

Charting a Course to Energy Independence

Providence, RI
August 9-12, 2009

ESPC + New Construction =
Energy Security at White Oak





ESPC + New Construction = Energy Security at White Oak

- The Need
- White Oak Project Overview
- ESPC/New Construction Concepts
- White Oak Case Study
- Program Challenges
- Program Benefits



The Need

- **Capital Budget Challenges**

- Limited Funding
- Lengthy Approval Process
- Functional Scope Creep
- Energy Item Vulnerability

*Congressional
Appropriations*

- **Enhance energy performance of newly constructed buildings**

- **E.O. 13423, EPA Act 2005, EISA 2007**

*Utility
Reliability*

*Counter-
Terrorism*

*LEED
Certifiability*



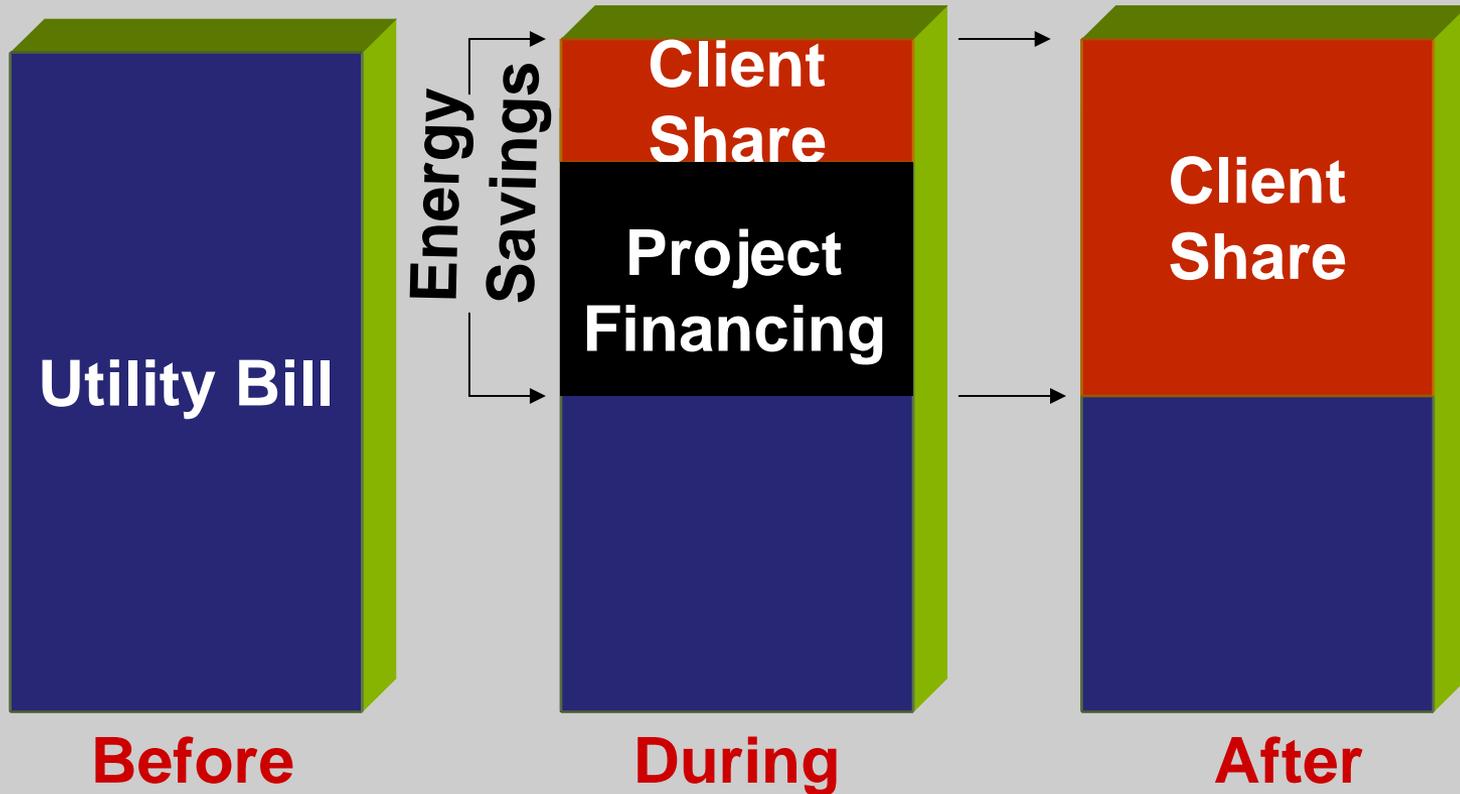
Project Location



Silver Spring, MD



Energy Performance Contracting



Savings achieved via introduction of various Energy Conservation Measures (ECMs)



