

COLD CLIMATE ENGINEERING, LLC

FROM PRIORITIES TO BUILDABLE PROJECTS – PART THREE!

ALASKA MUNICIPAL LEAGUE
ALASKA INFRASTRUCTURE DEVELOPMENT SYMPOSIUM

Craig Fredeen, PE
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Introduction



- Mechanical Engineer
- Geek
- 30 years designing throughout Alaska and Antarctica
- Facility Managers are my real clients (Shhh! Don't tell the Architects!)



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Congratulations!!!

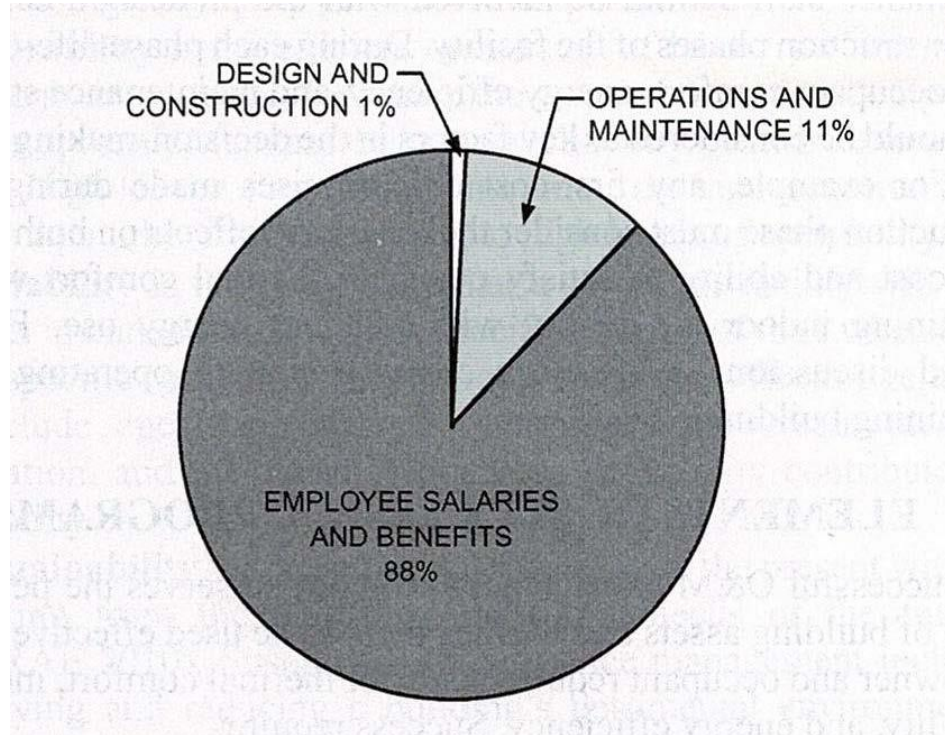
- You've spent countless hours planning
 - ... and finding funding...
 - ... and designing...
 - ... and constructing...
 - ... and finally cutting ribbons!
- Now you have to operate it
- ... for the next 50 years...



What are Your Priorities?

- Every project has unique priorities
- You need to rank these in the beginning!
- Project Priorities
 - First Cost
 - Long Term Operational Costs
 - Reliability / Redundancy
 - Mission / Performance
 - Environmental Impact

