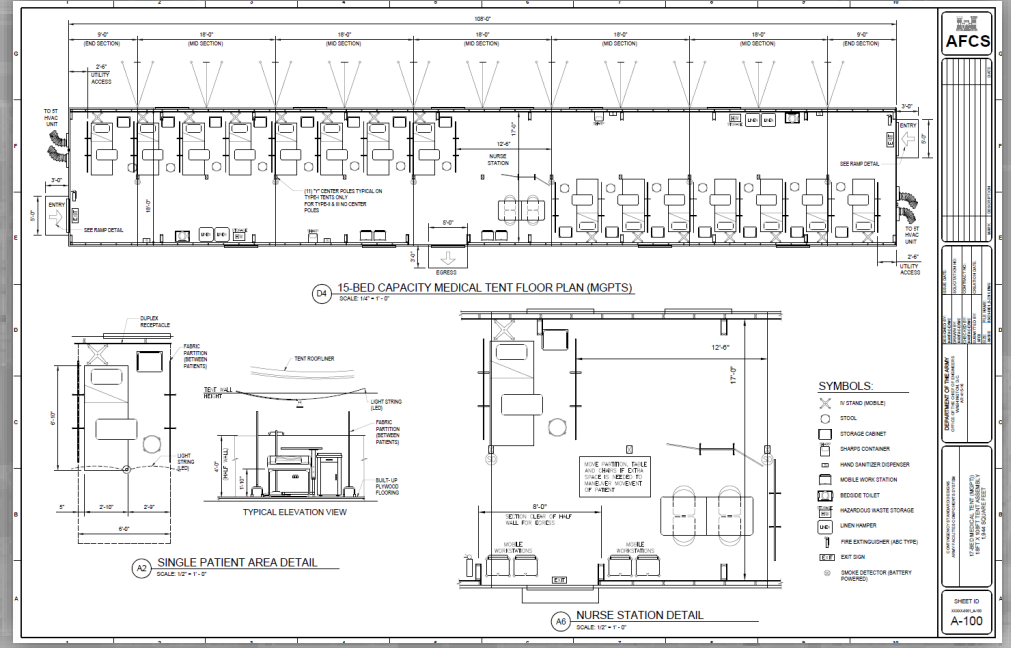
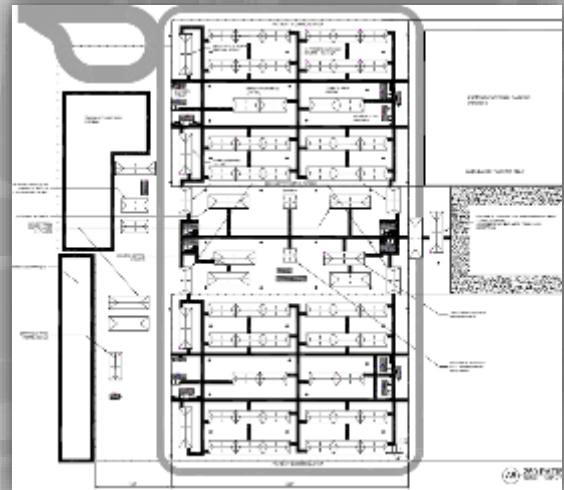


TENT CAMPS TO HEALTHCARE CONCEPT (TC2HC) (COVID – NON-ACUTE) ALTERNATE CARE FACILITY (ACF)



US Army Corps of Engineers



PURPOSE



- This concept may be most appropriate for areas where suitable hard-walled facilities are not available.
- Compliments other alternate care site concepts in response to the 2020 COVID-19 Pandemic.
- Concept is designed around the supplies and equipment provided through the Federal Medical Stations (FMS).
- Is compliant with and can be used with Health and Human Services (HHS) Federal Medical Station (FMS) Concept of Operations and other relevant health and safety code criteria (Appendix 7.1) of CONOPS.
- Provides technical assistance to State, Local, Tribal, and Territorial (SLTT) entities establishing and operationalizing alternate care sites with both military and commercially available equipment.



SCOPE



- Ideally locate these camps within close proximity of a hospital and in areas requiring minimal site work (ie. Hospital Parking Lot, large shopping center parking lot, City Parks, etc).
- Each Medical Tent Camp provides general (non-acute), low-level care for mild to moderate symptomatic COVID-19 patients. This includes patients that may need oxygen (less than or equal to 2L/min), who do not require extensive nursing care, and who can generally move about on their own.
- Design includes Blueprints for 250, 500 or 1000-bed Medical Tent Camps including all detailed designs, associated construction material (bills of material), estimated costs and schedules for each layout.
- Each 250-bed camp is designed with separate 125-bed modules. Each module patient area is to be either completely COVID (+) or COVID (-), but not mixed.
- These Medical Tent Camps can be built in unimproved fields, but such sites may require gravel, compaction and more site utilities.
- Medical Tent Camps can be built by troops or commercially contracted.
- Potential Use-Case Scenarios:
 - Local Hospital requests additional capabilities in parking lot
 - Rural Community requests additional space without availability of hotels or arenas
 - Military installations want local-temporary facilities within their boundaries
 - International community requests expeditionary facilities
 - State Agencies (Governor) wants military solution for ARNG execution



BASIS OF DESIGN



Patient Care

- **Low-acuity Care**, 125-bed modules are considered all COVID (+) or all COVID (-) in order to reduce negative air pressure or isolation requirements.
- Common support functions are located outside of COVID (+) areas to eliminate exposure to operations and maintenance personnel.

Site

- Layout accommodates **all 18-functions of the Federal Medical Station (FMS) CONOPS** (March 2014), Appendix B3.
- Can be placed on **hospital or shopping center parking lots** within easy accessibility of hospital or can be built in city parks or field.
- Can be operational in 3-weeks from decision point.
- General site layout is adaptable to near infinite configurations.

Facilities

- Standard military tents have 12-month design life with minimal maintenance.
- Tents utilized in design match national warstock items for immediate availability.
- Basic patient layout includes three Modular General Purpose Tent Systems (MGPTS) (Medium) connected together (18' x 108') with 15-patient beds and a centralized Nurse Station.
- Pharmacy: Consists of a MGPTS Small (18'x18') tent (for distribution) but medical staff will store pharmaceuticals in two locked (20' and 40') refrigerated storage unit.
- Per **current Warstopper and Regular DLA inventory, DLA can outfit 88 EA, 250-bed medical tent camps (approx. 22,000 beds)**.
- Similar sized, commercial-off-the-shelf (COTS) Tents are available with 10-130 days lead time.

Mechanical

- Each tent section (three GPTMS Mediums or one GPTMS Large) generally requires 5-Tons of cooling for international climate zone 4A median extreme high of 100 °F and median extreme low of 0 °F.
- The design team segmented entire areas (with controlled access) to be either COVID (+) or COVID (-) **to minimize exposure of personnel and to minimize the large HVAC and power requirements to isolate systems**.
- If the operating agency determines to mix a section of the camp (or individual tents), **negative pressure and/or HEPA filtration can be added (to individual tents)** but may require separate power generation.

Electrical

- Primary plan is to utilize commercial power grid. Due to hospital requirements, include 100% back-up power of 2 EA 1-Megawatt Generators.
- If commercial power is not available, design requires 2 EA 1-Megawatt Generators as primary source and 2 EA 1-Megawatt Generators as back-up.
- Design includes common and commercially available power generation and distribution equipment.

Fire Protection (complies with)

- National Fire Protection Agency (NFPA) 101, "Life Safety Code", 2018 Edition
- International Code Council, International Fire Code, 2018 Edition
- National Fire Protection Agency (NFPA) 101, "Life Safety Code", 2018 Edition
- National Fire Protection Agency (NFPA) 72, "National Fire Alarm and Signaling Code", 2019 Edition

Sewer/Water

- 5,000 gal Storage included for 6 gal per person per day for filling field hygiene stations. (3-days of supply); site has room for accommodating additional water storage to increase days of supply.
- 2 EA field hygiene stations (manual pump sinks) are located in each Medium or Large tent. 1 EA field hygiene stations are located in each small tent.
- Latrines and showers include source for hot water and are located along perimeter fence/access road to be serviced daily.

NOTE: Please see full Concept of Operations/Basis of Design Document and full Design Set for specific details.