Savings Identification

- Model baseline condition
- Value engineer design from energy standpoint
- Model energy efficient design

Energy \$base – Energy \$eff. = Level of Alternative Financing Available



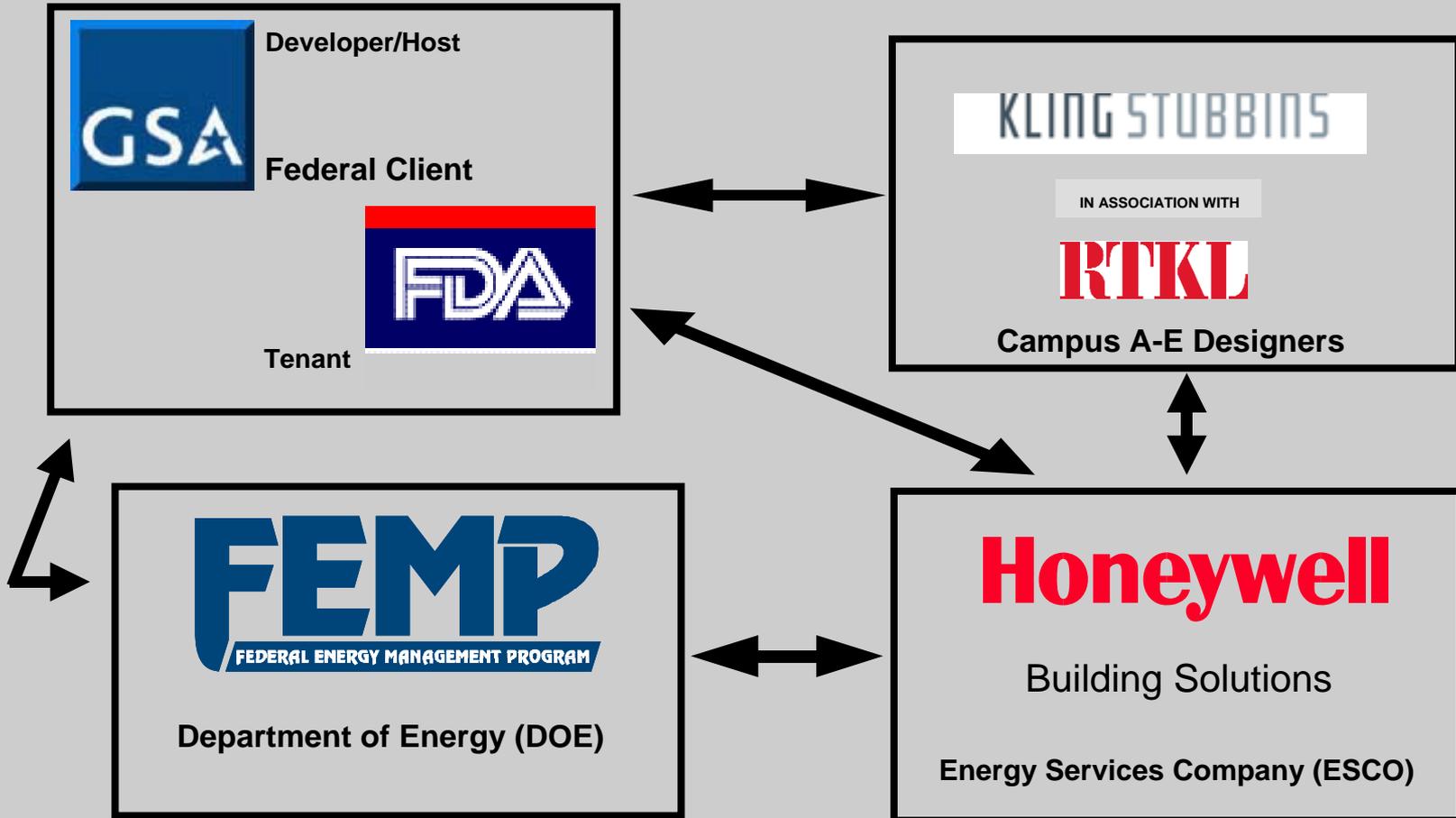
Baseline Development

- Current design for new building
- ASHRAE 90.1 standards
- Energy performance of current location
- Typical, recent experience of GSA
- Combination of above

Whatever is agreeable; needs to withstand audit!

