

***Scope Management -
INTEC Treated Water
System Modification Project***

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Project Drivers

- Aging Equipment
 - Six, 600 gpm water softeners
 - Three, 133 gpm reverse osmosis (RO) units
 - One, 200 gpm RO unit
 - Plant usage averaging 1600 gpm
- New Department of Environmental Quality Discharge Limits
 - Wastewater Land Application Permit

Project Background

- Project started in 1998
- Several Delays & Changeovers – I am the 5th PM
- Engineering requested to prepare performance specification and conceptual design report
 - Engineering can't agree on best system to install
 - AFC package – Water Softeners only
 - Design for RO units only
- Change of site Contractors
 - New Management
 - New philosophies

Definitions

- Scope Management
 - Complete all the work
 - Keep people from randomly adding scope
 - Make sure all changes fit within the project charter
 - Defines what is included and excluded in the project
 - Prevent extra work or gold plating
- Product Scope
 - Requirements related to the Product
- Project Scope
 - What you need to do to deliver the Product

Charter

- Replace the existing treated water system with a new system that will meet the customer requirements and the new state DEQ discharge limits by December 31, 2005

Planning

- Determined stakeholders
- Defined the PRODUCT Scope
 - BBWI company water expert
 - Assessed existing system and plant requirements
 - Made recommendations
- Determined PROJECT Scope
 - Design Build Contract
 - Install temporary water treatment system