STANDARD SITE-LAYOUT (250-BED)



Design Characteristics

Area (minimally acceptable):

- 7.1 Acres (490' x 630') without patient parking
- 8.2 Acres (630' x 630') with patient parking

Site:

- Asphalt, Field or Combination
- Self-contained systems
- Perimeter Fencing = 3,150 LF
- Perimeter Roadway = 1,820 LF
- Power = 63'x45" Generator Pad (accommodates up to 4 EA 1-MW Generators)

Workflow:

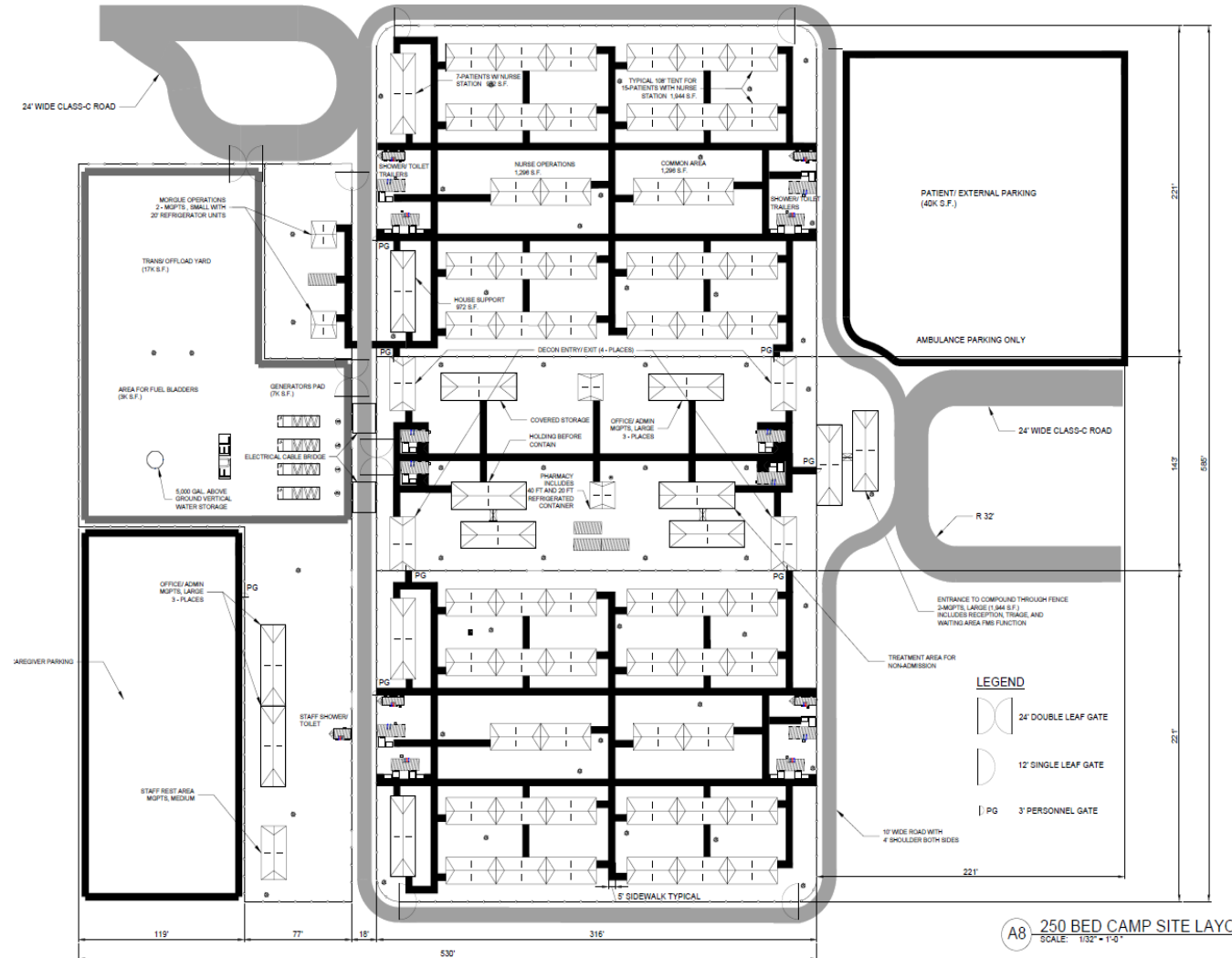
- Low-acuity care
- 2 EA, 125-Bed modules
- All COVID (-) or COVID (+) modules; NO mixing
- Common Support Area
- Controlled personnel and vehicle access

Tent Requirements per 250-bed Module:

- MGPTS Small/16x16 Temper = 8
- MGPTS Med /Temper Type IV = 55
- MGPTS Large/Type I, II Medical = 14

Operability:

- Sewage: Contract Vac Truck for leased Latrine/shower trailers; Contract portable hand-washing station with grey water removal.
- Water: Bottled water for drinking; contract services for leased latrine/shower facilities
- Electricity: Primary Source is tie-in to local utilities with 2 EA 1MW generators as back-up.
- Trash: contracted housekeeping service to collect and remove solid waste.
- Security: contracted gate-manning and random patrol





EXPANDED SITE-LAYOUT (500-BED)



Design Characteristics

Area (minimally acceptable):

- 12.6 acres (875' x 625') without patient parking
- 14.5 acres (1175' x 625') with patient parking

Site:

- Asphalt, Field or Combination
- Self-contained systems
- Perimeter Fencing = 6,300 LF
- Perimeter Roadway = 3,640 LF
- Power = 2 EA 63'x45" Generator Pad
(accommodates up to 8 EA 1-MW Generators)

Workflow:

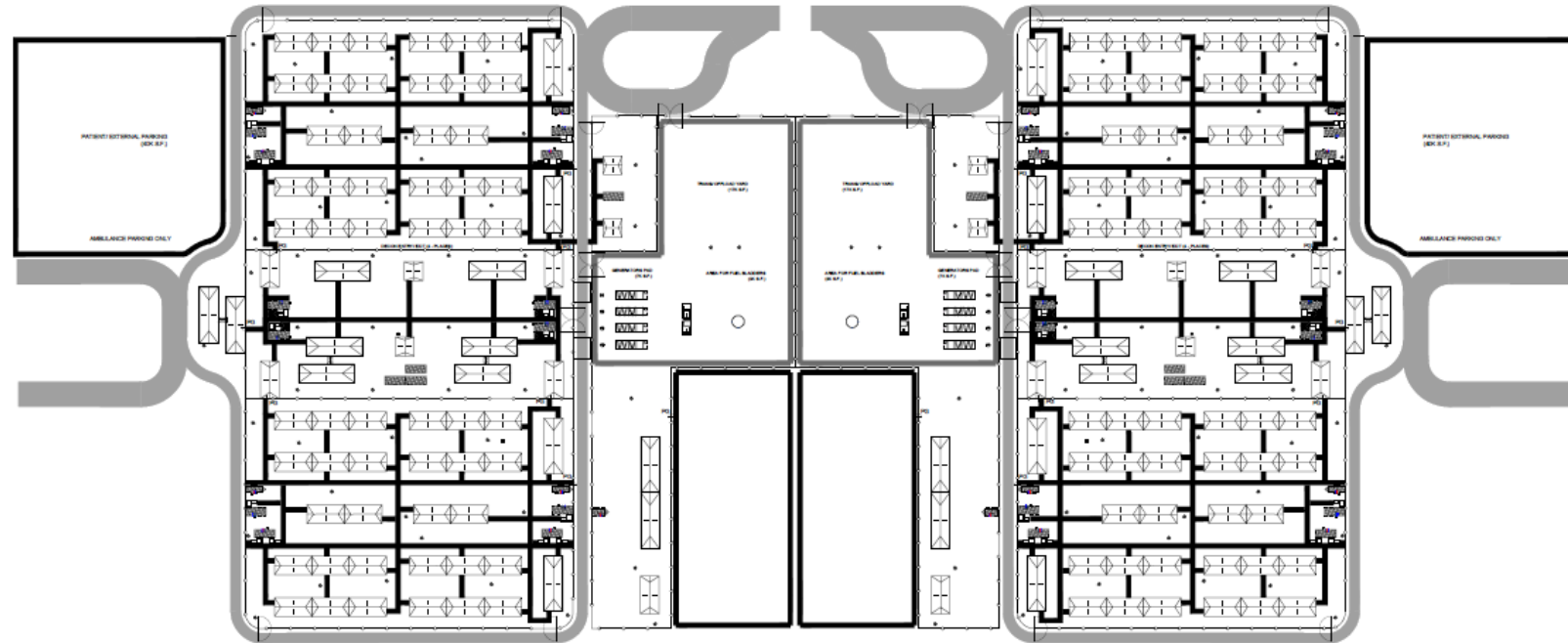
- Low-acuity care
- 4 EA, 125-Bed modules
- All COVID (-) or COVID (+) modules; no mixing
- 2 EA, Common Support Areas
- Controlled personnel and vehicle access

