



CampusEnergy2021

BRIDGE TO THE FUTURE

Feb. 16-18 | CONNECTING VIRTUALLY

WORKSHOPS | Thermal Distribution: March 2 | Microgrid: March 16



District Energy in an Emergency: How District Energy Supported the Rapid Deployment of a COVID Care Facility

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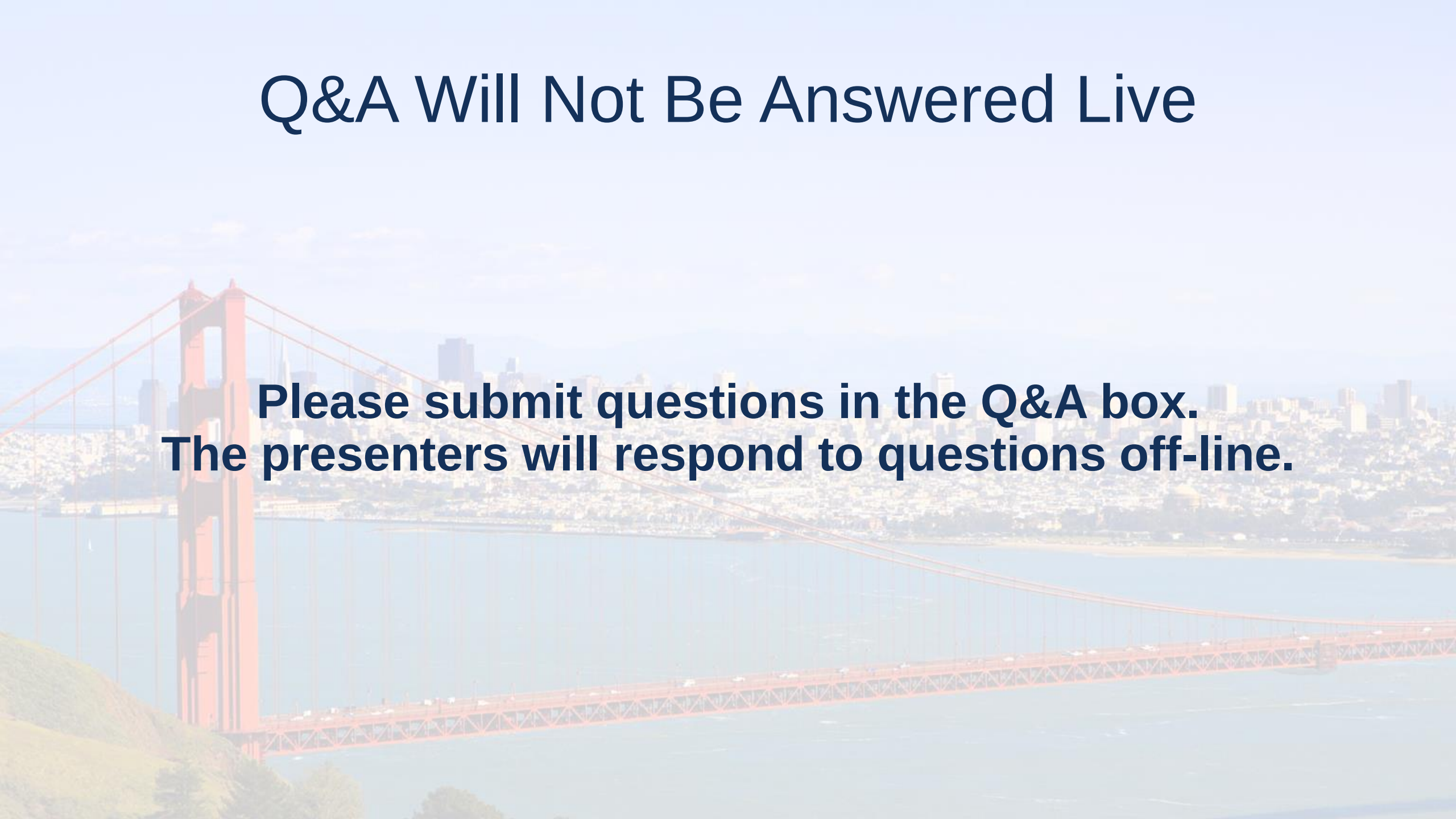


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Q&A Will Not Be Answered Live

**Please submit questions in the Q&A box.
The presenters will respond to questions off-line.**



The Project

- Turn the Colorado Convention Center into a functioning COVID care facility in 26 days
- 2,000 beds each with oxygen
- Handwashing and shower facilities
- Separate patient care and staff support areas



Challenge #1: Need to Make Snap Design Decisions and Daily/Hourly Drawing Updates

- Layout and typical patient room needed to be designed in 2 days
- Design had to use pre-fab blocks that could be provided at scale

ASSUME 34" COUNTER HEIGHT

CHROME BRISTLE FAUCETS

LEVEL & SOAP DISPENSERS BY ?

