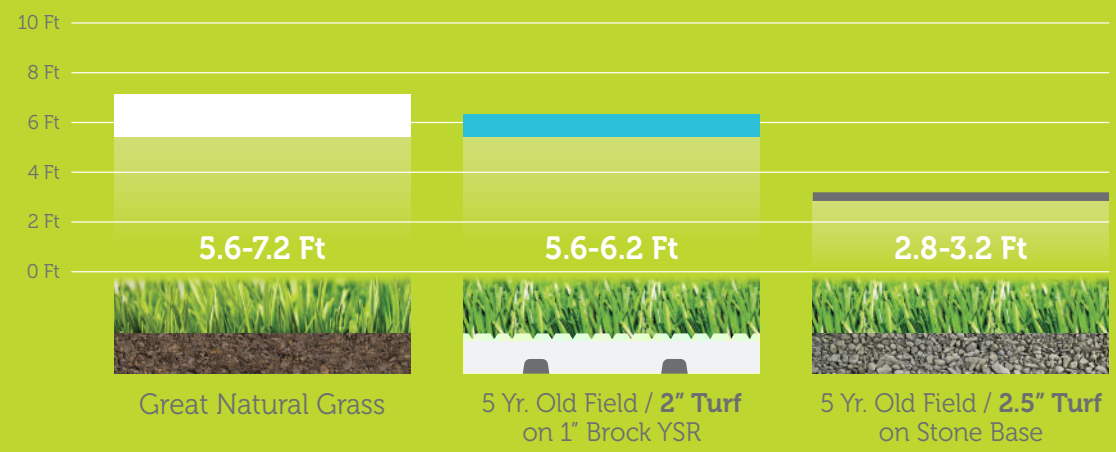
**"Knowing what we do now about concussions in sports we have an increased responsibility to build the safest environment we can for these kids."**

– A.R., Director of Facilities

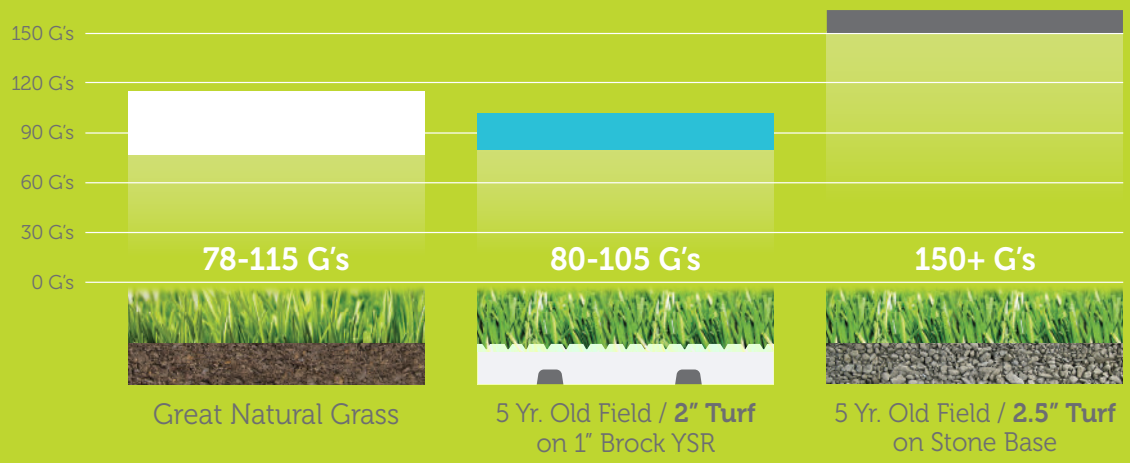
# Perfect natural turf: The benchmark

**An artificial turf system should be as safe as great natural grass. So how do they compare?**

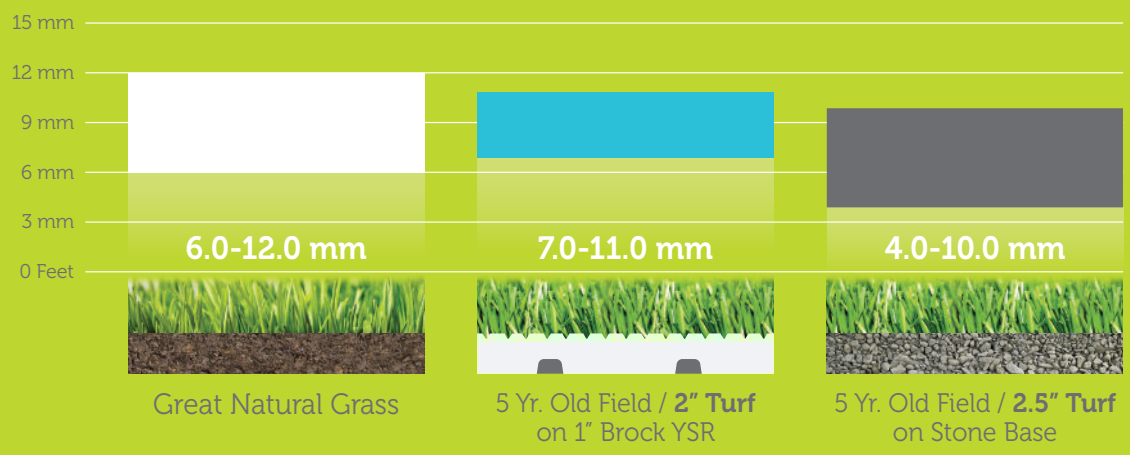
## Critical Fall Height **(Higher Is Better)**




