

CFAC Review



Conventional Facilities Status Update

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Director for Conventional Facilities

September 25, 2007

Outline

- Charge
- Status of Previous Review Items
- Recap and Update Method of Accomplishment
- Scope Recap and Update
- Design Status
- Cost Estimate Status
- Schedule
- Risk Assessment

Charge

Charge to the CFAC Committee:

In preparation for the External Independent Review and the CD-2 Lehman review, both scheduled for November 6, 2007, I request the CFAC Committee evaluate and make recommendations for the following:

- That the scope, WBS and functional requirements for NSLS II Conventional Facilities (CF) are sufficiently defined to establish the performance baseline for CD-2
- That the CF cost estimate reflects the project scope and is sufficiently detailed to provide confidence in the cost baseline
- That the CF resource loaded schedule is sufficiently detailed, has appropriate logic and is of reasonably achievable duration to provide confidence in the CF schedule baseline.
- That risks that could impact the CF technical, cost and schedule baseline are identified, assessed and managed such that appropriate mitigation is underway or planned and that appropriate contingency is identified.
- With recognition that Title I design documents are still being developed and are not completed, your recommendations as to final preparation and content of the documents would be very beneficial.

Method of Accomplishment Recap

- Project Management – by NSLS II CF Project Team
 - M. Fallier - CF Division Director
 - O. Dyling - CF Asst. Director for Design Management
 - S. Sawch – CF Asst. Director for Construction Management
- Design
 - NSLS II buildings, site & utilities
 - HDR Architects & Engineers, Alexandria VA – M. Jamison
 - Vibration & Acoustics – Colin Gordon Assoc., -H. Amick
 - Chilled Water Facility - Giffels Engineers, Southfield MI
 - BNL Design Support
 - Facility Dynamic Modeling and Analysis – N. Simos
 - Plant Engineering Design Support Team

