Construction of Cricket Squares in Asia

Overview

1. Summary of two Asian cricket square reconstructions
2. Insight into decision making process of new cricket squares
3. Summary of construction processes in Asia
4. Observations of pitch preparations on newly constructed cricket squares

Kowloon Cricket Club

THE KOWLOON
CRICKET CLUB
SINCE 1904

Need For Reconstruction

1. Club unhappy with current performance
2. Low/Slow bounce
3. Excessive moisture created poor root growth, therefore poor recovery
4. Inconsistent surface falls / clay depths
5. Cricket square generally had an unstable feel to it even when surface was dry →Damp base
6. Spider web cracking pattern

→ **Performed poorly in general**

Existing Cricket Square

1. Constructed in 2001, which formed part of a complete ground reconstruction
2. Existing wicket was built using Brisbane Clay (60% clay)
3. Overlaying a sand base
4. 10mm aggregate and installed drainage

→ **Standard construction**

Reasons For Failure

Top soil too high clay content

1. Unsuitable due to poor drying conditions
2. Evaporation rates at certain times of year are as low as 1mm/day
3. Lead to excessive preparation times
4. Prepared wickets were always damp

→ **Created preparation difficulties in poor drying conditions**

Reasons For Failure

1. Sand base too deep (ranged between 10 -14 inches deep)
2. Resulted in sand drying out at depth, causing sand to become hydrophobic, resulting in the sand being loose & failing to support rollers
3. Dry sand conditions created a poor relationship between clay and sand, and a perched water table resulted, and created even higher moisture retention in clay
4. Shallower sand layer would have resolved the problem, as it would have created perched water table between gravel & sand, & acted as an extension of clay

CONSTRUCTION CONSIDERATIONS

1. Needed a change in direction – current system not working
2. Considered various construction methods
3. Looked at various soils & base options
4. Drainage requirements

→ **Approached with an open mind**

CONSTRUCTION CONSIDERATIONS

1. Surface camber requirements
2. Outfield match in
3. Grass species
4. Maintenance requirements
5. Desired playability
6. Artificial wicket / Tiger Turf product

Decision Making Process

1. Finally decided to import Thai Soil
2. Past success in both Thailand & Hong Kong (reputation)
3. Suitability
4. Availability

→ **Element of risk involved**

Decision Making Process

1. Mixture of three soils
2. 5:3:2 mixture
3. 5 parts Smectite clay (Montmorillonite), 3 parts loam soil, 2 parts Kaolinite clay
4. Mixed by hand
5. Nutritionally unbalanced

⟶ **Very unconventional make up**

Decision Making Process

1. Low clay content
2. High sand content
3. Low linear shrinkage
4. Low crushing strength

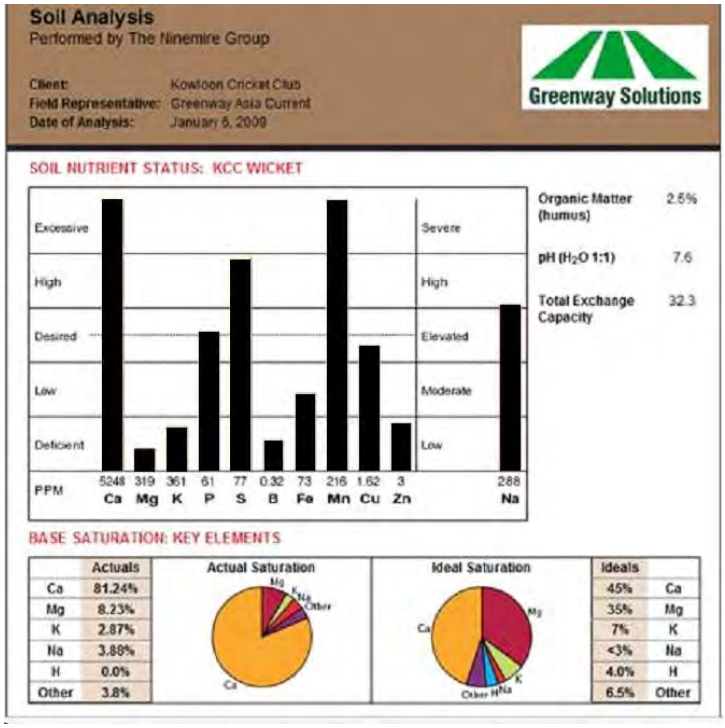
→ **Unsuitable in comparison**

Kowloon Cricket Club Physical Analyses

The results of the physical analyses are:

