



# IDEA2021

Powering the Future: District Energy/CHP/Microgrids  
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# Austin Energy – Austin Community College Highland Chiller Plant Project

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Challenging today.  
Reinventing tomorrow.



Customer Driven.  
Community Focused.<sup>SM</sup>



# Agenda

- Chiller Plant Evolution
- Design Challenges and Solutions
- Construction Challenges and Solutions
- Plant Technical Data
- Utility and College Benefits
- Lessons Learned
- Q&A

# Chiller Plant Evolution

- Purpose
  - Campus redevelopment
- Partnership
  - AE– ACC collaborative effort
- Challenges
  - Space
  - Schedule

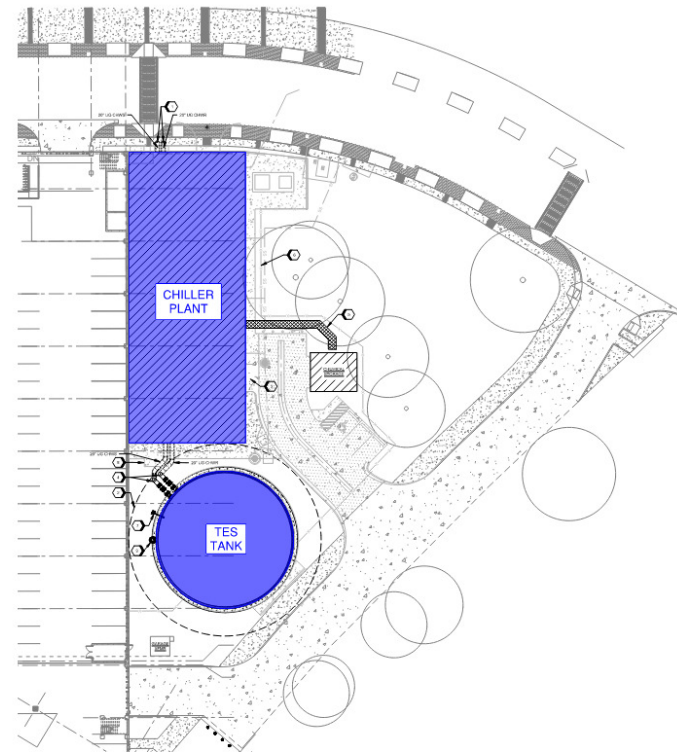


**Long Range Build-Out Site Plan**



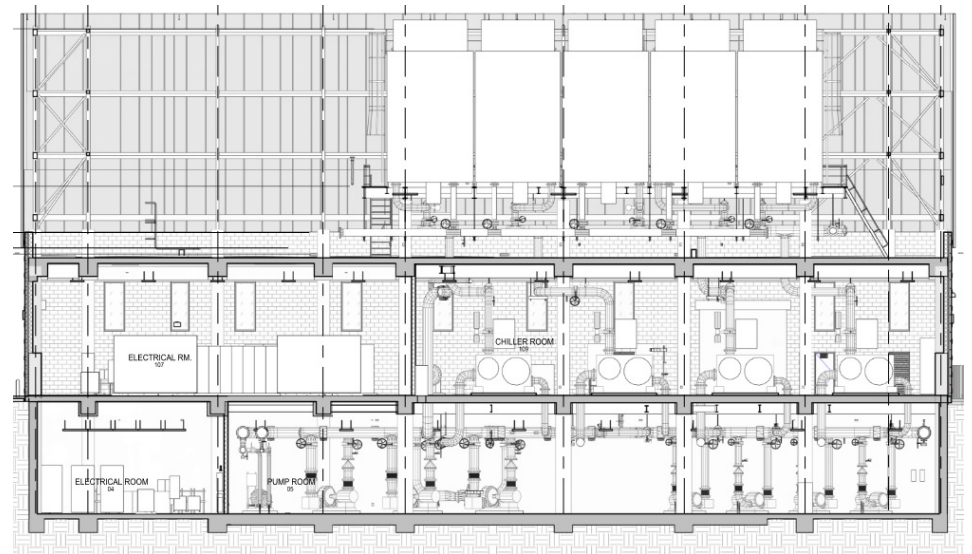
# Design Challenges

- Space allocation
- Proximity to garage
- Capacity increase
- Remote operation
- Aesthetics
- Water table



# Design Solutions

- Space allocation
  - Basement
- Proximity to garage
  - Shared design
- Capacity increase
  - 4160V switchgear



