



The StrathAyr Track

**From Research to
Proven Performance**

Bill G Casimaty

December 2005

StrathAyr History

- 35 years in the turf business
- Supplier to Australian racing since the 70's
- Revolutionisation of turf technology
- World leader in turf research, development and installation
- Product proven in major racetracks and stadia worldwide

Target Objectives for Racetracks

- All weather track
- Consistency
- Safety: equine and jockey
- Cost effectiveness
- Low maintenance
- Longevity

Four of the World Series
Racing Championship events
are now being conducted on
sand /mesh surfaces

- Hong Kong Cup(2000m) and the Queen Elizabeth II Cup (2000m),Sha Tin Racecourse
- Singapore Airlines International Cup (2000m), Singapore Racecourse
- Carlton Draught Cox Plate (2040m), Moonee Valley Racecourse

Cost Effective

- No race meeting ever cancelled due to track condition
- Reduced maintenance costs
- Longevity of track life (30 years +)

All-weather

There has never been a wet weather cancellation
on a StrathAyr System field or racetrack

Drainage capability designed to suit local
conditions

Longevity

Consultants to the Moonee Valley Club estimated a track life of 15 years for a conventional profile and 30 years for a track which incorporated ReFlex® mesh elements.

Sections of the Sha Tin track in Hong Kong have been in use for seventeen years and measurements clearly indicate that a thirty year life expectancy is extremely conservative.

There has been a considerable difference of opinion between various experts on the period of years that an all-weather, and a standard turf track should last without deterioration.

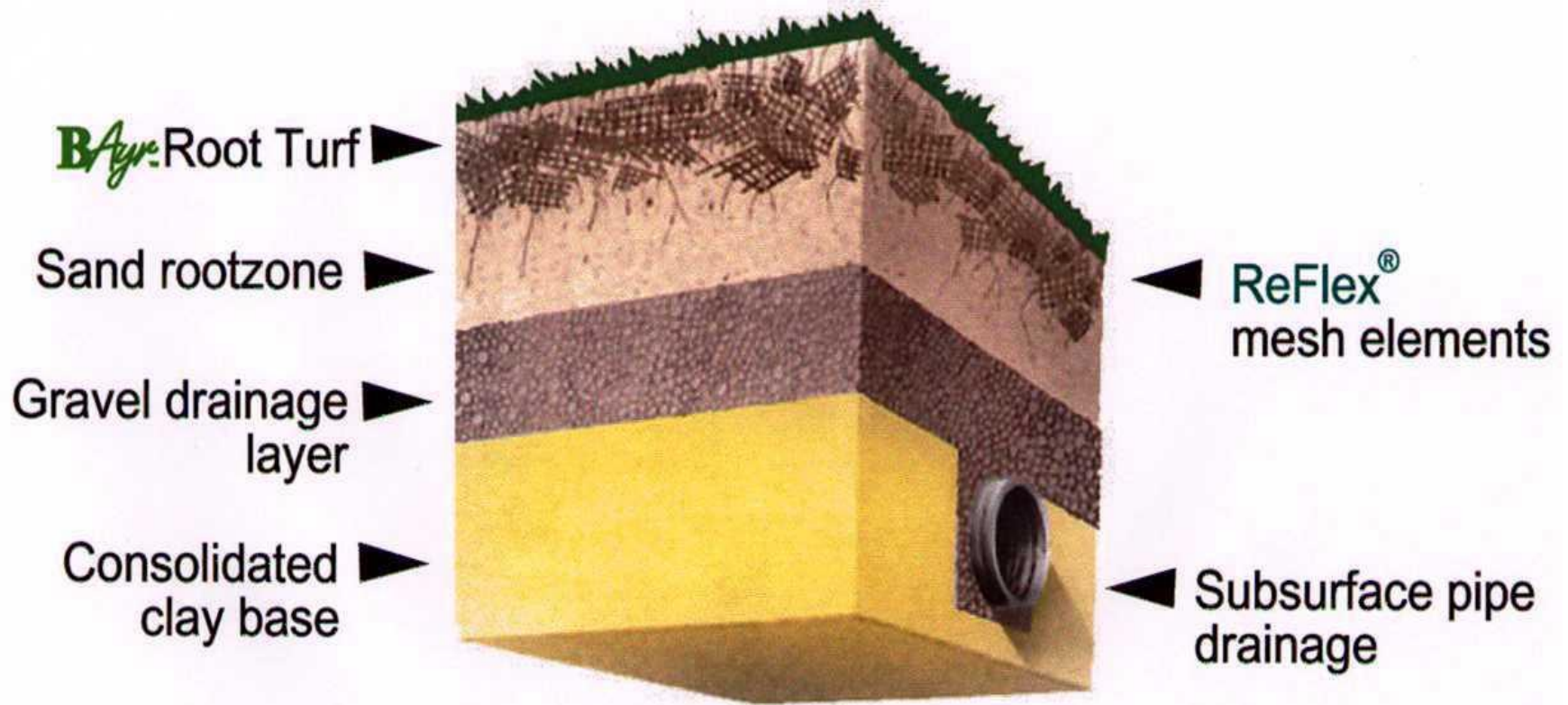
These estimates include:-

Estimate by	Standard Turf Track	Turf & Mesh All-Weather Track
Racing Victoria	15 years	25 years
Racing Mgr MVRC	8-10 years	20-25 years
Fisher & Stewart	15 years	30 years
Average	13 years	25.8 years

