

# THE ESTIMATING OF ENGINEERING SERVICES



# INTRODUCTION

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# WHAT'S THE PROBLEM?

- The QS is responsible for the overall cost plan, but the M&E costs are provided by the engineer
  - Split and uncertainty of responsibility
  - Applies to estimates and post-contract variations
  - Many QSs do not understand M&E systems, and the impact of changes
  - Costs are not an engineers core skill

# A QUICK CAVEAT.....

- Focus will be on 'normal' projects
  - Projects such as data centres, process engineering plants, infrastructure works all need special attention
  - Clients such as Defence and TfNSW bring their particular specifications and peculiarities
  - 'Special' projects need special attention

# THE PRICING OF MECHANICAL & ELECTRICAL BUILDING SERVICES

- Sources of data
  - Tender returns
  - First principles estimates
  - Historic data from previous projects in the office
  - Benchmark data
  - Pricing books (Rawlinsons, Cordells)

# TENDER RETURNS

- ‘Real’ prices from the market
- The more detailed the breakdown the better
  - Bill of Quantities are ideal
  - but the more detailed the request less the chances of getting meaningful data back
  - A good PTE can provide a meaningful breakdown of a lump sum tender price
  - Beware of front-end loading or other ‘manipulation’ of tender schedules

# FIRST PRINCIPLES ESTIMATES

- Considering the labour, plant and materials that will be required to complete the works
- First principles is the only way to go for some works
- But it takes time and effort



# HISTORIC AND BENCHMARK DATA

- You need to know the source of the data, and the background of the base project
  - Benchmark data is only useful when normalised, ie common definitions are used in its creation



# PRICING BOOKS

- When was the last time you read the “How to use this Handbook”?
  - “Costs can provide no more than a rough guide to the probable cost of a...” (Rawlinson pg 36)
  - “..costs can vary considerably from the range given..” (Rawlinson pg 36)
  - Cordells states “profit and overheads vary from 5% to 35%” (pg2)

# PRICING BOOKS

- Some things you might not agree with;
  - Some Canberra offices are 15% more than Sydney, but some hotels are 15% cheaper (you did realise that Canberra has its own section in Rawlinsons.....?)
  - Mechanical Services in high-rise, shell & core lettable office are \$900.75/m<sup>2</sup> gfa (R. pg 95)
  - Contingencies at feasibility stage are 2.5%

# PRICING BOOKS

- Base assumptions;
  - Base date of pricing is December of the previous year
  - Detailed Prices are for projects in excess of \$1.5M with average site conditions
  - They DO NOT make allowance for site requirements such as works in the CBD

# PRICING BOOKS

- Scope of the cost items;
  - \$/m2 for Shell & Core lettable offices include for ceiling grid installed, and supply of ceiling tiles and light fittings (R. pg48)
  - External works are excluded from \$/m2 rates
  - Incoming utility supplies are excluded
  - Detailed Prices do not include for ‘minor items and labours’ required. Adding 5% to 10% “would normally suffice”

# PRICING BOOKS

- Percentages additions;
  - Cordells excludes contractors OH&P
  - Rawlinsons includes 5% main contractors OH&P (\$/m<sup>2</sup>), and
    - In Detailed Prices, 2.5% for main contractors 'head office OH&P' on elec and mech contractors, 5% on other trades
  - Regional location factors can vary by 5% between books

# PRICING BOOKS

- Factors not mentioned;
  - High rise. MCA (USA) gives labour correction factors. As an example, working above 20<sup>th</sup> floor reduces productivity by 2% to 4% per floor (so a fit-out on 40<sup>th</sup> floor has only ~50% productivity compared to ground level)
  - Sustainability. Aiming for 5\* or 6\* NABERS, or WELL, adds to construction CapEx for services
  - Variation in specification, eg specialist lighting

# WHAT CAN WE DO?

- Acknowledge the uncertainties
- Use data you know and understand
- Be aware of the limitations of data from others – including published data
- Be mindful of the particulars of the works you are estimating
- Get a peer review





ANY QUESTIONS?

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