

Construction Manager Project Narrative

To:	Cherokee Nation	Date:	March 14 th , 2024
		Project #:	2023011
		Project Name:	Cherokee Nation – Catoosa CDC
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* The following is the Schematic Design structural narrative for the above referenced project. The purpose of this narrative is to provide schematic system descriptions only and should not be used for construction.

2. ARCHITECTURAL

2.1 Project Description

A. The Cherokee Nation Catoosa CDC is a new 33,600sf 24-hour facility designed to serve Hard Rock employees and the community, while encouraging growth by taking in students from even further extents of the surrounding area. The building will house ten classrooms, four pre-school classrooms for ages 2 - 3 ½, six infant/toddler classrooms for ages 0 - 2, two gross motor rooms which will double as storm shelters, and a full commercial kitchen. The central administration area will host enough space for approximately six administrative offices, break/work room, nurse's room, and conference rooms. The exterior materials will consist of stone veneer, metal panel, wood detailing, and fenestration utilizing storefront glazing. The roofing system will be a combination of standing seam metal roof and membrane roofing to allow for more strategic locating of kitchen vent equipment. The facility will be

conditioned by a four-pipe system with air-cooled chillers and condensing boiler. The site will utilize approximately 82 parking spaces and a front drive lane for pick up and drop off.

3. LANDSCAPE

3.1 Playground Description

- A. There will be two overall playground types – one for pre-school classrooms and one for infant/toddler classrooms to accommodate age differences in classes. Classrooms will share playgrounds at each area, with no more than 4 classrooms sharing a playground. Both types of playgrounds will feature a minimum of three play surfaces, such as poured-in-place rubber, sod, synthetic turf, rubber mulch, or gravel. Play elements in each playground include a crawl-through space, balance beam, sandbox with removeable cover, trike track, artificial turf play mound, stepping logs, water play area, and musical play elements. Shade will be provided in multiple play areas using shade sails. Additionally, a covered patio outside of each classroom on the north side of the building will provide a protected outdoor learning space. To reduce maintenance, inorganic or composite materials and native vegetation will be used wherever possible. Hand sinks within the exterior classroom door and a yard hydrant will be provided as additional amenities. Emergency egress and maintenance access will be provided for each of the playgrounds.

3.2 Playground Square Footages

- A. Outdoor shade – 3,200 total square feet (not including shade sails)
- B. Outdoor play – approx. 20,650 total square feet (includes Outdoor shade number)

4. INTERIOR DESIGN

4.1 Interiors Description

- A. The overall interior design will be described as bright, natural, clean, and sharp. Where possible, interactive or educational elements are to be incorporated into the interior design to create a more enriching educational experience for the children. Wood, stone, and muted pops of color will make up most finish appearances. The front entry will provide a professional welcome to guests, while classrooms feature pops of color and easily cleanable flooring. The Gross Motor Room / Shelter will bring playgrounds indoors with a synthetic gathering tree and custom murals featuring outdoor motifs. Corridor interior design elements will be incorporated to encourage movement into the classrooms and easier wayfinding for parents.

- 4.2 Anticipated Interior Finishes
 - A. Classrooms
 - 1. Flooring – wood-look welded vinyl
 - 2. Ceiling – acoustic ceiling tile system with inlaid wood-look louvers
 - 3. Walls – paint
 - 4. Millwork:
 - a. Cabs – wood-look laminate, white laminate
 - b. Counters – solid surface
 - B. Offices
 - 1. Flooring – wood-look welded vinyl
 - 2. Ceiling – acoustic ceiling tile
 - 3. Walls – paint
 - C. Meeting
 - 1. Flooring – wood-look welded vinyl
 - 2. Ceiling – acoustic ceiling tile
 - 3. Walls – paint
 - D. Kitchen
 - 1. Flooring – epoxy
 - 2. Ceiling – cleanable acoustic ceiling tile
 - 3. Walls – FRP
 - E. Storage
 - 1. Flooring – sealed concrete
 - 2. Ceiling – open to structure (paint)
 - 3. Walls – paint
 - F. Gross Motor Room
 - 1. Flooring – welded vinyl
 - 2. Ceiling – open to structure (paint), cloud louver system
 - 3. Walls – paint, interactive wainscot
 - G. Corridors
 - 1. Flooring – welded vinyl
 - 2. Ceiling – acoustic ceiling tile
 - 3. Walls – paint
 - H. Lobby
 - 1. Flooring – wood-look welded vinyl
 - 2. Ceiling – acoustic ceiling tile, acoustic wood louver accent
 - 3. Walls – paint, acoustic wood louver accent

5. STRUCTURAL

5.1 Building Description

- A. Pre-Engineered Metal Building structures with light gage metal wall and conventional steel infill. The classroom areas will be separated from the

kitchen and shipping and receiving area by a structural expansion joint. The gross motor rooms will function as ICC 500 storm shelters during high wind events.