Consistent Surface

- Consistent track surface
- Tracks never rated hard or fast
- Never been a wet weather cancellation on any StrathAyr System installation

Incorporating ReFlex[®] mesh elements

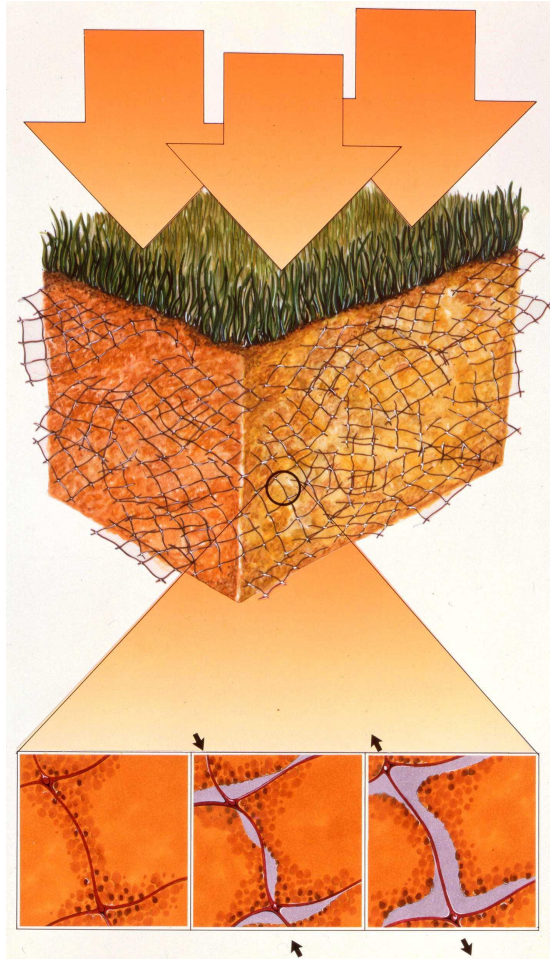


ReFlex[®] mesh elements



- All Weather (better drainage)
- Resists Compaction (extends track life)
- Better Growth All Year (increased usage)
- Safer for Horses (lower potential for injury)
- Consistent (track rating good or dead, rarely slow)

Resists Compaction



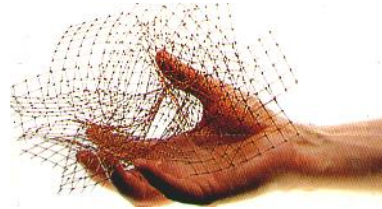
- Compaction resistance
- Indefinite life of profile
- Better growth all year

Extends Track Life

Load Bearing



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Specialised Machinery



Preparing mesh element matrix

Specialised Installation & Quality Assurance

Specialised Machinery



Installing matrix layer

Specialised Installation & Quality Assurance

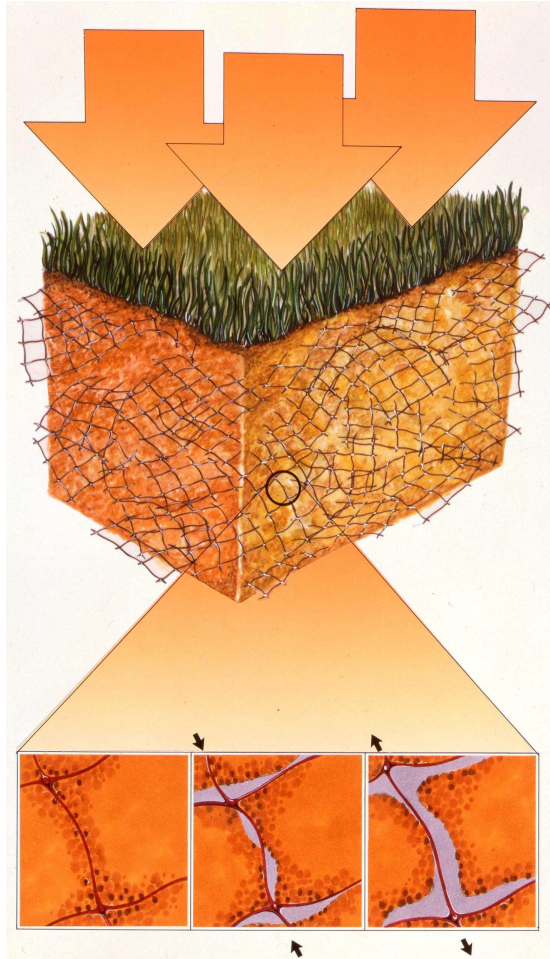
Specialised Machinery



Spreading 10mm topping layer

Specialised Installation & Quality
Assurance

Resists Compaction



- Compaction resistance
- Indefinite life of profile
- Better growth all year

Extends Track Life

Rootzones

Since the Hong Kong jockey Club pioneered the construction of sand rootzone tracks reinforced with ReFlex[®] mesh elements, there have been numerous attempts to develop a magic mix which will provide the conflicting requirements for racing of:-

- a. High Permeability
- b. Stability

A rootzone is a living biological medium that changes over time. While sometimes there are quite long honeymoons, the provision of drainage and stability was an elusive objective until the advent of mesh element reinforcement.