Tent Requirements Per 500-bed Module

- MGPTS Small/16x16 Temper = 16
- MGPTS Med /Temper Type IV = 110
- MGPTS Large / Type I, II Medical = 28

Operability:

- Same as previous



C5 500 BED CAMP SITE LAYOUT
SCALE: 1/64" = 1'-0"



SUPER SITE-LAYOUT (1,000-BED)



Design Characteristics

Area (minimally acceptable):

- 25 acres (875' x 1250') without patient parking
- 34 acres (1175' x 1250') with patient parking

Site:

- Asphalt, Field or Combination
- Self-contained systems
- Perimeter Fencing = 6,300 LF
- Perimeter Roadway = 3,640 LF
- Power = 2 EA 63'x45" Generator Pad
(accommodates up to 8 EA 1-MW Generators)

Workflow:

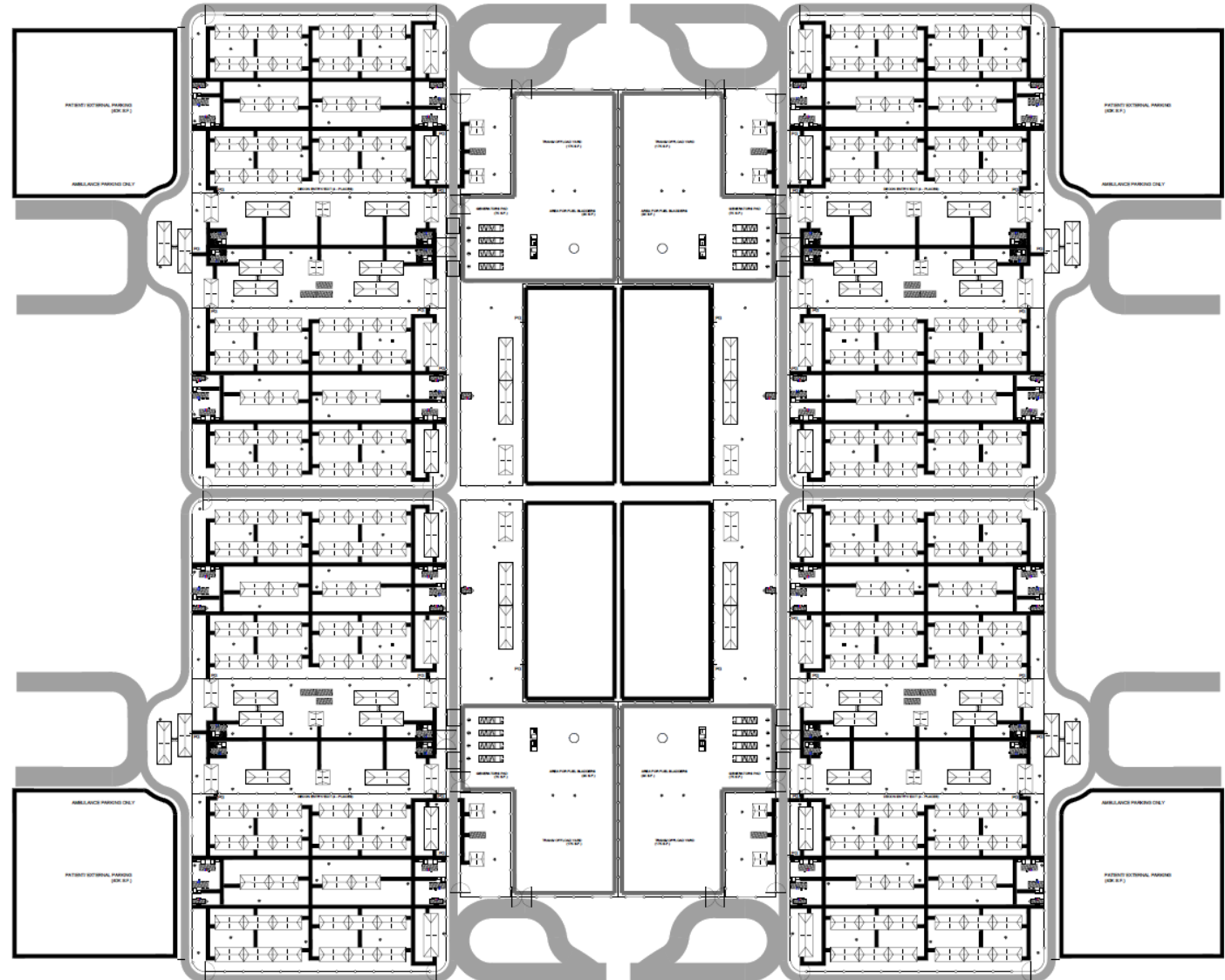
- Low-acuity care
- 8 EA, 125-Bed modules
- All COVID (-) or COVID (+) modules; no mixing
- 4 EA, Common Support Areas
- Controlled personnel and vehicle access

Tent Requirements Per 1,000-bed Module

- MGPTS Small/16x16 Temper = 32
- MGPTS Med /Temper Type IV = 220
- MGPTS Large / Type I, II Medical = 56

Operability:

- Same as previous





ALTERNATE CONFIGURATION(S)



