

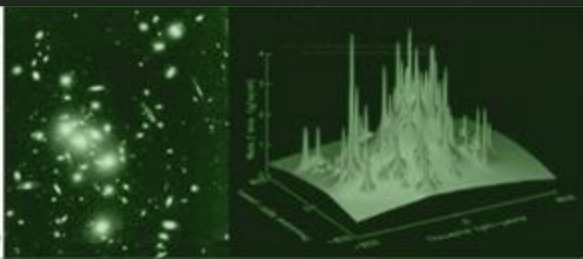
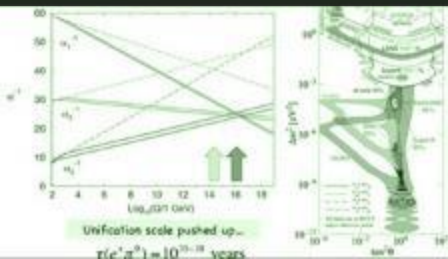


Development of an RFP Package for LZ Davis Campus Infrastructure Improvements

Pre-proposal Meeting and Site Visit

November 8, 2017 8:00 AM

John Keefner



Agenda

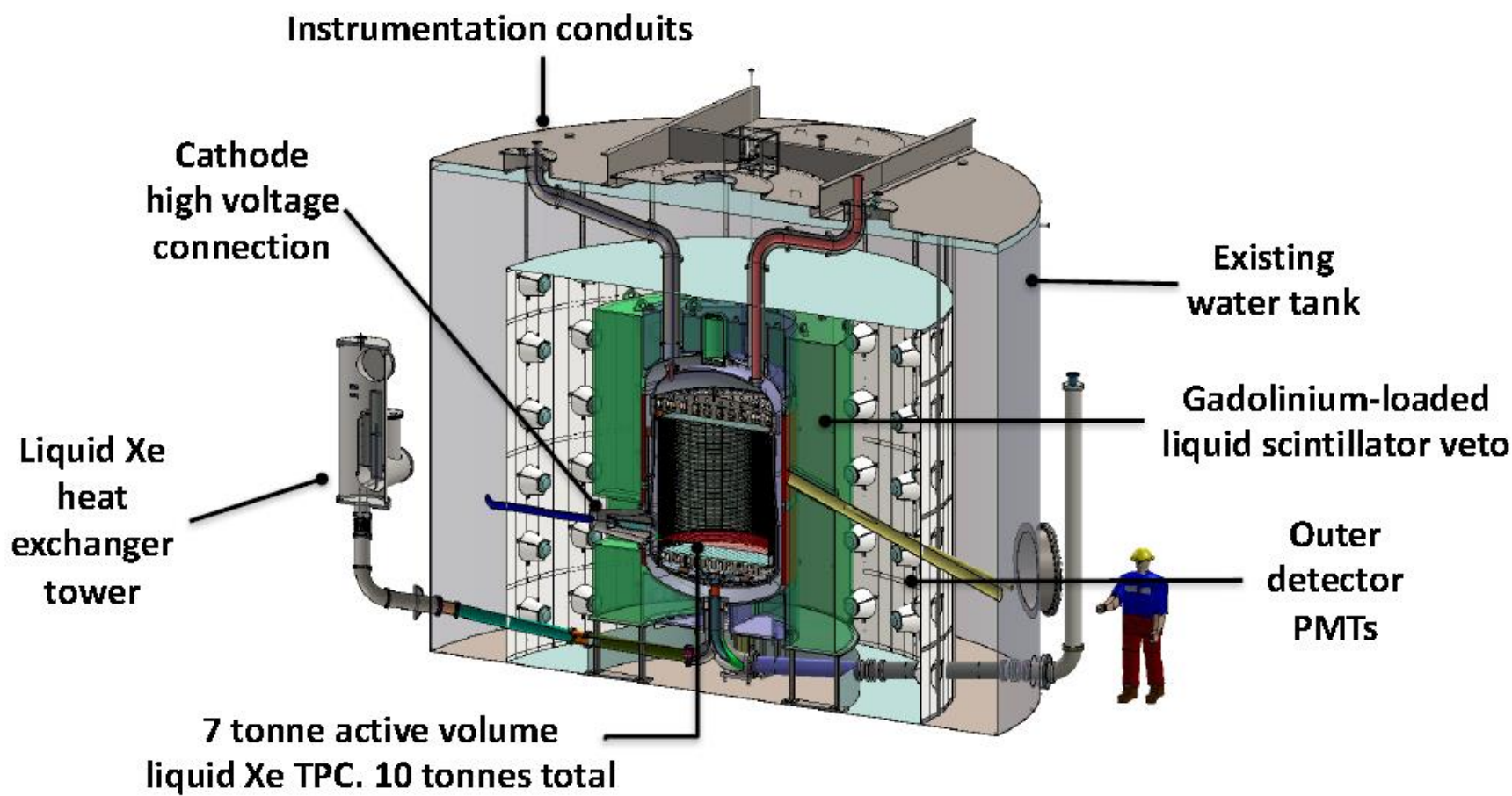
8:00-8:05am	Sign-In/Welcome/Introductions	All
8:05-8:35am	Project Description and Scope	John Keefner
8:35-8:40am	ESH Considerations	Jason Rosdahl
8:40-9:05am	Key RFP Guidelines and Timeline	Michele Baumann
9:05-9:15am	Break	
9:15-9:30am	Video and Waiver	All
9:30-9:45am	Walk to cage and PPE checkout	All
10:00-10:15	Cage ride to 4850 level	All
10:15-11:45	Davis Campus Walkthrough • BigX to Davis Lab • Mechanical room • Xenon storage drift/decline • LN storage • Backup generator room	John Keefner
11:45-12:00	Cage ride to Surface/Return PPE/Adjourn	All

