



Designing for Liquid Cooling

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SC14

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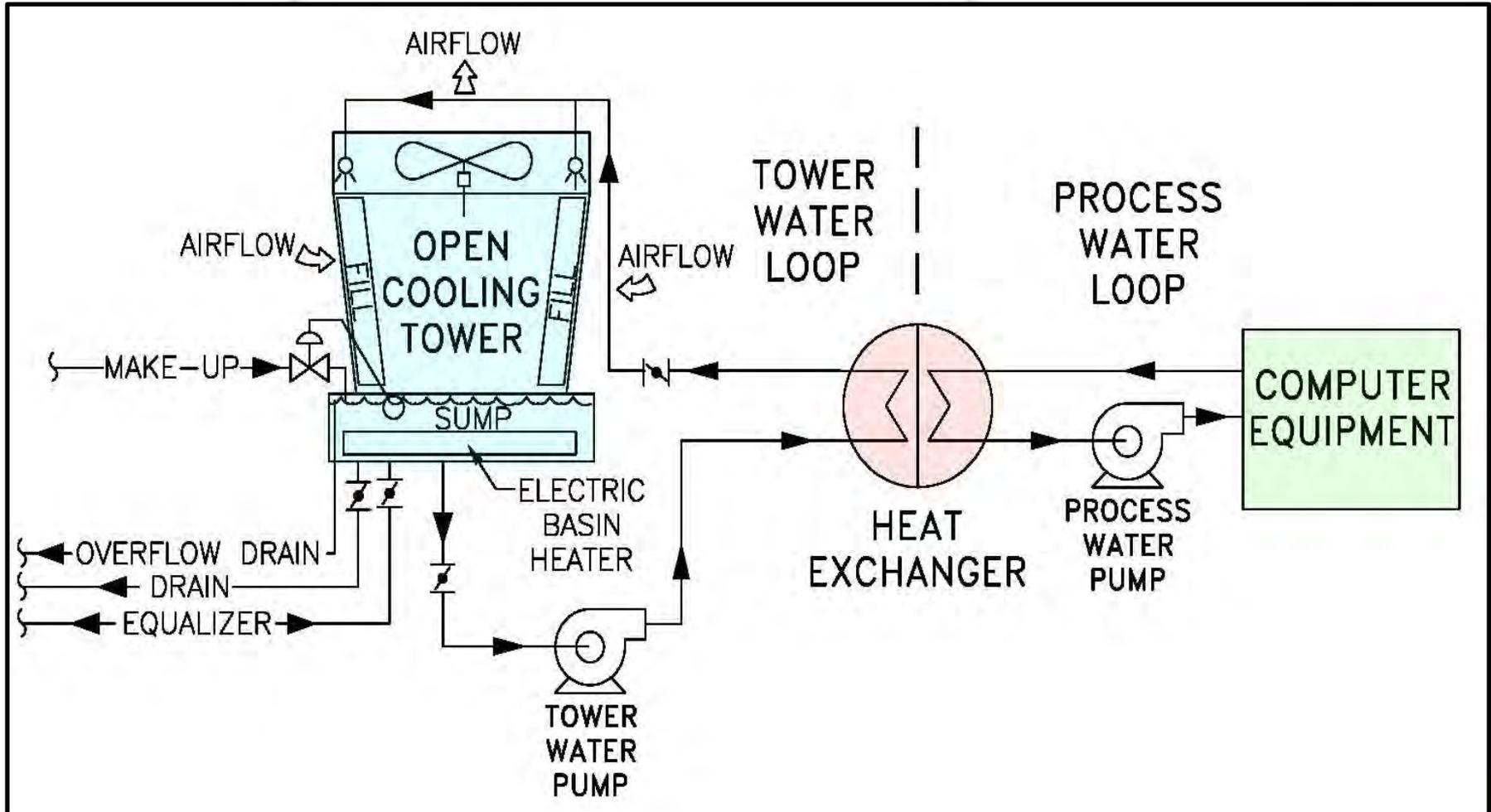
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Long lead time required

