Brookhaven National Laboratory

U.S. DEPARTMENT of ENERGY

Environmental Updates

Community Advisory Council Meeting

Jason Remien
Manager, Environmental Protection Division

September 11, 2025

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Building 197 – Project Status

Completed/Ongoing Actions

- Demobilization and general site cleanup
- Inspections and maintenance of erosion controls
- Maintenance of site barricades and postings
- “As-left” mercury vapor survey using Jerome meter
- Occasional monitoring of the site boundary to confirm no exposure risks
- Establishing a contract with a consulting firm to help prepare a Remedial Status Report and document agreed upon Stabilization Plan

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Building 197 – Project Status

Next Steps

- Further stabilize and characterize the site as agreed upon with regulatory agencies (EPA, NYSDEC, SCDHS) to ensure protection of human health and the environment
  - Perform mercury screening surrounding building footprint
  - Installation of a temporary monitoring well
  - Installation of a permeable geotextile demarcation layer on top of the existing grade within the building footprint
  - Backfill within building footprint with approved clean fill
- Install Land Use Institutional Control (LUIC) signs, update existing LUIC fact sheet, and include building 197 in semi-annual LUIC inspections

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EIC Tunnel Components Cooling Water Design

Charlie Folz

Infrastructure Division Director

Electron-Ion Collider

Community Advisory Council

September 11, 2025

Electron-Ion Collider

A bit about me…

- Born and raised on Long Island
- Graduate of the US Merchant Marine Academy at Kings Point

- Deep Sea commercial shipping experience – USCG Licensed Chief Engineer

Continued….

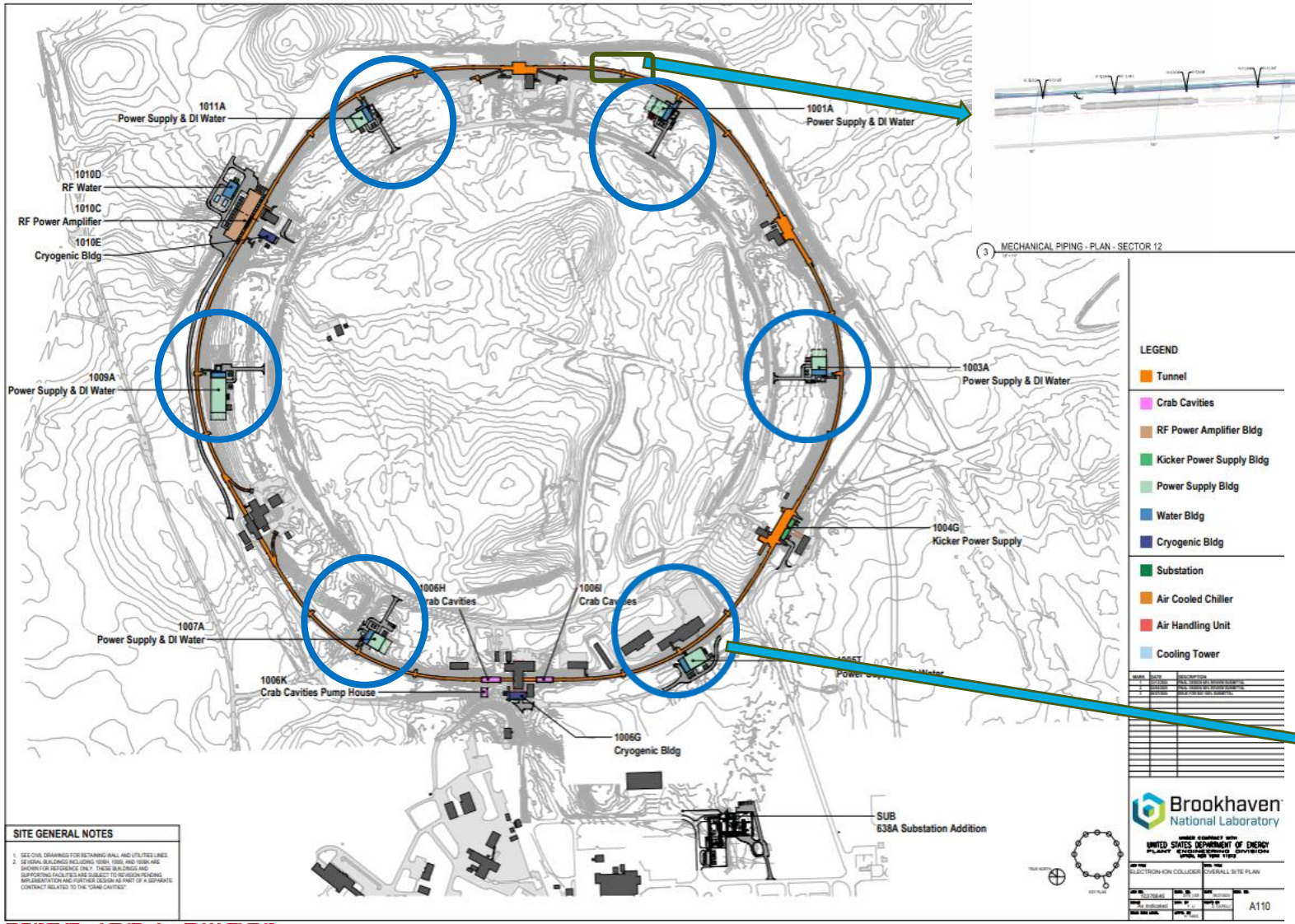
- NYS Licensed Professional Engineer
- Prior to BNL, was in powerplant operations at NYPA's Poletti Project in Astoria, NY

