



NCAR-Wyoming Supercomputing Center (NWSC) Update

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***CHAP Meeting
14 May 2009***

Recent Highlights

- Architecture and engineering (A&E) award made to H+L Architecture/CDCDG in early March
 - CDCDG, *Electrical Systems Design*
 - Rumsey Engineers, *Mechanical Systems Design*
 - RMH Group, *Production Engineering*
 - Martin/Martin, *Civil and Structural Engineering*
 - Rider Levett Bucknall, *Cost Estimation*
- 30% (schematic) design materials delivered to UCAR on 24 April; formally accepted during week of 27 April
- Competitive procurements run and awards made for design peer review and commissioning
 - *Reliable Resources, 30% and 75% design peer reviews*
 - *E Cube, Inc., Commissioning*



Sustainability Focus

- Power Usage Effectiveness (PUE) of 1.3 or better (annual average) targeted
 - $PUE = Total\ Facility\ Load / Total\ Computing\ Load$
- Utilization of free cooling to the greatest degree possible
- Investigating use of DC or higher voltage AC systems
- Minimization of water use
- Daylighting in spaces wherever possible
- “Recycling” of computer room waste heat to provide some heat to service, office spaces
- LEED certification:
 - *Silver or Gold targeted*
 - *Gold under LEED for New Construction looks achievable; Platinum under new LEED for Data Centers a possibility*
- Power from renewable sources:
 - *Minimum of 10% of power from renewable (wind) sources; working with Cheyenne Light, Fuel & Power to see if 100% renewable power is achievable*
 - *Photovoltaic system to provide power to office spaces*



Site and Building Concepts

- Function drives form
- Harmonize with site and climate
- Clear and efficient
- Exciting, energetic and comfortable work environment
- Protected outdoor spaces
- Blurring of indoor and outdoor spaces



Slide courtesy of H+L Architecture/CDC/CDG

Site Concept Plan



Slide courtesy of H+L Architecture/CDCDG

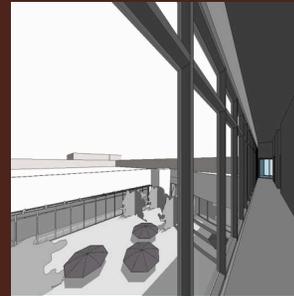
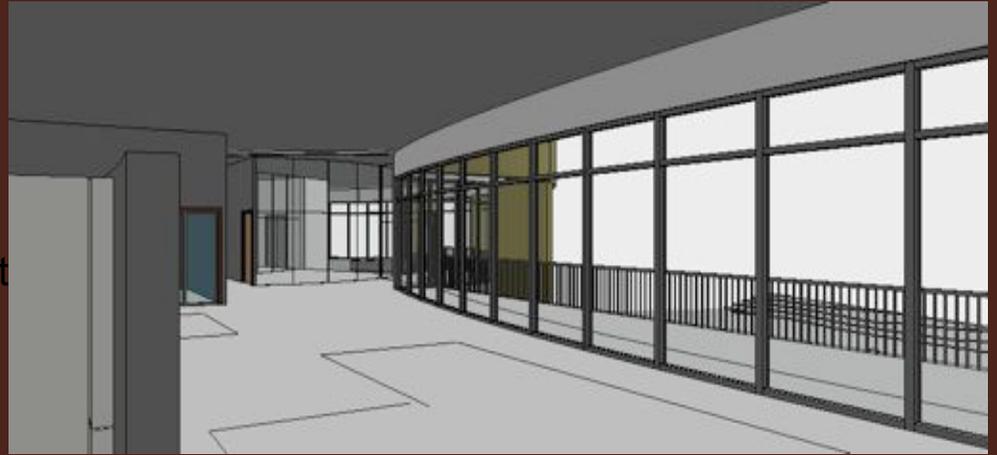
Admin/Visitor Ctr/NOC Concept