- Approximate Timeline:
 - 2011: Liquid cooling engineering study
 - 2012: Design begins, targeting class W2
 - 2013: Design approvals, construction begins
 - 2014: Major construction completed
 - 2015: Site prep, platform arrives
- Design, approvals and construction take years!
- LANL verified design targets through multiple sources including participation on EE HPC WG

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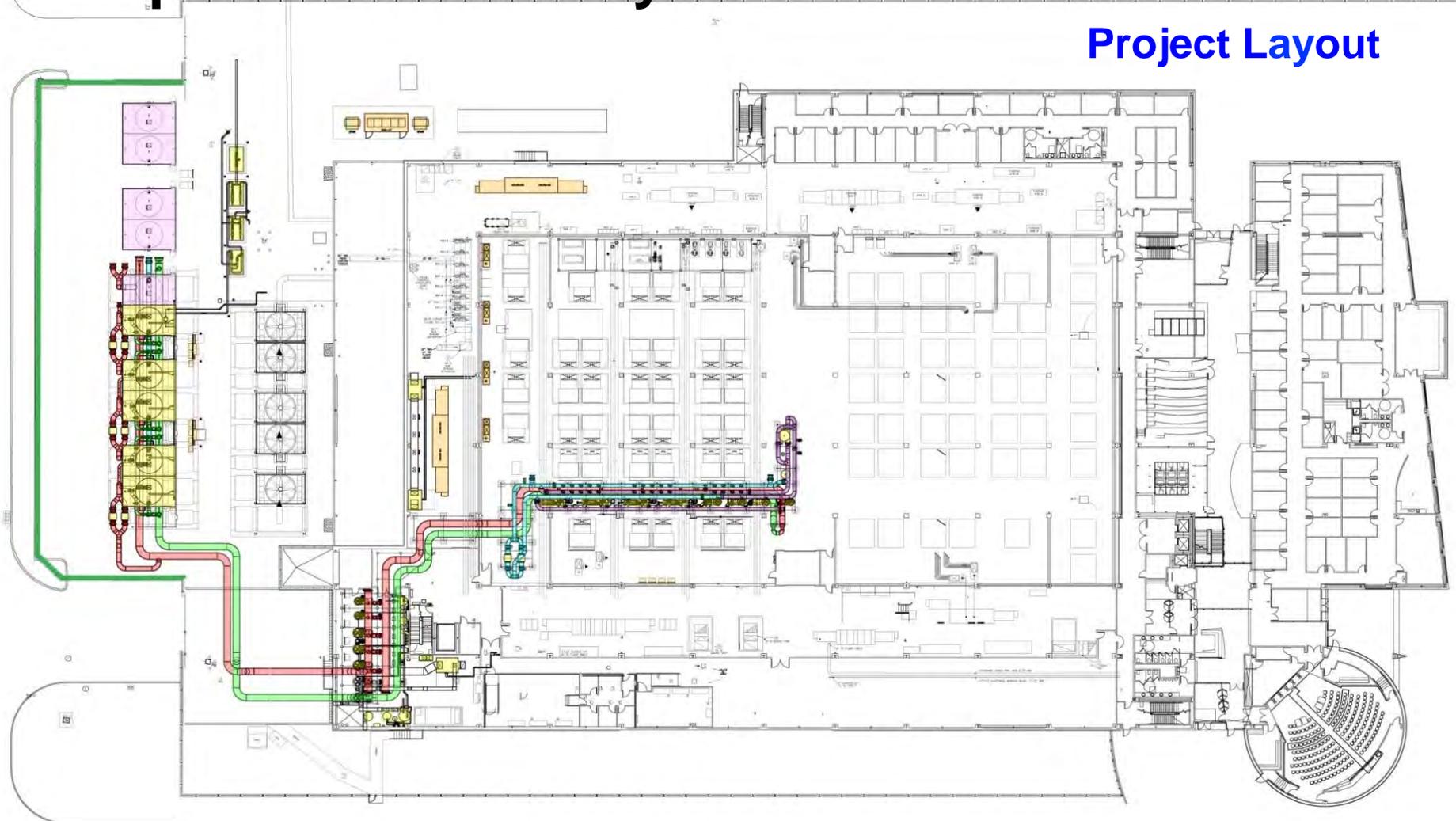
Open-Cell Tower Flow Diagram