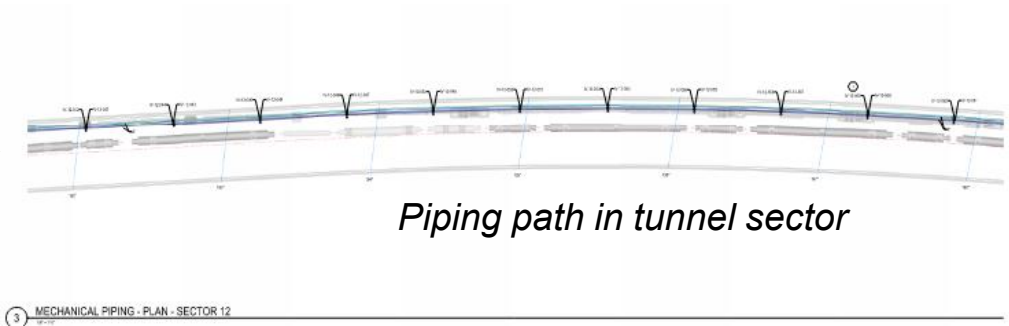
- Came to BNL in 2009 in Collider Accelerator Experimental Support and Facilities
- Worked on evolution of EIC Conceptual Design and now serving as part of the Project Team

EIC Tunnel Components Cooling Systems

- Systems for Magnet and Vacuum Beam Pipe Cooling water are needed to cool components for the Electron Storage Ring
- EIC is expected to produce tritium in cooling water systems at concentrations well below the Drinking Water Standard (DWS) of 20,000 pCi/Liter
  - Production estimate is ≤ 300 pCi/Liter/year
  - These estimates are contained in a published BNL Technical Note that provides calculations and analysis
- Design is incorporating lessons learned from Collider-Accelerator Operations, including:
  - Minimize the number of pipe joints
  - Installing leak detection via makeup fill metering
  - Concrete or steel sleeving of penetration paths into the tunnel to prevent impacts of leaks on the environment
- EIC will sample systems annually and take actions, such as periodic drain and refill, to keep tritium concentrations well below the DWS
- System design bases and operational commitments are being documented in a formal EIC Project document Record of Decision.

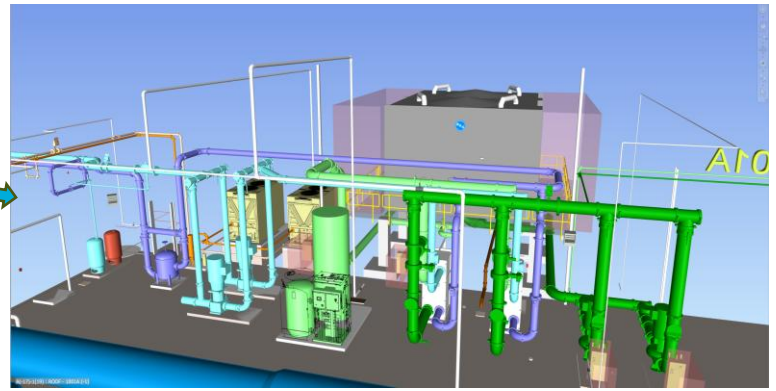
System Overview – Site Plan and Layout





Piping path in tunnel sector

- There are six “closed-loop” de-ionized water cooling systems
- Each one originates at one of six Power Supply/DI Water Buildings pump rooms
- Piping is routed to and from tunnel for accelerator component cooling



Pumproom cutaway

Piping Requirements and Design

- System provides cooling of vacuum beampipe (Electron Storage Ring) and “warm” (not cryogenically cooled superconducting) magnets
- Requires piping route from Power Supply/Water Service Buildings into (supply) and out of (return) the EIC tunnel
- Routing is through a newly installed precast concrete duct bank (most instances) or a corrugated steel pipe = no direct burial
- System is stainless steel piping with (predominantly) roll-groove connections

Roll-grooving*

roll grooving

Roll grooving: a method for mechanical pipe joining

Roll grooving is a pipe connection technology where a groove is cold-formed into the end of a pipe using a roll grooving machine. This creates a recessed area on the outside diameter and an indent on the inside diameter of the pipe. This groove allows for the pipe to be connected using grooved couplings. Roll grooving has become a standard method for pipe end preparation in various piping systems due to its efficiency and reliability.

