COMMON DIFFICULTIES ON SPORTS FACILITY CONSTRUCTION IN REGARD OF DESIGN & CIVIL WORKS

HOW TO SOLVE IT!

BERT HAMMES

Design – New Construction & Upgrade

- Design to meet sporting standard requirements
- Site specific requirements
  - Dimensions, level, slope
  - Drainage system(s)
  - Service pipe locations
  - Base construction
  - Subgrade condition (especially vapour pressure)

Design Adaptation & Problem Solving

- Problems can be solved through assessing the site & developing viable solutions
  - Sound construction to last well into the future
  - Need to consider locally available resources (materials, equipment, labour)
  - Must be economical & cost effective for project

Problem Solving Examples

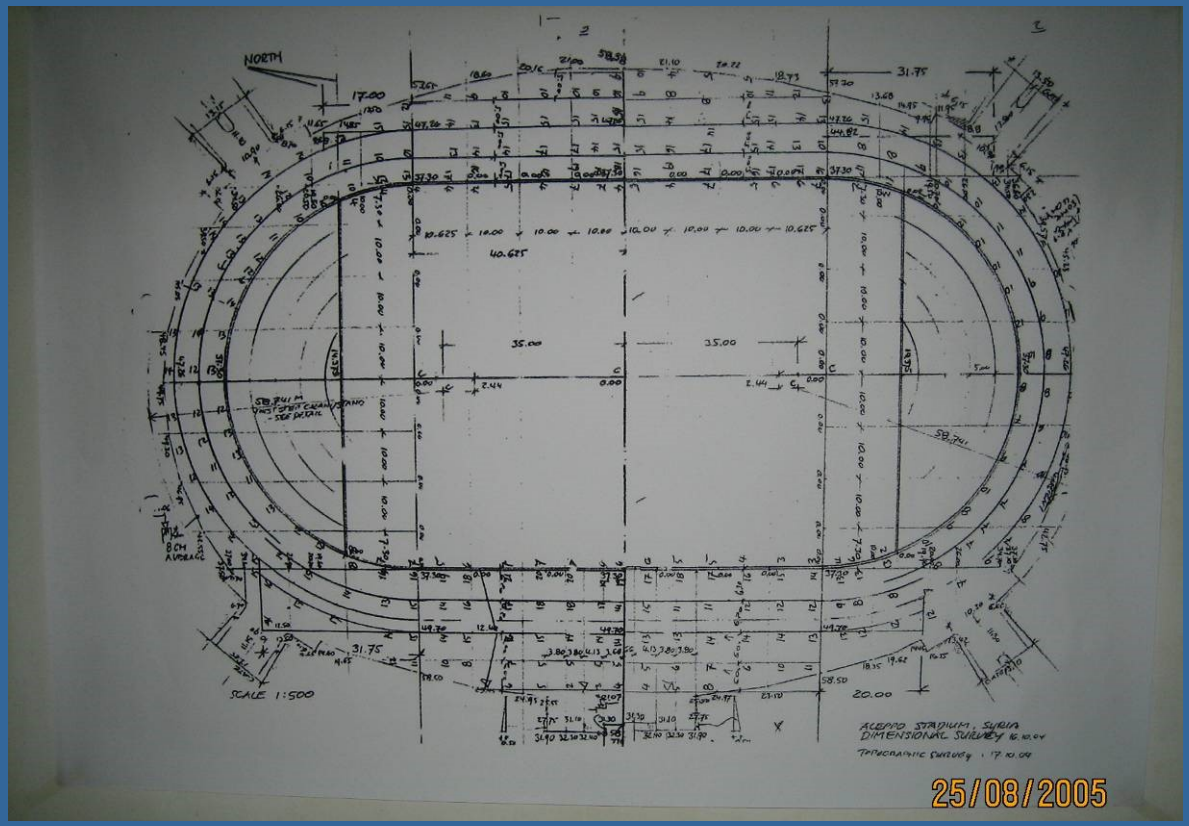
- Control on basecourse
- Control on vapour pressure (high water table)
- Selection of appropriate base construction material
  - Roadbase requirements & layer thicknesses
  - Asphalt mix design (e.g. permeable, semi-permeable)
  - Concrete pavements
- Incorporating other sports or requirements
  - E.g. Integrated athletics track/soccer fields
  - Marrying into existing facilities & infrastructure