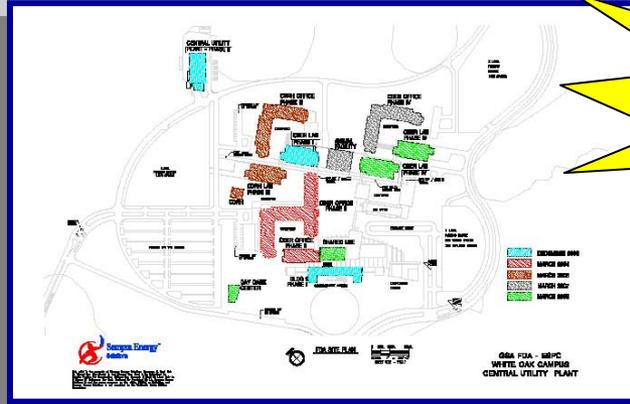


Partnership

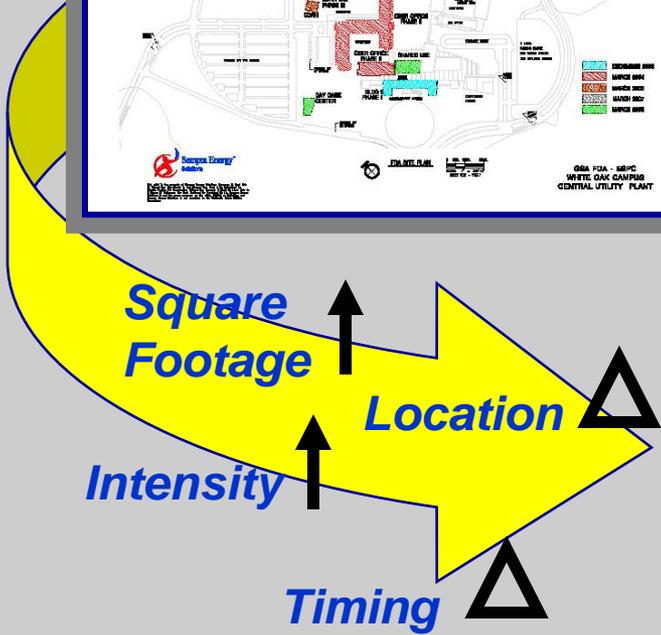
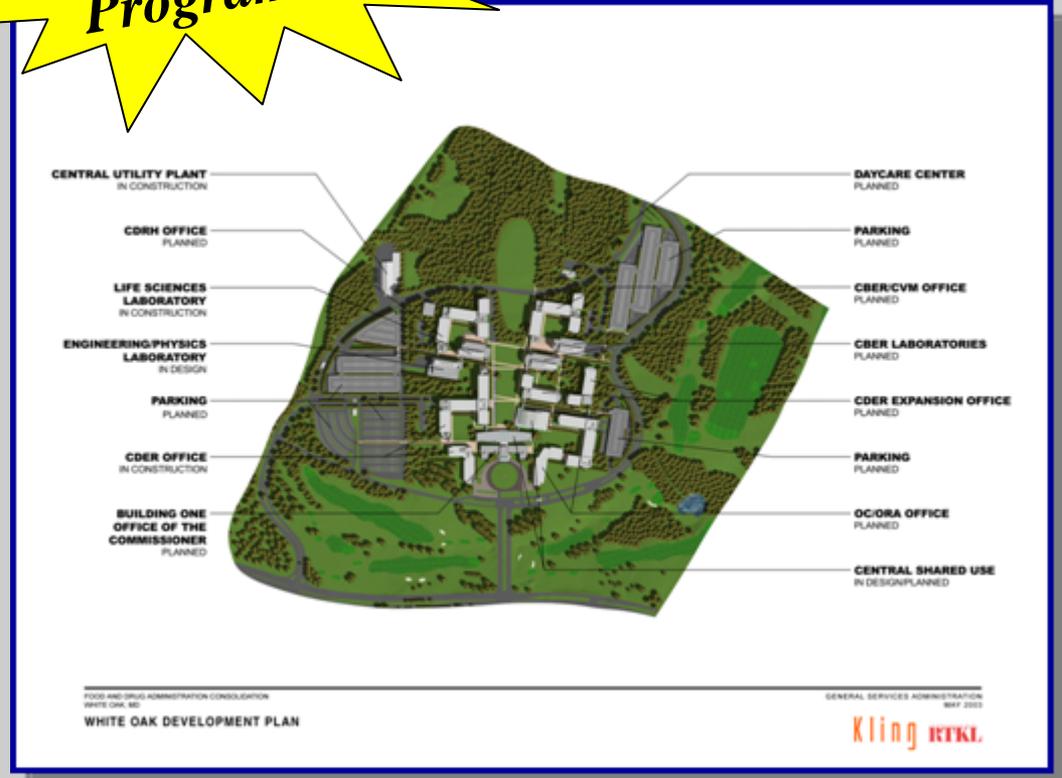