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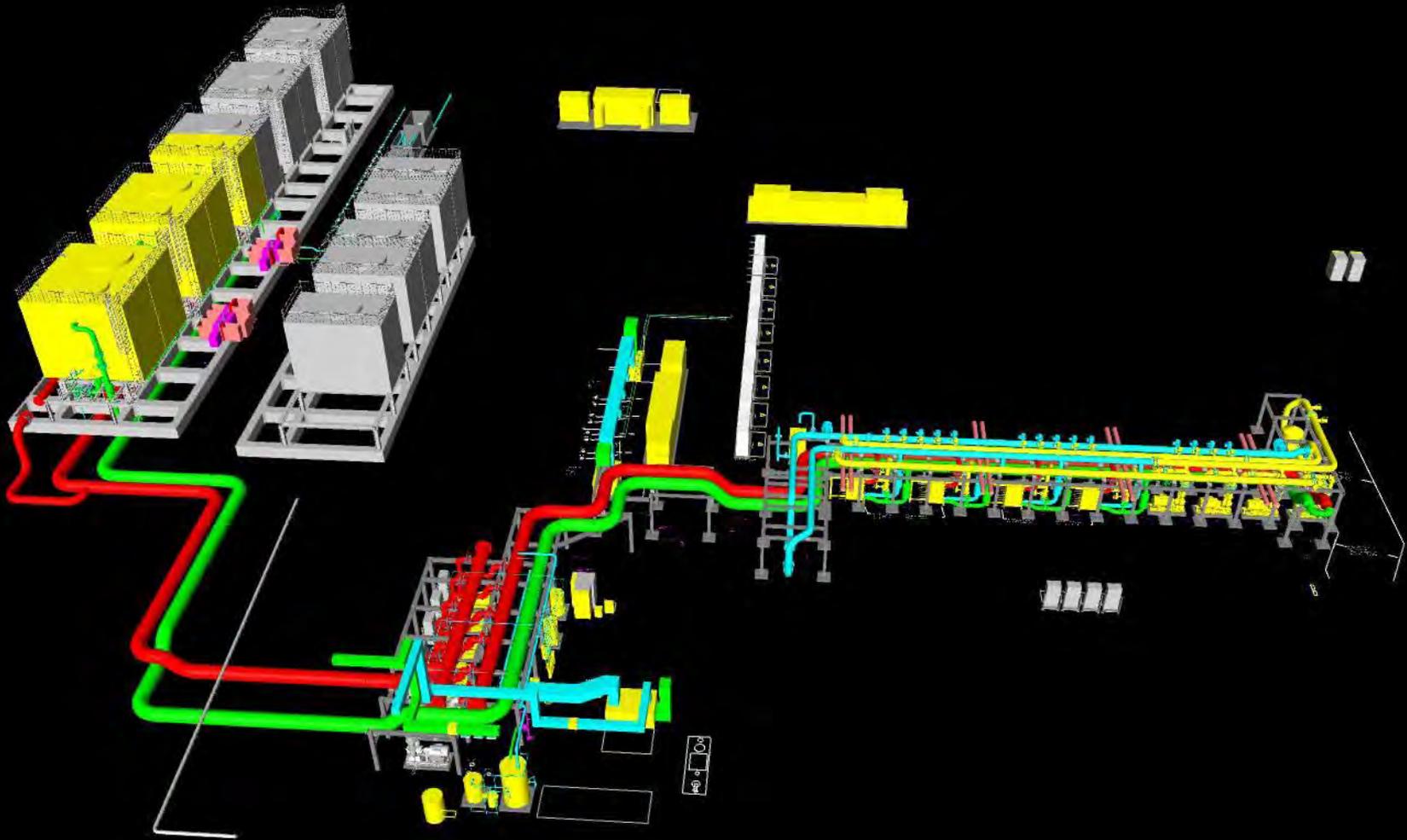
Infrastructure Upgrades Project Preparation for Trinity