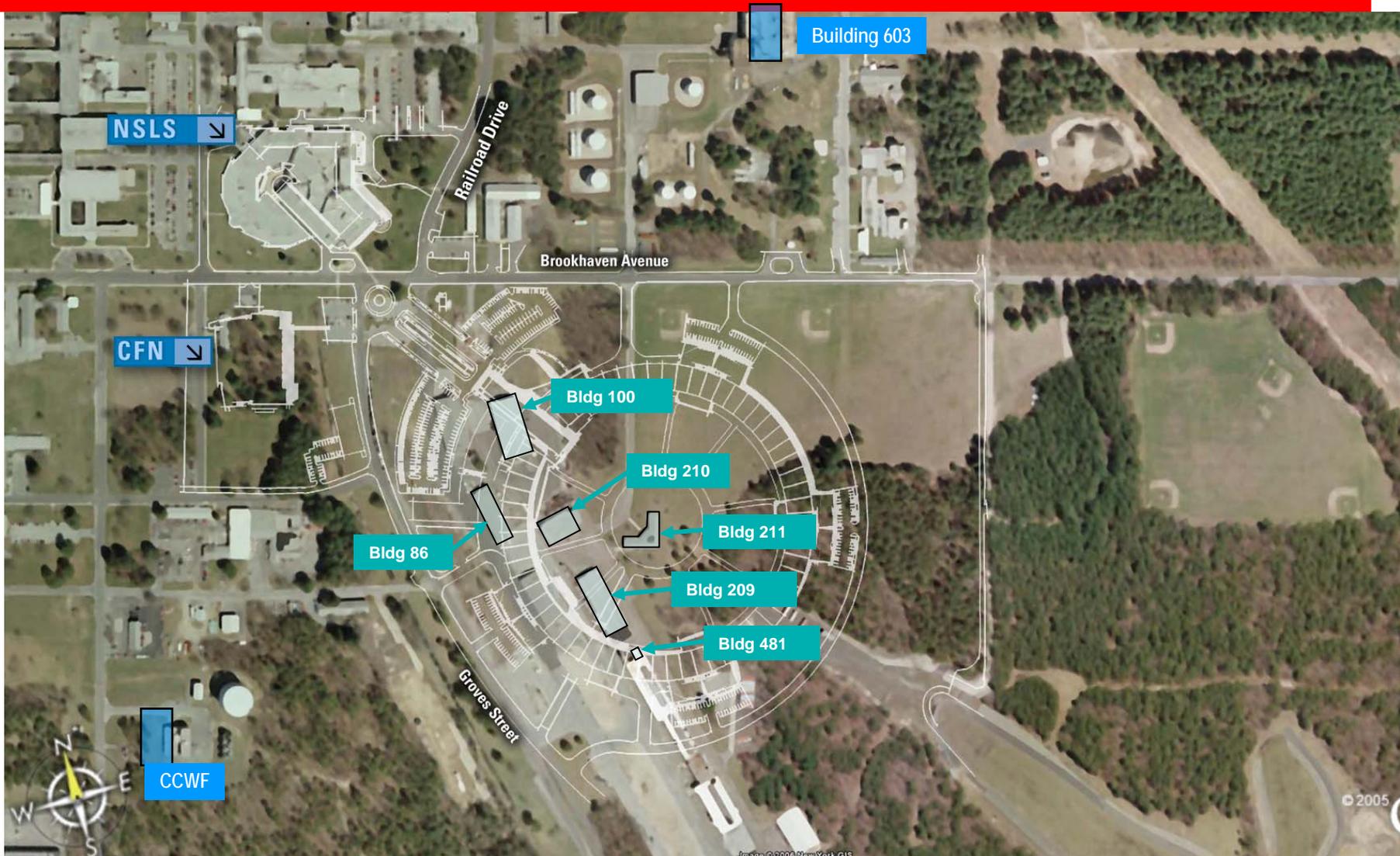
Method of Accomplishment Recap cont'd

- Construction Management
 - Design phase preconstruction services – LIRO/Gilbane
 - Construction Phase - Agent CM – To be awarded in FY08
- Construction Contracts – All fixed price, best value award
- Construction Packages
 - Site Preparation - <\$1M ~ 6 months, award 10/08
 - Ring Building (main contract) - ~\$170M ~ 40 months, award 2/09
 - Chilled Water Plant Expansion - ~\$13M ~ 16 months, award 3/09
 - Chilled Water Piping to site - ~\$1M ~ 12 months, award 8/09
 - Electrical Substation Upgrade - ~\$3M ~ 12 months, award 5/09
 - Process Water Cooling Tower & Piping - ~\$3M, 12 months, award 2/10