Some definitions

- Dark matter
 - It's about 25% of the mass-energy of the universe
 - We know it exists but don't know what it is
 - Experiments world-wide to try to understand dark matter
- LUX(Large Underground Xenon) experiment
 - Ran from 2012 to 2016, about 1 mile beneath us
 - Xenon – element that is present in trace amounts in the atmosphere
- ZEPLIN(ZonEd Proportional scintillation in Liquid Noble gases)
 - Was dark matter experiment in United Kingdom
- LZ – merger and expansion, new experiment to be here at SURF
 - Will be most sensitive in world
 - Takes about 4 years to design, fabricate and install



The LUX-ZEPLIN detector



A Few Numbers.....

- Very roughly, one million dark matter particles pass through you every second...but you never notice
- 200 scientists and engineers are working on the LZ experiment from around the world
- LZ contains about 10 tons of liquid xenon
- Liquid xenon is a dense liquid, about 3 g/cm^3 , so aluminum will float
- Xenon is 0.0000087% by volume of air...so it's hard to extract from the air around us.



Scale Up ≈ 50 in Fiducial Mass



15

Relationship to today's meeting

- Parts of LZ made all over the world
- They come here to SURF
- Assembly of subsystems takes place in lab space on surface before they are taken underground
- We are refitting the existing underground cavern for the next round of science