Project Layout



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3D View

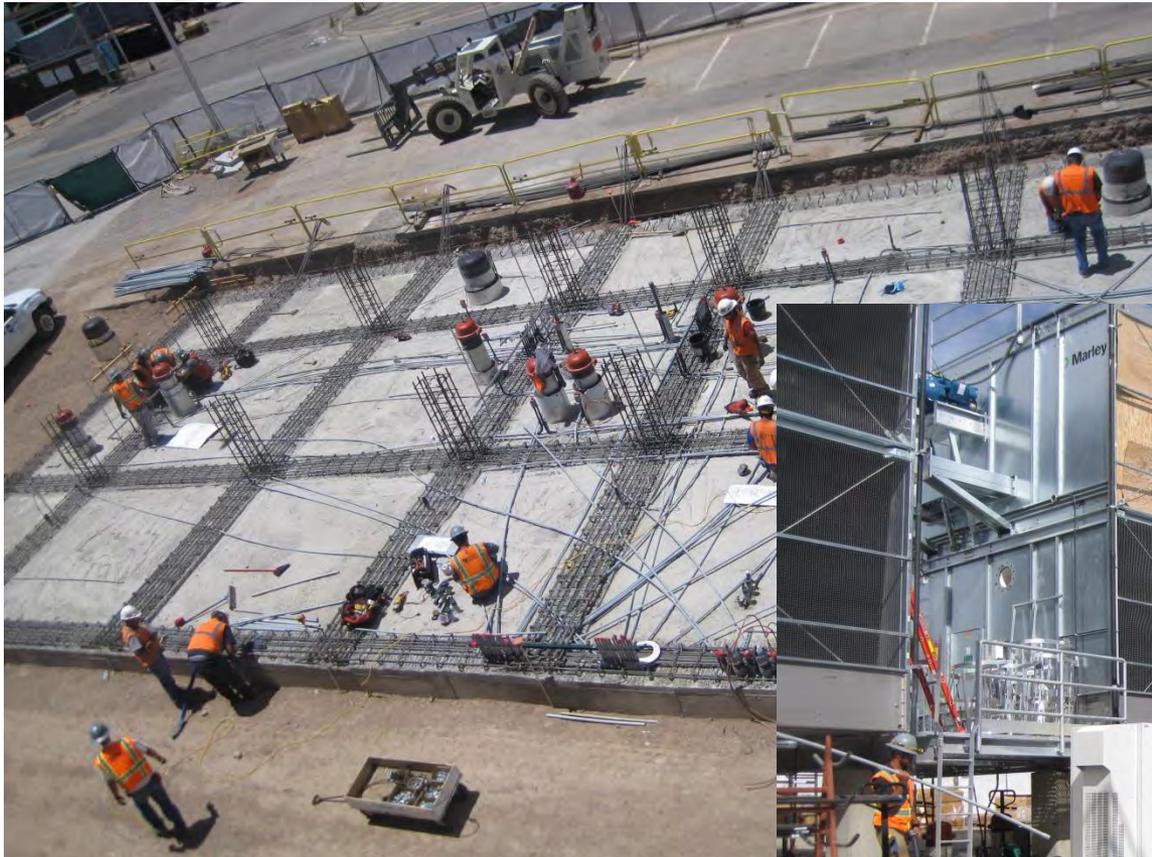


New 36" Cooling Tower Loop



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5 Additional Open-Cell Towers



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Before and After



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Infrastructure Changes

Mechanical

- (x5) 1200ton open-cell cooling towers with 100HP fans
- (x3) 300HP and (x2) 150HP cooling tower pumps
- (x4) 250HP process pumps
- (x4) 3MW heat exchangers
- (x8) 40mesh basket strainers
- Trane controls
- (x3) AHUs for equipment cooling