Proven Mesh Technology

- Product developed in 1982
- Extensive research undertaken by Strathclyde University and Texas A&M
- Incorporated in Happy Valley Racecourse in 1988
- StrathAyr's specialised machinery developed
- Utilised in stadia and racecourses globally

RootZone Laboratories International



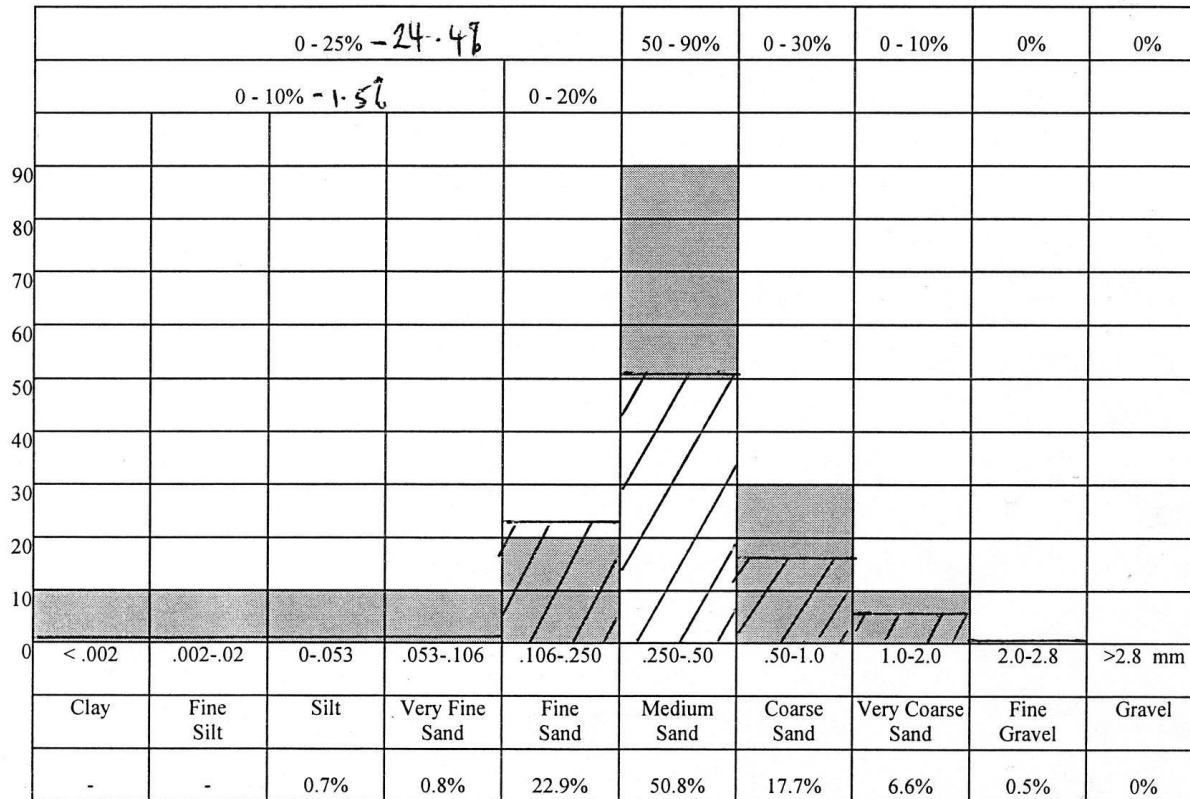
- Formerly ACT Canberra Parks Laboratory
- Specialises in root zone hydrology
- Dr Bent Jakobsen, Consultant. Julia Rudolph, Laboratory Manager
- Provides laboratory & consulting services to all StrathAyr installations & researches and develops new StrathAyr concepts



