

**Enclosure 1**  
**Presentation Slides for the June 5, 2024**  
**Kairos Power Meeting to Discuss**  
**Hermes Foundation Design**  
**(Non-Proprietary)**

(Note that the enclosed information is preliminary and pre-decisional and is subject to change during detailed planning and project execution. It is provided for planning and familiarization purposes in support of pre-application discussions with the NRC Staff.)



# Kairos Power


## Hermes Foundation Design

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JUNE 5, 2024



Kairos Power's mission is to enable the world's transition to clean energy, with the ultimate goal of dramatically improving people's quality of life while protecting the environment.

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In order to achieve this mission, we must prioritize our efforts to focus on a clean energy technology that is *affordable* and *safe*.

# Agenda

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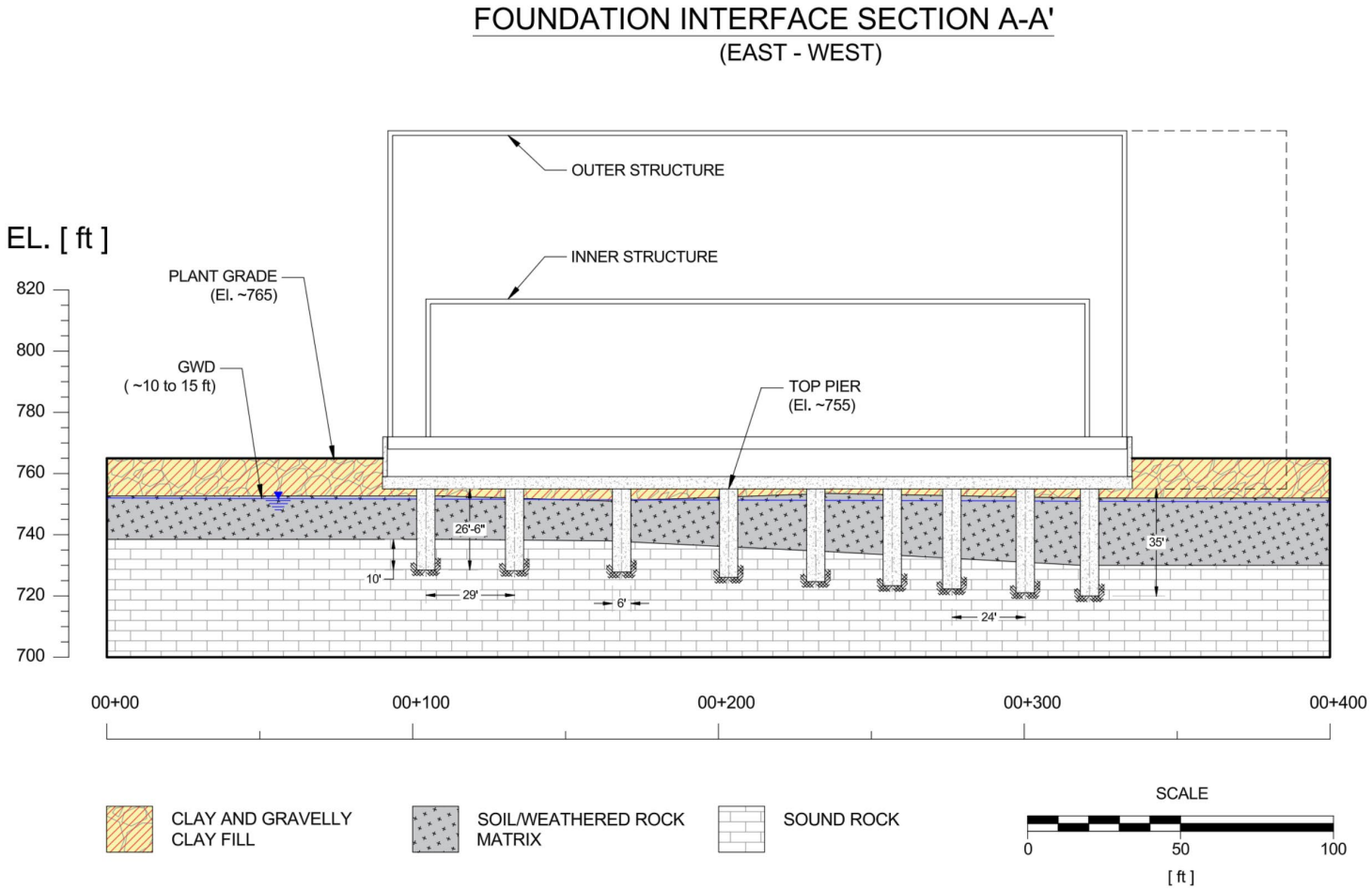
- Foundation concept (focus of this presentation)
- Hermes Foundation Concept
- Foundation Design and Analysis
- Inspection and Testing
- Discussion

# Hermes Foundation Concept

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- The load bearing stratum for the Hermes foundation will be the sound Murfreesboro limestone
- Foundation Concept Described in the Hermes PSAR
  - Open excavation with active dewatering, and use of concrete fill between the top of the sound rock and the bottom of the foundation basemat
  - The implementation of dewatering barriers through the overburden soil and weathered rock was shown to be a time-consuming construction constraint
  - Large amounts of excavated soil and rock
- In-Progress Construction Design – Drilled Piers
  - Still meets the principal design criteria identified in the PSAR
  - Drilled piers (or shafts) socketed into the sound rock and connected to the foundation basemat
  - Proven foundation system commonly used for critical infrastructure
  - Design and analysis to the same standards as the nuclear safety-related portions of the Reactor Building structure