W/ PALLET JACKS
EACH END

ANKLS
BLACK

3" CHASE

2 SIDED
STEEL FRAME &
PLEXIGLASS
SHIELD

20"

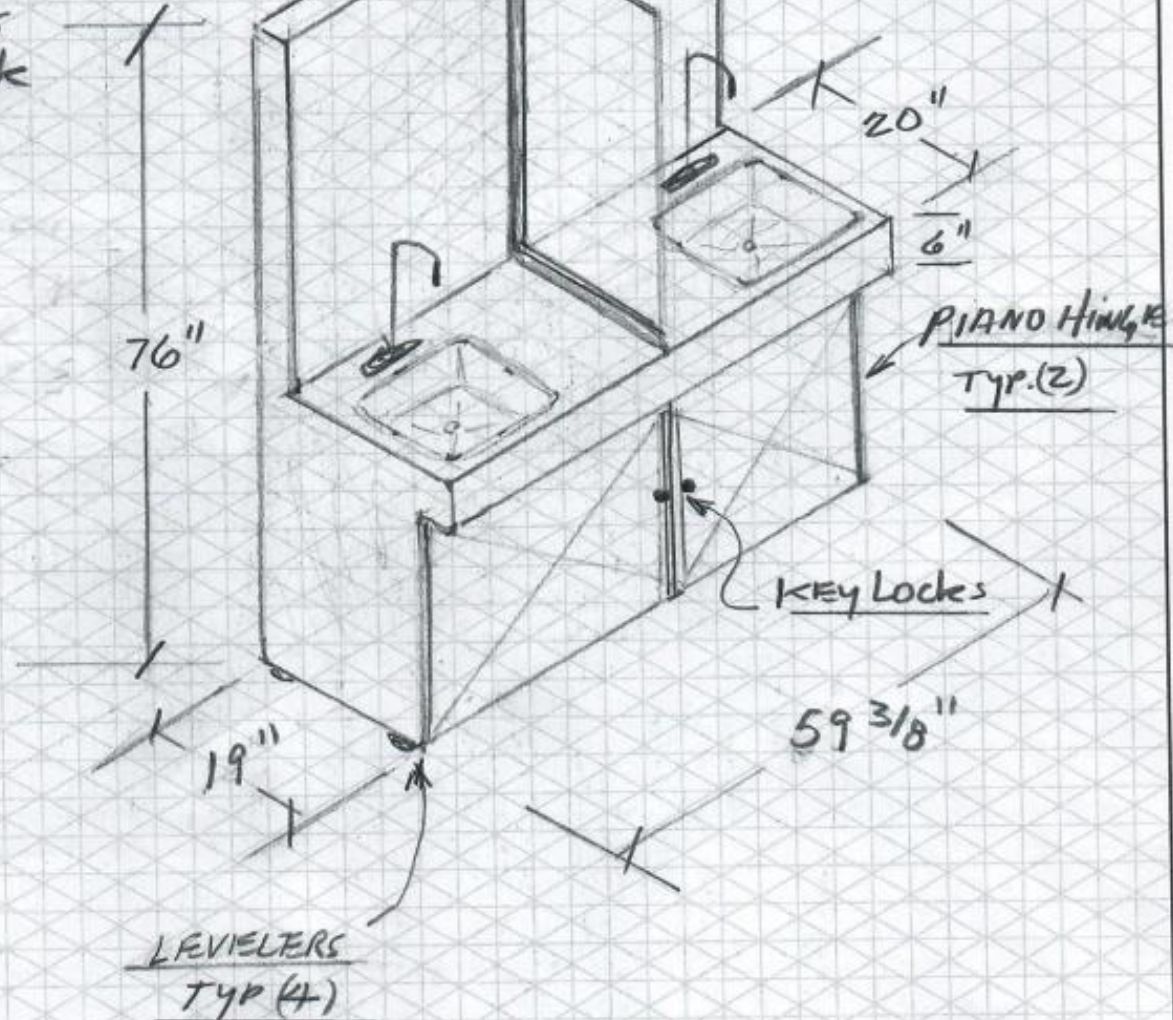
6"