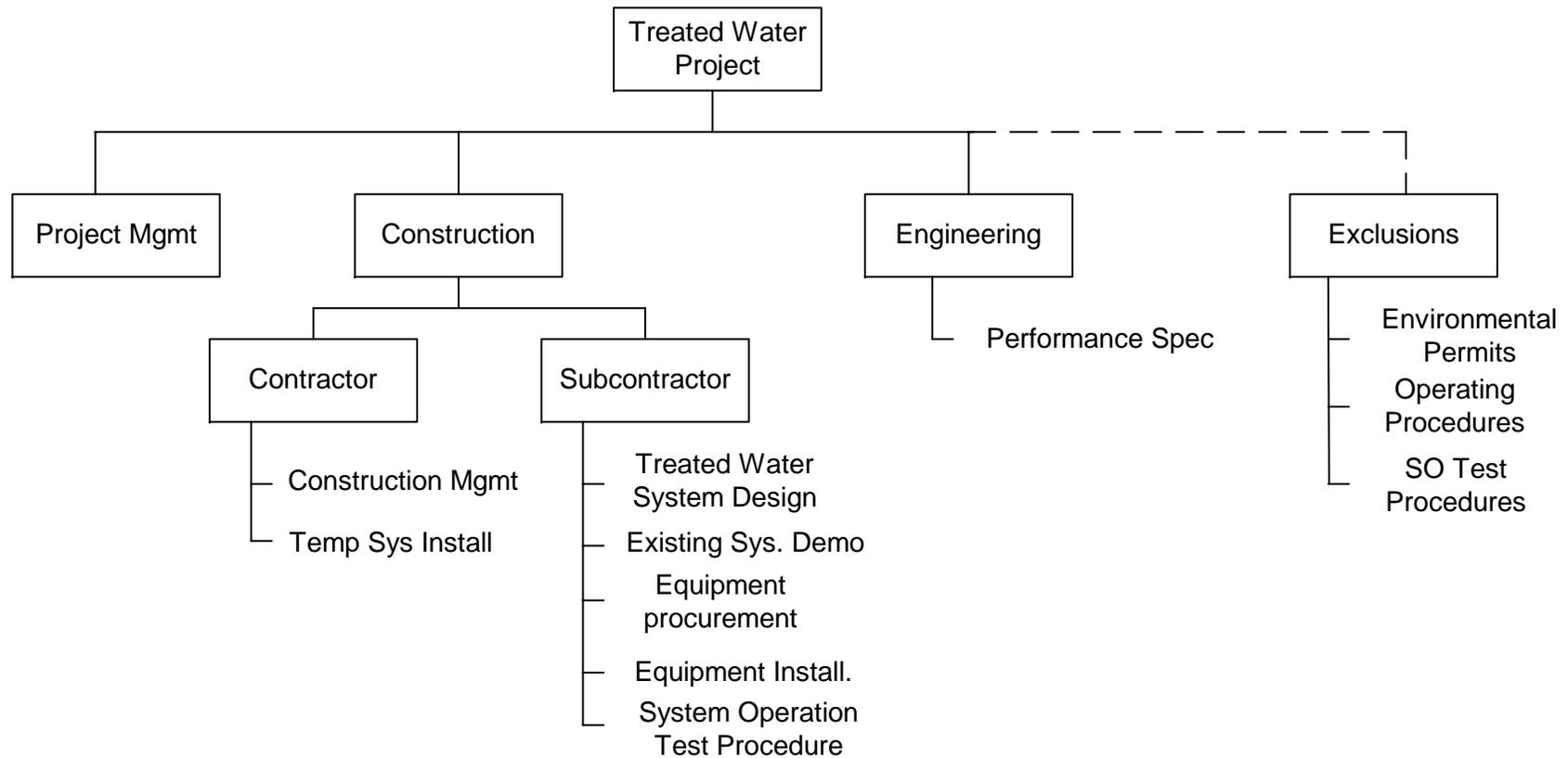
Defined Scope Statement

- Temporary water treatment system
- Three 200 gpm water softeners
- Two 200 gpm RO units
- 970 gpm to plant at <65 ppm CaCO₃
- 130 gpm to boilers at < 2 ppm CaCO₃
- Two Pre-Filter skids
- Two Cartridge skids
- Two Clean-in-Place RO cleaning units
- TDS < 500 ppm CaCO₃
- CL < 250 ppm CaCO₃
- Two new, 250 hp raw water pumps

Restraints

- Foot print defined by existing system
- Work within an operating facility
- Plant requirements must be met while new system is installed and brought on line