LZ collaboration, Fall 2017

38 institutions, 250 scientists, engineers, and technicians

SURF collaboration meeting, July 2017



- | | | |
|---|---|--|
| 1) Center for Underground Physics (South Korea) | 15) Brookhaven National Lab (US) | 29) University of California, Davis (US) |
| 2) LIP Coimbra (Portugal) | 16) Brown University (US) | 30) University of California, Santa Barbara (US) |
| 3) MEPhI (Russia) | 17) Fermi National Accelerator Lab (US) | 31) University of Maryland (US) |
| 4) Imperial College London (UK) | 18) Lawrence Berkeley National Lab (US) | 32) University of Massachusetts (US) |
| 5) Royal Holloway University of London (UK) | 19) Lawrence Livermore National Lab (US) | 33) University of Michigan (US) |
| 6) STFC Rutherford Appleton Lab (UK) | 20) Northwestern University (US) | 34) University of Rochester (US) |
| 7) University College London (UK) | 21) Pennsylvania State University (US) | 35) University of South Dakota (US) |
| 8) University of Bristol (UK) | 22) SLAC National Accelerator Lab (US) | 36) University of Wisconsin – Madison (US) |
| 9) University of Edinburgh (UK) | 23) South Dakota School of Mines and Tech. (US) | 37) Washington University in St. Louis (US) |
| 10) University of Liverpool (UK) | 24) South Dakota Science and Tech. Auth. (US) | 38) Yale University (US) |
| 11) University of Oxford (UK) | 25) Texas A&M University (US) | |
| 12) University of Sheffield (UK) | 26) University at Albany (US) | |
| 13) Black Hill State University (US) | 27) University of Alabama (US) | |
| 14) Brandeis University (US) | 28) University of California, Berkeley (US) | |