PIANO HINGE
TYP. (2)

KEY LOCKS

59 3/8"

LEVELERS
TYP (4)



Challenge #2: Supply Chain

- No time for custom equipment
- Chartered plane to pick up critical equipment from all over the country



Challenge #3: Lots and Lots of Oxygen

- Typical diversity for medical gas systems would not apply
- 5 lpm per patient plus 100 beds for respiratory distress at 15 lpm



Challenge #4: Electrical Power

- Patient care space needed emergency power
- Lighting – thousands of fixtures
- Fire alarm modifications
- Find 2MW for mechanical systems



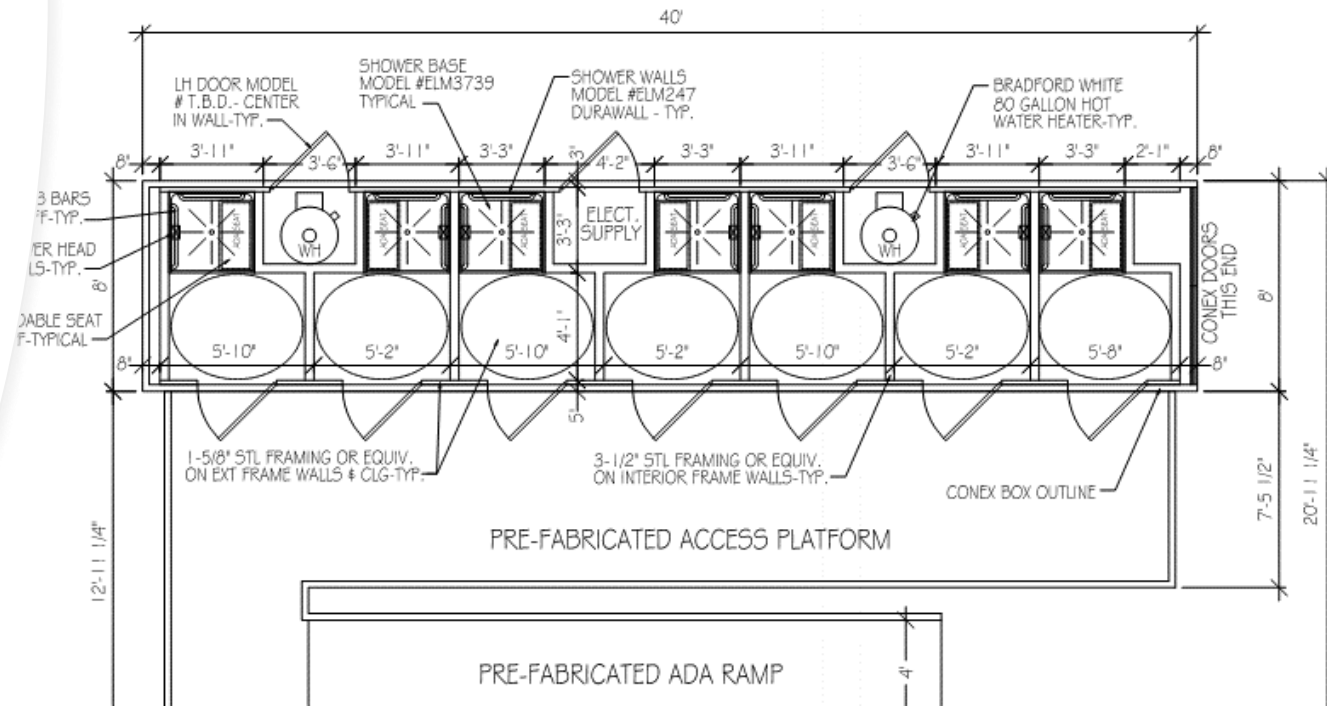
Challenge #5: Meeting Caregiver Needs

- Handwashing in/out of patient care areas and while inside patient areas
- Break space to rest without PPE
- Showers and lockers for end of shift



Challenge #6: Lots and Lots of Hot Water

- 200 hand washing sinks and 82 showers were needed
- Almost 4 MMbtuh peak hot water load with diversity