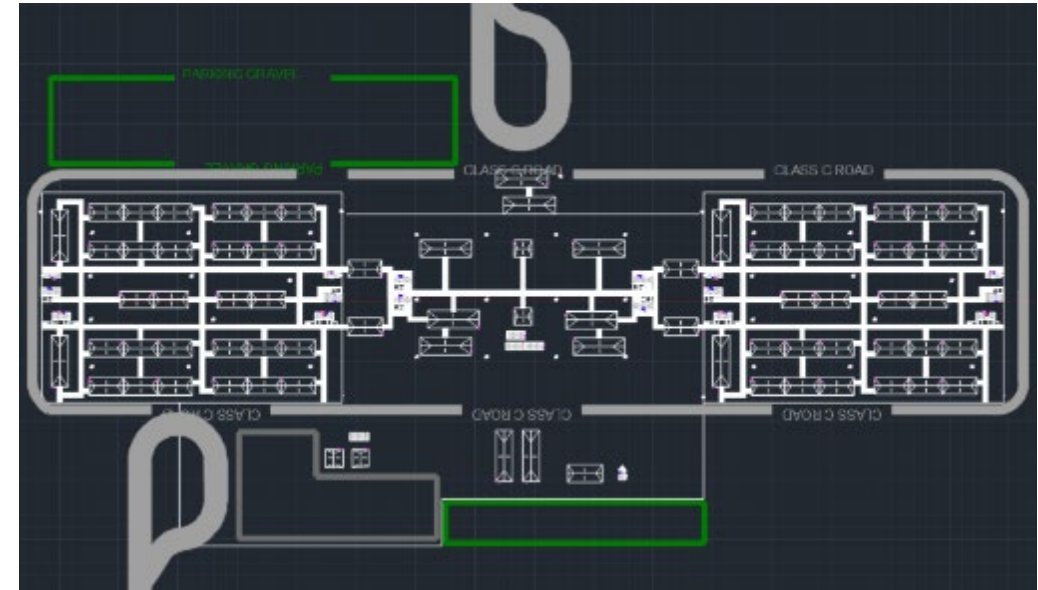
Design Characteristics

Various Alternate Configurations

- Horizontal: 1050' x 400' = 9.6 ac
- Double-Stacked: 490' x 615' = 6.9 ac

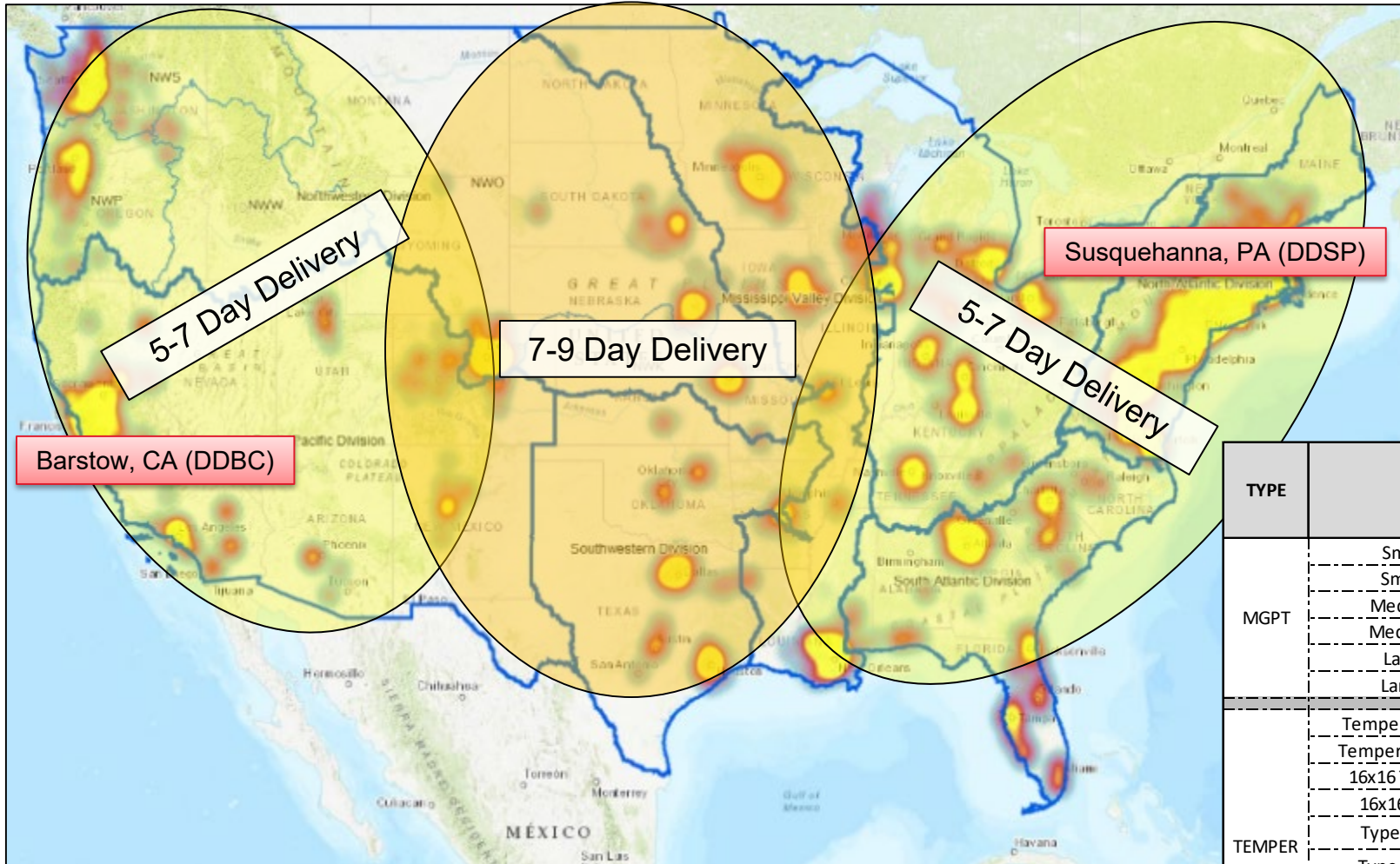
Uses same configurations as standard 250-bed design

- Materials
- Equipment
- Utilities
- Cost
- Schedule
- Patient Workflow
- Medical Provider Workflow





DEFENSE LOGISTICS AGENCY – CURRENT TENT AVAILABILITY

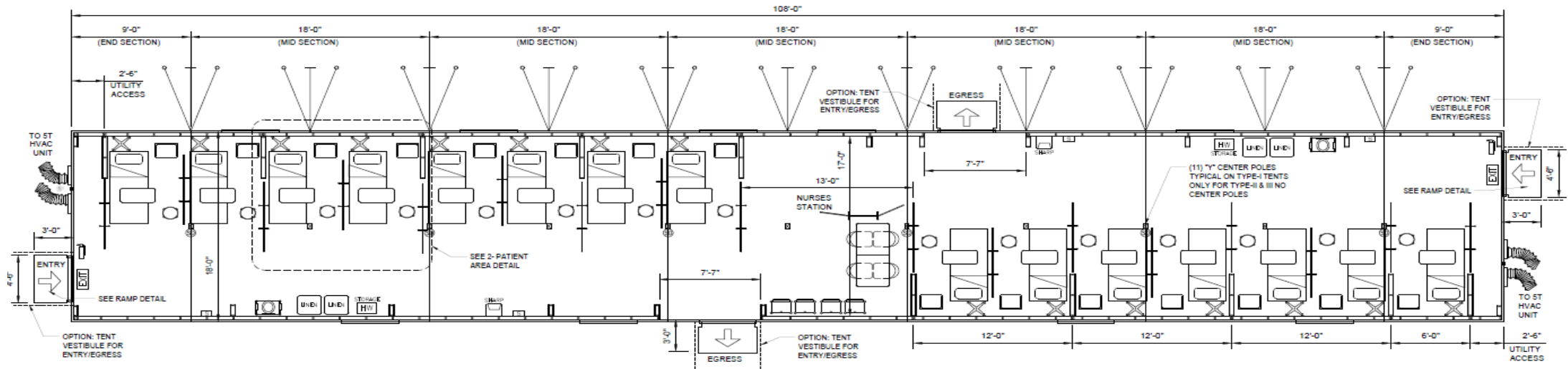


- Per current Warstopper and Regular DLA inventory, DLA can outfit 60 EA, 250-bed medical tent camps (approx. 15,000 beds).
- Current DLA Commercial-Off-The-Shelf (COTS) solutions project another 20 camps (5,000 bed) availability within 10-30 days.

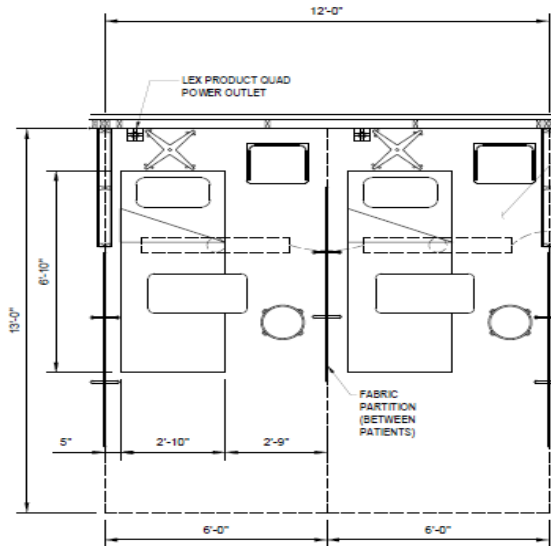
TYPE	NAME	NSN	Location	Total Quant	TOTAL SF AVAIL
MGPT	Small - OD	8340014563633	DDBC-237/DDSP-59	296	95,904
	Small - Tan	8340014911507	DDSP-(41)	41	13,284
	Medium - OD	8340014563628	DDBC-1,126/DDSP-578	1704	1,104,192
	Medium - Tan	8340014911515	DDBC-2132/DDSP-384	2516	1,630,368
	Large - OD	8340014563674	DDBC-457/DDSP-382	839	815,508
	Large - Tan	8340014911479	DDBC-65	65	63,180
TEMPER	Temper Type IV - OD	8340011966272	DDBC-185/DDSP-219	404	258,560
	Temper Type IV - Tan	8340011852628	DDBC-622/DDSP-539	1161	743,040
	16x16 Tent - Green	8340007823232	DDBC-22/DDSP-450	472	120,832
	16x16 Tent - Tan	8340015058656	DDSP-(73)	73	18,688
	Type I - Medical	8340-01-185-2616	DDBC-5/DDSP-3	8	10,240
	Type II - Medical	8340-01-185-2617	DDBC-75	75	96,000
	Type V - Medical	8340-01-185-2614	DDBC-37	37	11,840
	Lightweight Maint. (Green)	8340-01-456-3637	DDBC-119/DDSP-577	696	16,128
Lightweight Maint. (Tan)	8340-01-507-4375	DDBC-44	44	33,792	



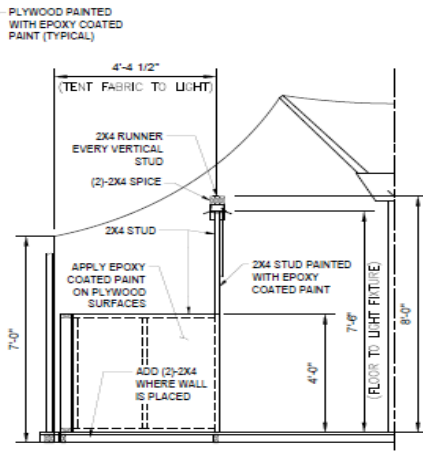
3 EA MODULAR GP TENT SYSTEM (MED) PATIENT TENT



D4 15-BED CAPACITY MEDICAL TENT FLOOR PLAN (MGPTS)
SCALE: 1/4" = 1' - 0"