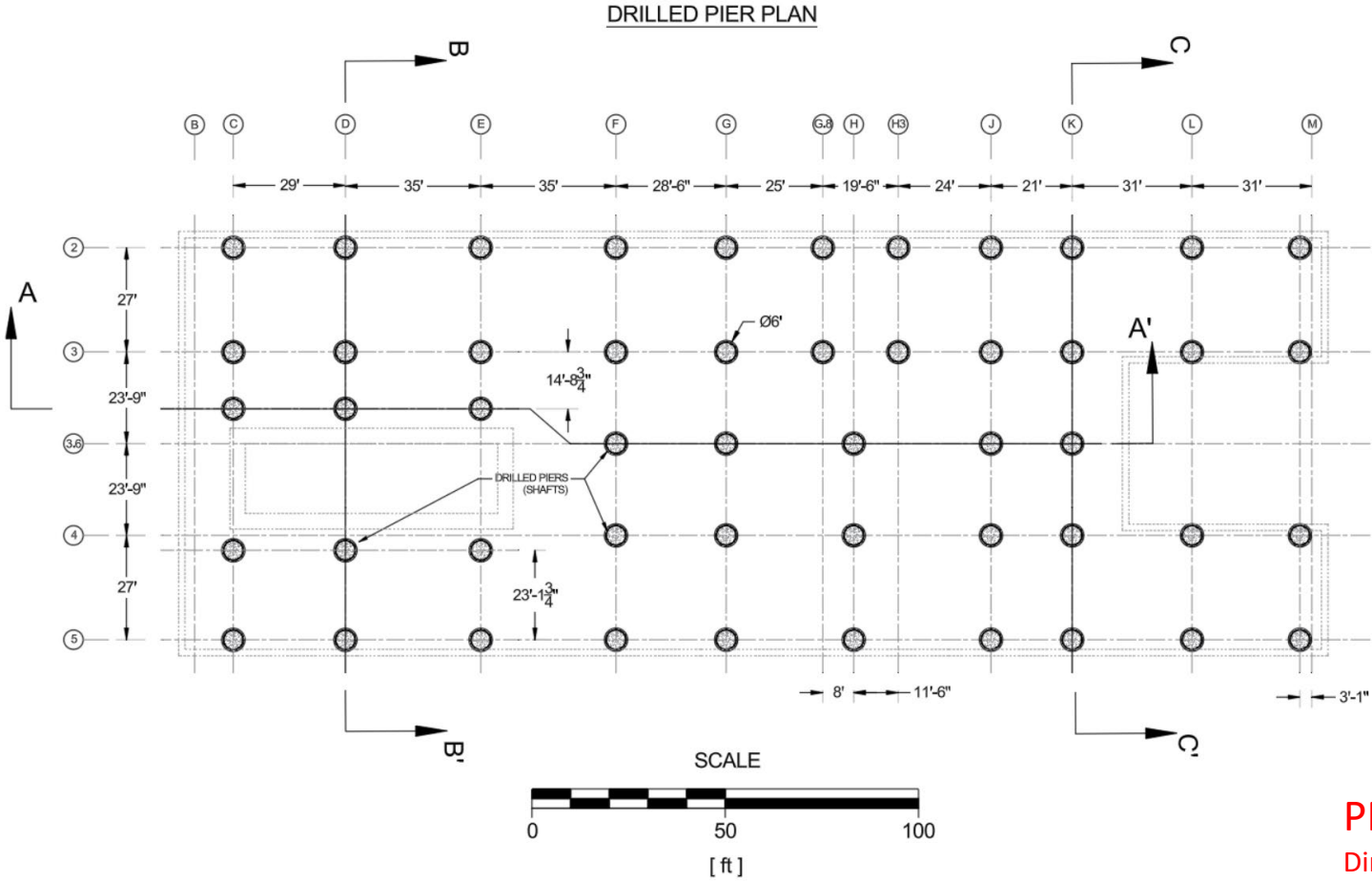
# Hermes Foundation (Conceptual Layout – Section A-A')



**PRELIMINARY**  
Dimensions are not final



# Hermes Foundation (Drilled Pier– Plan View)



# Foundation Design and Analysis

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- Design Philosophy
  - Drilled piers and contacts with rock and foundation considered as safety-related
  - End bearing, socketed into sound rock
  - Side friction along weathered rock or overburden soil is neglected
  - Transfer gravity loads into drilled piers without reliance on near-surface subsurface materials
- Analysis
  - Drilled pier vertical end bearing capacity
  - Dynamic Soil Structure Interaction (SSI) model includes the drilled piers
  - Springs along the height of each pier accounting for near-field lateral interaction effects between pier and subsurface materials
  - Two-step seismic analysis for Reactor Building (RB): SSI of soil-foundation-structure system; then detailed analysis of superstructure



# Inspection and Testing

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- Kairos Power will implement an inspection plan to enforce a geologic mapping condition; the rock sockets of the piers will be inspected to verify the condition of the foundation rock and adjust design parameters such as Rock Quality Designation and Geologic Strength Index to confirm acceptable levels for Factors of Safety
- Comprehensive pre-shaft installation drilling for bedrock mapping and aid to shaft builder for location of sound bedrock and position of rock socket
- Inspection of rock sockets can be performed with a combination of available technologies
  - Shaft Inspection Device (SID) (downhole camera)
  - Shaft Profile Area Evaluator (SHAPE)
- Shaft Integrity will be verified with technologies such as non-destructive Pile Integrity Testing (PIT)



Questions