Here's a breakdown of roll grooving:

The process

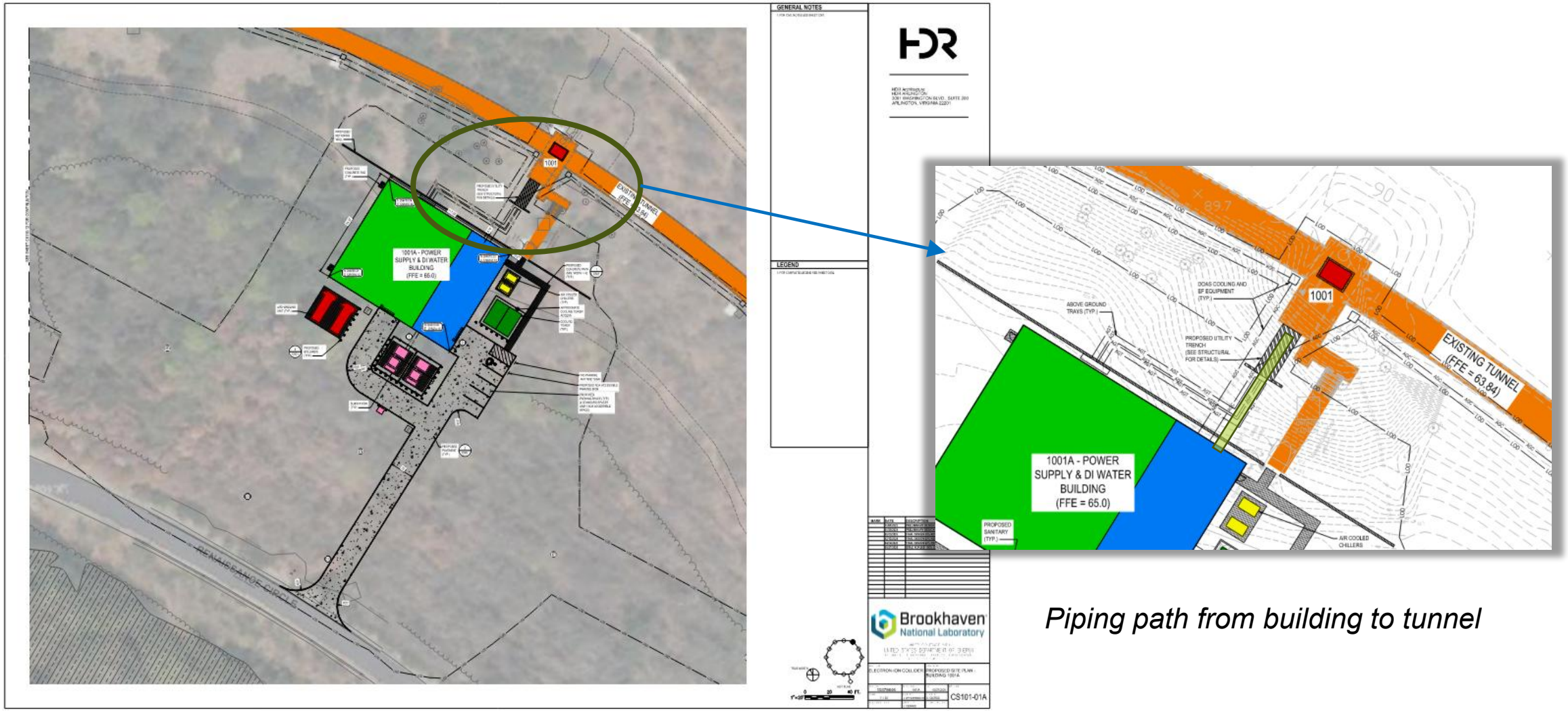
1. The pipe is placed on the drive wheel (lower wheel) of a roll grooving machine.
2. The drive wheel rotates the pipe while the groove wheel (upper wheel) applies pressure to the pipe's outer surface.
3. The pressure causes the pipe material to be displaced inward, forming a smooth, recessed groove.