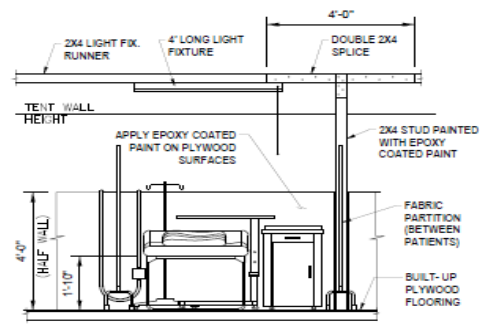
A1 2- PATIENT AREA DETAIL
SCALE: 1/2" = 1' - 0"



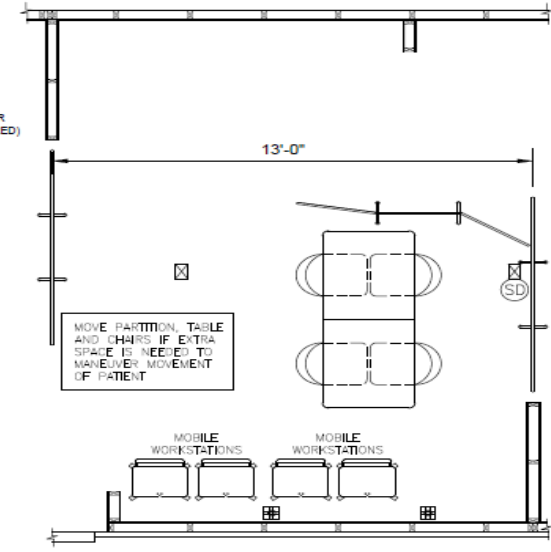
A4 SECTION
SCALE: 1/2" = 1' - 0"

SYMBOLS:

- IV STAND (MOBILE)
- STOOL
- STORAGE CABINET
- SHARPS CONTAINER
- HAND SANITIZER DISPENSER
- BEDSIDE TOILET
- HAZARDOUS WASTE STORAGE
- LINEN HAMPER
- FIRE EXTINGUISHER (ABC TYPE)
- EXIT SIGN
- MOBILE WORK STATION
- SMOKE DETECTOR (BATTERY POWERED)



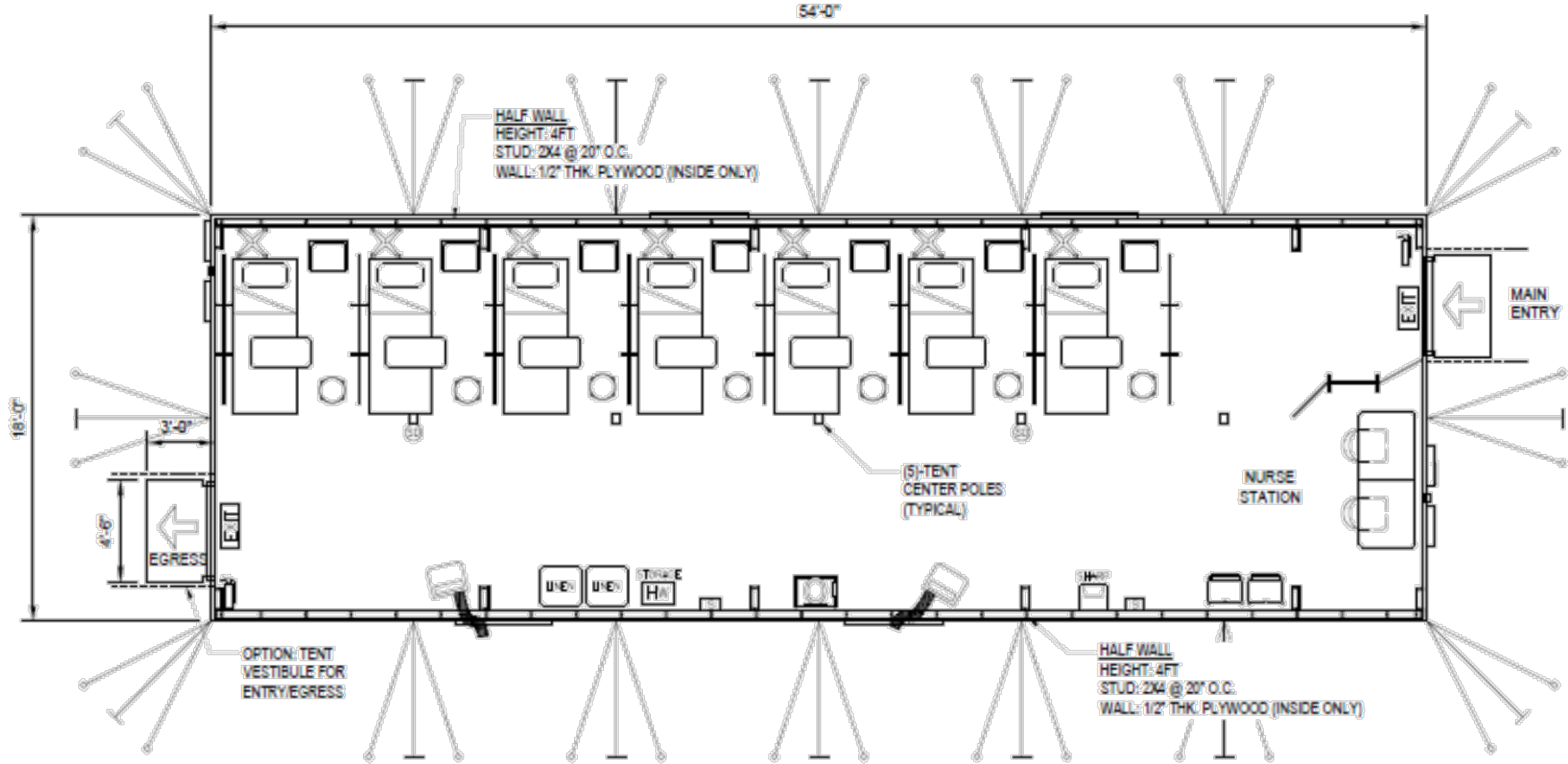
A6 ELEVATION VIEW
SCALE: 1/2" = 1' - 0"



A8 NURSES STATION DETAIL
SCALE: 1/2" = 1' - 0"



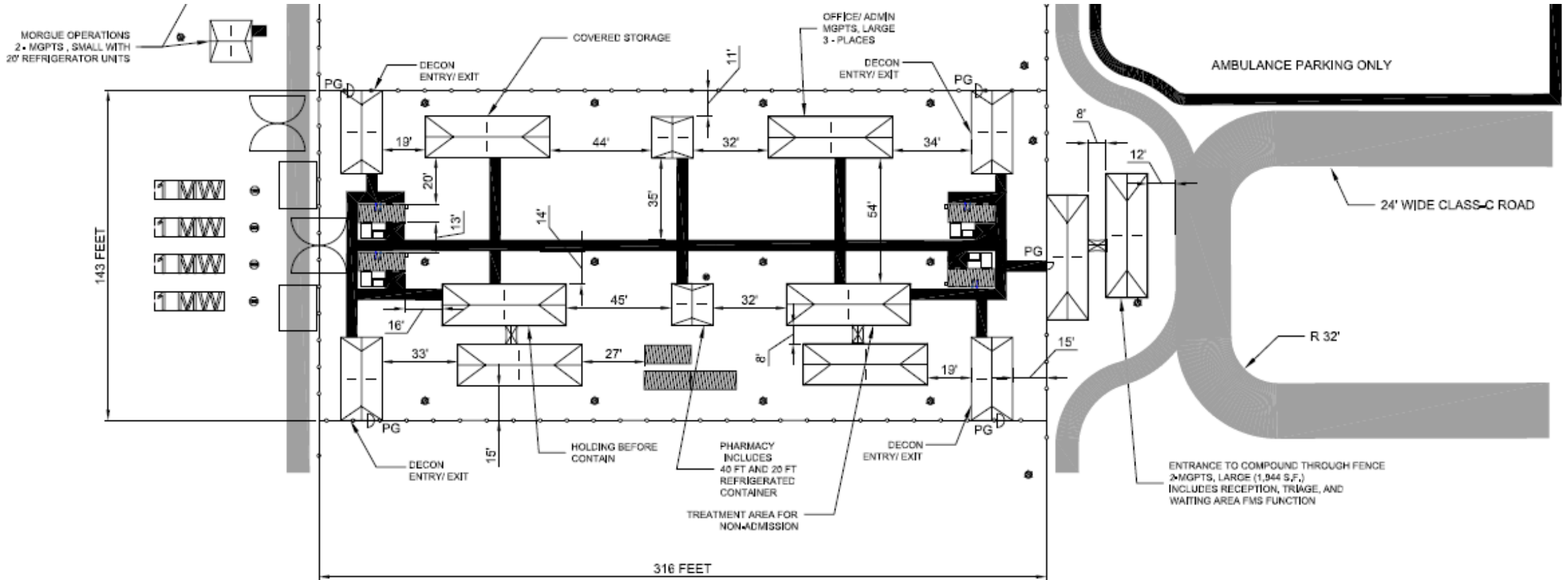
MODULAR GP TENT SYSTEM (LARGE) PATIENT LAYOUT