# Design Solutions

- Aesthetics
  - Screen wall
- Water table
  - French drains
- Remote operation
  - N+1, dual power and fiber



# Construction Challenges

- Schedule
- Garage location
- Waterproofing
- Unexpected





# Construction Solutions

- Schedule
  - Different shell and MEP GC
  - Schedule for 7
- Garage location
  - Parallel construction
  - Same garage and plant GC



# Construction Solutions

- Waterproofing
  - Xypex at basement
  - Moisture resistant insulation
- Unexpected
  - COVID
  - Texas Winter Storm



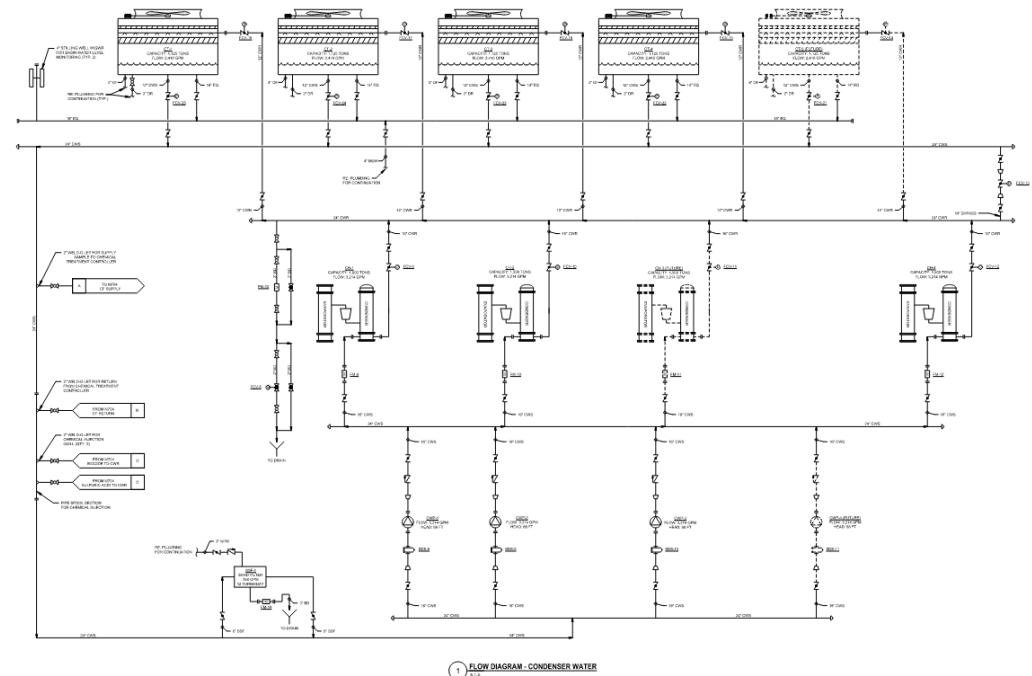
# Technical Data

- Cooling capacity
  - 6,000 tons installed
  - 4,500 tons firm capacity
- Thermal Energy Storage
  - 1.8 MG
  - 18,000 ton-hrs
  - 4.5 MW load shifting
- N+1
  - Chillers
  - Cooling Towers
  - Pumps