Understanding site conditions

- Need to assess site prior to construction
  - You need to understand what is underground

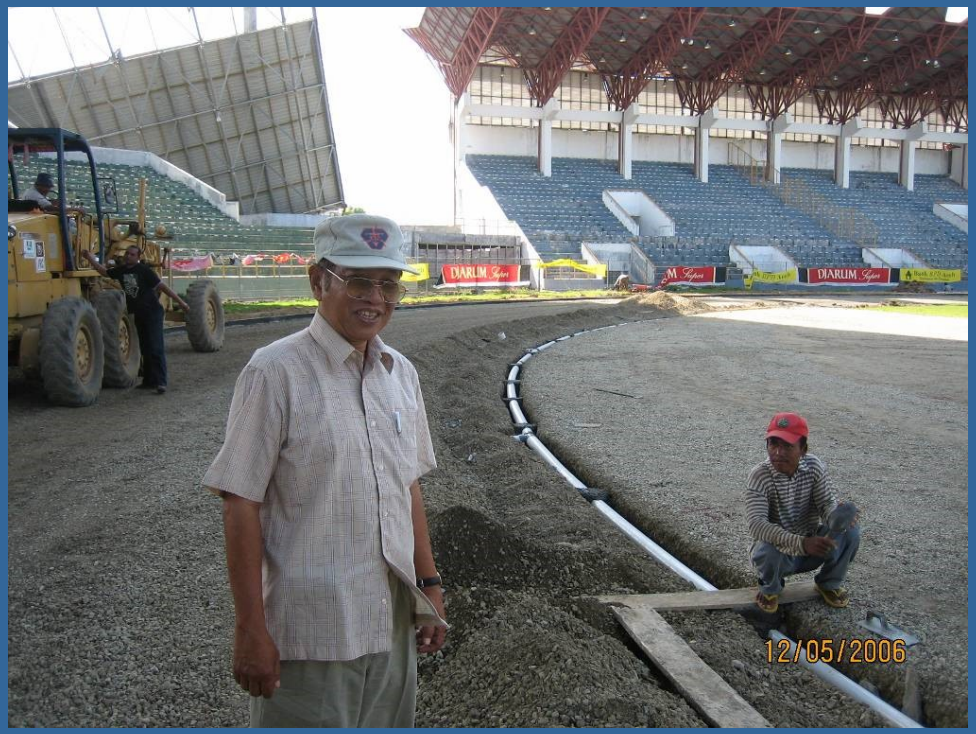
Understanding site conditions

- Topographic survey prior to asphalting



Understanding site conditions

- Adapting design to utilise existing infrastructure can provide large cost savings



Civil Works - Compaction

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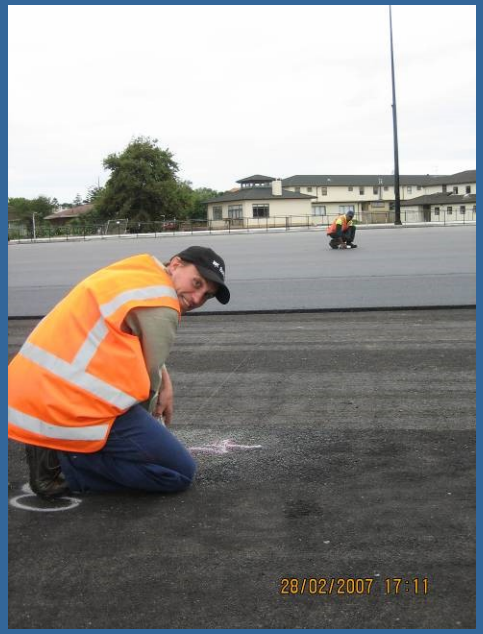
- Concentrated compaction along trench backfill & edges