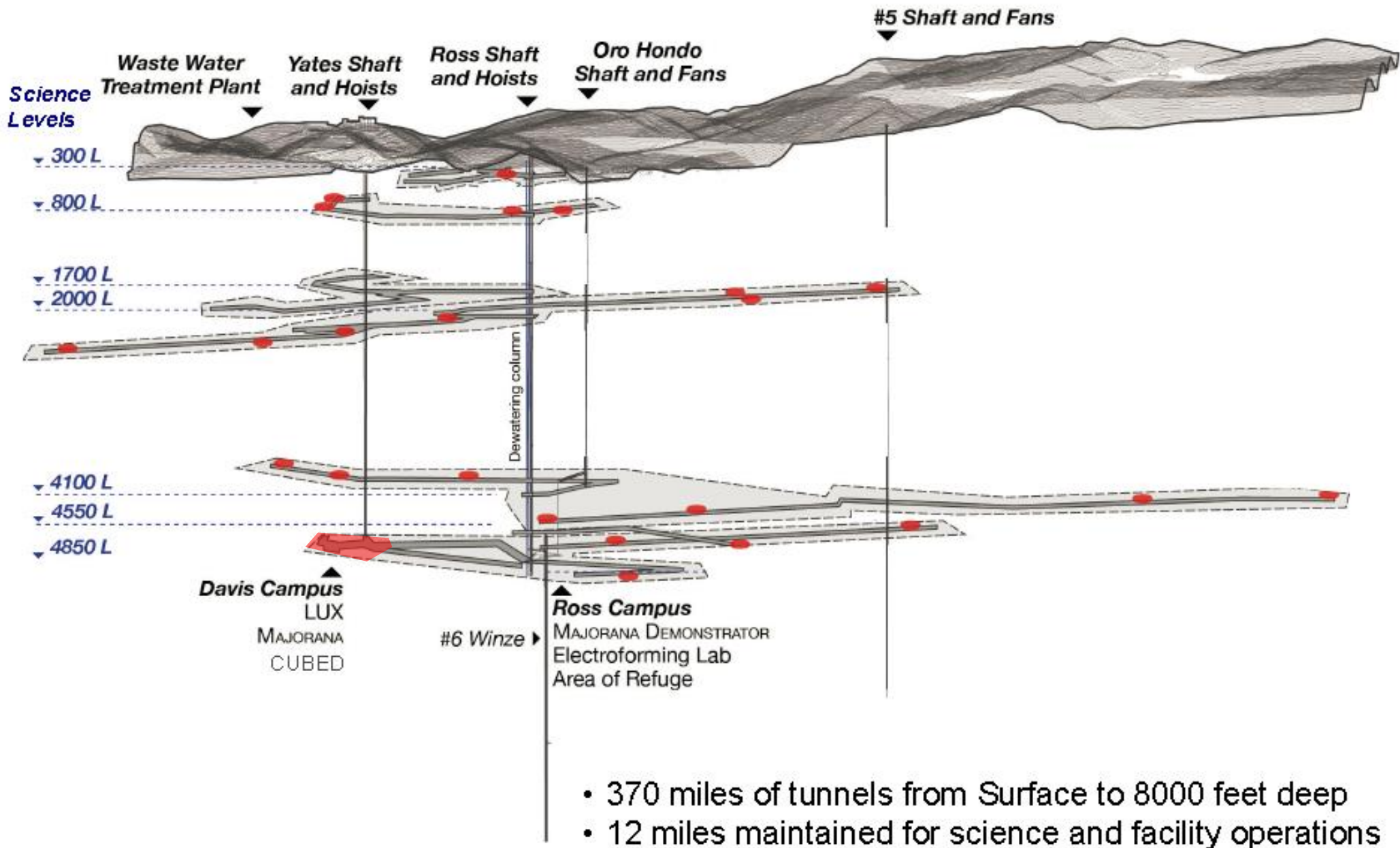
Carter Hall

LZ Status Director's Review at LBNL November 13, 2017

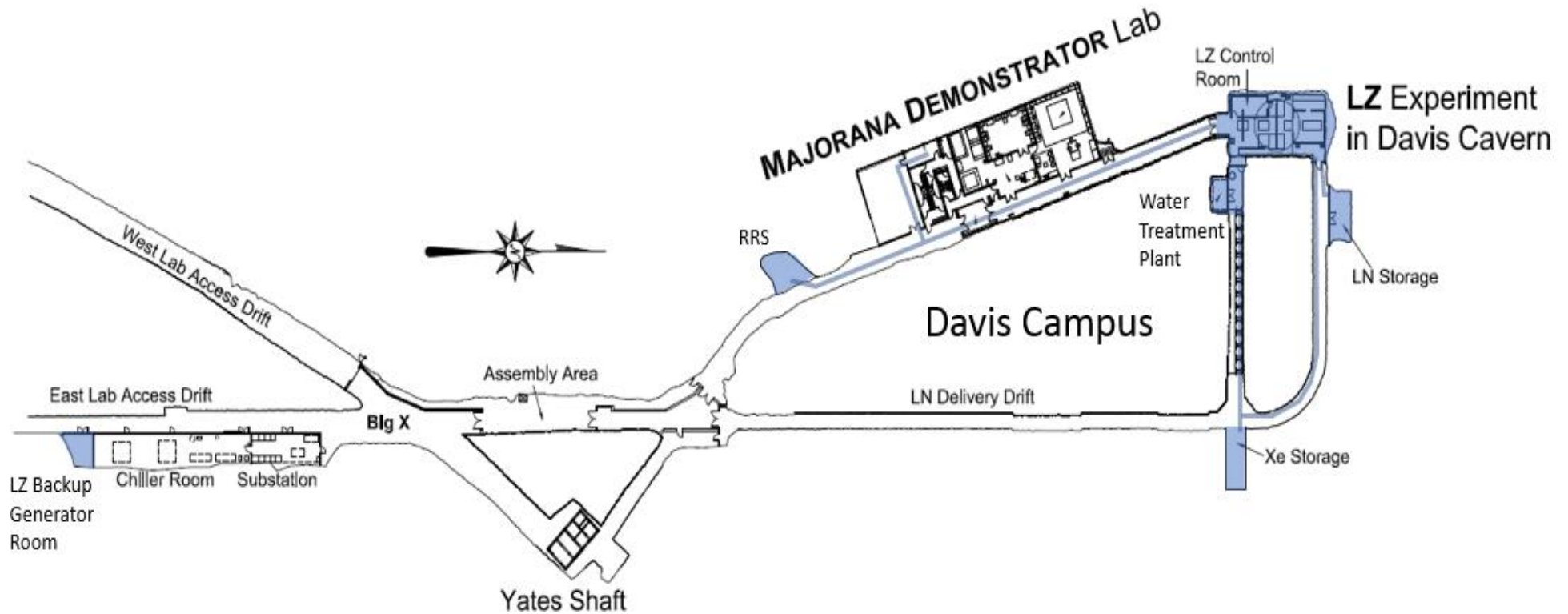
LZ Site Plan



SURF Science Locations



Location of Work – 4850 Campus



Scope of Work

Modifications to the Davis Campus infrastructure to support installation and operation of the LZ detector.

- **Demolition of some existing infrastructure**

- ☐ Ducts,
- ☐ Cleanroom,
- ☐ Overhead monorail
- ☐ As needed to proceed with construction

- **Electrical Systems**

- ☐ Equipment,
- ☐ Cables,
- ☐ Cable trays,
- ☐ Conduits,
- ☐ Lighting,
- ☐ Receptacles,
- ☐ Transformers, and
- ☐ Associated equipment
- ☐ Stand-by Generator as an option

- **HVAC Systems**

- ☐ Fans,
- ☐ Ducting and
- ☐ Ducting modifications,
- ☐ Insulation and
- ☐ Associated chilled water piping

- **Plumbing and Fire Suppression Systems**

- ☐ all Water Supply and Drainage systems,
- ☐ Piping,
- ☐ Valves,
- ☐ Sprinklers,
- ☐ Compressed Air Lines, and
- ☐ Associated fittings