5.2 Anticipated Structural Design Parameters

A. Structural elements and systems shall be designed on the following criteria:

1. Building Code

a. 2018 International Building Code (IBC)

1. Risk Category II

b. ASCE 7-16 Minimum Design Loads for Buildings

2. Live Loads (Uniform/Concentrated)

a. Roof (typical)	20 psf / 300 lbs.
b. Offices	50 psf / 2000 lbs.
c. Corridors	80 psf / 2000 lbs.
d. Classrooms	40 psf
e. Storage	125 psf

3. Snow Loads

a. Ground Snow Load, Pg	10 psf
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4. Wind Loads

a. Basic Wind Speed (3 Second Gust), Vult	108 mph
b. Wind Exposure Category	C
c. Internal Pressure Coefficient, GCpi	+/-0.18

5. Seismic Loads

a. Seismic Importance Factor, I	1.0
b. Mapped Spectral Response Acceleration, S _s	0.128
c. Mapped Spectral Response Acceleration, S ₁	0.072
d. Site Class	Awaiting geotechnical recommendation
e. Seismic Design Category:	

- The seismic design category will be determined once the site classification has been made by the geotechnical engineer.

5.3 Structural Elements

A. PEMB system by PEMB manufacturer.

5.4 Roof Framing

A. Roof Structure

- Roof structure will consist of PEMB system Z girts spaced as required.

5.6 Wall Framing

A. Typical Exterior and Interior Walls

- At PEMB, PEMB wall system by PEMB manufacturer
- At kitchen and shipping and receiving area, non-load bearing light gauge metal studs.

- 5.8 Foundation and Slab
 - A. Foundations
 - 1. Foundation system will be determined upon final recommendations from the geotechnical engineer.
 - B. Slab-on-Grade
 - 1. Slab-on-grade will be a 5 inch reinforced concrete slab on grade over a minimum 20 mil Stego vapor barrier over a minimum of 4 inches clean gravel over a minimum amount of structural fill based upon final recommendations from the geotechnical engineer. Capillary break per Geotechnical Engineer recommendations to be provided.
- 5.9 ICC 500 Storm Shelters (2)
 - A. Wall Framing
 - 1. Fully grouted and reinforced CMU Bearing Walls
 - B. Roof Framing
 - 1. Roof and Floor Deck
 - a. Roof and floor deck will be 3 inch x 20 ga. type “VLI” galvanized metal composite deck with 4 1/2” thick concrete topping, 7 1/2” total thickness
 - 2. Roof Structure
 - a. Composite structural steel wide flange beams spanning to fully grouted and reinforced CMU walls.
 - 3. Foundations
 - a. Foundation system will be determined upon final recommendations from the geotechnical engineer.

6. ELECTRICAL

- 6.1 Anticipated Electrical Service
 - A. This service will be an approximately 1,600 Amp 120/208V/3 phase service for the building and be fed from a transformer on the ground located in a location to be determined. The electrical room will need to be centrally located sized approximately 200 square feet depending on layout and will need to have two points of access for code purposes. Transformers and subpanels will be located in this.
- 6.2 Generator
 - A. A diesel generator will be provided for life safety, emergency lights, I.T., Offices, & Refrigeration
- 6.3 Lighting
 - A. The lighting systems in this facility will be lay-in LED lay-in lights throughout the space. The classrooms will be lit using high performance LED fixtures with dimming capability to provide even and comfortable

light. Building exterior will be lit using LED wall packs and LED pole mounted lighting to provide approximately 1 fc average throughout.

- 6.4 Power
 - A. Power distribution will be spread out throughout the building from the main electrical room. The entire facility will have receptacles as required and GFI receptacles in early childhood development areas as well as receptacles on a standard layout (each wall) for office spaces and classrooms, etc. as required.
- 6.5 Special Systems
 - A. The special systems on this facility include fire alarm, intercom, security, phones and data. Multiple 4" conduits will be routed from the AV/Storage area to the property line for communications systems.
- 6.6 FEMA-Rated Storm Shelter
 - A. A central inverter will be required using an approximately 5 kw Dual-Lite LSN inverter or equivalent for the safe rooms.