Infrastructure Changes for Trinity

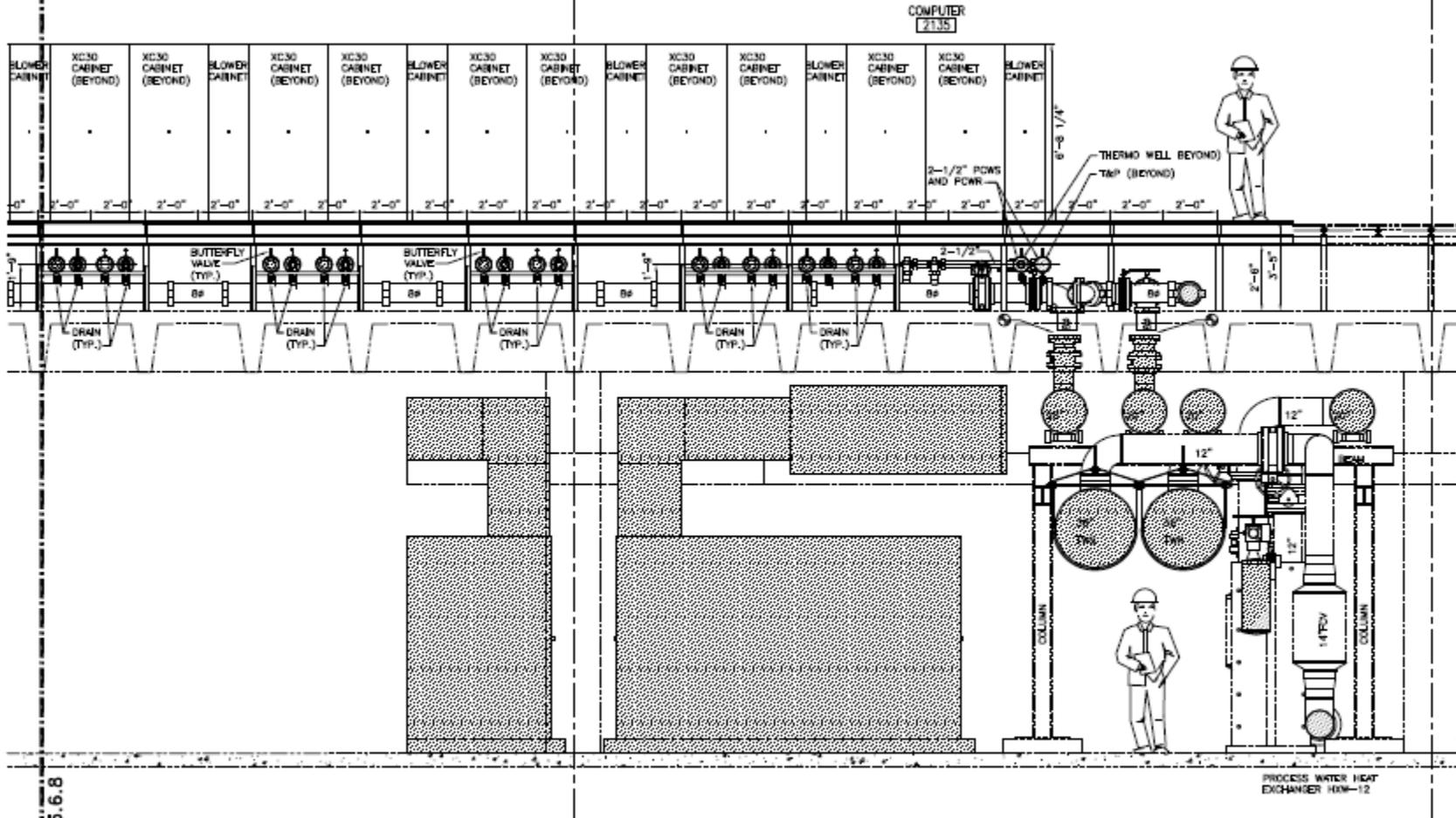
Chemical Treatment



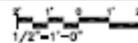
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NOTE: Notional
Trinity Layout