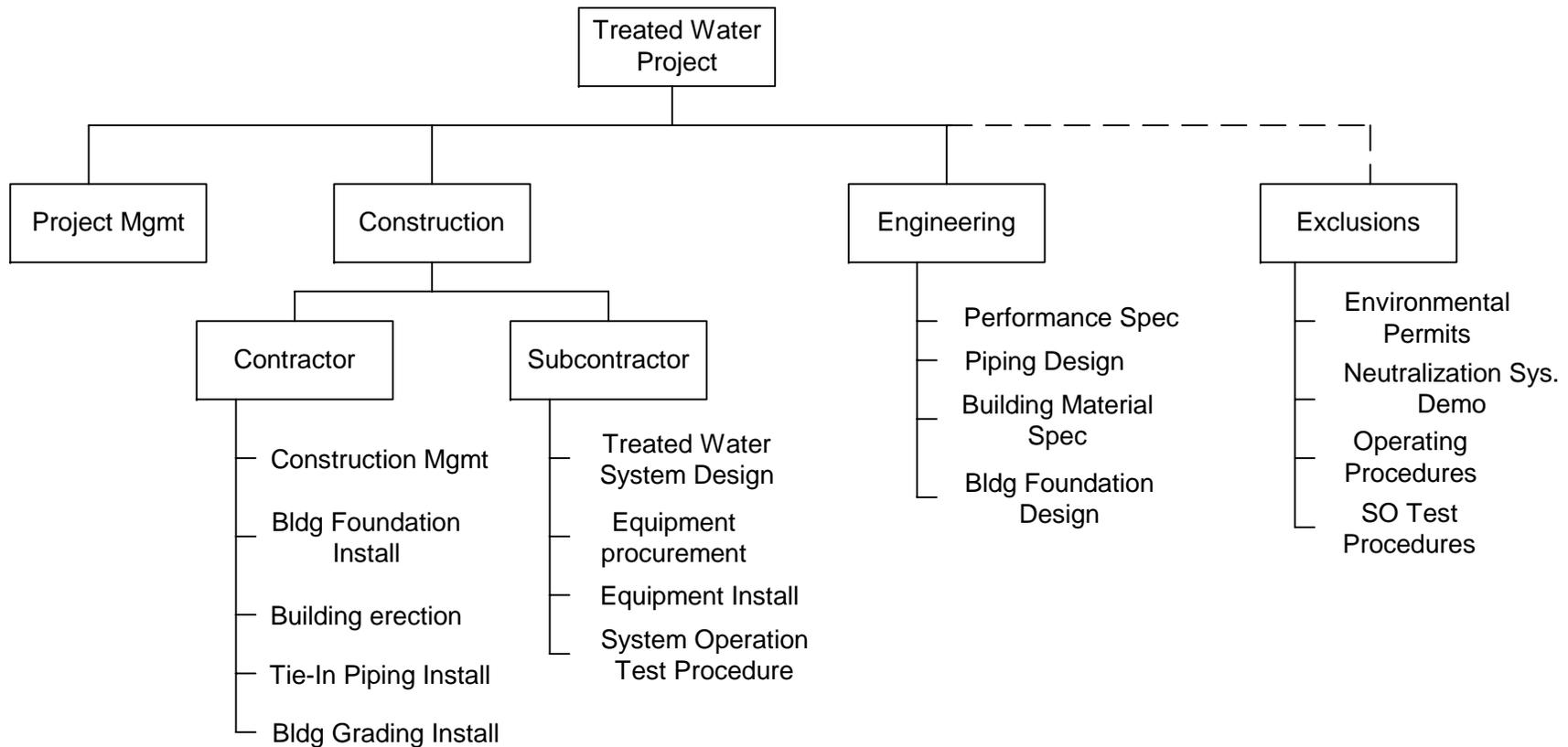
Treated Water Project WBS



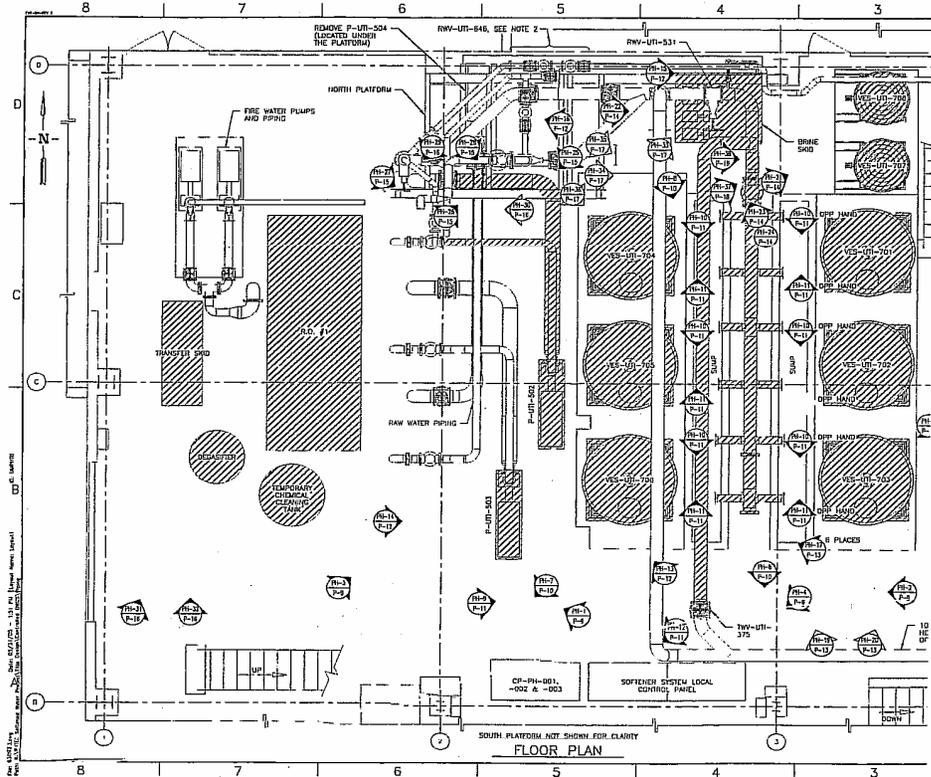
Execution

- Procurement specification prepared
- Pre-bid tour
- Bids received ~ 2 ½ times estimate
- Regrouped to determine how to meet identified budget