Level control – laser guided systems

- Laser mounted on tripod above machinery level for constant laser signal

Level control – laser guided systems

- Constantly check levels with laser & string line



Level control – laser guided systems

- Paving method & orientation critical

Case Study – Taipa Stadium, Macau

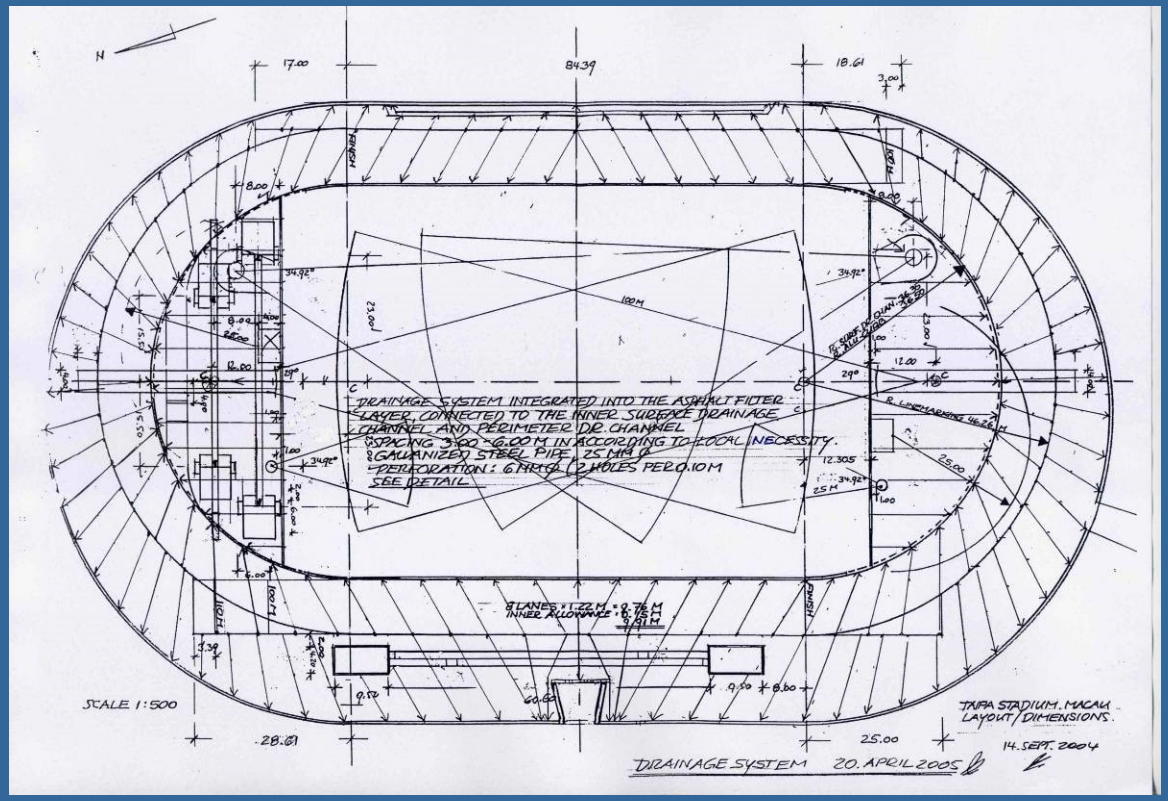
- National Athletics Stadium
  - Originally constructed in 1996
  - Constructed on reclaimed coastal land
  - Concrete base with dense graded asphalt
  - Bubbles appeared on track from upward moisture migration caused by tidal variations in ground water