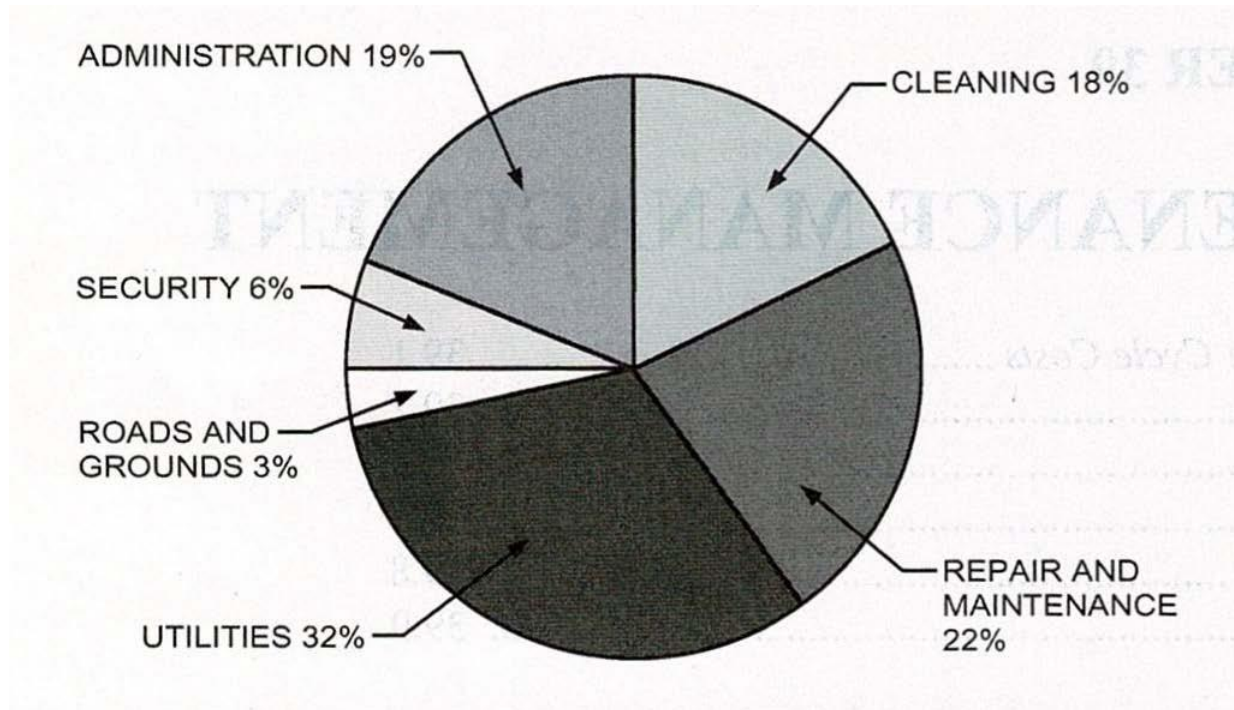
Long Term Operational Costs



Business Costs for Nonresidential Builds, Including Salaries and Benefits to Occupants

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Long Term Operational Costs



Operations and Maintenance Cost Elements for
Typical Office Building

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Planning For Maintenance

- Asset Management!
- Digitize Drawings and O&Ms
- Standardization of equipment/systems
- Develop Design Guides/Standards
- This can be done during planning!

Planning for Maintenance

- Include Facilities/Maintenance personnel in all aspects of the project!
 - Selection Team(s)
 - Planning
 - PER development, site visits
 - Capital Improvement Plan
 - Design
 - Construction
 - Close-Out

Planning for Maintenance

- Project Close-Out is Critical!
 - Commissioning
 - Robust O&M Manuals
 - Record/As-Built Drawings
 - Record Training
- Withhold significant \$\$\$ in Schedule of Values for Close-Out
- Budget for Preventative Maintenance!

Best Practices for O&M in Cold Climates

- “Best Practices to Support Operation and Maintenance in Cold Climates”
- 62 pages.
- Started in 2016.
- Multidiscipline Body of Knowledge, specific to our climate and challenges.
- Developed by Alaskans for Alaskans.
 - Over 200 Alaskan Professionals have added their knowledge into the document!

Summary

- Rank your priorities
- Plan and construct for the long term
- Include Facilities/Maintenance in all aspects of the project
- Design around maintenance
- Budget for maintenance

Questions?

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“Best Practices for Operation and Maintenance in Cold Climates”

<https://coldeng.com/best-practices/>



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 - "Best Practices for Operation and Maintenance in Cold Climates"
 - <https://coldeng.com/best-practices/>