D2 7-BED CAPACITY MEDICAL TENT FLOOR PLAN (MGPTS-LARGE)
SCALE: 1/4" = 1'-0"



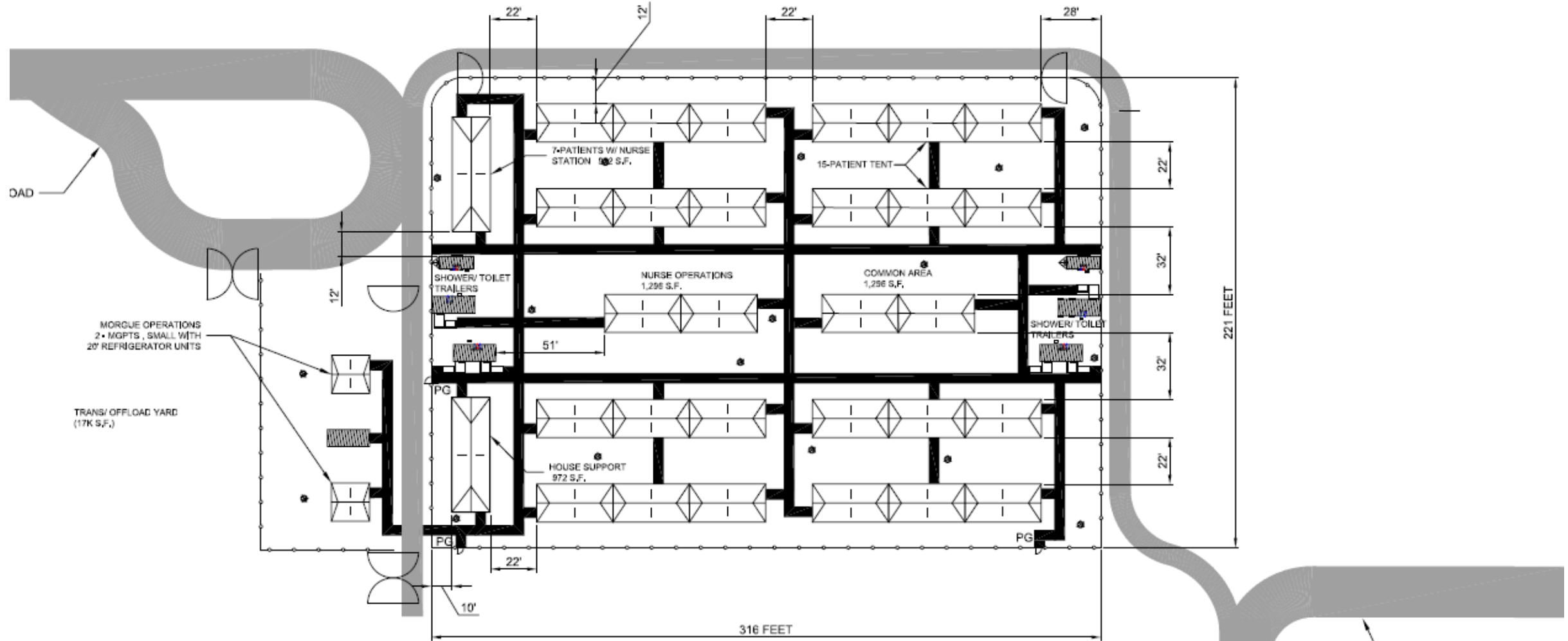
COMMON AREA TENT LAYOUT



E4 CENTRAL COMMON AREA LAYOUT
SCALE: 1/32" = 1' - 0"



125-BED MODULE LAYOUT



A4 125-BED PATIENT MODULE
SCALE: 1/32" = 1'-0"

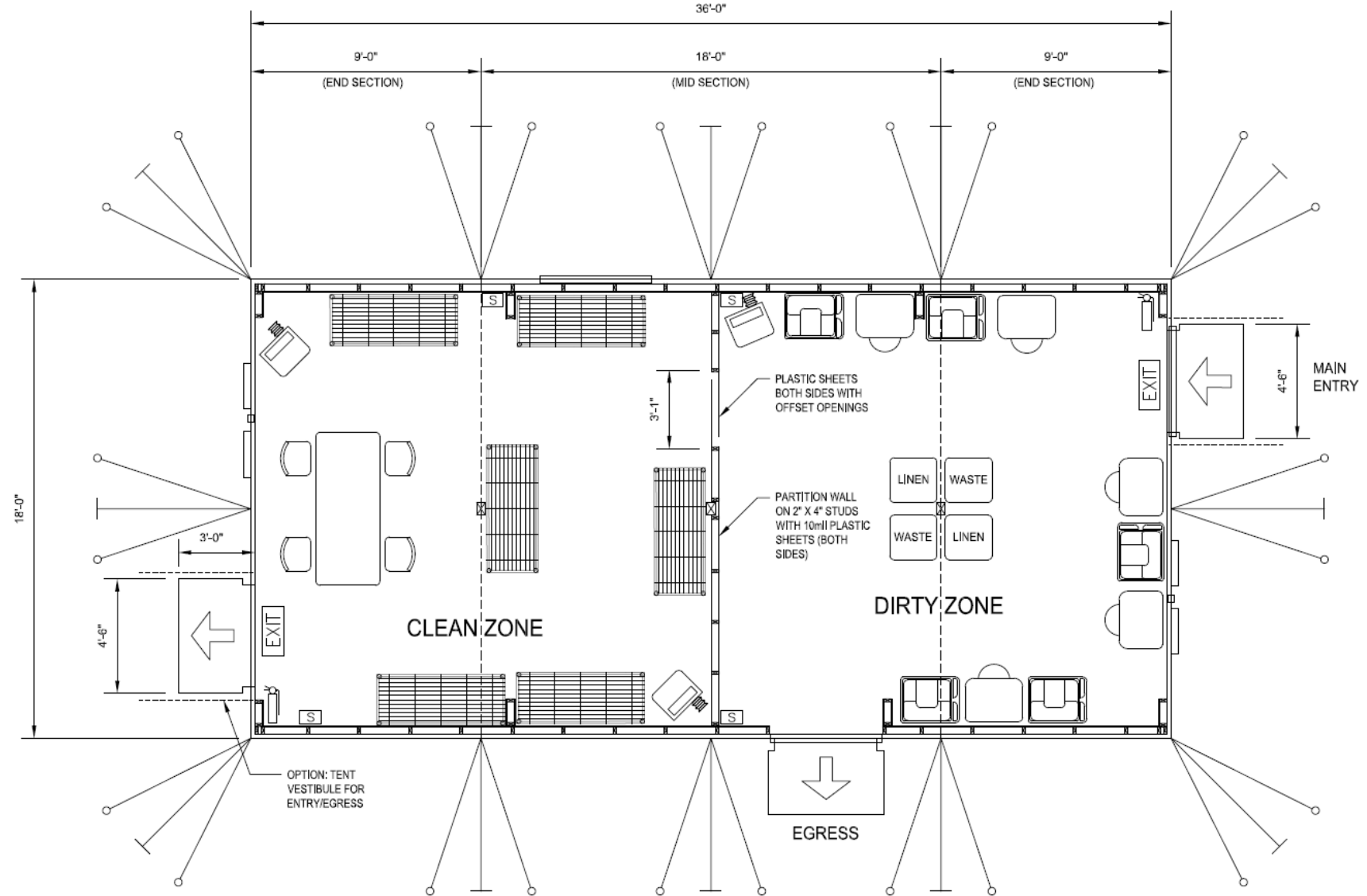


DON / DOF / DECON TENT



Function

- Provides space to for medical care providers and housekeeping staff to put on and remove PPE
- Controls restricted access to COVID(+) areas



