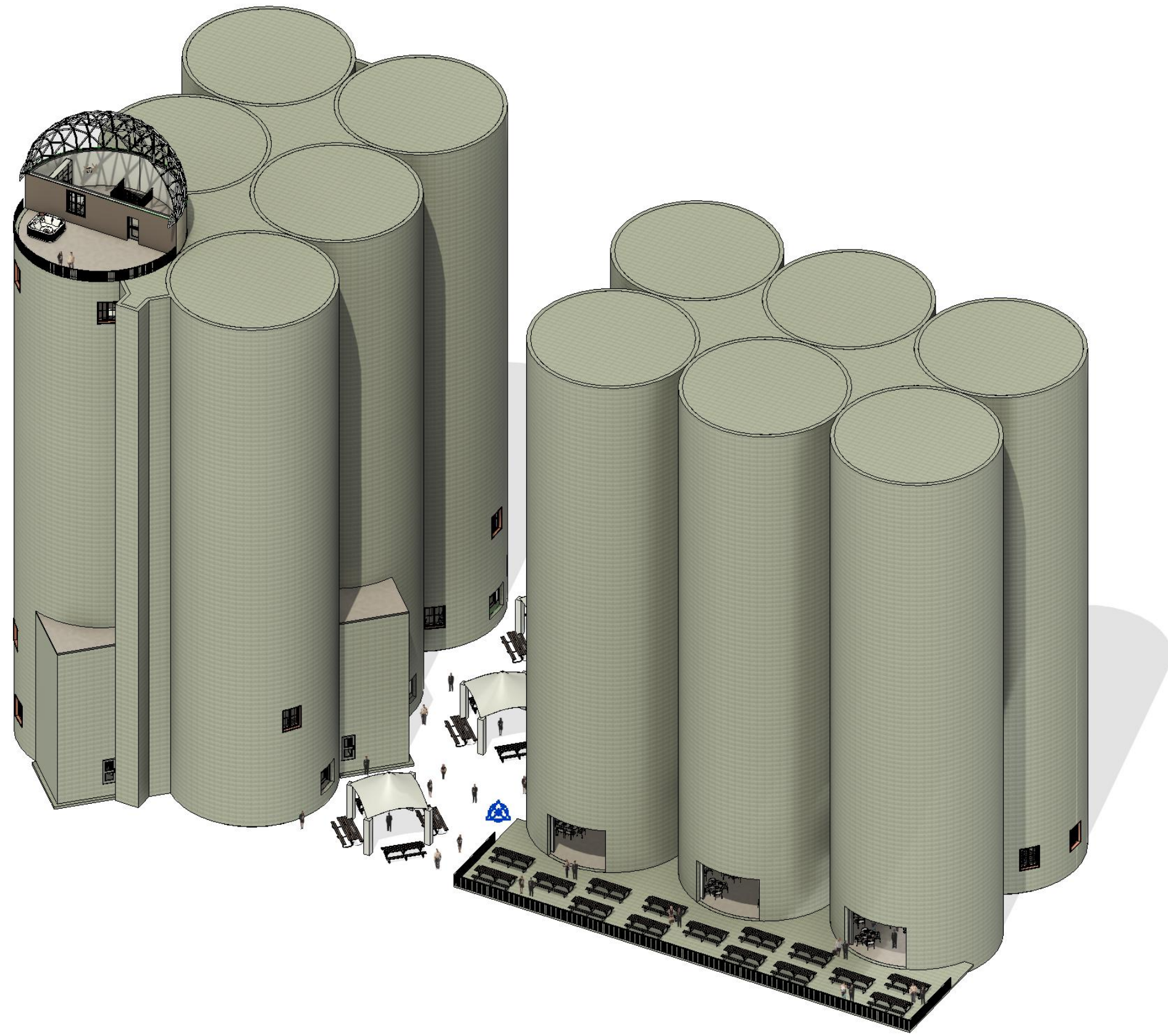


Brady Adams, Alexis Isenberg, Jack Muller, Alexa Vekich

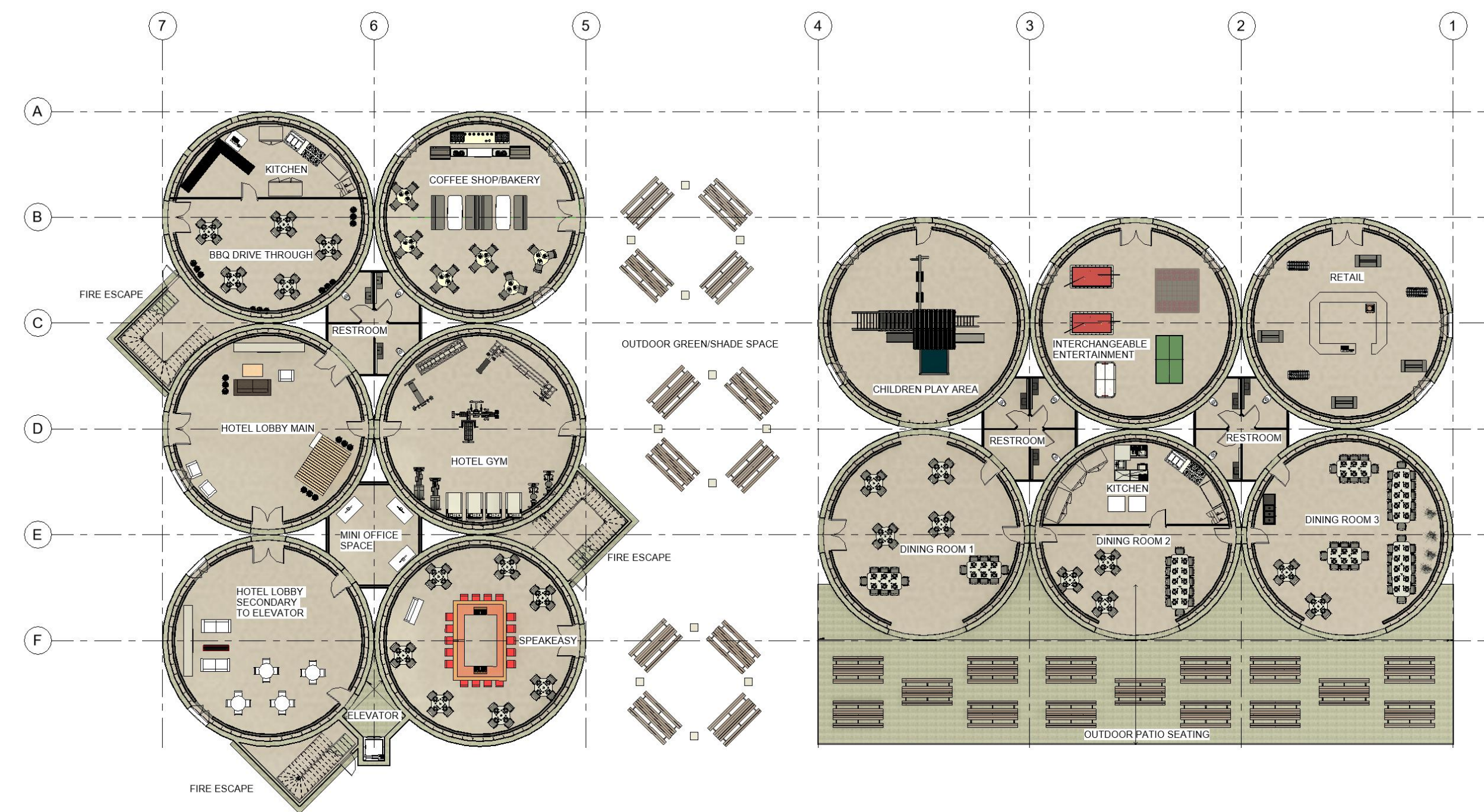
Project Scope

The City of Bondurant

Contact: Tiffany Luig – Economic Development coordinator



Architectural Design

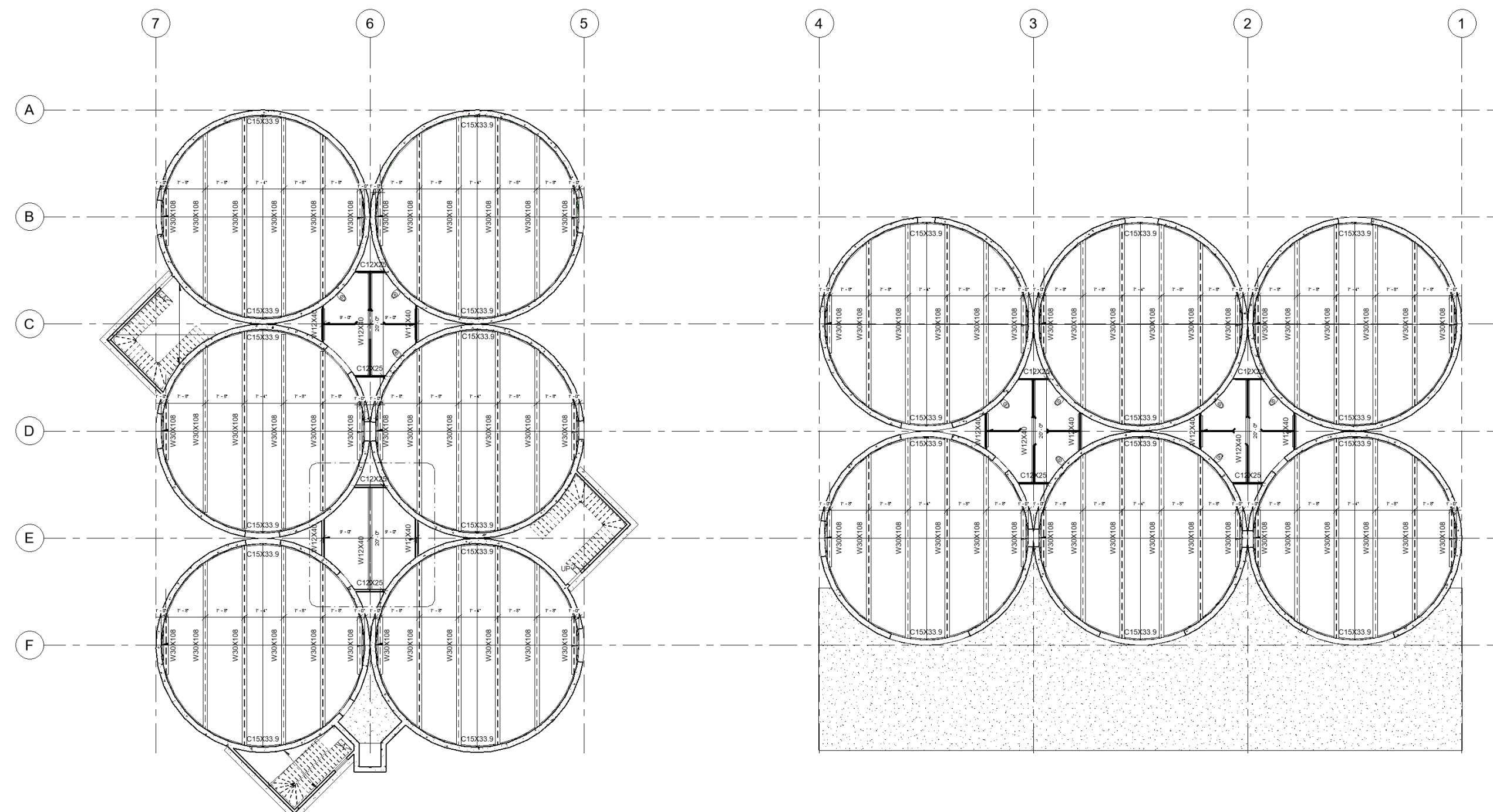


The architectural design contains the footprint for level one of the adaptive reuse. In the eastern silo complex, there is a restaurant spanning multiple silos with an outdoor patio, connected to the restaurant is a children's play area as well. To round out this complex there is also a retail space, and an interchangeable entertainment space included.

Between the two silo complexes is an outdoor green space with picnic tables and shade sails for visitors to utilize and enjoy.

In the western six pack there are three main public spaces including a barbecue restaurant with a drive through, a coffee shop/bakery, and a speakeasy. The remaining spaces act as hotel support spaces to display how a future hotel can incorporate the silos into its design.