Site Development



Dynamic Program!



FOOD AND DRUG ADMINISTRATION CONSULTATION
WHITE OAK, MD
WHITE OAK DEVELOPMENT PLAN

GENERAL SERVICES ADMINISTRATION
MAY 2003
Kling STUBBS



Energy Conservation Measures

**Central Plant
Improvements
(CHP)
41%**

**Operations &
Maintenance
41%**

**Photovoltaics
.1%**

ECMs in Campus Buildings

- Lighting & glazing upgrades
- Air handling unit redesign
- VFDs on pumps
- Demand controlled ventilation
- Night setbacks

17%

*“%” reflects
approximate savings
percentage
contribution of ECM
type to original ESPC
project*

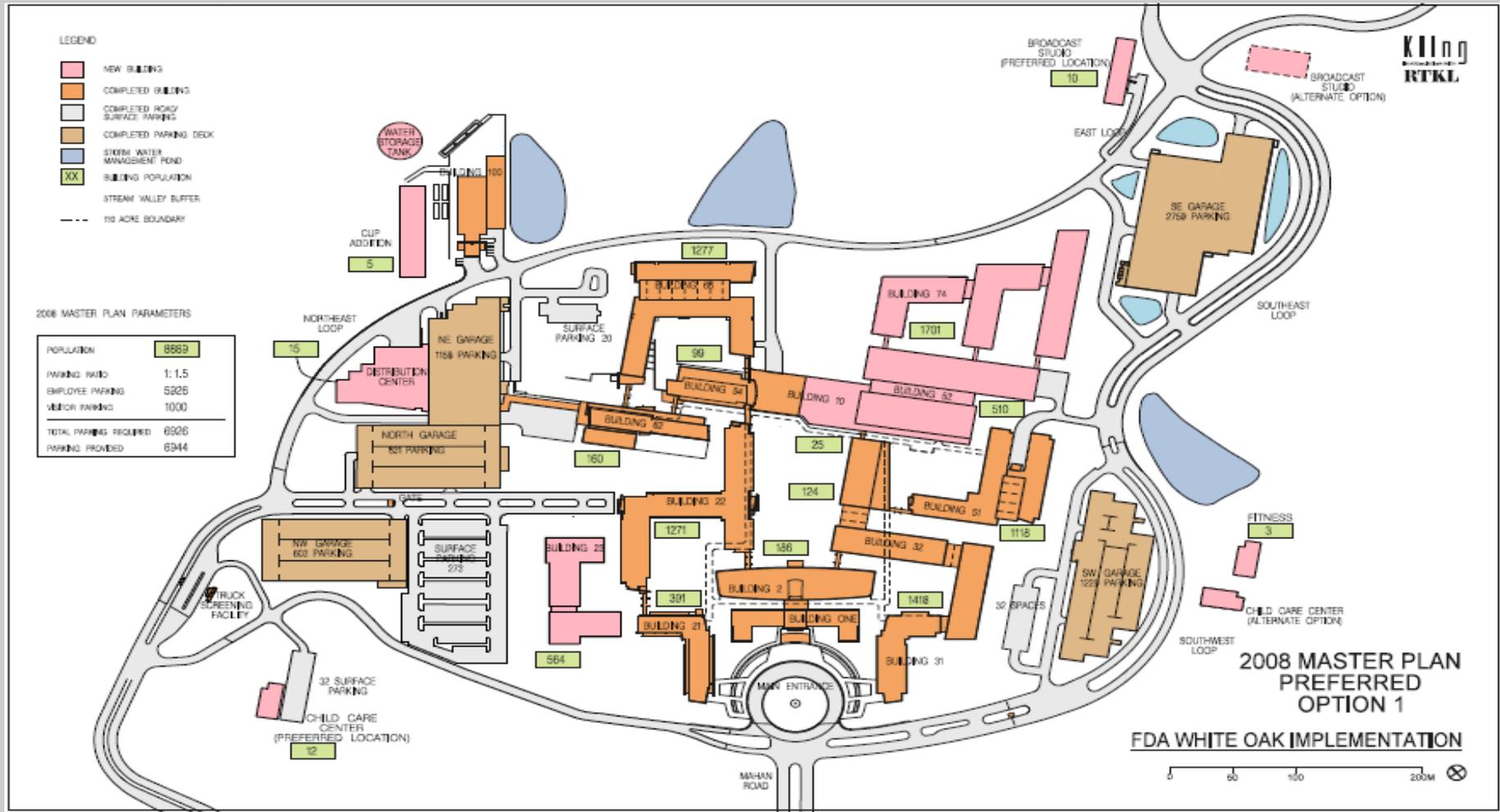


Facilities Supported

	PHASE	BUILDING NAME/GROUP	GROSS SQ FT	OCCUPANCY DATE
ESPC I	1	CDER LAB	133,400	Oct-2003
	2	CDER OFFICE	551,000	Aug-2005
	3	SHARED USE (Phase 1&2)	127,000	Jun-2006
ESPC II	3	CDRH LAB	160,000	Mar-2007
	3	CDER OFFICE EXPANSION	390,000	Mar-2008
	3	LOGISTICS BLDG.	141,319	Jun-2009
	3	SHARED USE (remainder)	80,000	Oct-2009
	4	CDRH OFFICE	393,000	Jun-2009
	4	OC & ORA	400,000	Nov-2009
	4	BUILDING ONE RENOVATION	93,342	Dec-2009
ESPC III	5	DAY CARE, FITNESS CENTER	31,000	Dec-2010
	5	CBER OFFICE	347,000	Jun-2012
	6	CVM/OC-2 OFFICE	357,000	Nov-2012
	5	CBER LABS (BT)	255,000	Dec-2012
	5	CBER LAB (Animal)(Vivarium)	177,000	Dec-2012
	7	FUTURE OFFICE/STUDIO	320,000	Dec-2013?
BUILD-OUT			3,956,061	