7. MECHANICAL

- 7.1 Anticipated HVAC System:
 - A. HVAC will include a 4-pipe system with hydronic heating and chilled water-cooling fan coil with six row cooling coil and reheat coil one row or two vertical or horizontal configuration with 125 tons air-cooled chiller with 100% redundancy and condensing boilers. Packaged air-cooled chiller to be located on the ground level behind the building. Total estimated tonnage 125 tons.
 - B. Chilled water and hydronic heating will be based on 2.5 to 3 gpm per ton pumping with VFD controlled pumping system with redundancy. Fan coil shall be provided with two-way controlled valve to maintain space temperature.
 - D. Outdoor air ventilation will be based on the International Mechanical minimum ventilation code rates table 403.3.1.1 and actual occupancy or code when is not provided.
 - 1. Classroom ventilation: $16 \text{ student} \times 10 \text{ cfm} + \text{area} \times .18 \text{ cfm per sq.ft}$
 - 2. Office ventilation: $\text{occupancy} \times 5 \text{ cfm} + \text{area} \times .06 \text{ cfm per sq.ft}$
 - 3. Corridor ventilation: $\text{area} \times 0.06 \text{ cfm per sq.ft}$
 - 4. Kitchen ventilation will be based on hood design and pressurization.
 - E. All outside air will be treated via dedicated outside air located on roof and ducted to space or HVAC return to provide neutral ventilation outside air.
 - 1. Dedicated outside air unit with direct expansion or chilled water tied to chiller, Natural heating, and reheat.

- a. Dedicated outside air unit for each classroom wing with energy recovery sized per IMC chapter 4.
 - b. Dedicated outside air unit for common area sized per IMC chapter 4.
 - F. Kitchen HVAC will be hybrid with fan coil cooling/heating and UL hood design with exhaust and make-up air. Hoods will be type 1 for cooking and type 2 for heat and vapor exhaust.
 - G. (3) IT Rooms will be served by an independent ductless wall or ceiling sized server KW.
 - H. Building Management shall be provided with a central control system with limited space override and web interface to schedule and modify system and setpoint.
 - I. (2) Area designated for Tornado Shelter will be designed in compliance with ICC-500.
 - K. Restrooms will be ventilated per mechanical code. Main restrooms exhaust fan will be controlled via the building management system.
- 7.2 Anticipated Design Conditions & Tonnage
- A. General: Components of the heating and air conditioning systems will be designed and selected according to the following design conditions:
 - 2. Final equipment tonnage will be based on selected building envelope, occupancy and below design conditions. Estimated tonnage will be:
 - a. 350 to 400 square foot per ton for classroom and office common area.
 - b. 100 to 150 square foot per ton for kitchen area.
 - 3. Indoor Conditions: (Common Area)
 - a. Summer: 75°F db, 50% RH.
 - b. Winter: 70°F db, no humidity control.
 - 4. Indoor Conditions: (Classroom)
 - a. Summer: 75°F db, 50% RH.
 - b. Winter: 70°F db, no humidity control.
 - 5. Outdoor Conditions: *Catoosa*, Oklahoma:
 - a. Summer: 105°F db and 78°F wb.
 - b. Winter: 0°F db.

8. PLUMBING

8.1 Anticipated Gas Service

- A. Gas service will be based on medium gas pressure with pressure regulator step down at the gas fired equipment.

8.2 Anticipated Domestic water service:

- A. Domestic water service will be 3" service based on water flush system. 60 psi will be required inside the building to overcome piping pressure losses and plumbing fixtures pressure requirement.
- 8.3 Anticipated Sanitary Sewer:
 - A. Sanitary sewer will be 6" gravity sloped at 1/8" per foot minimum slope installed below frost depth.
 - B. Provide waste and vent system per International Plumbing code 2018 based on layout and Kitchen layout.
- 8.4 Anticipated Domestic Hot Water:
 - A. Condensing gas waters that provide domestic hot water to lavatory and sinks with circulating pump and piping distribution system. Circulating pump to be controlled via temperature sensor with timer.
 - 1. Kitchen will be provided with 140-degree hot water for compliance with health department and plumbing code requirements.
 - 2. Rest of the areas will be provided with 110-degree hot water.
 - 3. Mixing valve will be provided to meet ANSI requirements.
 - 4. Multiple condensing gas water heater.
 - 5. Provide booster pump if water flow
- 8.5 Anticipated Storm Drain
 - A. To be determined based final building roof design and foundation drains.

9. FIRE PROTECTION

- 9.1 Fire Sprinkler
 - A. The anticipated estimated system demands based on building height, NFPA 13 Ordinary Hazard classification, hose streams, 5% safety factor, backflow and balancing is approximately 625 gpm at 55 psi. 6" fire service will supply with backflow preventor located inside building. Sprinkler system will be hydraulically calculated based on available water pressure and system demand.
 - 1. 8" service if fire pump is required based on available pressure and flow.