Structural Design

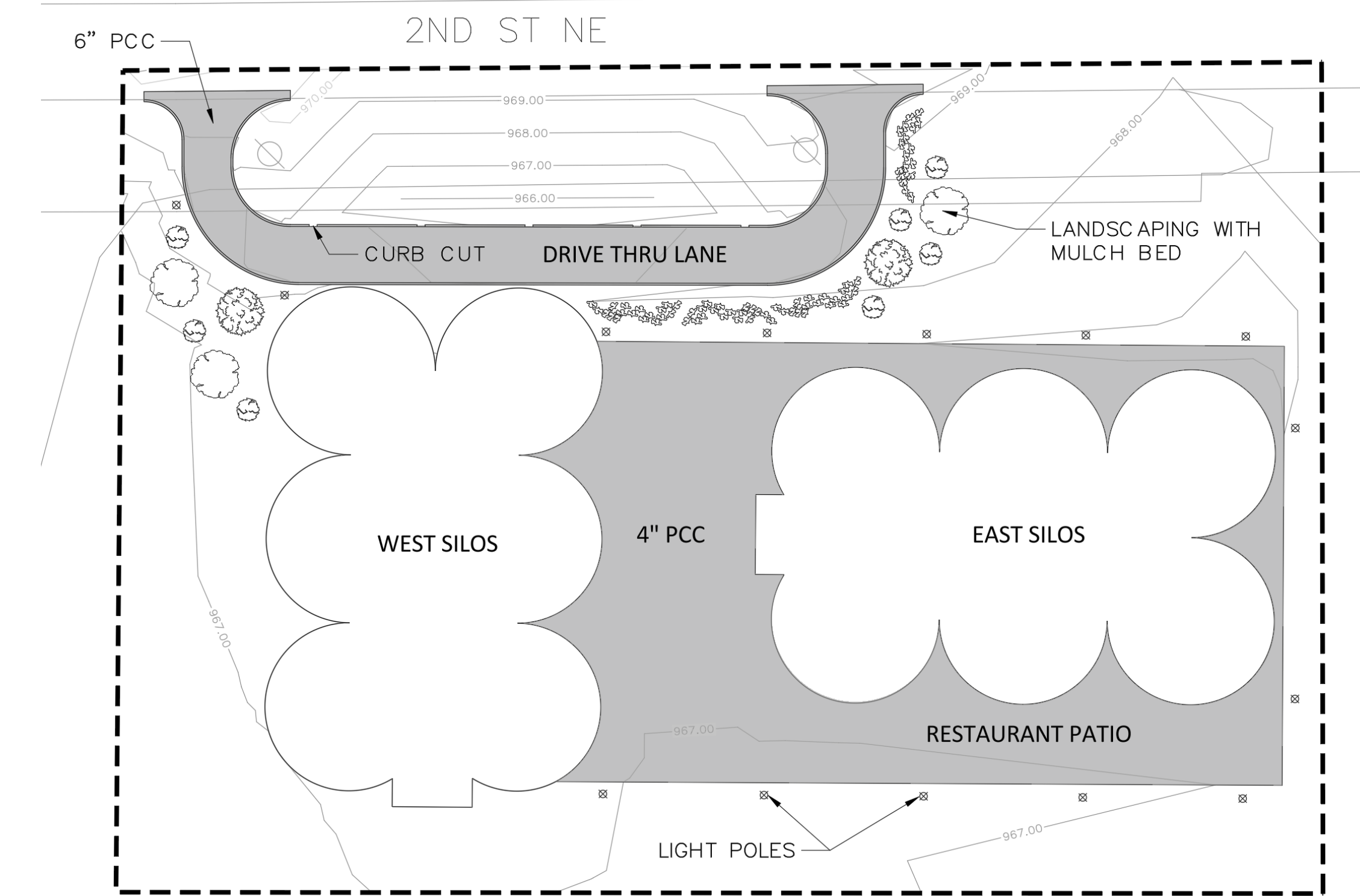


The floor and roof framing systems are supported by a continuous C-channel ring beam anchored to the interior face of the existing silo wall. Wide-flange beams span across the silo, bearing on this ring beam to transfer gravity loads efficiently into the existing structure. In the smaller office and restroom areas, framing consists of paired C-channels and wide-flange beams welded to connection plates and bolted to the exterior silo wall.

The floor system utilizes a composite corrugated metal deck to achieve composite action with the supporting beams, enhancing stiffness and load-carrying capacity. In contrast, the roof systems employ an acoustic metal deck, prioritizing sound control over.

At the penthouse level, the structural system consists of HSS columns arranged along the north half-dome, supporting vertical loads and resisting torsion. Lateral resistance is primarily provided by a shear wall located on the south side of the penthouse, establishing a clear and efficient lateral force-resisting system. The HSS columns are welded to base plates and anchored into the existing silo wall, while the shear wall is similarly secured using anchor bolts.

Site Design



The site design aims to improve outdoor aesthetics while keeping initial costs and future maintenance to a minimum. The two paved areas are covered with Portland Cement Concrete of varying thicknesses—one equipped for vehicle traffic and the other for pedestrian use only. The site is graded to convey stormwater away from the silo structures while maintaining slopes that comply with ADA standards. Curb cuts in the drive-thru lane allow water to flow directly into the northside ditch, negating the need for an expensive underground conveyance system.