- **Communication, Controls and Monitoring Systems**

- ☐ Temperature and HVAC Controls,
- ☐ Telephone and Data Systems – new network

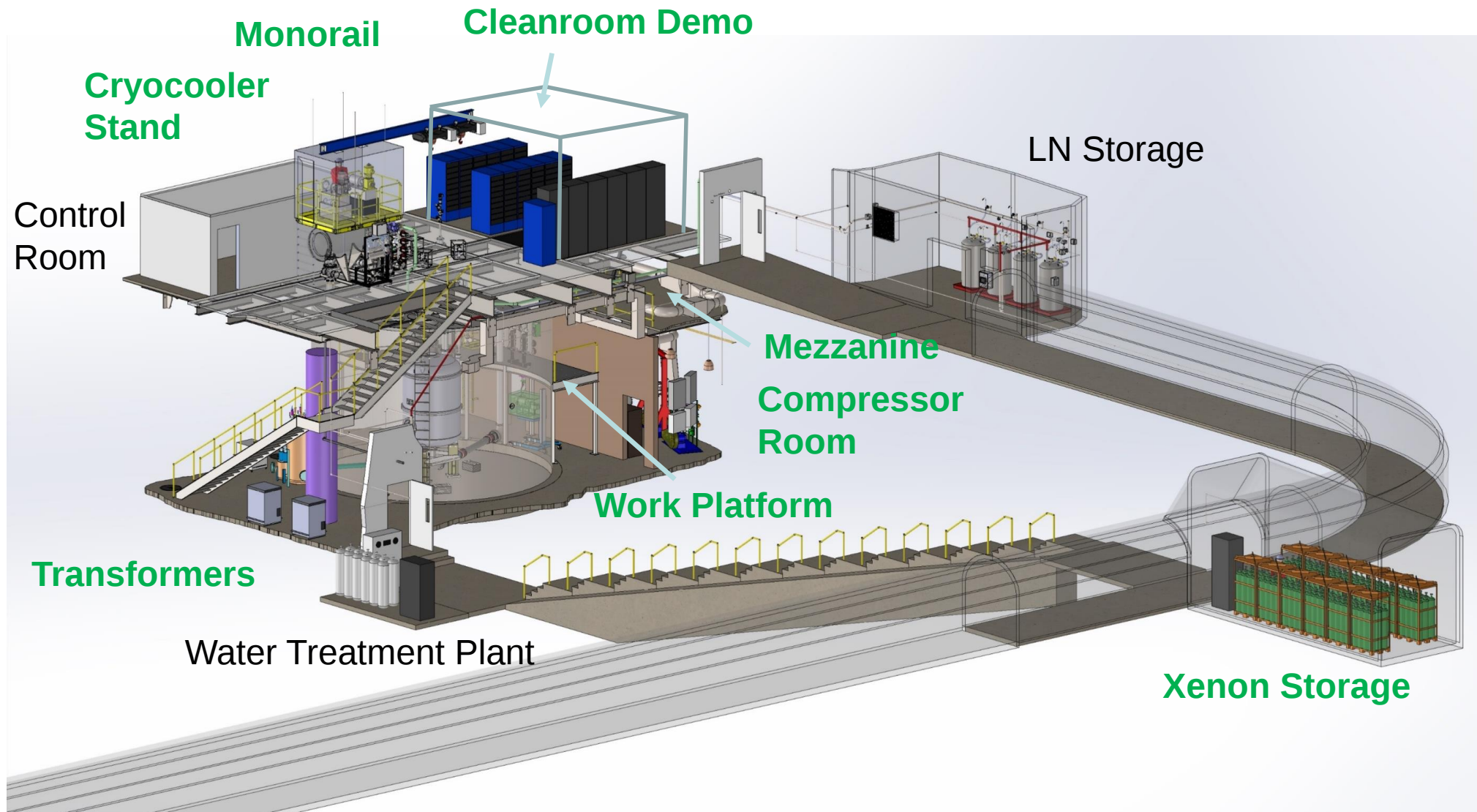
- **Fire Detection and Alarm Systems**

- **Structural and Architectural Systems**

- ☐ MEP supports,
- ☐ Mezzanine,
- ☐ Work Deck,
- ☐ Ladder ways,
- ☐ Fire Separation Walls and Doors,
- ☐ Monorail relocation and installation

- **Systems Integration and Commissioning**

- ☐ General contractor and all sub contractors to coordinate with a third-party commissioner



Areas with significant work
Existing facilities

Construction Documents by LAD

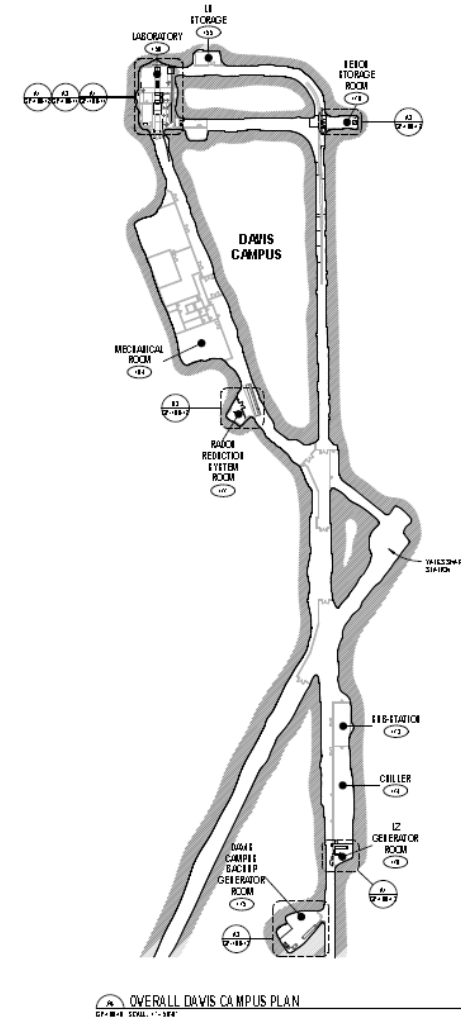
Amendment

100% Construction Set Available

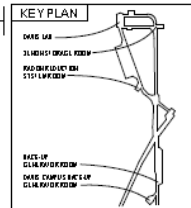
006-LZ Davis Campus-100% Construction Documents20171102.pdf