Mechanical Sieve Analysis & Particle Shape

Mechanical Analysis

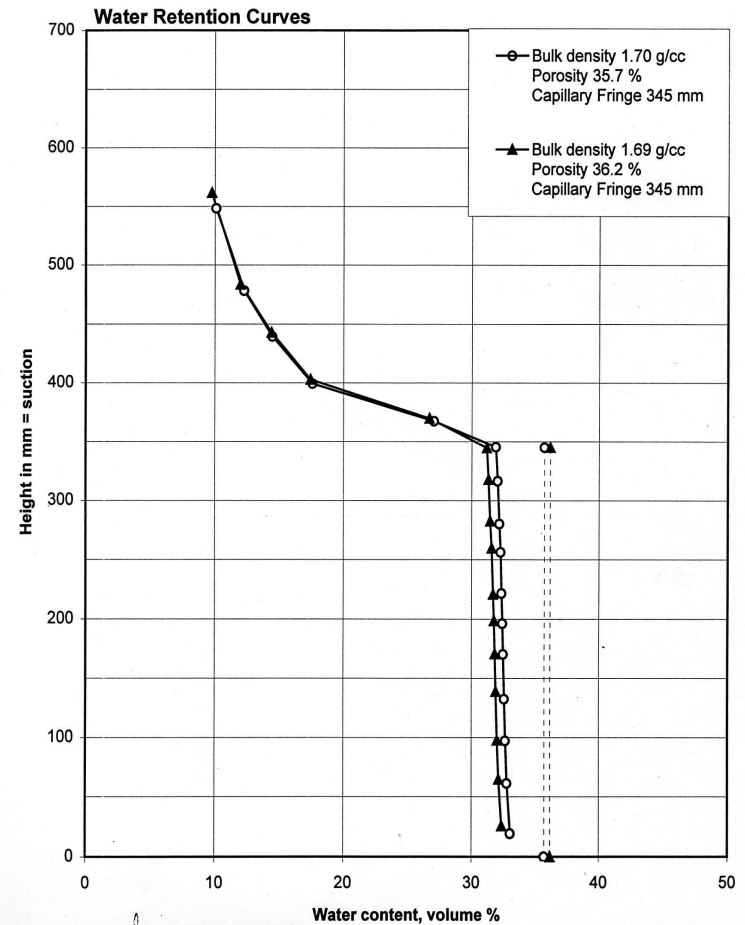
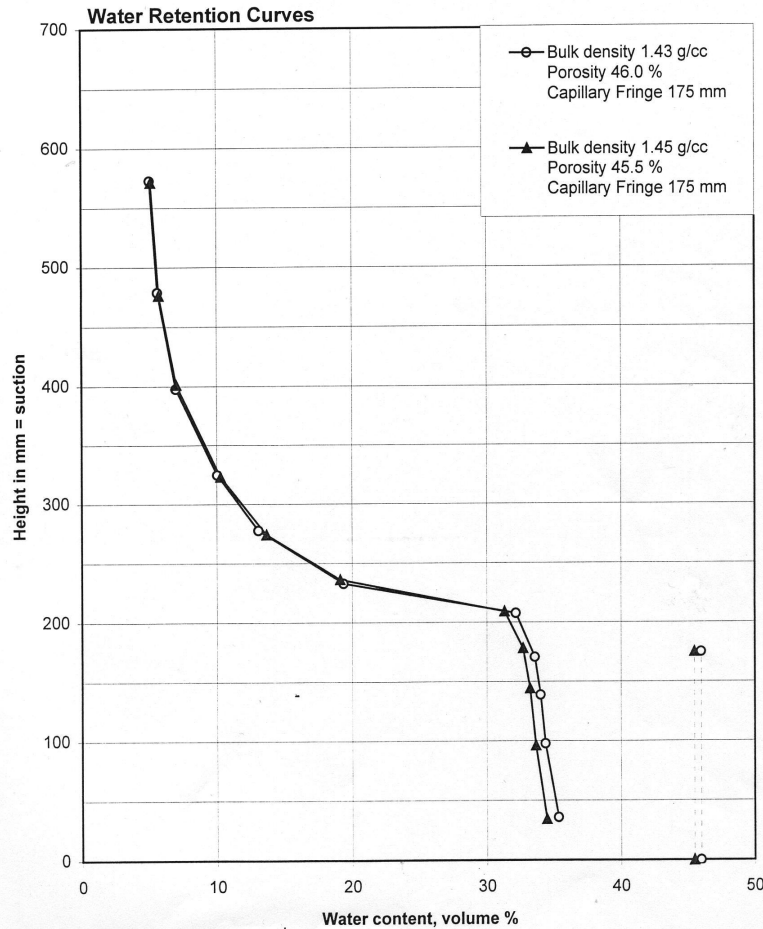
Soil tested against a type 'P' sand



