



PROJECT DESIGN OVERVIEW

Primary Engineering Systems

Architecture (Design and Functional Components)

Civista's expansion includes the construction of a new four-story, 120,000 square-foot patient care facility, two new levels of a Cardiac Intensive Care Unit expanded above the existing structure, and miscellaneous renovations throughout the existing facility. Updates and additions to the emergency department, surgery, same-day-surgery, and nursing units are all included in the scope of work.

The materials used to construct the façade will match those of the existing structure to blend the new with the old. Its functional design does present a few new features. A curtain wall atrium at the east service



Figure 1: Rendering of Civista's East Service Entry

entry reflects Civista's modern and updated look and a new courtyard in the structure's interior acts as retreat for recovering patients and family members. Its new construction will be technologically viable and visually appealing.

Building Envelope

The exterior walls of the Civista Medical Center consist of four different systems; (1) field glazed, prefabricated single and multi-span aluminum curtain and window wall,



(2) modular face, non load-bearing brick, (3) prefabricated calcium silicate masonry, and (4) metal wall panel assembly.

- 1) Field glazed, prefabricated single and multi-span aluminum curtain and window wall systems consists of windows that are either 1” clear, low E coated insulate glass units or 1” spandrel glass assembly. These systems are located at the east service entrance and all exterior windows (except at the CICU expansion, where there are fixed aluminum window systems).
- 2) The modular face, non load-bearing brick is designed to match the existing building in terms of size, color, and orientation. This system is constructed over either concrete block backup or over steel stud. The brick over concrete block backup is located along the ground floor masonry screen wall between the courtyard and service area. The brick over steel stud is located elsewhere.
- 3) The prefabricated calcium silicate masonry units are located at various locations. They are architecturally appealing and measure 11-5/8” wide x 23-5/8” long x 3-5/8” wide. Its assembly is similar to the brick over the steel stud system.
- 4) The metal wall panel assembly is a system consisting of prefabricated, non-insulated, metal panels applied to the face of the structural steel stud framing and secured to outside face of the floor slab. Metal wall panels are located at various locations.

Finally, the roofing system is comprised of loose laid EPDM membrane with rock and paver ballasts over tapered insulation, all on top of the level concrete deck.



Demolition

The demolition required on the Civista project occurs in three phases. Phase 1 includes 3500SF of the existing asphalt paving along the southwestern entrance, the existing helipad (upon completion of proposed helipad), and an existing police office/shed. Phase 2 includes approximately 7600SF of asphalt, 440LF of curbing, and 2400SF of parking island removal along the southeastern part of the building in preparation for the construction of the new addition. Phase 3 of demolition includes the existing La Plata Town Hall and surrounding asphalt. The Town Hall is approximately 6200SF and the remaining asphalt is another 2460SF. During all work, contractors have to protect trees, plant growth, and features designated to remain as final landscaping and as required by local regulatory agencies.

Structural

The foundation consists of augered cast-in-place pile foundation system. Cast-in-place pile caps along with grade beams tie the foundation system together. The slab on grade is typical at a 5” depth, and 6” at the loading dock area. Two-way concrete slabs account for the majority of the elevated structural system. Concrete is bucket placed by tower crane at a typical 10” in depth with 6.25” drop panels. The slabs are supported by 24” square columns. Concrete slabs require a 4000psi strength and columns require a 5000psi strength. In total, the foundation requires approximately 2000 Cubic Yards of concrete. Four floors of elevated slab, along with columns, require 1300 Cubic Yards of concrete.

Steel is the main structural element at the loading dock and access bridge areas only. They require approximately 45 tons of steel. Here, it is incorporated as composite



floor systems consisting of steel floor decking with nominal column size of 12". As for the foundation, 32 tons of rebar and 208 SF of weld wire mesh were utilized as reinforcement. The elevated cast-in-place slabs and columns require another 50 tons.

Electrical

The electrical service to the new addition will be provided by expanding and reconfiguring the existing 13.8 kV primary switchgear line to a new 15 kV 480/277-Volt switch. The primary distribution will feed lighting and major mechanical equipment loads (including elevators). Dry-type transformers will provide 208/120-Volt power for small mechanical equipment loads and receptacles. The existing outdoor standby diesel generator, located adjacent to the existing building, will provide emergency power to the new addition.