Revised Project WBS

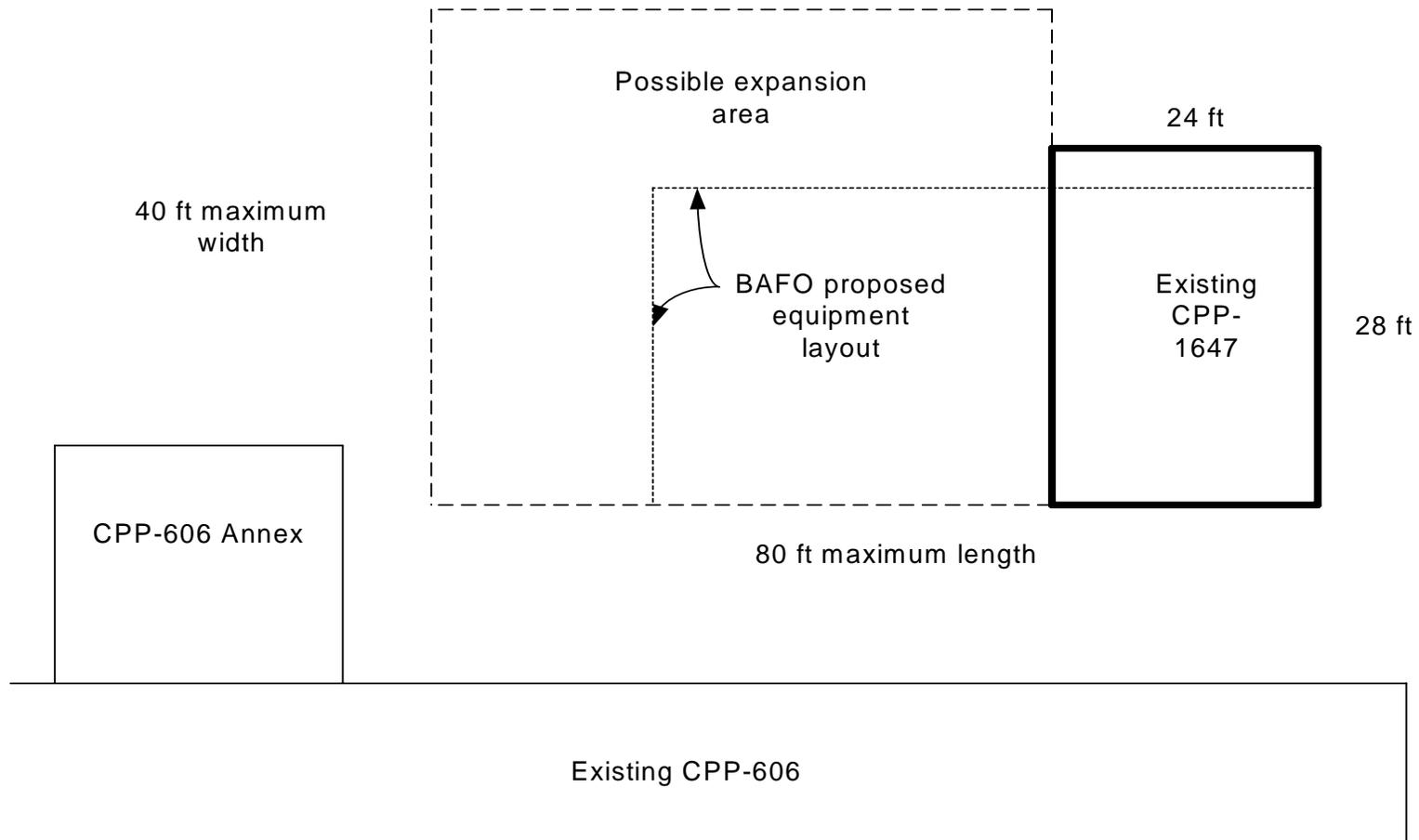


Existing Treated Water System



INTEC Treated Water System
Modification Project

Proposed New Treated Water Facility Site



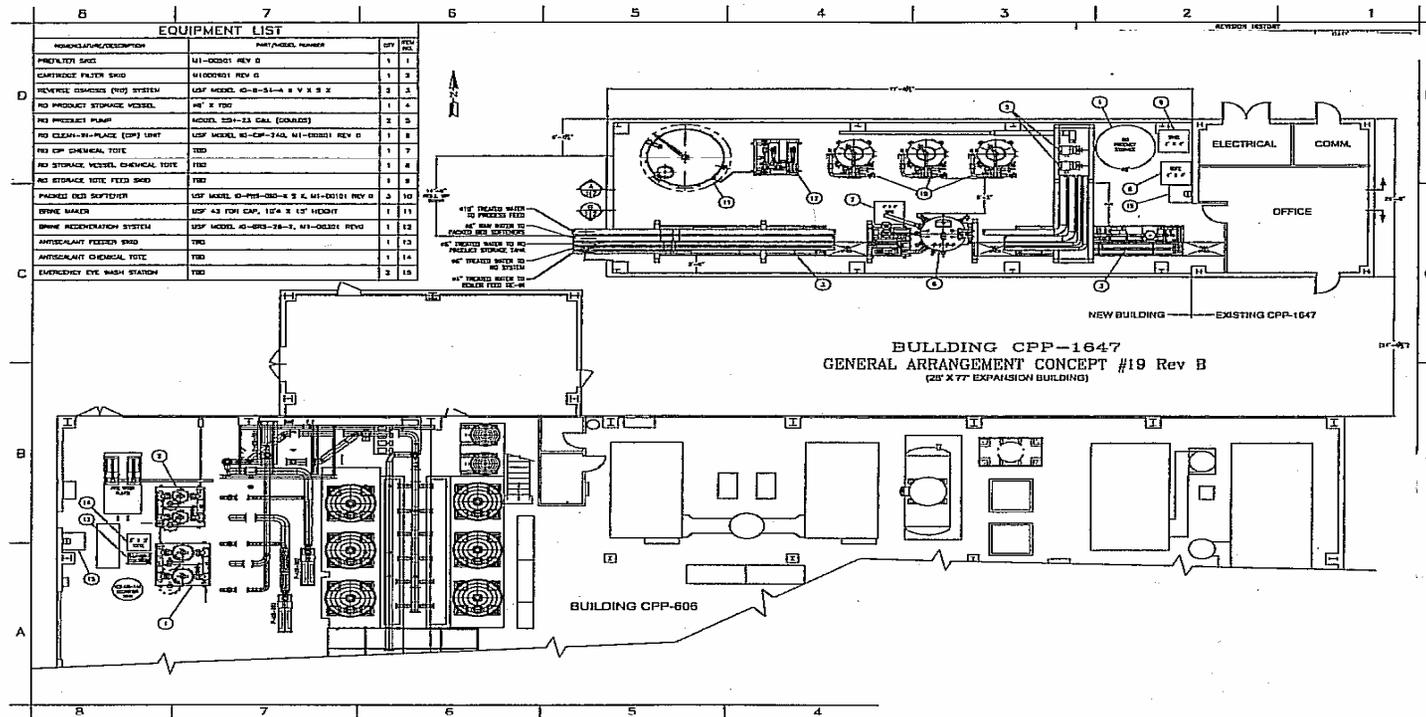
Owner Induced Scope Creep

- Owner decision to do away with 2400 volt and go with 480 volts
- Owner requested scope changes
 - Operations requests new shift office
 - Operations request for storage above office
- Specifications allowed subcontractor to drive changes in contractor work scope
 - Building size increased 60%
 - Power requirements increased by 4X