Test	Sample A
pH	7.7
Total Salts (ppm)	4336
Particle Distribution (%)	
Clay	13 – very low
Silt	36 – very high
Sand	51 – very high
Cracking	1 – very low
Shrinkage	0.029 – very low

	pH	Salts	Shrinkage	Cracking	Clay
High	X	X			
Desired					
Low			X	X	X
Actual	7.7	4336 ppm	0.034	9 pieces	55%
Ideal Range	6.0 - 7.0	<1000 ppm	0.08 - 0.15	2 - 5	>60%



Soil Analysis
Performed by The Ninemire Group

Greenway Solutions

Client: Kowloon Cricket Club
Field Representative: Greenway Asia Current
Date of Analysis: January 6, 2009

SOIL NUTRIENT STATUS: KCC WICKET

Organic Matter (humus)	2.6%
pH (H_2O 1:1)	7.6
Total Exchange Capacity	32.3

BASE SATURATION: KEY ELEMENTS

	Actuals
Ca	81.24%
Mg	8.23%
K	2.87%
Na	3.88%
H	0.0%
Other	3.8%

Actual Saturation

Ideal Saturation

Ideals	
45%	Ca
35%	Mg
7%	K
<3%	Na
4.0%	H
6.5%	Other

Concerns

1. Ability to grow grass/recovery of turf
2. Producing flat pitches
3. Penetration of water
4. Mixing ratios/uniform blending
5. Quality of future topdressing material
6. Batting creases ‘dusting up’/crumbling

→ **Concerned about future maintenance**

Proposed Advantages

1. High bulk densities
2. Better pace and bounce
3. Shorter preparation times
4. Faster drying - easier summer maintenance
5. More spin
6. One day cricket only

→ **Given these factors it was more than suitable**

Sub - Base Construction

1. Decided against drainage
2. Water table no issue
3. Considered un-necessary due to low infiltration rates
4. Opted for firm/ non-permeable base
5. 1 % camber
6. Catcher drain around perimeter

→ **Importance was placed on keeping construction simple**

Turf Species

1. Used species currently used
2. Local hybrid Bermuda grass
3. Handles all stresses of cricket
4. Nursery on side of ground

⟶ **Emphasis was placed on using a grass that is adaptable & proven**

June 2008

Average Temp: 26.7C
Total rainfall : 1346.1mm
Total evaporation rate: 103.7mm
Total sunshine duration: 75.5hr
Relative Humidity : 95%

September 2008

Average Temp: 29 C
Total rainfall : 159mm
Total evaporation rate: 213.9mm
Total sunshine duration: 146.1hr
Relative Humidity : 80%

December 2008

Average Temp: 18.4C
Total rainfall : 9mm
Total evaporation rate: 89.5mm
Total sunshine duration : 188hr
Relative Humidity : 60%

Information from HK Observatory

Laying of Clay

1. Clay laid in 50mm layers
2. Levels indicated by string lines & set by dumpy level
3. Each layer compacted by 3 ton roller for 2 hours each wicket
4. Each wicket was keyed in – 20mm verticut
5. Surface leveling by ‘peg & rail method’

Very precise inputs

Laying of Clay

1’

2. Metal rails using dumpy level to set levels

3. Screened using a straight edge

→ **Importance placed on ensuring perfect levels were achieved**


ICKET CLUB


KOWLOON CRICKET CLUB

Turf Establishment

1. Cut turf from previous cricket square & stored
2. Washed turf, scarified & Stolonised at a rate of 1:3
3. Spread by hand
4. No consolidation/crimping method

→ **Importance placed on achieving consistent cover**

Turf Establishment

1. Hand watering 6 times daily
2. First cut 10 days later
3. Heavy fertilizer program to encourage grow in
4. Green up within 5 days
5. Regular ‘dusting’
6. Reduced to final cutting height of 8mm

⟶ **Perfect growing conditions were present**

Preparation Program

1. Slow water infiltration
2. Difficult to keep pliable
3. Use of wetting agents
4. Fast surface drying process
5. Slow base drying process
6. 10 day preparation

→ **Unique preparation method**

Observations

1. Non-grassed areas stable
2. More forgiving
3. Excessive pace & bounce
4. Required 30% less rolling
5. 'Dusting' creases
6. Acceptable recovery of turf