## GMax **(Lower is Better)**




## Vertical Deformation **("Sweet Spot" for Speed and Agility)**



# Head Injuries are serious business.

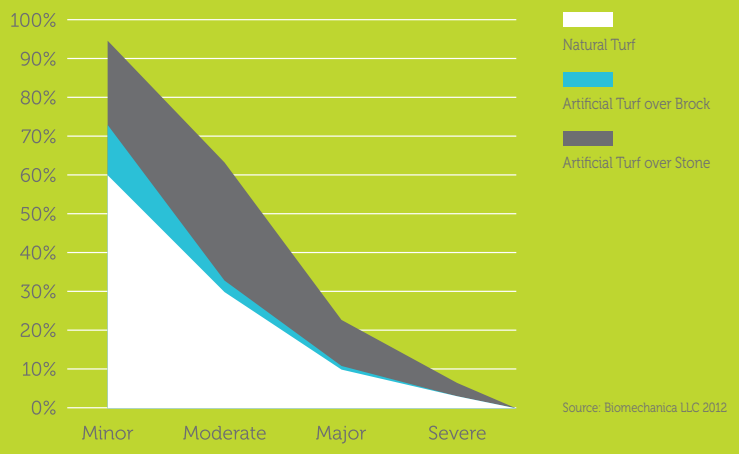
Only by understanding impacts to the brain and body could we engineer the highest safety and performance shock layer available. You wouldn't buy a used helmet with a recycled foam liner to protect a kid's brain, and the same applies to your shock pad.

Head Injury Criteria (HIC) is the internationally recognized standard for head injury. You want your field to have the highest Critical Fall Height possible, like that of a high quality natural grass. When PowerBase YSR is used under a proper infilled turf system, Critical Fall Height, GMax and Vertical Deformation all mimic that of a quality natural grass and significantly improve the safety of the field. Turf over stone simply does not.

## HIC: Turf over Rock / Turf over Brock / Natural Turf

**What does this mean for head injuries?**

**23-50%** reduction in the relative risk of common head injuries from a fall height of just 1 meter.



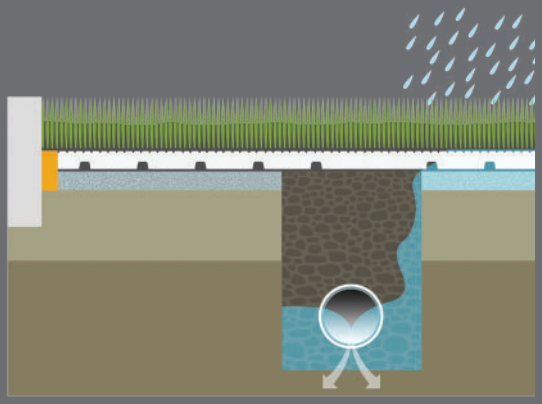

Source: Biomechanica LLC 2012

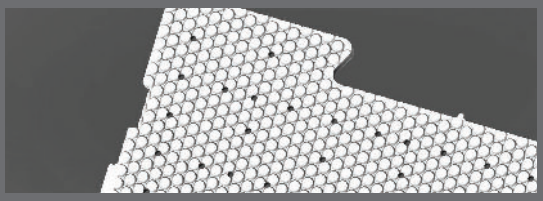
"Estimates for 5-year old surfaces showed a somewhat larger effect of the underlayment, directly attributable to the faster deterioration of impact attenuation performance of surfaces without underlayment."

– Biomechanica, 2009

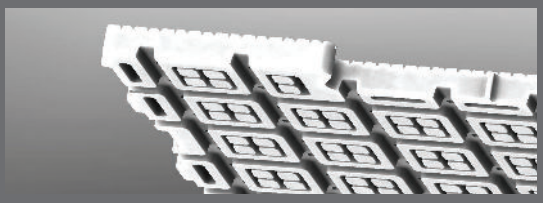
# Proven, fast drainage.

Brock PowerBase YSR has large lateral channels that help transport water to the collector system along the edge. ASTM D3885 Dual-ring infiltrometer testing on fields that use the Brock cross section have shown field drainage rates of greater than 70" per hour. EN12616 drainage test produces vertical drainage of the panel alone greater than 100" per hour.