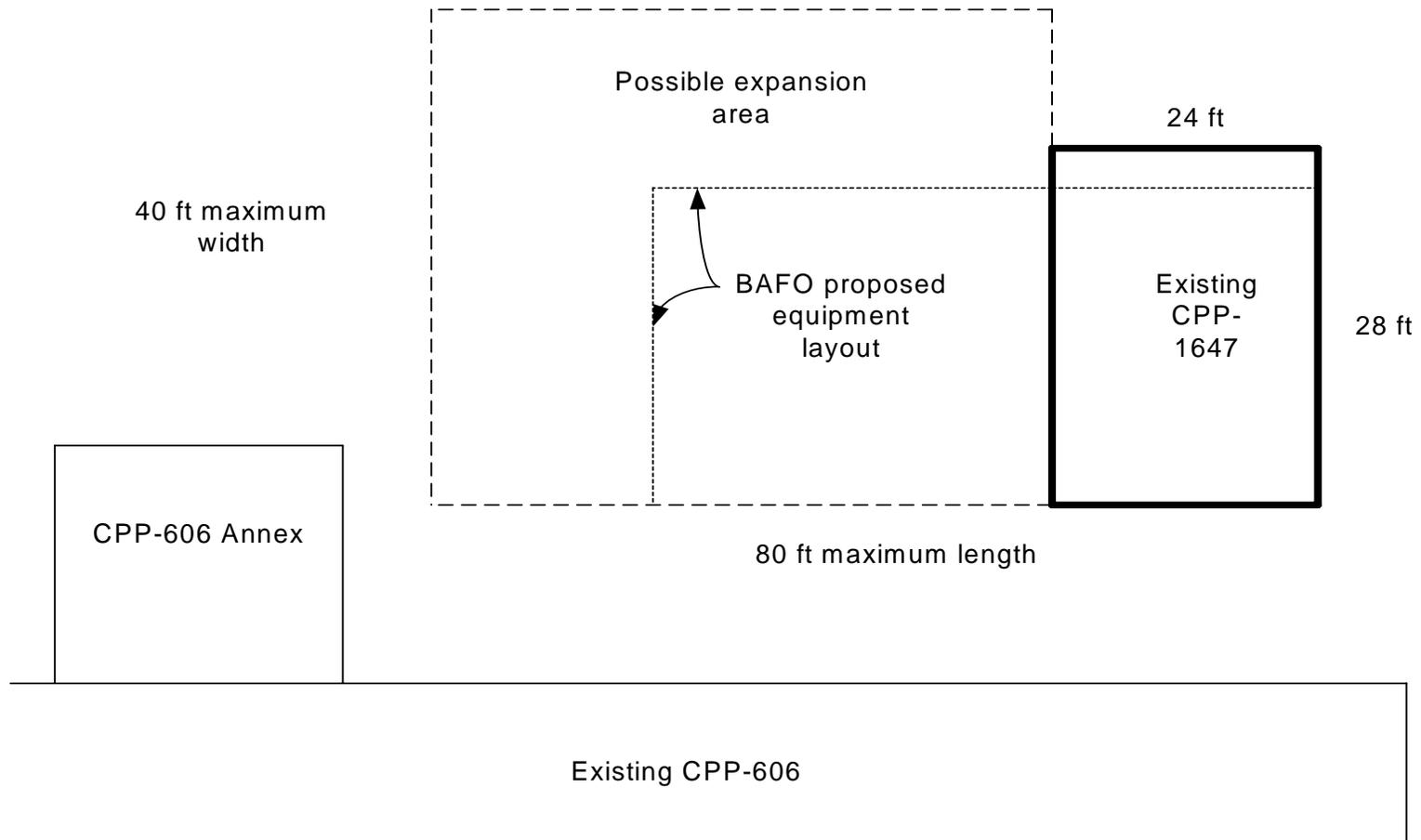
Subcontractor Induced Scope Creep

- Power requirements increased
 - 200 Amps, 480 Volts planned, 800 Amps requested
- Subcontractor required separate room for electrical panels
- Foot print increased due to sizing of subcontractor's equipment