Mechanical

Heating: The new addition will be service by a 60psig steam supply system from the main plant. It will also be used to generate humidification. Domestic hot water heating is electric-fired (no steam). The heating system includes:

- 60psig steam boilers
- Steam pressure reducing valve stations
- Steam to heating water heat exchangers and pumps (one stand-by)
- Base mounted end-suction or vertical split case hot water circulating pumps (one stand-by)
- Automatic heating water flow control valves and associated accessories

Cooling: Civista's chilled water capacity is generated by two separate plants.

The cooling system includes:

- New 500 ton Cooling Tower
 - New 225 ton Chiller



- Existing 667 ton Cooling Tower
 - Existing 450 ton Chiller
 - Existing 400 ton Chiller
- Existing 500 ton Cooling Tower
 - Existing 125 ton Chiller
 - (2) Existing 75 ton Chillers

Air Handling: There are five air handling units designated to serve the building.

They are as follows:

- **AHU-1:** 28,100 cfm, (2) supply fans at 50 HP and (2) return fans at 15 HP, variable volume unit with hot water reheat
- **AHU-2:** 26,200 cfm, (2) supply fans at 50 HP and (2) return fans at 15 HP variable volume unit with hot water reheat
- **AHU-3:** 51,000 cfm, (1) supply fan at 100 HP and (1) return fan at 25 HP, variable volume unit with hot water reheat
- **AHU-7:** 10,555 cfm, (1) supply fan at 30 HP and (1) return fan at 15 HP, variable volume unit with hot water reheat
- **AHU-8:** 18,000 cfm, (1) supply fan at 30 HP and (1) return fan at 15 HP, variable volume unit with hot water reheat

Fire Protection

Existing 6" fire service will be removed and rerouted. A new 6" fire loop will be provided around the site and will supply the new addition with a 6" Fire Water (FW) service and 6" Domestic Water service. Both will connect to the existing / rerouted service. The FW will include a double check valve backflow preventer on a new 250 gallons per minute electric pump at 15 HP. The pump will service inside sprinklers and hoses. A combined sprinkler / standpipe system will be provided. The standpipe risers will be located in stairwells. All fire department valves will be located on floor landings. Pre-Action systems will be provided for the elevator machine rooms. Sprinklers in all rooms will be Quick Response. In existing areas undergoing renovations, the existing piping will be modified as required to accommodate the new layouts.



Project Cost Evaluation

- **Actual GMP** (less site work, landscaping, etc.):
 - \$29,651,976
 - Unit Price @ 159,167 SF: \$186 / SF

- **Total Project Costs:**
 - \$43,941,344
 - Unit Price @ 159,167 SF: \$276 / SF

- **Major Building Systems Costs:**
 - Mechanical: \$6,480,995 – \$41 / SF
 - Electrical: \$3,782,322 – \$24 / SF
 - Structural: \$5,743,840 – \$36 / SF
 - Site work: \$2,700,000

- **Square Foot Estimate from Cost Works 2005**
 - Unit Price of total project costs: median - \$181 / SF, $\frac{3}{4}$ percentile - \$275 / SF
 - Mechanical & Electrical: median - \$60 / SF

- **D4 Cost Estimate**
 - Smart averaging of 3 medical facilities ranging from 117,000 SF to 164,000 SF
 - Estimate Cost \$32,927,840

Project Summary Schedule

Civista is organized into three different phases. Phase 1 focuses on site preparation. During this phase, three main activities occur. First, the ambulance route to the emergency room is rerouted and the old route is reconstructed. Next, preparation can begin for the building pad of the new addition. Finally, the helipad is relocated and parking lots are demoed. Phase 2 focuses on the new addition. During this phase, the foundation and four new levels are constructed as well as an elevator core. Phase 3 focuses on the renovations. Renovations will occur in selected areas and departments of the existing hospital.

**** Please reference Appendix A.**