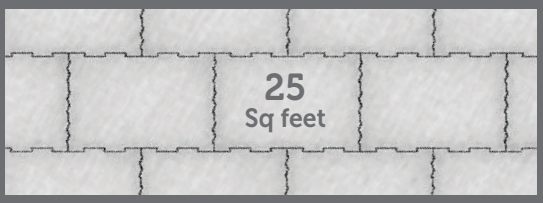




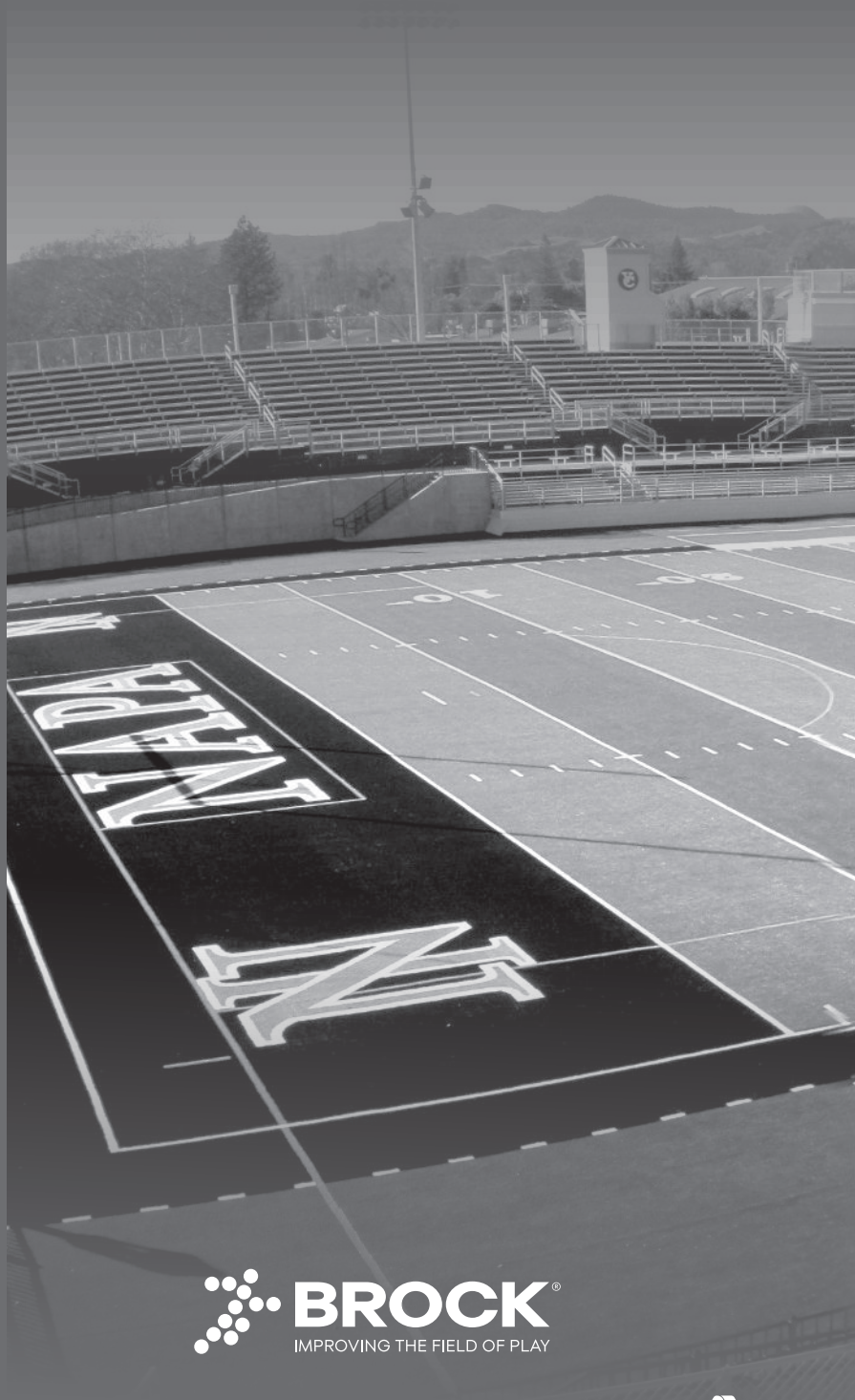
Shock absorbing pistons, dovetail interlock, turf support edges, and 2 million drain holes on a typical field.



Large drainage channels, shock absorbing structures, and 25mm thickness provide both player safety and effective drainage.




**STABLE INTERLOCKING SYSTEM** No cutting, no gluing, no taping, no shadowing through turf. Consistent feel and safety across every inch of your field. Larger panels speed up installation, can be installed in both directions



BROCK®
IMPROVING THE FIELD OF PLAY

*US Patents: 8,236,392, 8,353,640 and D637318 and other patents pending.*

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