Slide courtesy of H+L Architecture/CDCDG

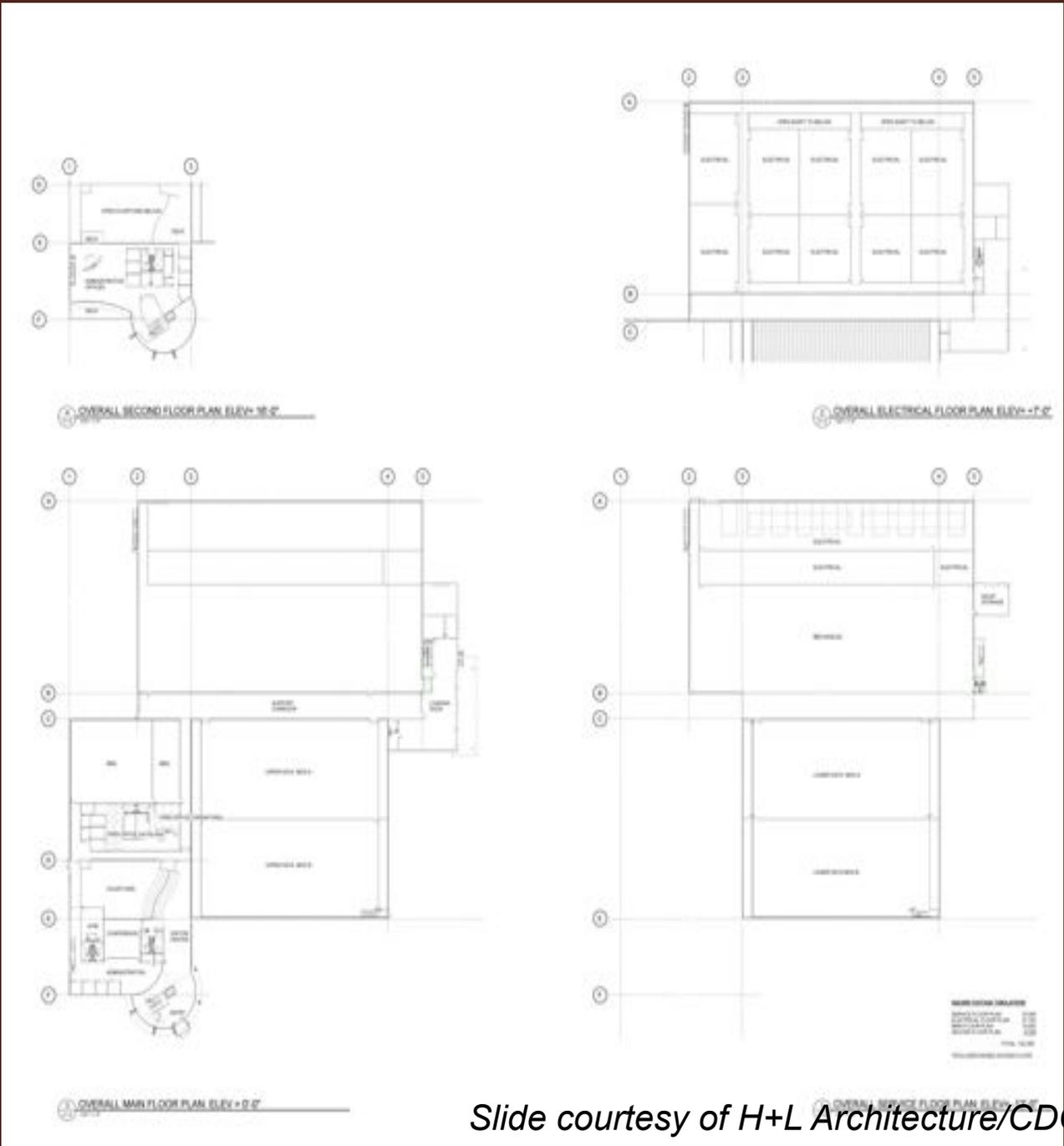
Building Concepts

- Open and airy
- Exciting and comfortable environment
- Maximize views, interior and exterior
- "Sharp shoot" areas for design
- Day lighting