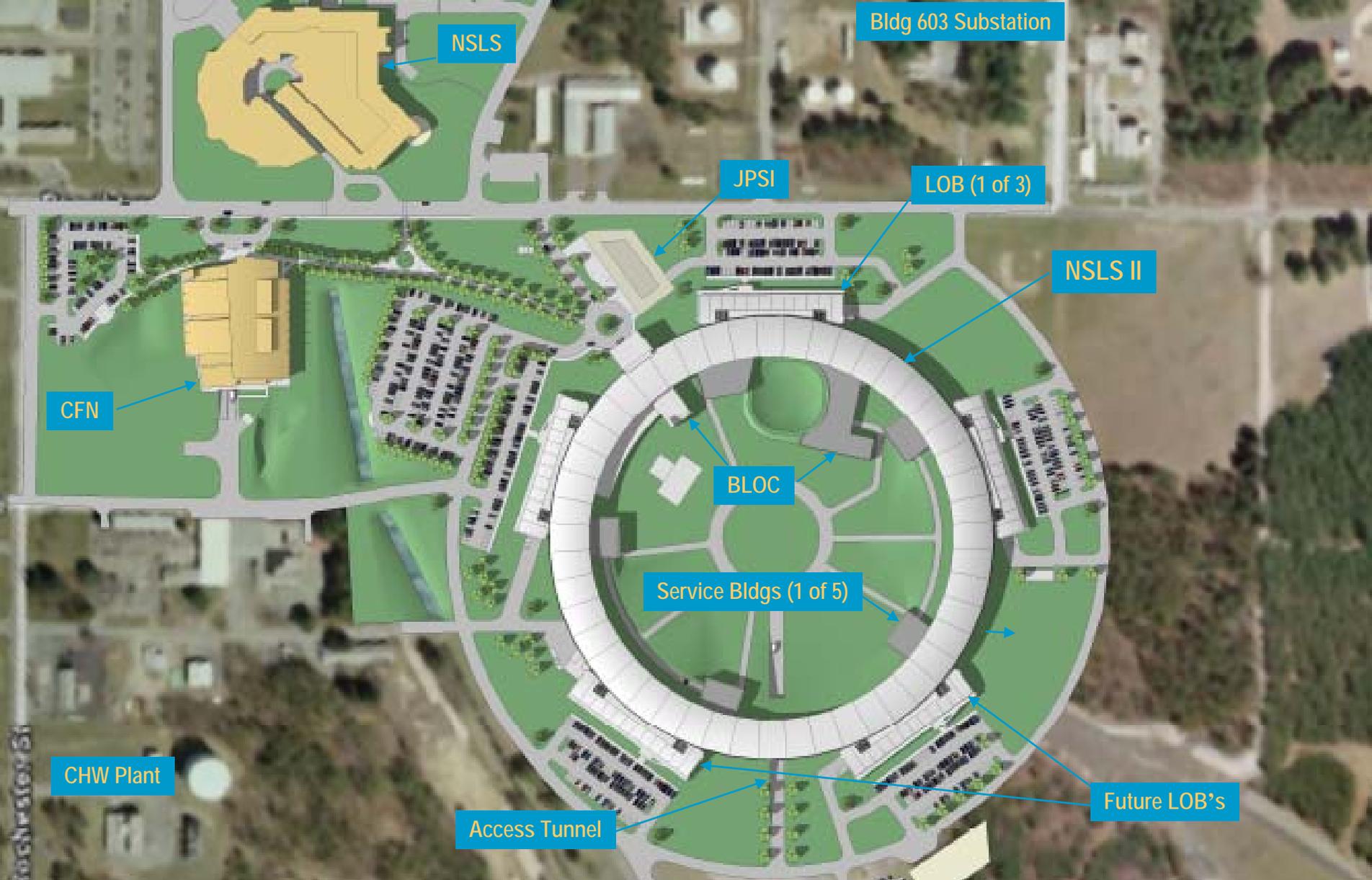
Conventional Facilities Scope Recap

- Engineering, design and construction of conventional facilities
- Site preparation and development
- Over 400,000 GSF of buildings for accelerator, labs & offices
- Utility and support service buildings
- Utilities
 - Power
 - Central chilled water
 - Central steam & condensate
 - Sanitary sewer
 - Potable water
 - Storm water
 - Data & communications
 - Cooling tower water for process cooling
 - LN2
- DI cooling water systems by Accelerator Div.