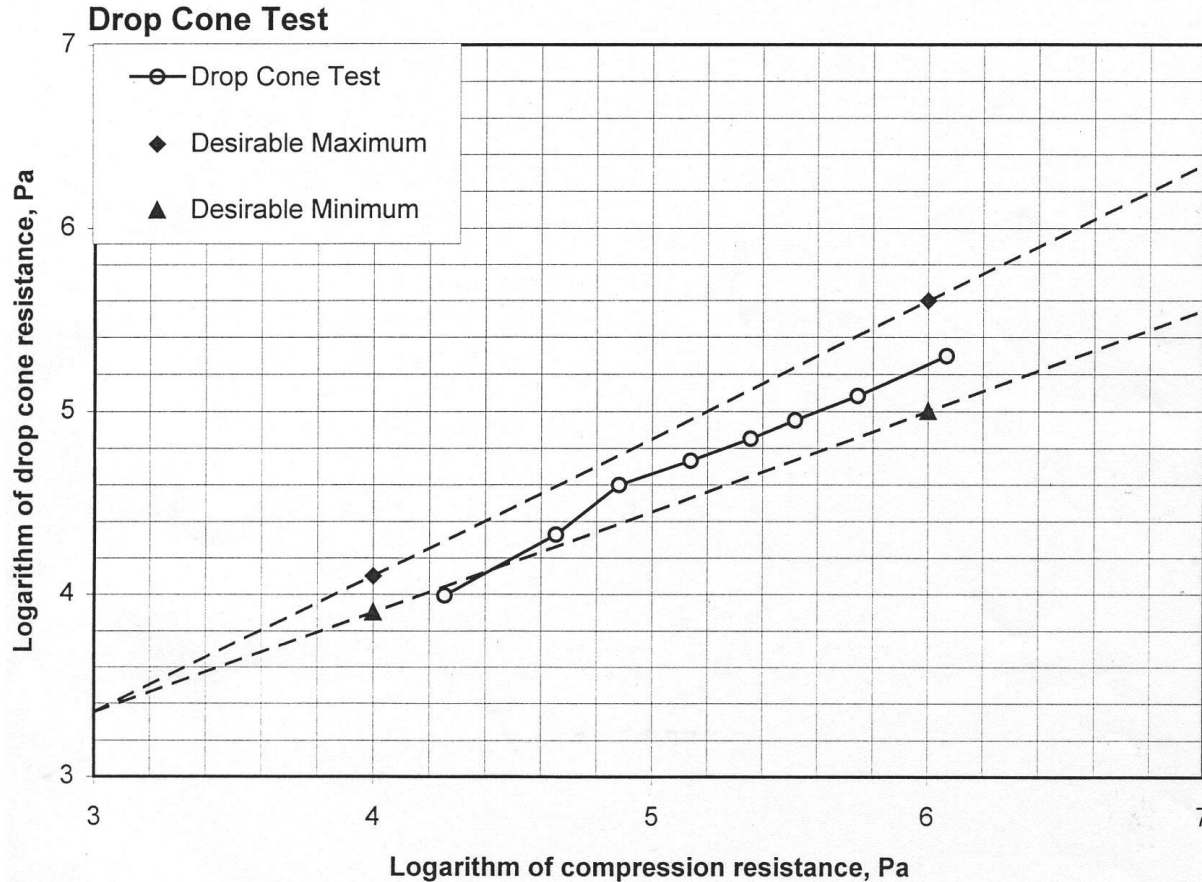
Shaded areas indicate the required particle size range for this soil type

D(85%) = 0.70mm

Moisture Release Curve (perched water table height)



Stability Testing



	Compression Resistance, kPa	Cone Resistance, kPa	Ratio, %
16 drops	954	192	20.1
32 drops	2034	329	16.2

Peatmoss / Amendment Testing

Need to balance amendment type for stability and moisture content without compromising drainage

Gravel Performance Testing

- Capillary Suction of Gravel

Capillary Suction

40mm water column

Bulk Density

1.38 g/cc

- Hydraulic Conductivity of Gravel

Hydraulic Conductivity

220,000mm/hr

Bulk Density

1.47 g/cc

- Migration Capability

Water Savings

The perched water table profile encourages deep roots and reduces overall water usage.