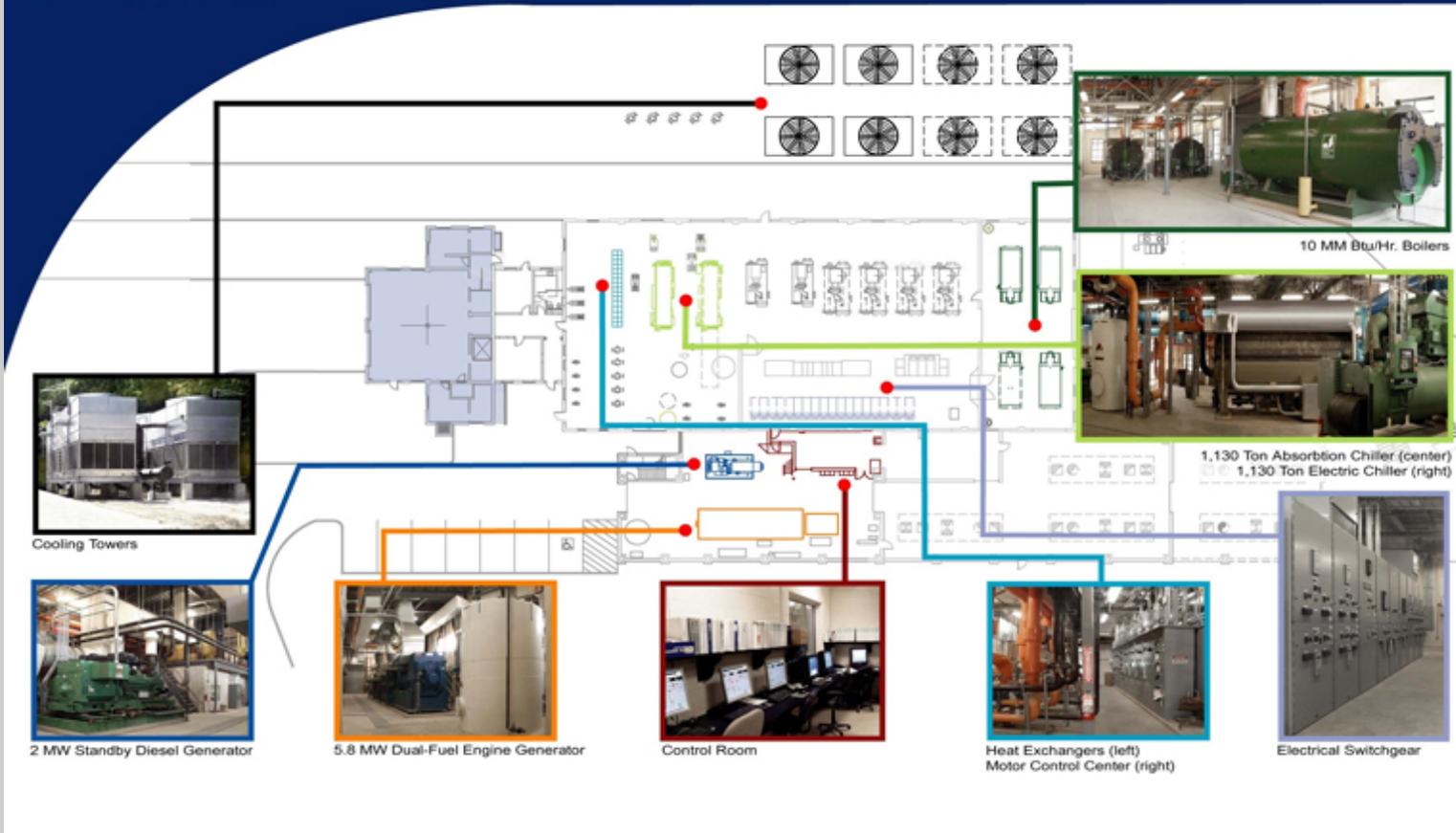
FDA Campus: Full Build-Out





Central Utility Plant: ESPC I

FRC Federal Research Center White Oak EQUIPMENT LAYOUT



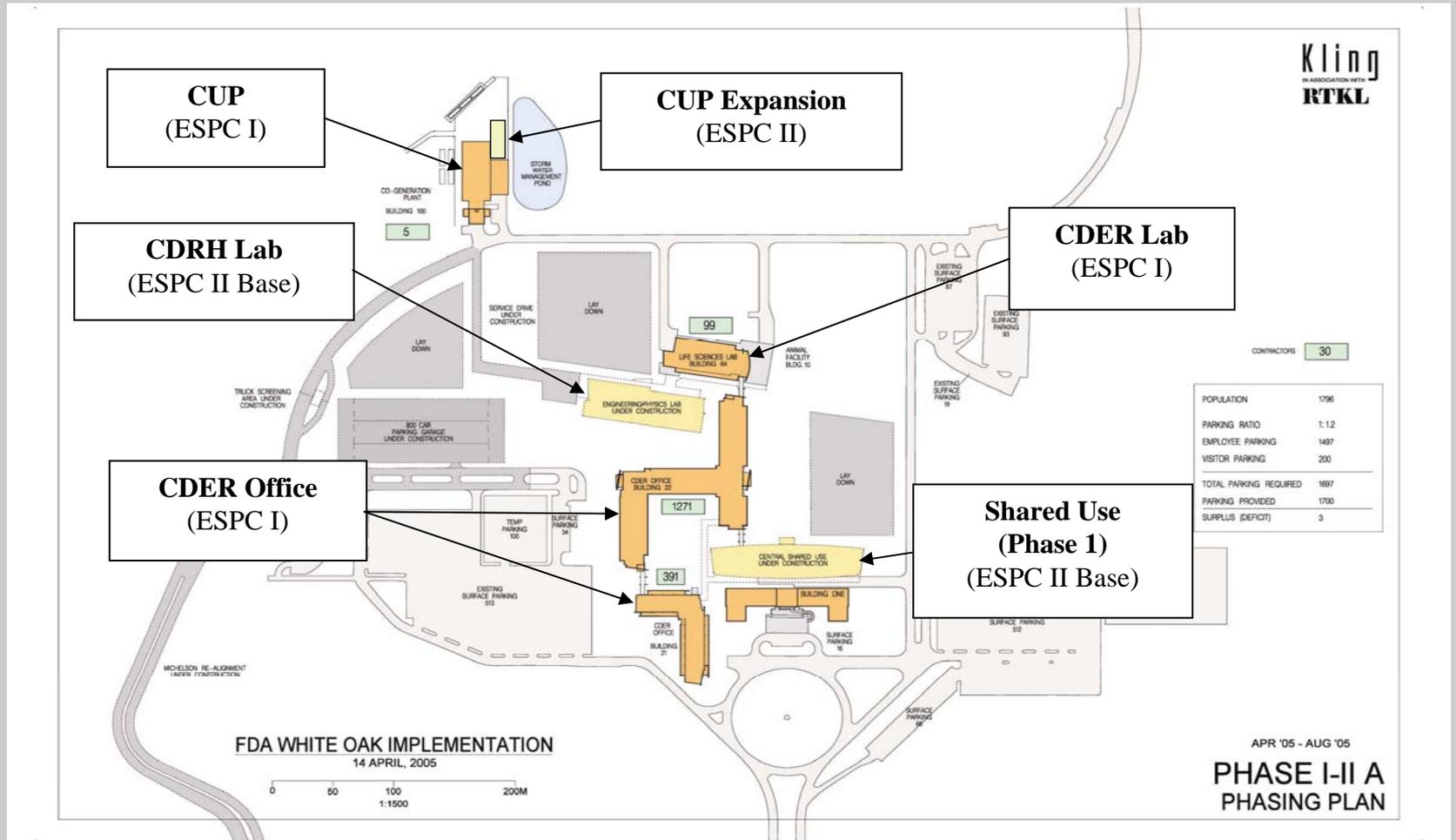


Total Savings Make-up

- Annual Savings
 - Energy savings (CUP improvements, building ECMs, photovoltaic system)
 - Maintenance Savings
- One-Time Ancillary Savings
 - Avoided demolition costs
 - Avoided construction costs
 - Avoided temporary heating and cooling costs