Existing Site



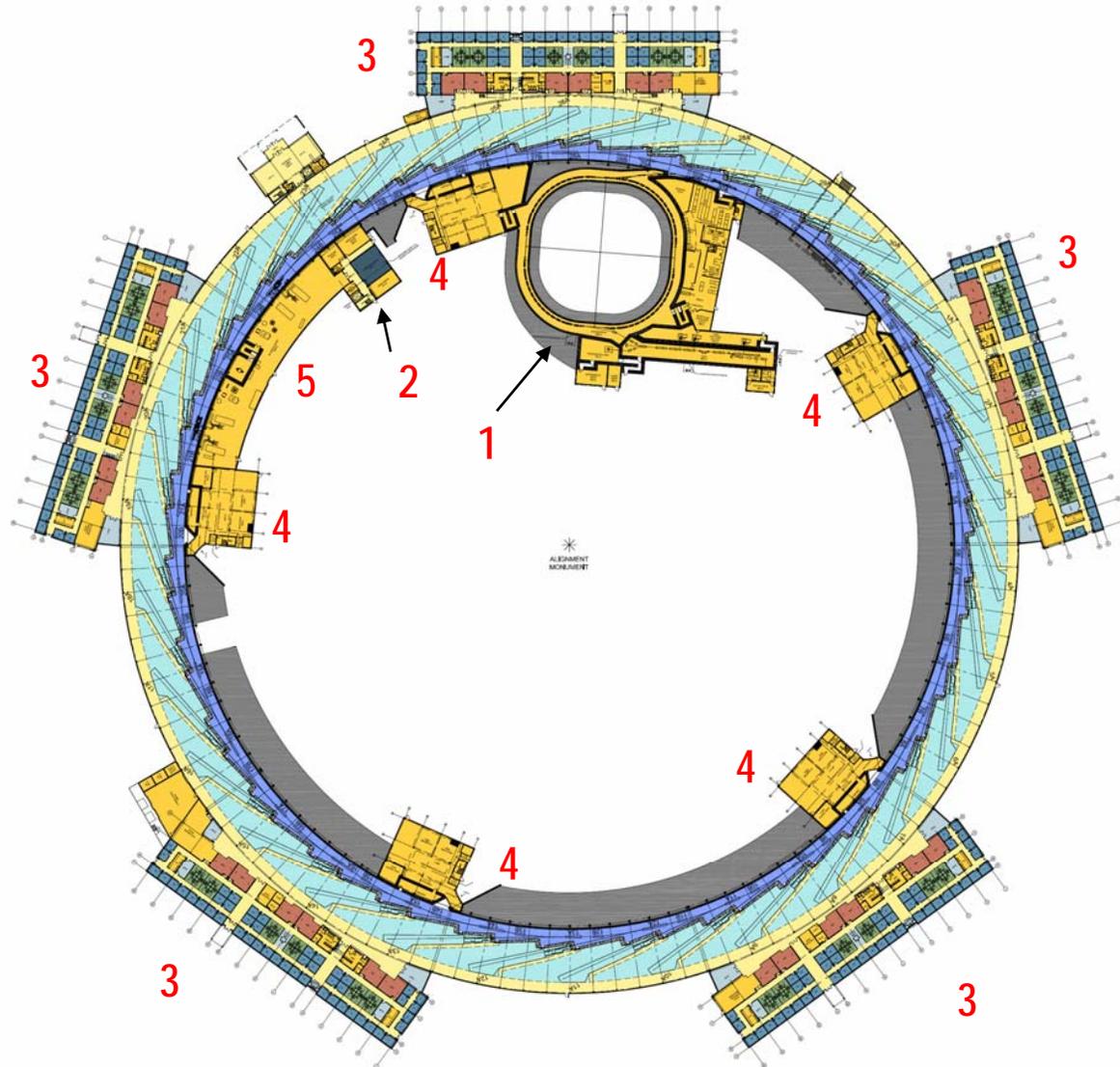
NSLS II Siteplan



NSLS II Floor Plan

NSLS II Floor Plan

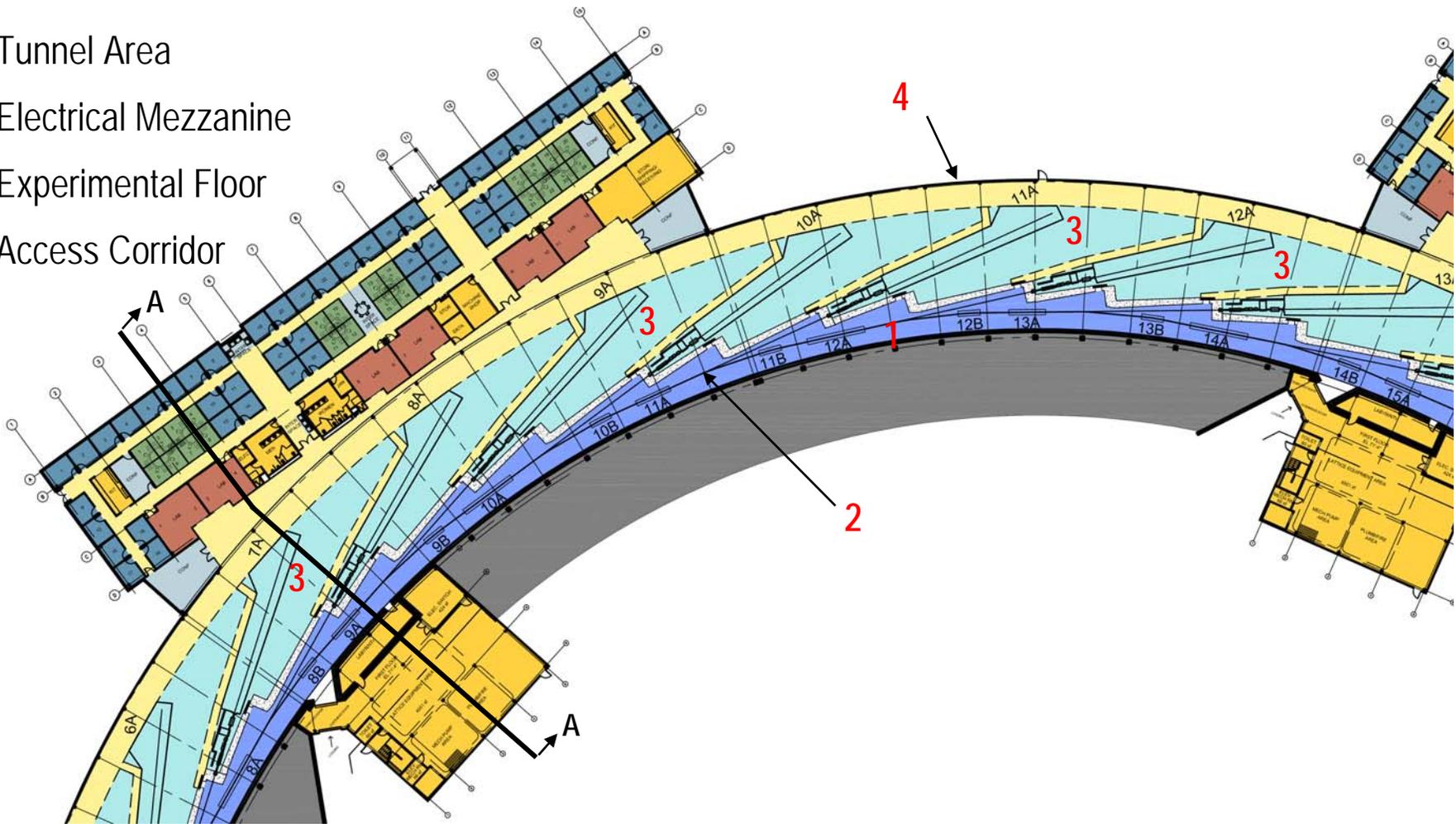
1. Booster/LINAC
2. Operations Center
3. LOB – Lab Office Buildings (3 base scope, 2 more future)
4. Service Buildings (5)
5. RF Area