Note: this supercedes:

SURF_006_LZ_Davis_Campus_Combined.pdf



OVERALL DAVIS CAMPUS PLAN
GP-100-10-100



REVISIONS		
NO.	REVISION	DATE

FILE LOG	
DATE	NO.
10/10/17	100
10/10/17	101
10/10/17	102
10/10/17	103
10/10/17	104

100% RFC#01 REVIEW

Project Description:	DAVIS CAMPUS
Location:	DAVIS CAMPUS
Revision:	100-10-100
Author:	100-10-100
Checker:	100-10-100
Overall Davis Campus Plan	
Sheet No.	006-GP-100-10-C1
Sheet Title	006-GP-100-10-C1

Specifications

- Important additions Include:
 - Scheduling Requirements
 - CQM Plan
 - Asbuilt Drawings
 - Submittal Register
- Uses LAD Project Manual plus SDSTA Division 1 Specifications
 - Technical sections are written/stamped by LAD, SDSTA sections are in UFGS format and take precedence
- Submittals go to SDSTA, reviewed by LAD, approved by SDSTA

Other Coordination

- Shaft schedule determines access
- Weekly meetings and schedule updates
- Permitting – City of Lead
- Active science at Majorana cleanroom – Class 100
- Commissioning – Questions & Solutions Engineering (QSE)

< November 2017 >							
	S	M	T	W	T	F	S
W	29	30	31	1	2	3	4
W	5	6	7	8	9	10	11
W	12	13	14	15	16	17	18
W	19	20	21	22	23	24	25
W	26	27	28	29	30	1	2

Example schedule – orange days and weekends are limited underground access

Schedule

- Estimate 80 days of construction activities
- Target construction dates:
 - Submit bids – 11/22/17
 - VE - December
 - Award Construction Contract – 12/18/17
 - Construction Completion – 4/27/18
 - Immediate start of water tank modifications and science construction

ESH Considerations

- Coordinated with SDSTA ESH group
- Must meet SDSTA ESH Standards
 - Training for site access
 - Designated contractor Safety Representative onsite during construction
 - Project and hazardous task Job Hazard Analysis – requires project manager approval and ESH concurrence
 - Material handling, including hoisting & rigging.
 - Working at heights
 - Fall protection
 - LOTO (electrical, pressurized water, and pressurized air)
 - Pressurized piping
 - Hot work
 - Hazardous waste generation and disposal (paint, adhesives, etc.)
 - Safety systems/Controls
 - Fire safety modifications
 - Coordinated with existing systems that must remain functional.

Key RFP Guidelines

Questions not asked today must be emailed to mbaumann@sanfordlab.org by the posted deadline. Questions and written responses will be published on the project webpage: <https://www.sanfordlab.org/contract/request-proposal-oro-hondo-drive-replacement-motor-rebuild>.

No other communication with SDSTA staff regarding this RFP is allowed prior to the selection process.

Today's presentation will be posted on the project webpage noted above, along with any addenda, updates, notices, changes, etc.

Please note any issues with or exceptions to the draft contract (or any other RFP language) in your proposal.

Submit proposals by email to mbaumann@sanfordlab.org.

Proposals will be evaluated according to the criteria outlined in Section 4. SDSTA may select one contractor, or invite a short list of candidates to respond to prepared questions during a scheduled on-site presentation.

Proposal Timeline

- RFP Posted: October 25, 2017
- Mandatory Site Visit: November 8, 2017
- Questions Posted: November 13, 2017 2:00 p.m. MT
- Questions/Answers Posted: November 18, 2017 2:00 p.m. MT
- Proposal Due Date: November 22, 2017 2:00 p.m. MT

Questions before the site tour?