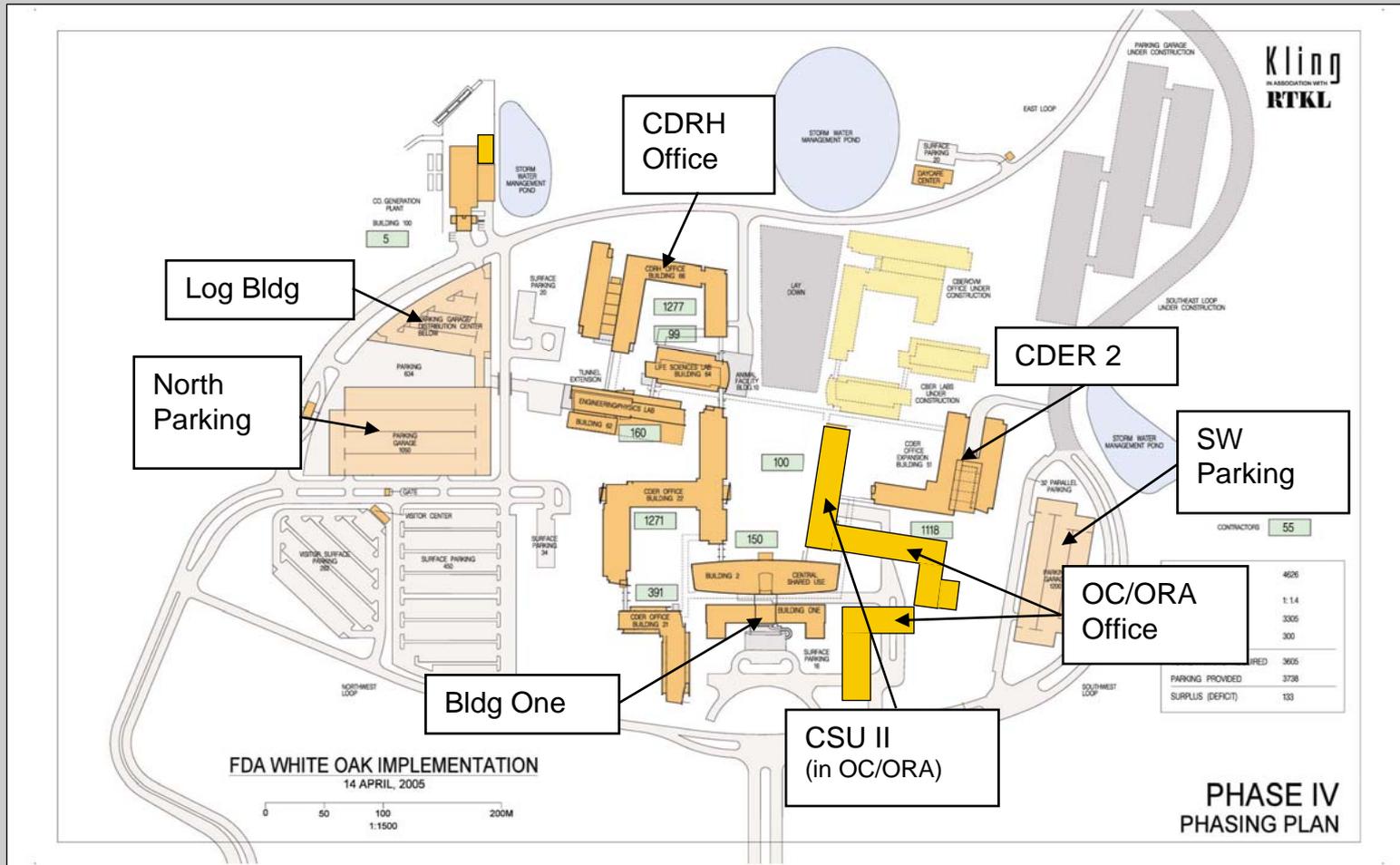


Incremental Expansion (ESPC II Base)





Incremental Expansion (ESPC II All Options & Elec Gen)





White Oak ESPC II Features

- **ESPC II Base Delivery Order**
 - Building Expansion for Generators
 - 1 - 4.5 MW Natural Gas Combustion Turbine
 - 1 - 1980-ton Electric Centrifugal Chiller
 - Photovoltaic Array Expansion
 - Ancillary Plant Equipment and Distribution System
- **ESPC II “All Options” Modification**
 - 2 - 4.5 MW Natural Gas Combustion Turbines
 - 2 - 1980-ton Electric Centrifugal Chillers
 - 1 - 1130-ton Absorption Chiller
 - Ancillary Plant Equipment and Distribution System
- **ESPC II “Elec Gen” Modification**
 - 1 - 4.5 Mw Natural Gas Combustion Turbine



ESPC II





Energy Security

- 5.8 MW Engine-Generator
 - Dual Fuel/Primary Power Source during early stages of campus development
- Underground Electrical Distribution System
- Interconnection with Electric Grid
 - Two separate feeders into substation
- 2 MW Standby Diesel Generator
- 4 - 4.5 MW Turbine-Generators



Optimization

Initial Approach

Near-continuous operation of engine-generator

Current Strategy

Real-time “make or buy” decision based upon cost of natural gas, electric tariff, campus loads vs. engine & cogen efficiencies, etc.

Bottom Line

Honeywell Building Solutions SES, GSA and tenants work in partnership to operate the facility in the best interest of the Government.



ESPC Project Challenges

- Programmatic Changes
- Commodity Pricing
- Grid Interconnection
- Load Shedding Strategy
- GSA Pricing Guide Changes
- Metering & Reporting Requirements
- Optimization Automation



ESPC Project Benefits

- Reduced first-cost to Government
- Reduced recurring costs to Government
- More energy efficient campus
- Fixed accountability for systems performance
- Flexibility to meet evolving program requirements
- Adaptive re-use of historic structures
- Demand response capability (\$ to GSA)
- *Enhanced Energy Security*



A Work In Progress...





Questions

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