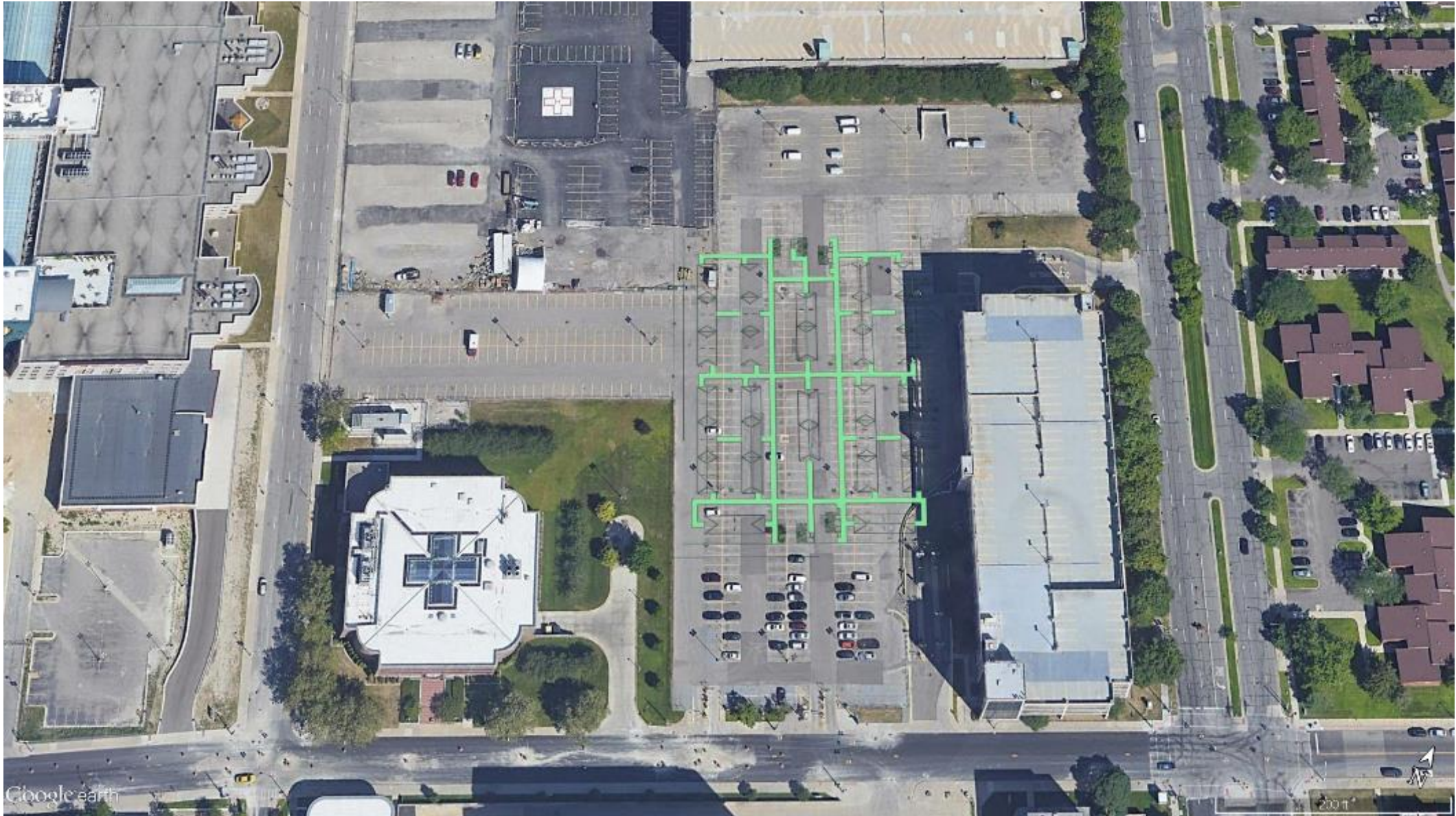
C4

DECONTAMINATION TENT FLOOR PLAN

SCALE: 3/8" = 1' - 0"