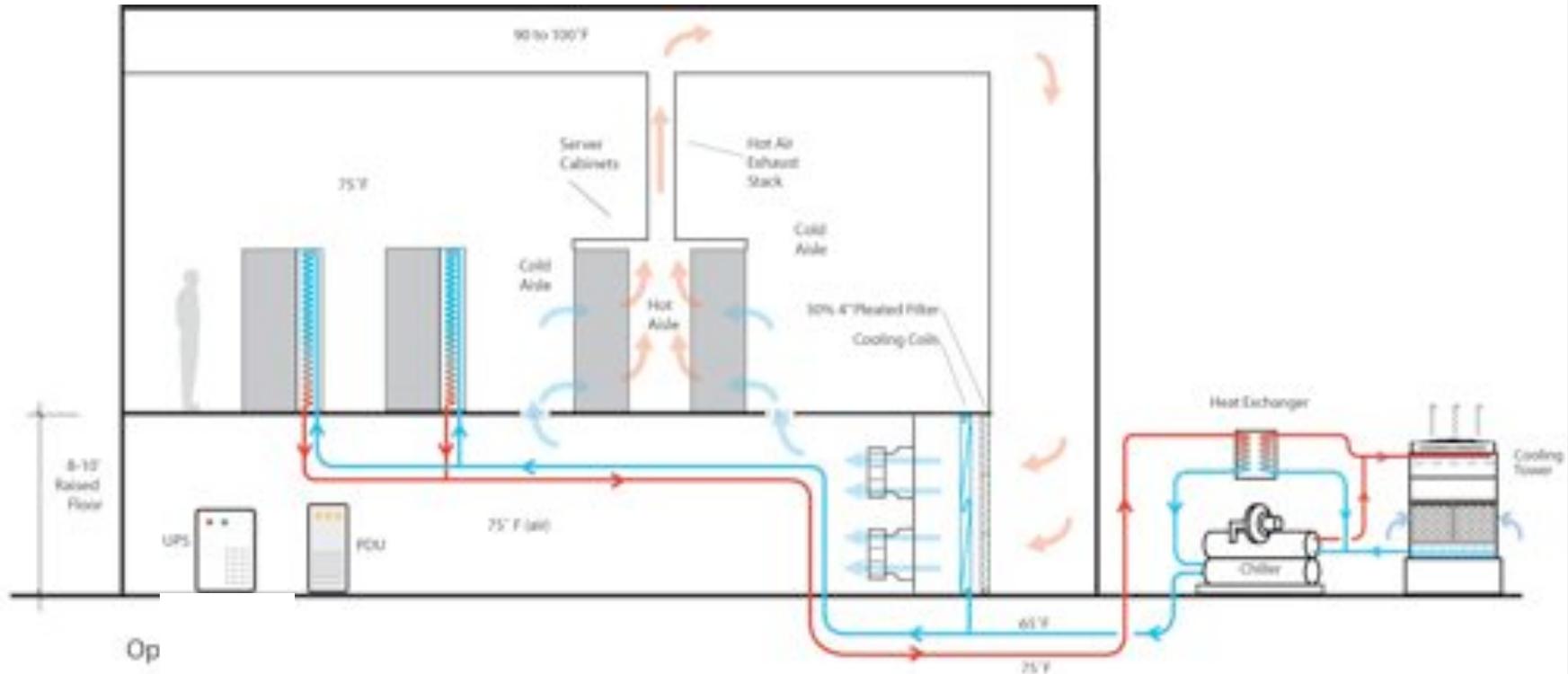
Slide courtesy of H+L Architecture/CDCDG

Overall Plans



Slide courtesy of H+L Architecture/CDG

Option 3: 100% Recirculation Air With Cooling Towers



Estimated PUE – 1.08

Potential for utilization of water treatment pond water to supply cooling tower water...significant reductions in amount of potable water used and annual water cost

Slide courtesy of Rumsey Engineers

Design Refinement

- Focus group discussions of 30% design materials currently being conducted. Sessions have been, or will be, held with:
 - *CISL/Enterprise Services Section (ESS)*
 - *CISL/High-end Services Section (HSS)*
 - *CISL/Network Engineering & Telecommunications (NETS)*
 - *CISL/Visualization & Enabling Technologies (VETS)*
 - *Physical Plant Services (PPS)*
 - *UCAR E&O*
 - *Wyoming partners*
 - *NWSC Oversight Committee (NOC)*
- Review and revision with H+L design team occur during regular charrettes and team meetings
- Next milestone is 65% design document and construction cost estimate delivery in early July





Thank you