Advantages

- **Speed and efficiency:** Roll grooving significantly reduces pipe preparation time compared to cut grooving or welding.
- **Safer solution:** Cold-forming eliminates the risks associated with welding or torch cutting, such as fire hazards, toxic fumes, and potential damage to internal linings.
- **Cleaner process:** No cutting oil or metal shavings are produced, reducing cleanup time and waste.
- **Maintains pipe wall integrity:** Since no material is removed, roll grooving can be used on various pipe wall thicknesses without weakening the pipe.
- **Accommodates seismic movement:** Couplings used with roll grooved pipes can accommodate seismic movement, enhancing system reliability in earthquake-prone areas.

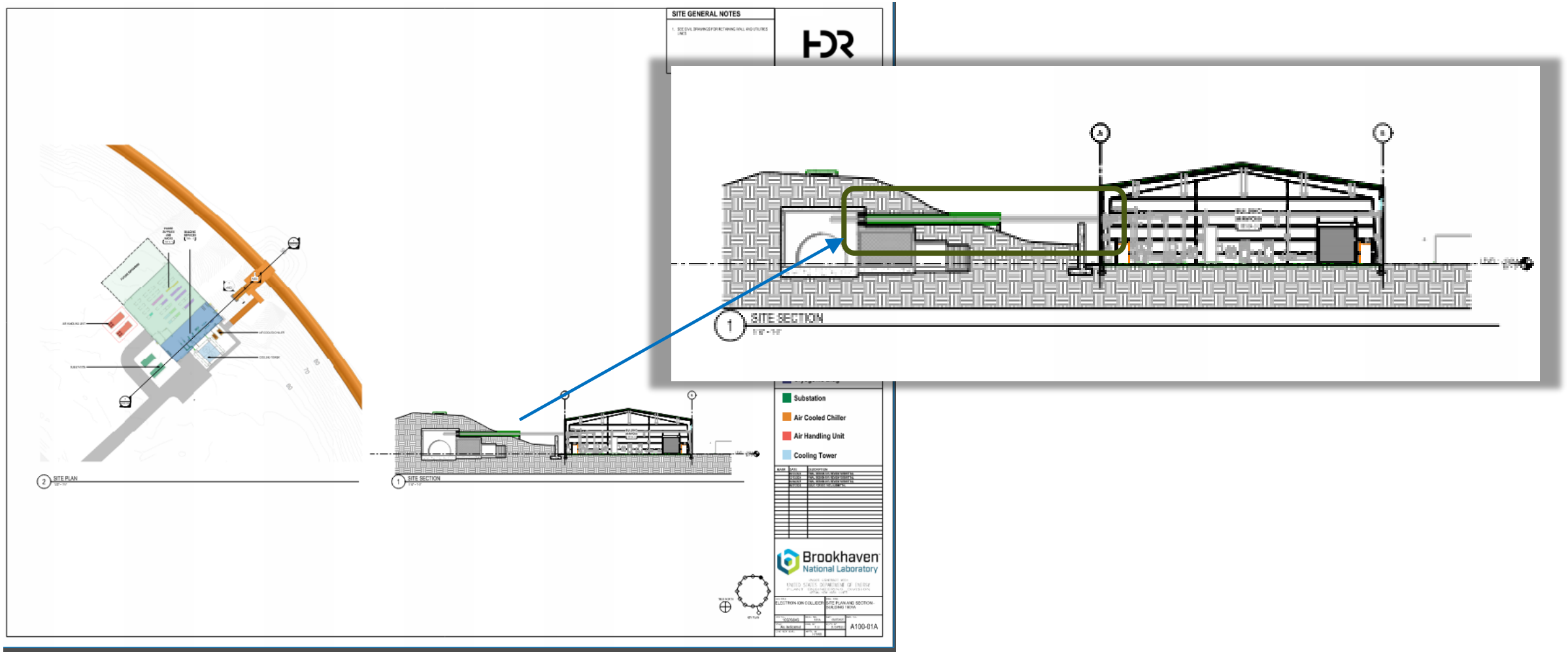
*Google AI Mode

Site Plan Overview – 1001A



Piping path from building to tunnel

Penetration Cross - Section



Summary

- Water piping to and from tunnel will be stainless steel with roll-groove connections. This system has demonstrated reliability along with ease of installation, inspection and repair
- Areas where piping enters and exits tunnel will be enclosed in either a concrete duct bank or corrugated piping sleeve
- The system will allow visual inspection/observation. Sections where piping is required to penetrate the berm to reach the tunnel will not have direct contact with earth/soil

Thank you for providing me the time and opportunity to present and discuss this topic with you this evening!