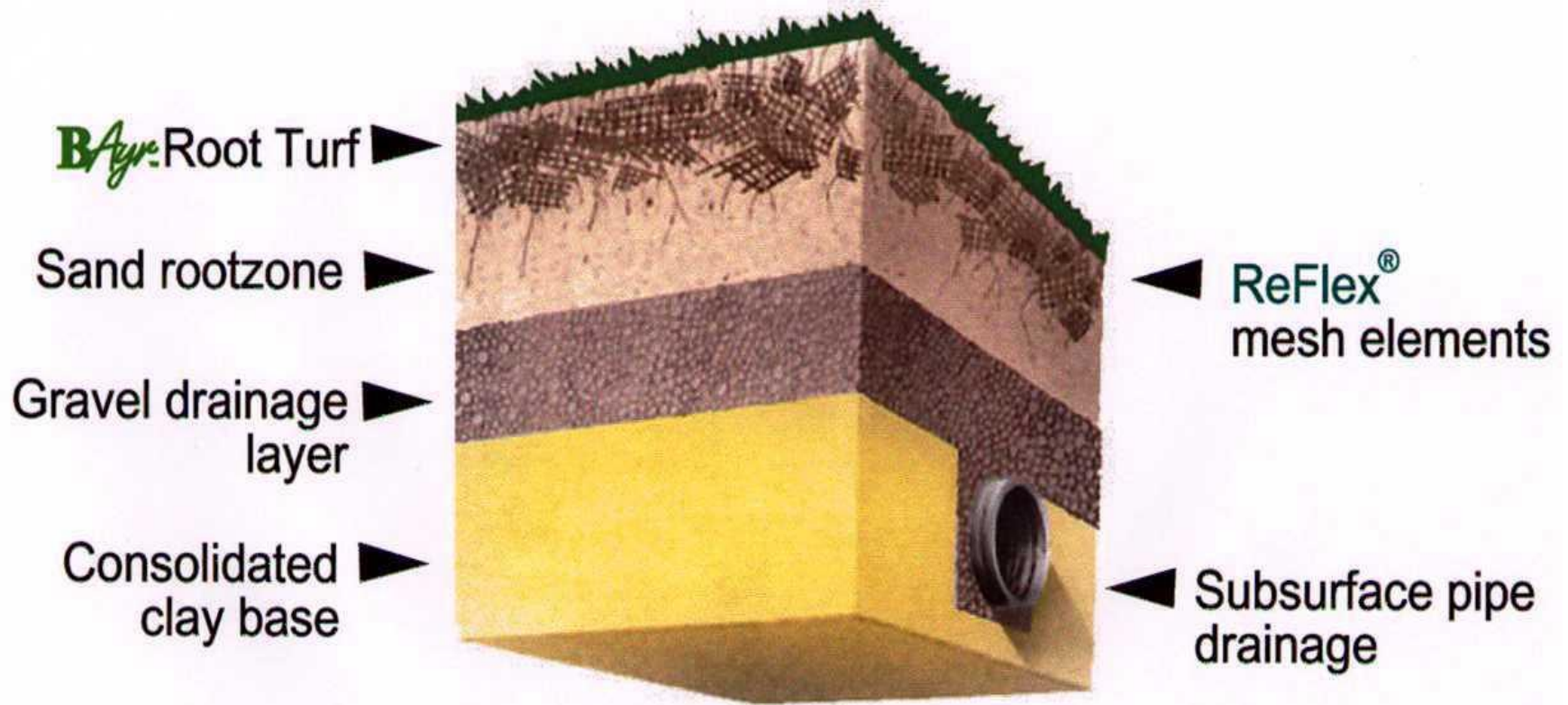
Experience is that less water is used and savings occur.

eg. Suncorp Stadium - Reduced water level usage by 54% while maintaining rootzone depth of 230mm

Environmental Advantages

- Track profile acts as filter for low quality water
- Facilitates use of recycled sewage

Incorporating ReFlex[®] mesh elements



Performance Specifications

Field Tests

- Infiltration rate (Infiltrometer)
- Hardness index readings (Clegg Hammer)
- Load bearing and rebound potential (Cyclical Plate Load Test)
- Lateral turf tear and traction assessment
- Ball roll

Laboratory Tests

- Moisture retention
- Rootzone porosity

General

- Testing done on benchmark project previously constructed
- Achievable for at least 30 years

Safety

- Increased surface consistency
- Galloping horses feel secure
- No surface water – no vision impairment to jockeys
- **Dramatic reduction in injuries:**
Singapore Turf Club: Non catastrophic injuries reduced by 55%. Reduced from 3.1 to 1.4 per 1,000 starts
- **There has never been a hard or fast rating on a StrathAyr surface**

Water Savings

The perched water table profile encourages deep roots and reduces overall water usage.

“Maintenance requirements are different for a sand reinforced profile but unlike what some may think require less water during summer months than the alternate conventional type of profile”

***Senior Manager (Tracks), Singapore Turf Club
Former Track Manager, Moonee Valley Racecourse***

Ian Trevethan

Increased Wagering

Singapore Racetracks

- The natural turf track attracts 30% more betting than the synthetic track
- Track measurements taken halfway through the meeting are provided to the punters via on site screens. This has been found to increase betting.

Usage Comparison

2004 – Singapore Turf Club

540 Races conducted around turf surface.

Total Gallops individual horses= 6,084.

Annual Rainfall:- 2,679mm

2003 – Singapore Turf Club

Total Gallops individual horses = 5,349.

Annual Rainfall:-3,206mm

The last two years StrathAyr Turf Track usage has increased, due to turf racing being more popular than Fibresand racing.

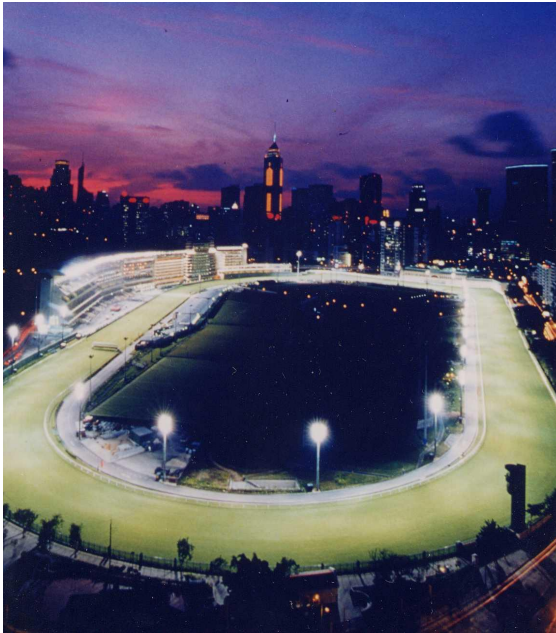
The track came through a 64 race program, then experienced a 3 week break from 17 December 2004 and resumed racing on 7 January 2005 into a 69 scheduled racing program.