# Technical Data

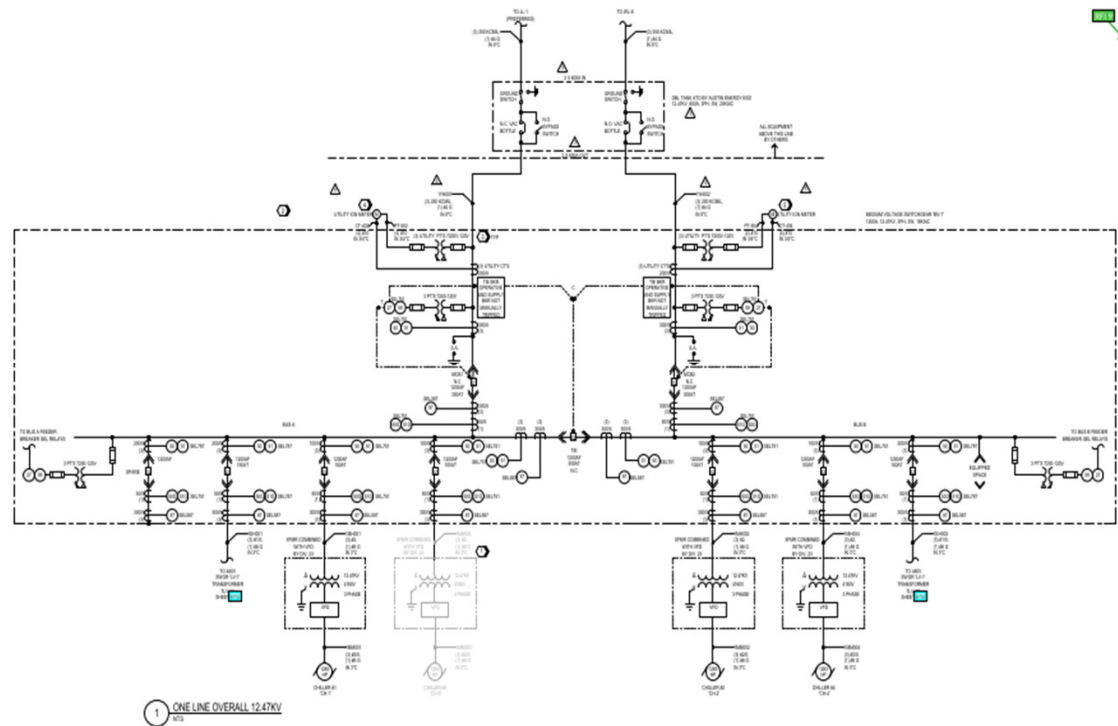
- Makeup water
  - Well water and city water
    - RO system (60 GPM)
- System Delta T
  - Chilled Water: 16°F
  - Condenser Water: 14°F
- Piping
  - All major equipment lineups headered





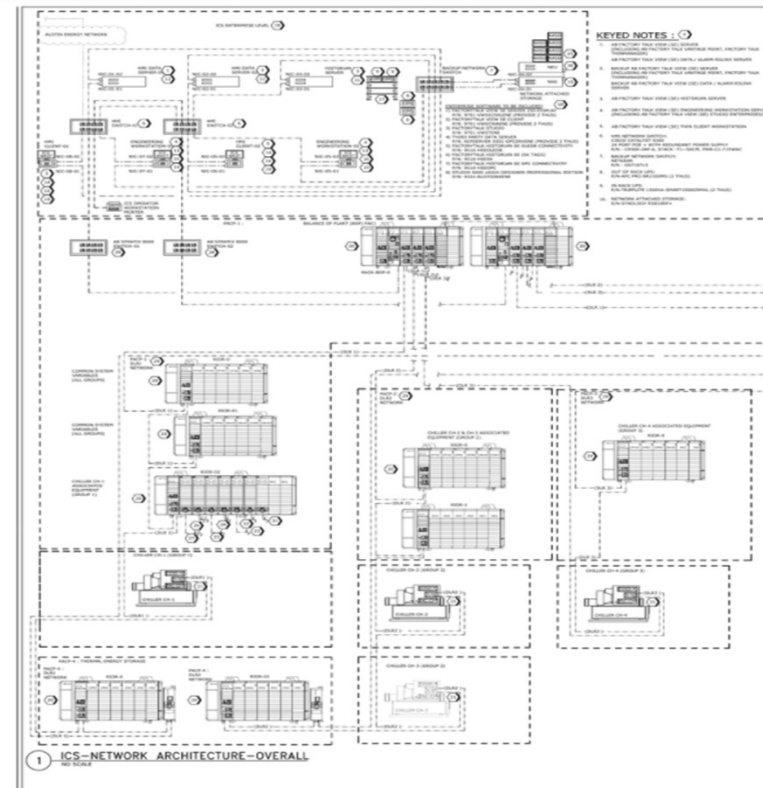
# Technical Data

- Dual-fed utility power
  - Automatic rollover
- Dual 125VDC batteries
- N+1 redundancy
  - MV distribution
  - Unit substations
  - LV switchgear
  - LV switchboard



# Technical Data

- Dual fiber
- Redundant process instrumentation
  - Flow meters for billing
  - TES tank temp and level
- Three ring ethernet/IP topo



# Benefits to Austin Energy

- Electric demand management
- Economic development
- New revenue
- Best practices
- Cost avoidance
  - ERCOT market savings
  - ERCOT regulatory savings



# Benefits to the College

- Reduce capital cost
- Deferred maintenance
- Simplicity – low risk
- N+1 reliability
- Lower life cycle costs
  - Well water