Case Study – Taipa Stadium, Macau

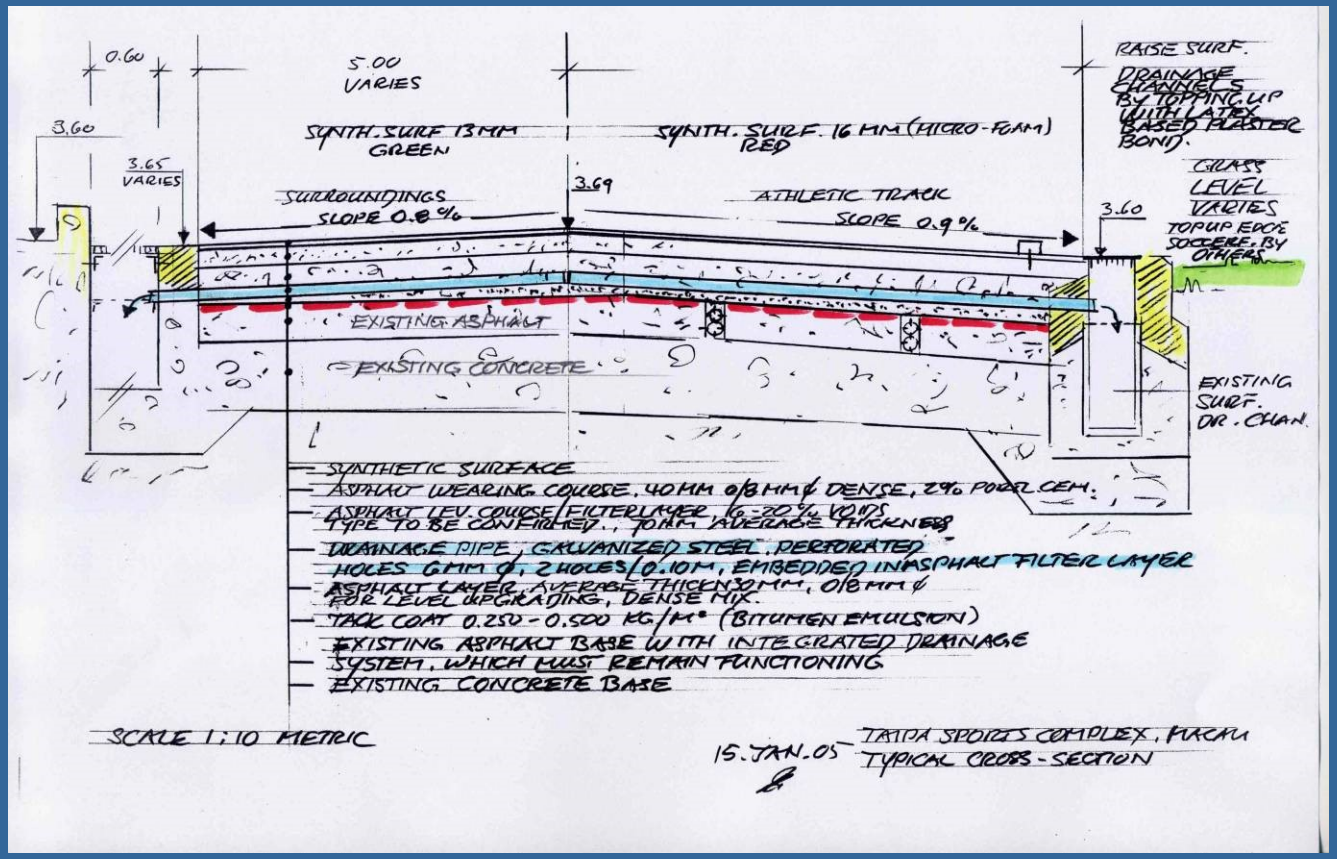
- Host venue for Asian Games 2005
  - Track needed to be upgraded prior to Games to IAAF Class 1 standard
  - Previous problems with water seepage & bubbling needed to be resolved
  - Design solution developed to prevent repeats of previous problems