Installations



Moonee Valley Racetrack
Melbourne, Australia

Installations



Sha Tin & Happy Valley Racetracks,
Hong Kong

The Hong Kong Jockey Club pioneered
the use of mesh elements in sporting
surfaces

Trevor McKee, *Trainer of Sunline*

“I think the mesh element tracks at Moonee Valley and Sha Tin provide exceptionally good racing surfaces and so does Sunline. She has won five out of five at Moonee Valley and one out of two at Sha Tin.”

Installations



Kranji Racecourse, Singapore

Malcolm Thwaites, *Champion Singapore trainer*

“Kranji has a lovely surface and is a lovely track. The going is generally good and, at worst, yielding. It is a fair track too, because every horse has a chance of winning.”

Danny Khoo, *Leading Singapore Racing Correspondent*

“The Kranji Racecourse is one that Singapore can be proud of because it is comparable with any in the world. The racing surface is excellent and durable as our first season of racing showed.”

Installations

Reliant Stadium
Houston, Texas



Installations



Sydney Showgrounds
Sydney, Australia



Sydney Olympic
Stadium
Sydney, Australia



Tad Gormley Stadium
New Orleans, USA

StrathAyr SquAyr



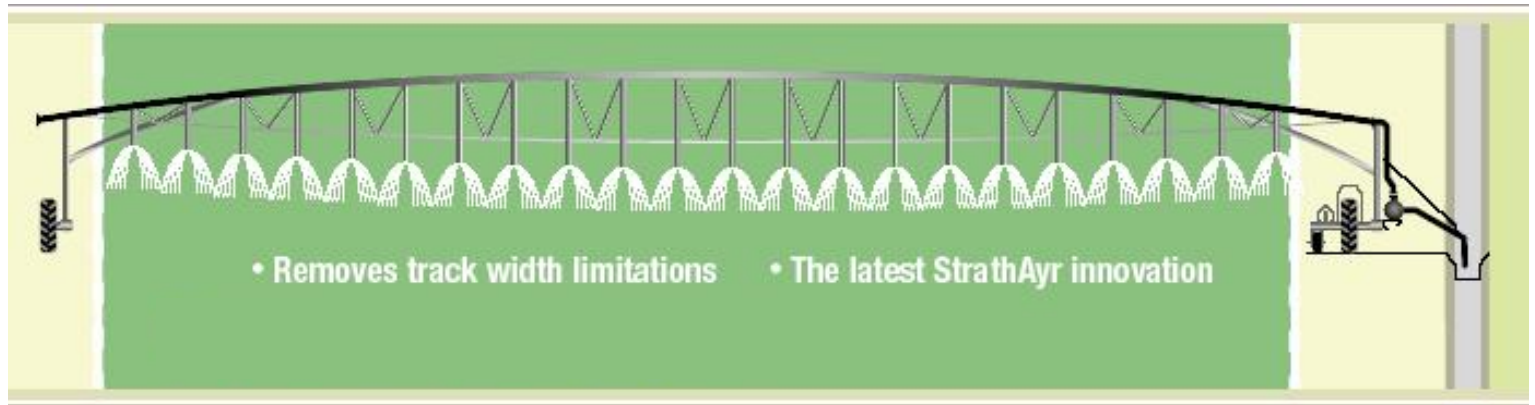
2.4 m x 2.4 m SquAyr

Instant repair system

Flemington Tunnel Project



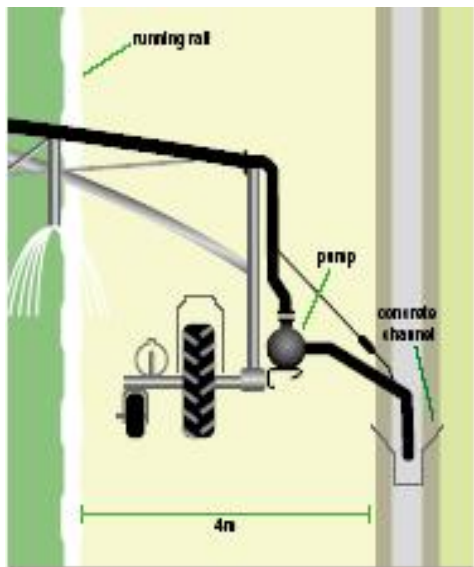
TrakSpan Irrigator



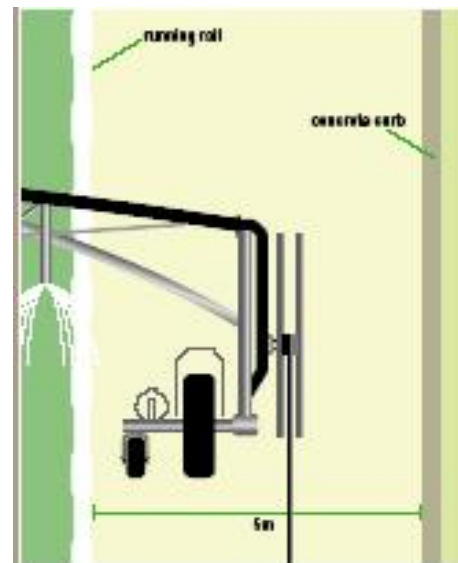
CUSTOM DESIGNED FOR RACETRACK IRRIGATION