# Lessons Learned

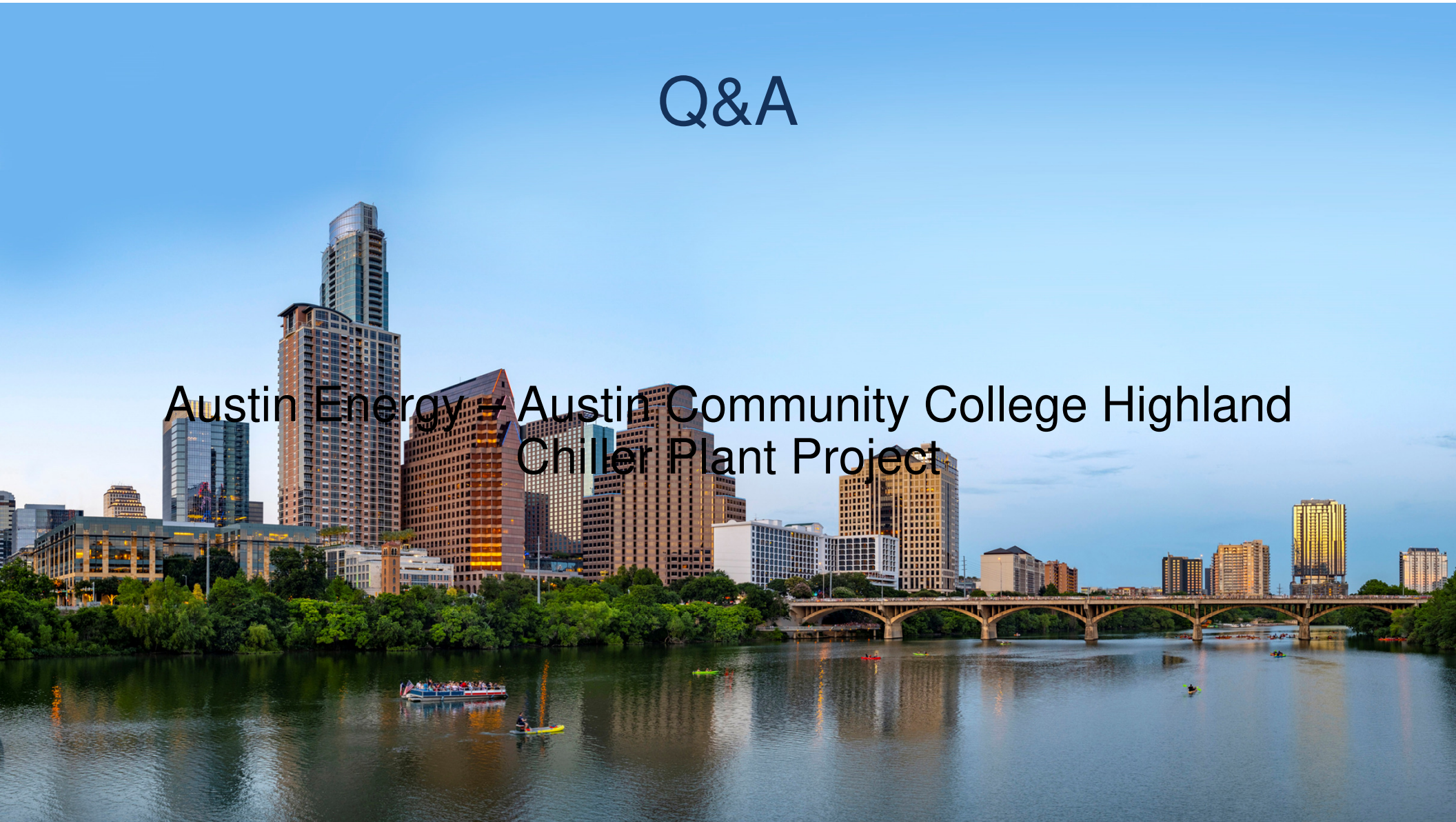
- BIM mandate
  - Engineer & Contractor
- Temporary power
  - Supplied by MEP Contractor
- Temporary cooling in Elec Room
  - Startup during summer months
- Geotech
  - Pier depth

# Lessons Learned

- Penetrations
  - Piping
  - Electrical & Controls
- Resiliency
  - Winter freeze
  - Texas Power Outage

# Q&A

## Austin Energy - Austin Community College Highland Chiller Plant Project



# Thank You!

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