Case Study – Taipa Stadium, Macau

- Detailed design development



Case Study – Taipa Stadium, Macau



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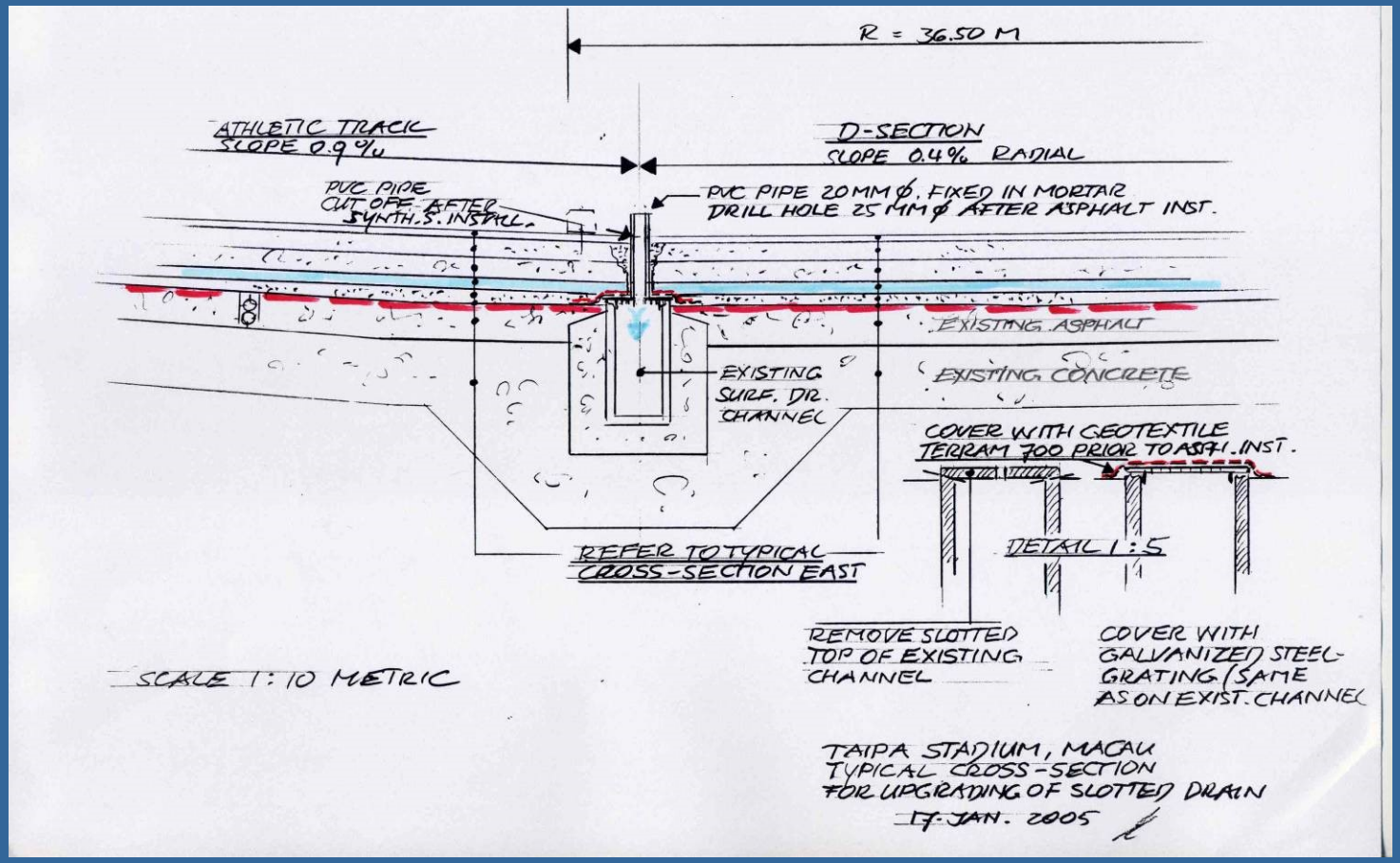

Case Study – Taipa Stadium, Macau

Case Study – Taipa Stadium, Macau

Insert photo of completed track

Thank you

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