DESIGN & CONSTRUCT CONTRACTS
for
MUNICIPAL SWIMMING POOL
PROJECT DELIVERY

GOOD? BAD? OR VERY UGLY?

J.H. Cockerell Pty Ltd
1. Condition of Existing Municipal Pools?

2. Why choose D & C?
   - Cost Control.
   - Quality Control.
   - Speed to completion of construction.

3. Our experience with D & C Projects?
**Well Designed + Well Constructed Municipal Pools**
(with formed concrete walls)

- 50 year useful life.
- minimum running costs.
- minimum maintenance costs.
- mid-life refit of pool water treatment plant.
- healthy experience for bathers.
Qld Council Pools have significant problems (likely to be Australia wide)

- reported on every 2 to 3 weeks by our office.
- increasingly those pools are only 10 to 12 years old.
- Council & Community left with a liability.
Why are Municipal Pools performing so poorly?

- Wetdeck Pools are now popular
  - right choice for next 50 years.
  - max. allowable pool movement ± 2mm for 50 years.
  - if pool movement exceeds ± 2mm → stagnant water.
  - no permanent fix for pool movement in expansive clays.
Why are Municipal Pools performing so poorly?

• Large range of pool water treatment options
  • Filters  - Sand  - Gravity
    - Medium Rate
    - High Rate
    - Large number of manufacturers
  • Diatomaceous Earth
    - Different media
    - Local or overseas manufacturer
  • Cartridge
    - Large number of manufacturers

• Difficult to make the correct choice?
Why are Municipal Pools performing so poorly?

- Large range of pool water treatment options
  - Disinfectants
    - Chlorine Gas
    - Sodium Hypochlorite
    - Calcium Hypochlorite
    - Chlorinated Isocyanurates
    - Chlorine Dioxide
    - Bromine based Disinfectants
    - Ozone
    - UV
  - Difficult to make the correct choice?
Why are Municipal Pools performing so poorly?

- Lack of specialist pool engineers
  - no university course.
  - no one book.
  - knowledge accumulated over a long period of time.

- State Government Purchasing Guidelines
  → Cheapest usually chosen by Councils

- State Government chooses their Pool Engineer for important facilities.
How can Councils & Communities avoid pools with serious problems?

- Qld State Government action?

- LOCAL COUNCILS MUST MAKE THE RIGHT CHOICES!
  (i.e. Choice of Specialist Pool Engineer for their pools).
Will D & C Contracts improve one or several of the following?

- Cost Control
- Quality Control
- Speed to completion of construction
1. Facility Construction Costs
   - Design + Documentation + Construction Inspections (for all consultants approx. 10% of project cost).
   - Construction (approx. 90% of project cost).

2. Facility Pool Running Costs for 50 year life of pool
   - $1m for small 25m pool.
   - $2m to $3m for 50m pool.

3. Facility Pool Maintenance/Repair Costs for 50 years?
   - Repair costs = construction cost after 12 years.
   - Repair costs often > $100,000.
OBSERVATIONS

1. Design + Documentation + Construction Inspection Cost.
   • Smallest of all costs.
   • If well done → Will reduce other whole of life costs.
     → Will provide Council & Community with an Asset not a Liability.
OBSERVATIONS

2. Builder controls D & C Tender process.

→ Will only provide to requirements of project brief.
→ **Contract Cost** is builder’s focus **not Whole of Life Cost**.
→ Design + Documentation + Construction Inspection just another **cost to be minimised**.
→ Engineer’s design required for lump sum D & C.
→ **Engineer’s design cost risk** if builder is not chosen.
→ **Sprayed concrete pools** - easy to design (i.e. cheap).
  - poor quality control
    (i.e. < 50 year life & expensive repairs).
CONCLUSIONS

• D & C Project Cost Savings = Poor Design Choices.

• Poor Design Choices → Pool’s useful life < 50 years.
  → Increased pool repair costs.
  → Increase pool running costs.
  → **Pool becomes a Liability** for the Community instead of an Asset.
Will D & C Contracts improve one or several of the following?

- Cost Control
- Quality Control
- Speed to completion of construction
Quality of completed pool depends on:

1. **Quality of project brief – important 1st step**

2. Builder & his Engineer’s interpretation of the project brief
   - who checks that interpretation on each D & C tender?
   - who checks the engineer’s capability on each D & C tender?

3. Quality of construction
   - who checks builder’s workmanship during construction?
   - Engineer’s site inspections are very important (e.g. Winton Pool)
     - expensive in remote locations.
     - minimised to win D & C contract.
OBSERVATIONS

1. Project briefs hopelessly inadequate – too many pool variables.

2. Councils typically choose the lowest tender because
   - unable to differentiate between quality of tenders.
   - have little or no experience in municipal pool projects (i.e. only happens every 10 to 20 years).
CONCLUSIONS

Reduced Quality Control because Builder will provide:

- minimum required by the project brief.
- little or no quality control of construction.
- a design engineer who has little and sometimes no experience.
WHY CHOOSE D & C

Will D & C Contracts improve one or several of the following?

• Cost Control
• Quality Control
• Speed to completion of construction
Regional Council’s Program for D & C of 50 metre pool project

- Jan 2011 → Tender Period.
- Nov 2011 → Complete construction.

D & C chosen in an effort to complete construction by Nov 2011.
OBSERVATIONS

1. Takes at least 3 to 4 months to design & document a pool project

   - On this project design & document phase reduced to tender period of 3 to 4 weeks.
     - quality control risks.
     - insufficient information for accurate costing
       → tender cost increase to cover this risk.
OBSERVATIONS

2. Little or no time saved by replacing 3 to 4 month Design & Documentation with 3 months to write D & C Brief.
OBSERVATIONS

3. Takes more than 10 months to construct 50 metre pool.
   - indicates Council is receiving advice from someone who is inexperienced.

4. January is not a good month for tendering.
   - most construction contractors close down between Christmas & end of January.
OVERALL D & C CONCLUSIONS

1. Any Cost Savings will be more than offset by Reductions in Quality.

2. Cost increases likely due to lack of time to design & document project.

3. Quality Control of design & construction usually ignored → reduced pool design life + increased running & repair costs.

4. Little or no savings in time to project completion.
1. Pool proposed for Inglewood before Council amalgamations
   - Asked to review Council’s preferred Tender.
   - Inadequate D & C Brief.
2. Pool for Buderim (Maroochy Shire Council)

- Asked to review tenders submitted.

- Inadequate D & C Brief to allow meaningful cost comparisons (one of D & C’s basic problems for special projects).
3. Brisbane Private School

- An old boy of the school wanted to give something back to the school.

- Approx. 4 years after completion of construction we were asked to advise on the pool’s problems.

- Inexperienced Builder & inexperienced Engineer.
4. Others but insufficient time.

Happy to talk later.
For projects involving pools never appoint an Architect to then select other consultants.

- Architects will typically charge 6% of project construction costs most of which are pool costs.

- To keep Consultants Fees within budget Architect has to choose a cheap pool engineer.