Back of Row-View



SECTION



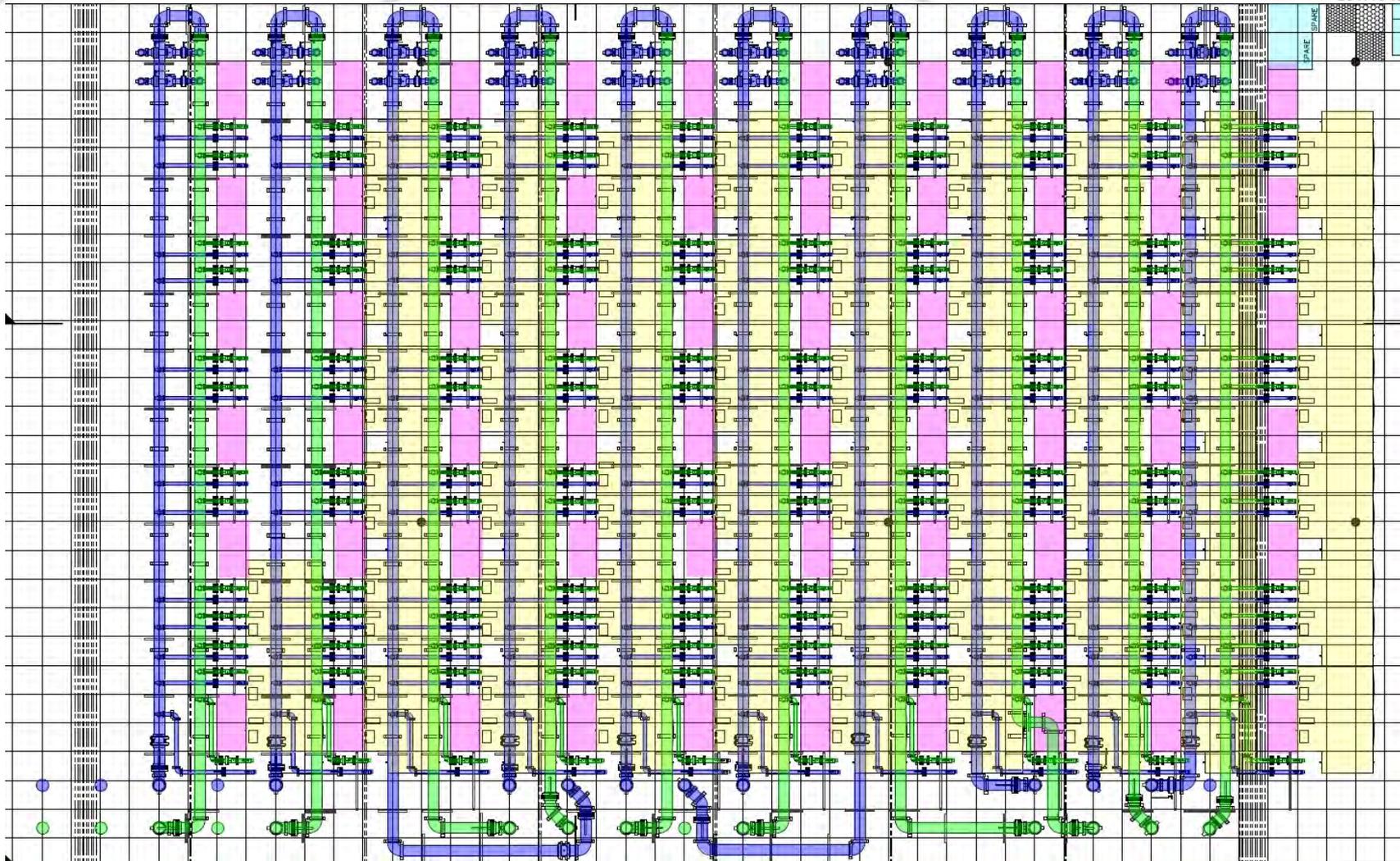
MATCH LINE
SEE SHEET M5.6.8

PROCESS WATER HEAT EXCHANGER HW-12

Underfloor Piping

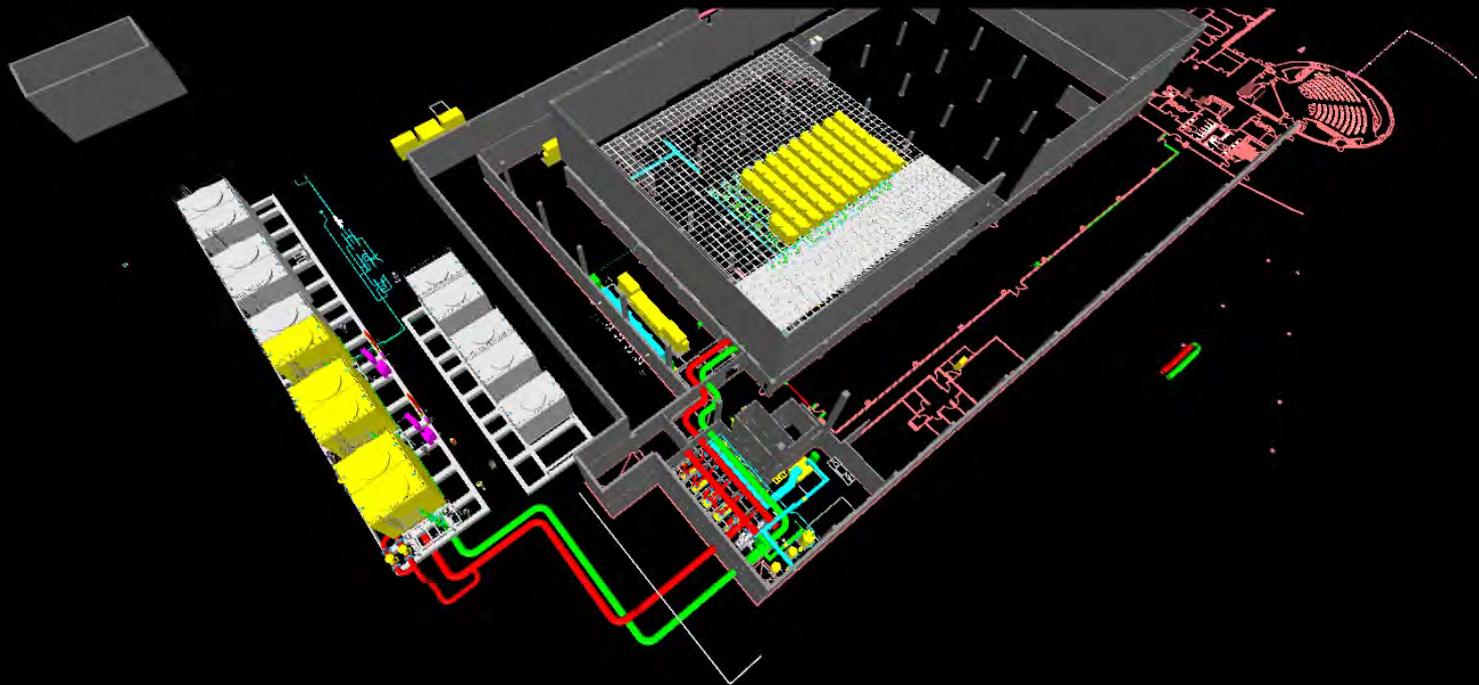
NOTE: Notional
Trinity Layout

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Liquid cooling design movie



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Abstract

Liquid cooling design, approvals, and construction requires long term planning. LANL plans decades ahead, and initiated the process over 4 years prior to the arrival of our next liquid cooled platform. Major construction is completed at the facility side, and platform-specific site preparation is under way. Liquid cooling enables deployment of energy efficient advanced technology systems and promises to improve the overall energy and water use efficiency by about 25%.

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