TrakSpan Irrigator

- Low pressure broad span boom irrigator based on a proven and extremely robust bowstring truss structure.
- Diesel/electric powered providing efficient low cost operation with a simple electric drive system with user-friendly controls.
- Suitable for any track width up to 50 metres
- Water efficient
- Two models - Channel Fed Model & Hose Drag Model



Channel Fed



Hose drag

Turf

- Turf is the icing on the cake
- Track performance is reliant on profile design, construction techniques and maintenance procedures including easy water management by incorporating proper drainage and irrigation
- Turf selection will be what is considered best for the area

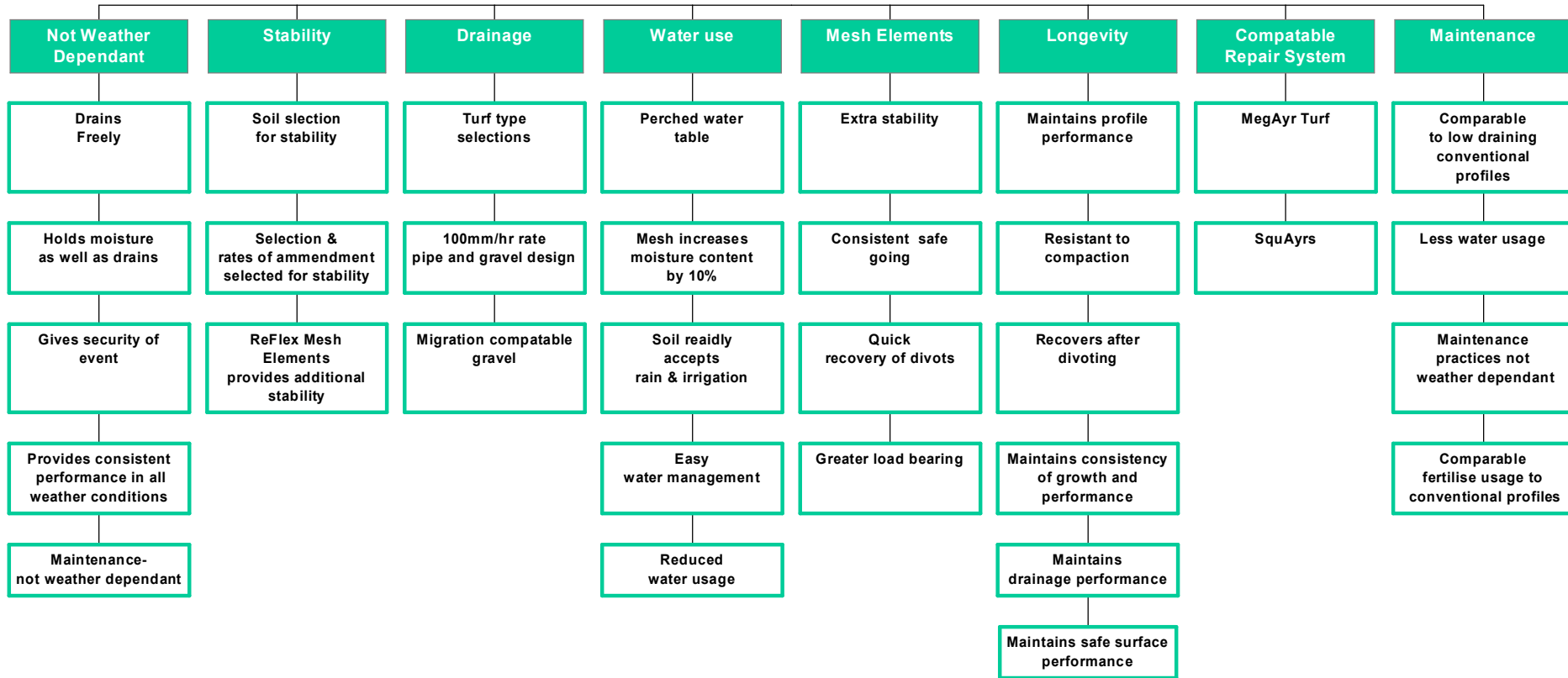
Fertilising Requirements

- Light and frequent has been the standard
- Moonee Valley fertilising schedule

100kg/ha every 2 weeks

(20-0-20) or (22-5-8) + root stimulants as required

StrathAyr Turf Systems for Racing



The logo features a dark green rectangular background with a white silhouette of grass along the top edge. The text "StrathAyr" is written in a white serif font, with "Strath" in a standard weight and "Ayr" in a bolder weight. A small "TM" trademark symbol is positioned to the right of the "r".

StrathAyrTM

www.strathayr.com