As-Built Treated Water Facility



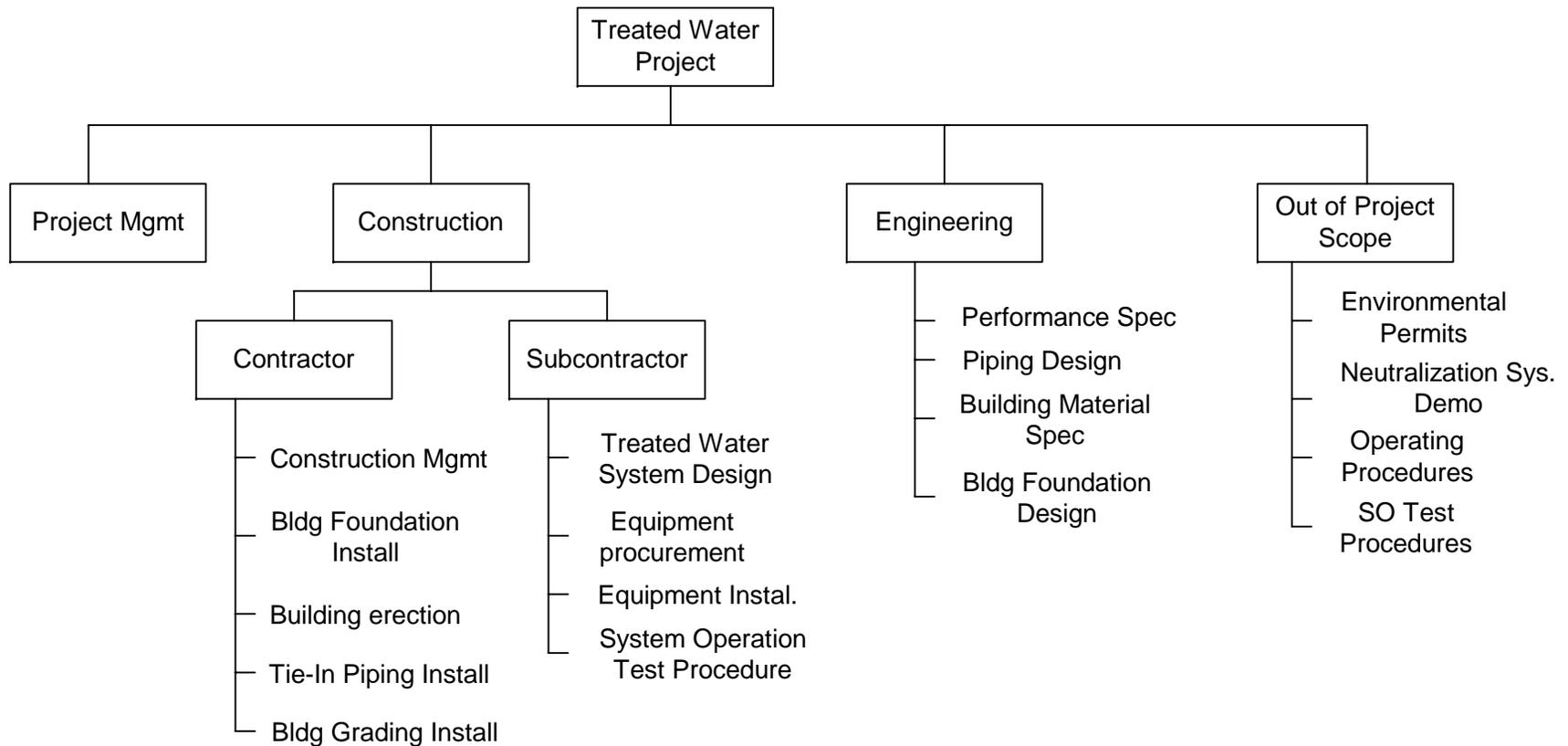
Proposed New Treated Water Facility Site



Change of Site Contractor

- Stakeholders changed
 - All new upper management – different acquisition strategies
- Changed acquisition strategy
 - All WBS elements included in Project scope
 - Added elements formerly excluded
 - Project totally responsible for all activities – cradle to grave
- Change in design and team members
 - Different design teams through life of project

Revised Project WBS



PRODUCT Scope Change

- Customer proposes to delete duplicate systems to save money
- Single skids larger – require more room
- Building size expands by 60%

Execution Strategy Changes

- Owner decision to delay design due to resource availability
 - Construction of building now in winter instead of late summer/fall
 - Causes other replacements/turnovers of personnel
- Customer directed execution strategy
 - Work overtime to meet self imposed commitment to state DEQ
 - Terminated overtime and renegotiated commitment to state for funding concerns

Issues Delaying Project Delivery

- 1st time subcontractor at site
 - extra time to acquaint him with processes
 - Vendor data system
 - Sub-surface investigations
- No requirement for subcontractor to have a local office
 - Subcontractor's design team in another state
 - Equipment suppliers located all across the USA and Canada
- Subcontractor PM change mid-stream

Lessons Learned

- Estimate needed full scope review and new bottoms up estimate
- Expedited design packages – source for re-work
- Understand the full extent of company culture
- No requirement for minimum number of face to face meetings with subcontractor
- Don't allow pressure to force the project to continue without evaluation of the full effect of the changes to date.

Lessons Learned Cont.

- Not a true design/build specification
- Bad Specification statements:
 - “Variances from this configuration to improve system performance may be proposed by the Subcontractor, and will be evaluated by the Contractor through the design review process.”
 - “Contractor to provide building to house new equipment”
- Three separate design teams – source for interferences (Customer, 2 subcontractors)

Product Scope

- Three, 200 gpm water softeners
- Two, 200 gpm RO units
- 970 gpm to plant at <65 ppm CaCO_3
- 130 gpm to boilers at < 2 ppm CaCO_3
- One Pre-Filter skid
- One Cartridge skid
- One Clean-in-place RO cleaning unit
- TDS < 500 ppm CaCO_3
- CL < 250 ppm CaCO_3
- Two new raw water pumps

Scope Verification

- Product scope delivered
- Final product meets customer expectation
- Cost – exceeded budget
- Schedule – In spite of delay,
Customers Happy