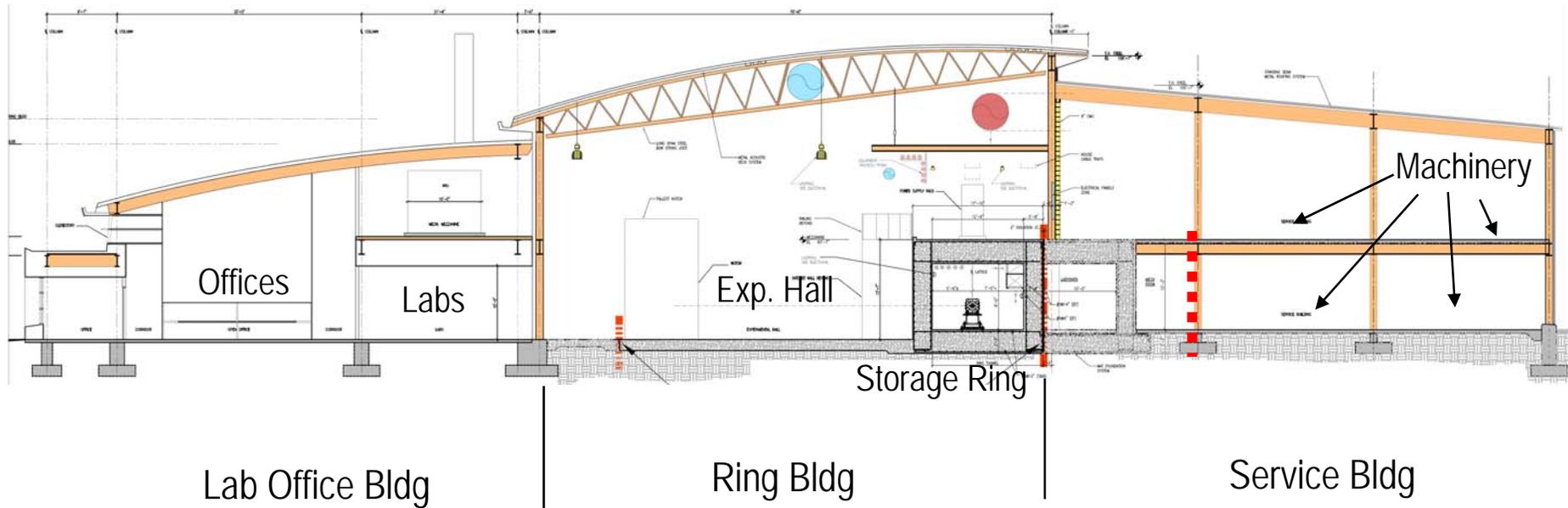
NSLS II Floor Plan

NSLS II Floor Plan

1. Tunnel Area
2. Electrical Mezzanine
3. Experimental Floor
4. Access Corridor



Building Section



Section A-A

Facility Program

Building /Area/Function	CDR Program	
	Base Scope GSF	Full Build-Out GSF
Ring Building	248,000	248,000
Service Buildings	53,000	53,000
RF Area	10,000	10,000
Operations Center ¹	12,000	23,000
Booster Ring	18,000	18,000
Linac	7,000	7,000
Lab Office Buildings (3 @ 23,600 ea.) ²	71,000	118,000
Total GSF	419,000	477,000

- ¹Base plan provides 2 story Ops Center with alternate for added 3rd floor of 11,000 SF
- ²Base plan provides 3 LOB's with plan for 2 more LOB's to be added in future.

Sustainable Design

- Recent DOE guidance does not require certification to USGBC LEED "Gold" std.

Exemptions: Projects that build new, special purpose facilities (such as light sources) will be reviewed on a case by case basis for the impact of applying the "guiding principles" to their efficacy and cost effectiveness.

- Approach is to pursue Certification with possible silver rating and identify alternates that could achieve Gold as cost performance and operational considerations allow.
- A/E has developed a detailed evaluation of LEED alternatives and costs - part of later breakout discussion

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39	15	15	Project Totals (pre-certification estimates)
Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points			

Design Status

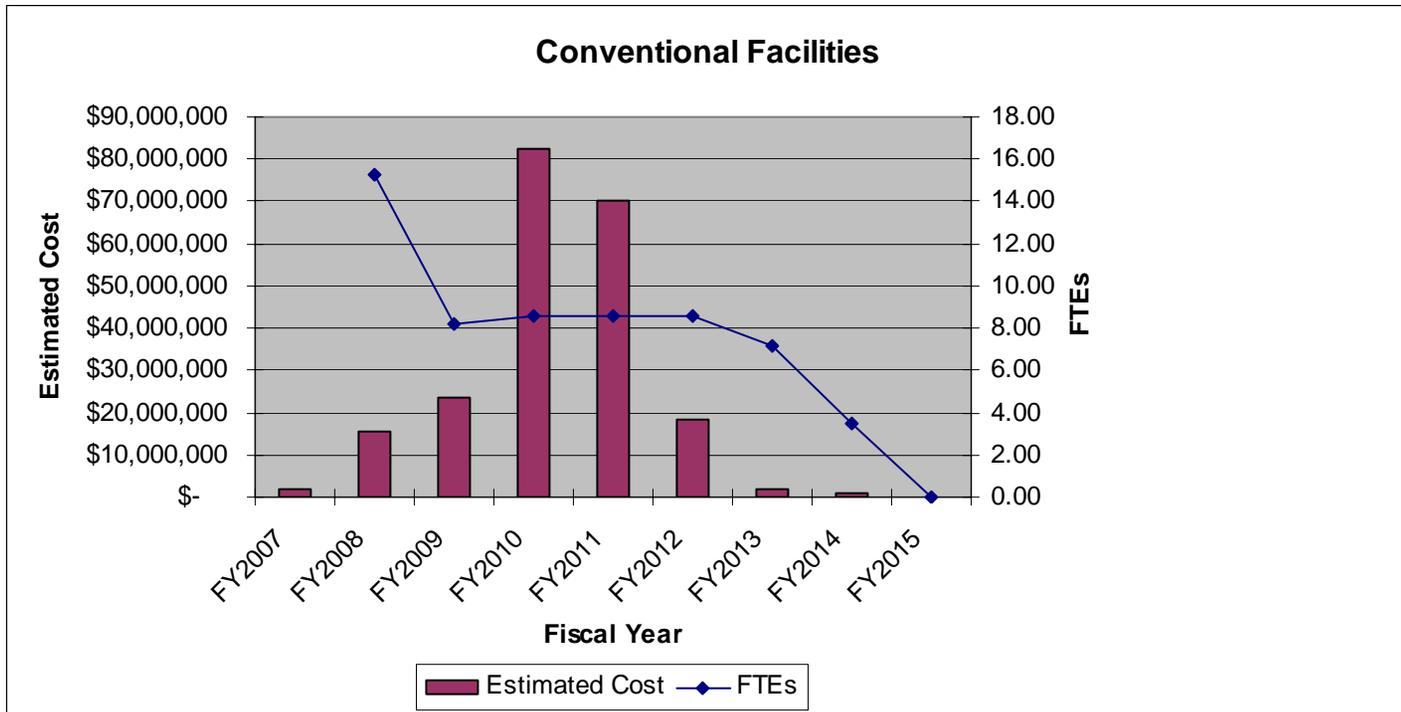
- Title I 90% Completed by HDR Sept 7th
- Title I 95% will be provided to EIR review team 10/2
 - They require it 5 weeks in advance of the EIR review
- Chilled Water Facility Title I 60% available 9/21
- CM Design Phase services underway preparing independent estimate, schedule and constructability review
- Comprehensive VE review 1st week of October
- Final Title I Design due mid October
- EIR & CD-2 Lehman review scheduled for November 6th.