Project Requirements

The Grain Silo Adaptive Reuse Project aimed to transform two existing six-pack silos into functional, multi-use spaces while preserving the agricultural history of Bondurant. The design focused on developing a feasible and creative reuse of the existing structures that support downtown growth and tie into the city's future development.

Design Services

Concept Development:

- Created a multi-story mixed-use design including commercial, conference and residential spaces

Civil Design:

- Provided site grading and exterior redevelopment, including a PCC pedestrian space and a drive-thru to allow flexible access to the silos

Structural Design:

- Floor Framing includes interior C-channel ring beam system with spanning wide flange beams supporting composite floor
- Penthouse framing includes HSS columns & shear wall supporting tempered glass dome and resisting any torsional loads due to wind

Site Integration:

- Layout encourages economic development and public use while preserving the existing silo exterior to showcase agricultural history of Bondurant and what these silos represent.

Cost Estimate

Item	Cost
Demolition	\$ 345,812
Site Development	\$ 200,351
Concrete	\$ 109,670
Structural/Framing Steel	\$ 1,656,395
Floor/Roof Systems	\$ 299,411
Finishes	\$ 712,071
Construction Cost	\$ 3,323,710
Contingency (15%)	\$ 498,557
Administration Fee (10%)	\$ 332,371
Total Project Cost	\$ 4,154,638

References

- IBC-2021 S021 International Building Code
- The City of Bondurant Code of Ordinances
- Iowa Statewide Urban Design and Specifications (SUDAS)