→ **Pleased with outcome**

VIZAKHAPATNAM CRICKET SQUARE RECONSTRUCTION

Need For Construction

1. Existing cricket square playing low and slow
2. Inconsistent & uneven bounce
3. Each wicket constructed differently
4. 3 wickets constructed on a sand base, other half constructed on a firm base
5. Poor lasting qualities
6. Only had 5 wickets

→ **Existing cricket square very inconsistent**

Construction Considerations

1. Assessed performance of each wicket in past seasons (particularly as built using 2 methods)
2. Dug many test holes in all existing wickets
3. Assessed local soils/grasses available
4. Due to the heavy playing schedules in India, encouraged to construct in two halves

→ **Considered all factors before deciding on construction method**

Decision Making Process

Clays & Base material

1. Typical black clay
2. Good shrinking & swelling properties
3. Proven in area for many years
4. Red base clay
5. Use base clay as firm base for black clay

→ **Focus was to construct a firm base that is compatible with black clay**

Decision Making Process

Profile make up

1. Settled on a construction method based on their best performed wicket along with personal beliefs
2. 100mm depth of clay
3. Due to humid conditions, any deeper making difficult to dry
4. 250mm of red earth
5. Compatibility provided extension of clay
6. Particle size similar, compatible with black clay & stable in nature

→ **Focused on what worked in the past**

Decision Making Process

Profile make up

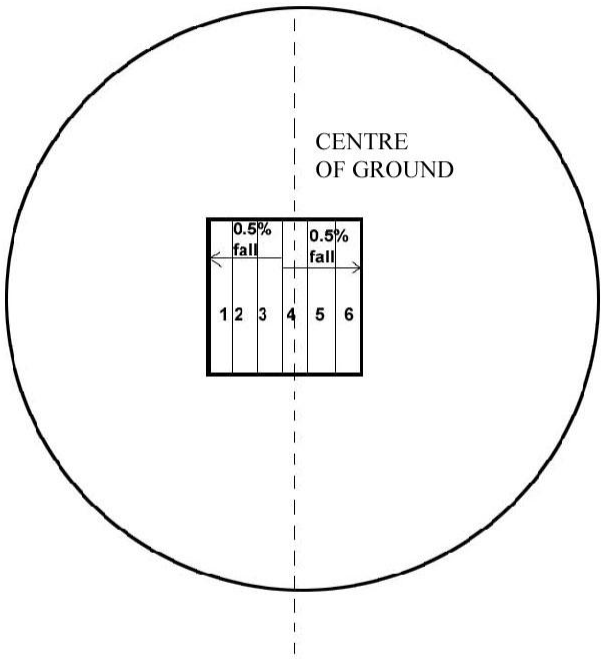
1. Existing underlying base bricks & granite stones
2. Already suitable base
3. Additional wicket constructed same
4. Decided drainage to be unnecessary

→ **Engineering like a road**

Surface Levels

1. 0.5% fall from centre out
2. Raised by three inches
3. Catcher drain around perimeter
4. Cricket square slightly off set to centre of ground

→ **Slightly raise levels above the existing**




VIZAGSTEEL

CONSTRUCTION PROCESS

1. Replaced base material with a red clay material to a depth of 225mm – 325mm
2. Areas requiring most sub-base material was laid first
3. Red soil acted as a ‘filler’
4. Laid in layers of 50mm and compacted with 8 ton roller
5. Levels indicated with string lines & Dumpy level

⟶ **100% compaction was seen as important**


VDCA

CONSTRUCTION PROCESS

1. Red base soil was scarified to depth of 2 inches to ‘key in’ black clay
2. Black clay was laid in layers of 1 inch
3. Compacted with 8 ton roller for 2 hours per wicket
4. Brick boarder to prevent soil movement

→ **Interface between the two layers was important, keyed in correctly**

The First Year

1. Focus on developing root system
2. Concentrate on nutritionally balancing the soil
3. Be aware of excess cracking/excess moisture
4. Ensure wicket rotation/ restrict overusage
5. Plenty of cross & diagonal rolling
6. Leave plenty of grass on prepared wickets

⟶ **Allow time to settle & consolidate**

Finally

1. Do your research
2. Understand the requirements well
3. Keep an open mind
4. Stick with what works for you