Recent Value Engineering

- Efforts to establish overall project baseline costs have resulted in the following VE and/or Scope reductions that differ from T-1 90% documents:

CF Scope & Cost Reduction Items	
1	Shell LOB 4
2	Only pursue LEED Silver instead of Gold in Ops and LOB's
3	Reduced Ring Bldg width by 3'
4	Reduced LINAC Bldg length
5	Move process cooling tower to infield
6	Use shorter utility routing
7	Ops Bldg Entry Lobby 2 story instead of 3
8	Reduce front end area height by 40 cm
9	Reduce thickness for Exp Hall and Tunnel floor slab
10	Eliminate return duct in storage ring
11	Distribute Beamline utilities to half of ring
12	Remove ratchet wall doors for 1/2 of Ring
13	Remove allowance for acoustic treatments (keep perf. metal deck)
14	Assume BNL removes all structures from site
15	Remove trees & shrubs from landscaping

Conventional Facility Costs



Description	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	Cumulative
1.05 Conventional Facilities	\$ 2,020,710	\$15,679,947	\$23,470,099	\$ 82,287,030	\$ 70,246,283	\$ 18,375,239	\$ 2,085,351	\$ 801,368	\$214,966,027
1.05.01 Conventional Facilities Management	\$ 128,877	\$ 2,297,961	\$ 1,347,152	\$ 1,365,531	\$ 1,409,228	\$ 1,452,207	\$ 1,500,861	\$ 801,368	\$ 10,303,184
1.05.02 Conventional Facilities Engineering and Design	\$ 1,891,833	\$12,659,224	\$ 1,359,978	\$ 1,347,871	\$ 1,407,334	\$ 1,416,436	\$ 187,182	\$ -	\$ 20,269,858
1.05.03 Conventional Facilities Construction	\$ -	\$ 722,762	\$20,438,144	\$ 78,420,877	\$ 66,334,313	\$ 14,912,011	\$ -	\$ -	\$180,828,108
1.05.04 Integrated Controls & Communications	\$ -	\$ -	\$ 201,145	\$ 217,880	\$ 228,774	\$ 163,035	\$ -	\$ -	\$ 810,834
1.05.05 Standard Equipment	\$ -	\$ -	\$ 123,680	\$ 202,094	\$ 739,799	\$ 207,614	\$ 397,308	\$ -	\$ 1,670,495
1.05.06 Conventional Facilities Commissioning	\$ -	\$ -	\$ -	\$ 732,777	\$ 126,835	\$ 223,936	\$ -	\$ -	\$ 1,083,548

Burdened and Escalated without Contingency

CF Schedule



Risk Assessment

- Technical Risk
 - Primarily building stability, vibration & temperature control
- Schedule Risks
 - BNL Warehouse relocation project
 - CF Engineering & Design are on the critical path
 - Construction of Ring Building is critical path
- Cost Risks
 - Technical and schedule risks can impact costs
 - Construction and material markets are still volatile but settling down
- Risk registry has been prepared and is being updated to reflect latest understanding of risks and maturation of design.
- Montecarlo analysis to take place 1st week of October
- Anticipate contingency in low 30% range

CF Path Forward

- Work remaining for CD-2 preparation
 - Finalize VE effort and estimates
 - Finalize Title I (PDR) & Functional Requirements
 - Finalize scope, cost and schedule baseline
 - Escalation basis
 - Risk analysis – contingency basis
 - Resource loaded schedule