NOTIONAL - 125-BED MODULE LAYOUT – HARPER HOSPITAL, DETROIT, MI





NOTIONAL - 500-BED CAMP – SIX FLAGS GREAT AMERICA, GURNEE, IL



Google earth

500 ft

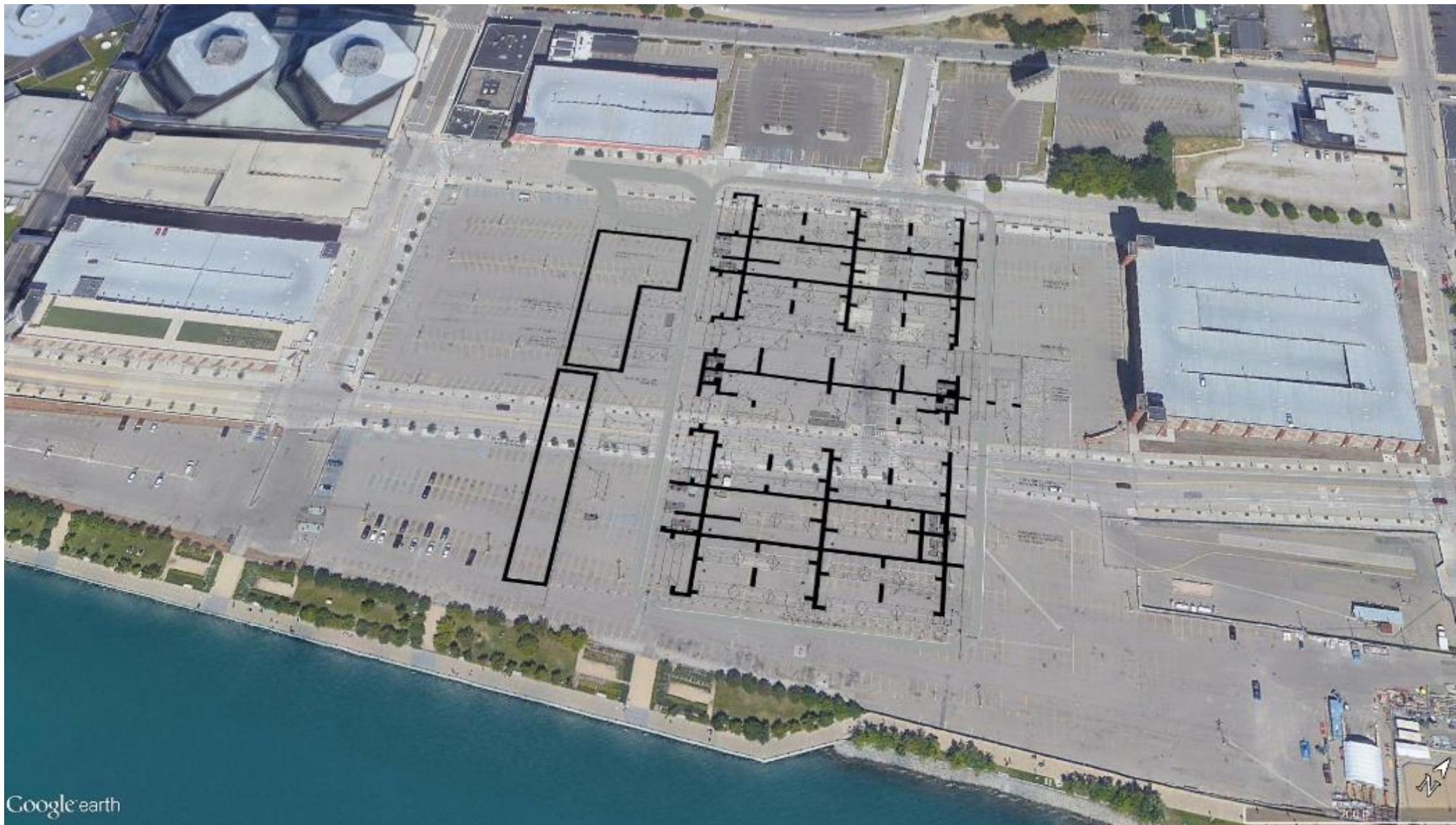


NOTIONAL - 1000-BED CAMP – SIX FLAGS GREAT AMERICA, GURNEE, IL



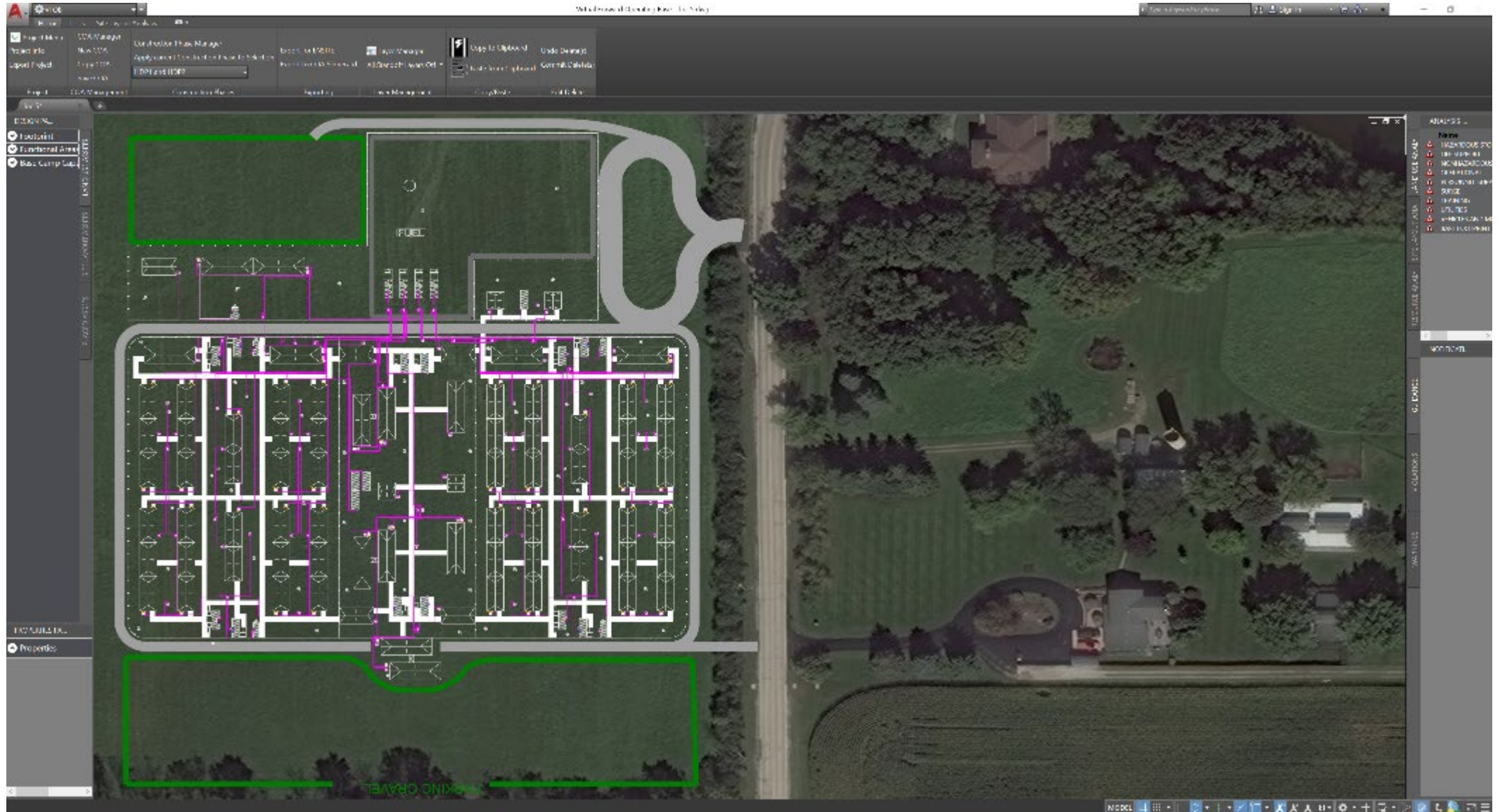


NOTIONAL - 250-BED CAMP – RIVER WALK, DETROIT, MI





NOTIONAL - 250-BED CAMP – GURNEE, IL





EXAMPLE 250-BED CAMP – WARREN TOWNSHIP HIGH SCHOOL, IL



The screenshot displays a software interface for a 3D architectural model of a 250-bed camp. The main view is an aerial photograph of Warren Township High School, with a white and purple 3D model of the camp layout overlaid on the school's grounds. The model consists of several rectangular buildings arranged in a grid, with various internal structures and furniture visible. The interface includes a top toolbar with various tools and a left sidebar with a 'DESIGN PALETTE' and a 'PROPERTY' panel. On the right side, there is an 'ANALYSIS PALETTE' with a list of functional categories and their status.

Category	Status
FUNCTIONAL CAPACITY	Checked
HAZARDOUS MATERIAL STORAGE	Checked
LIFE SUPPORT	Checked
MAINTENANCE AND VEHICLE	Checked
NONHAZARDOUS MATERIAL STORAGE	Checked
OPERATIONAL SUPPORT	Checked
PERSONNEL SUPPORT	Checked
SECURITY	Checked
TENT MEDICAL CAMP ADD-ONS	Checked
TENT MEDICAL CAMP FACILITIES	Checked
TRAINING SUPPORT	Checked

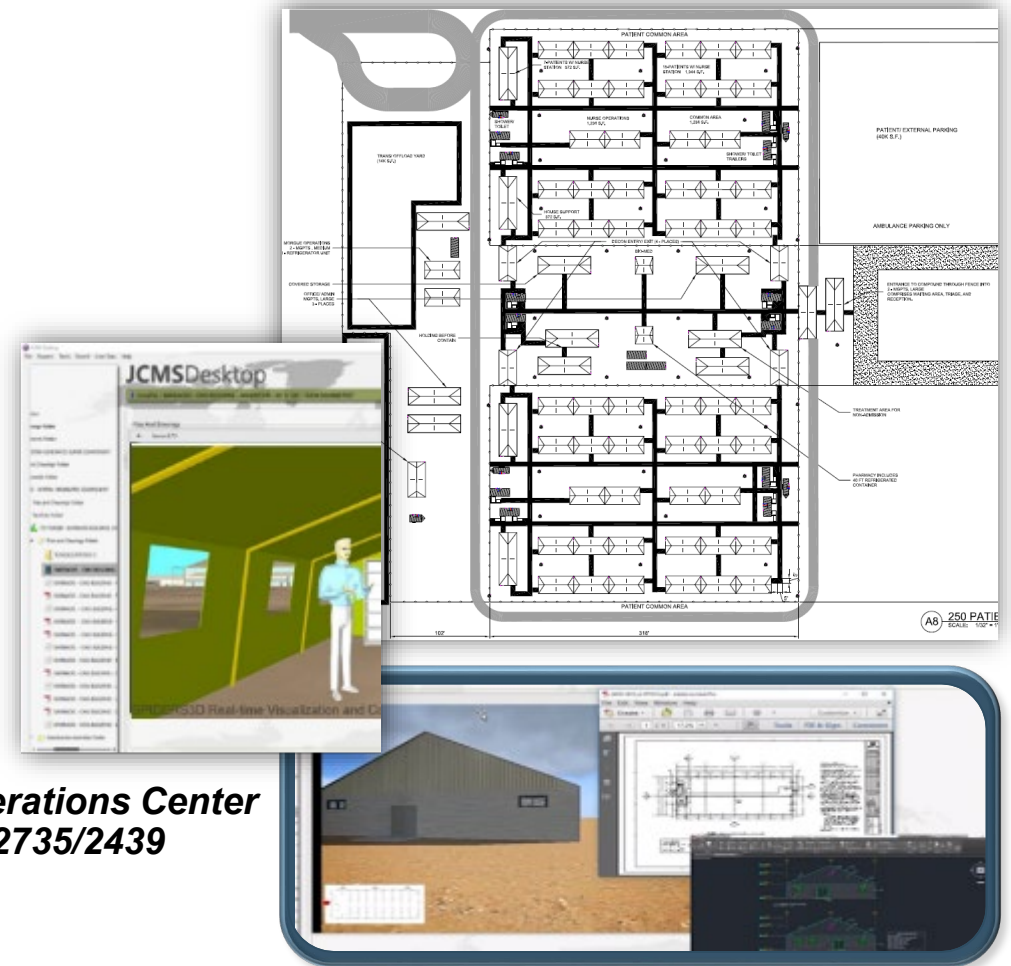


TENT CAMP TO HEALTHCARE CONCEPT (TC2HC) CAPABILITY SUMMARY



ERDC's Army Facilities Components System (AFCS) Joint Construction Management System (JCMS) tools provide site selection, master planning, and standard designs for contingency temporary facilities.

- Provides standard design and site planning of scalable 250 to 1000 bed low-acuity medical tent camps constructable by troops or contractors
- Includes detailed designs, bills of material, estimated costs, and construction schedule
- Uses COVID-19 lessons-learned to 'optimize' design and complies with HHS FMS CONOPS and relevant health and safety code criteria
- Materials arrive in 5-7 days; construction (250-bed) complete within 3-weeks from execution decision point
- Current DLA inventory can outfit 88 EA 250-bed medical tent camp (approx. 22,000 beds)
- Site specific design capability available through JCMS 4.1, JCMS 5.0, UROC-CERL reachback, or USAR Technical Engineer units



Civilian: USACE Alternate Care Sites at <https://www.usace.army.mil/Coronavirus/Alternate-Care-Sites/> or CE-UOC@usace.army.mil.

Military: USACE Reachback Operations Center uroc@usace.army.mil; 601-634-2735/2439

Provides Temporary Structure Designs & Site Plans