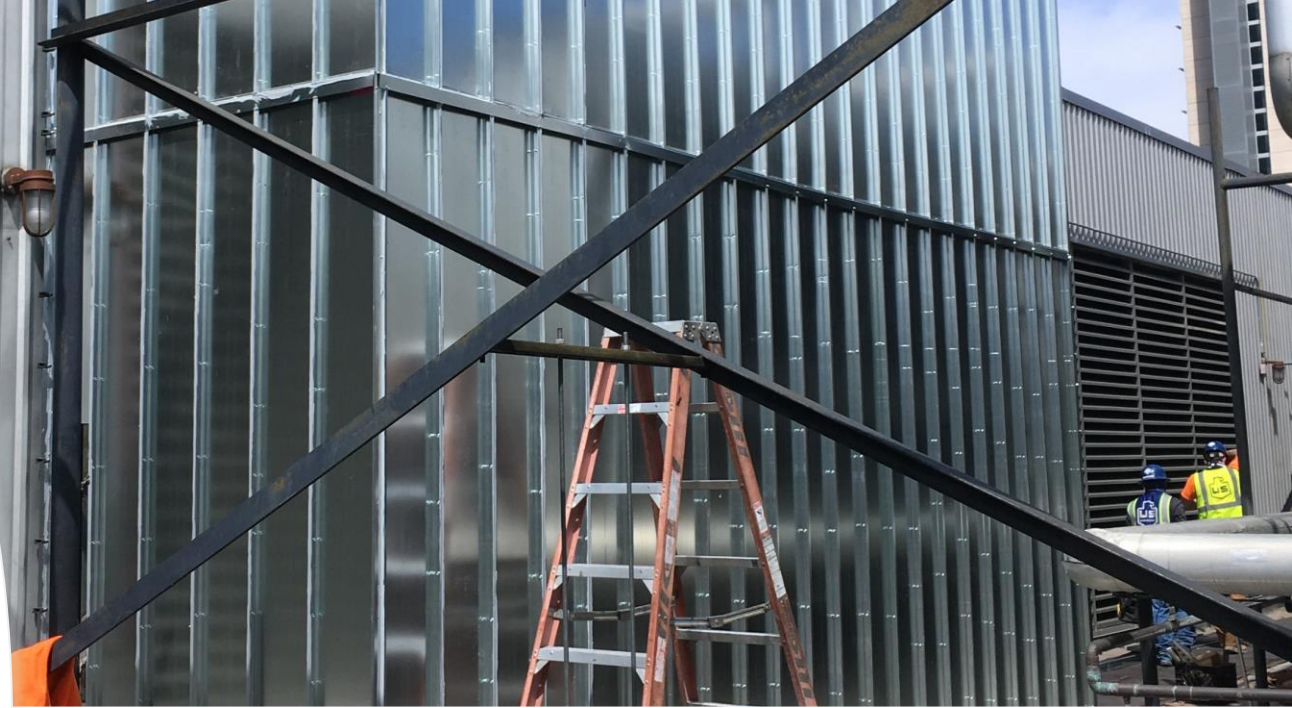
Challenge #7: Lots and Lots of Air

- Air handlers serving the patient care space to deliver 1.7 million CFM
- Air handlers serving “clean” space to deliver 1.1 million CFM
- Air handlers designed for 16%-25% outside air



Challenge #8: Energy

- Domestic hot water for hundreds of new fixtures
- Maximize ventilation
- Change building pressurization



District Energy to the Rescue

- Convention Center is on utility steam and chilled water district energy systems



District Energy to the Rescue

- Load shifting = extra energy available for air handlers



District Energy to the Rescue

- No new equipment would arrive in time....
- ...but, in an emergency any equipment in the district could potentially be requisitioned



Project Outcomes: Milestones

- April 6 – Design Start
- April 17 – 591 Beds
- April 24 – 652 Additional Beds



Project Outcomes: Materials

- 6 miles of copper O2 piping
- 19,000-gallon O2 system in operation (larger than most hospitals)
- 2 MW of domestic hot water heating
- Modified the HVAC for more than 575,000 square feet
- 2,330 emails



Project Outcomes: Fully Certified Medical Oxygen System



Project Outcomes: Successful Pressurization Test



Project Outcomes: Held Temperatures through Spring Snowstorm



Project Outcomes: Shower Trailers and Hand Washing Sinks

- Functional shower trailers and hand washing sinks for all the completed beds and staff support areas



Questions?



Thank You!

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