PROJECTS:
1. Marana Bus Shelters [Funded]
2. AzCA Playground [Funded Outreach]
3. Interstitial Installation [College Service]
4. Bus Shelter Prototypes [Funded Outreach]
5. Wind Tunnel [College Service]
6. 2335 [Professional Practice]
7. D-Gallery Stair [Professional Practice]
8. Rose Pedestrian Bridge [Outreach]
9. Sexpartite [Creative]
Marana Bus Shelters: Funded Project | 2010-12 | delivered through paid student employees and 497/597b students

The Marana Bus Shelter project is a collaboration between the College of Architecture and Landscape Architecture at the University of Arizona and the Town of Marana. The project was seeded in the presentation of the Bus Shelter Prototypes project to the Regional Transportation Authority. Representatives from the Town of Marana were in attendance and were impressed with the design, delivery and performance of the prototypes; in terms of regional specificity, and the environmentally and socially sustainable approach.

As the principal investigator I was contracted to lead a student centered funded project for the design, development and delivery of two custom bus shelters that would comprise the transit center for the new Civic Center in the Town of Marana. I directed a team of two paid student interns, David Koenst and Kevin Moore, in the design and development of contract documents. The shelters were fabricated by a fabrication class [497/597b] taught by Jean-luc Cuisnier.

The Shelters are sited on opposite sides of Main Street, Marana. Each shelter is designed in response to the specific conditions of their respective sites. Both utilize a horizontal louver system calibrated to eliminate early morning and late afternoon solar exposure during the summer solstice. The louvers are configured in varied densities; wider and deeper to accommodate seated and standing occupant vistas. The louvered enclosure minimizes vertical surfaces typically prone to graffiti and facilitate a sense of security for the occupants as they eliminate concealed spaces. Both shelters harvest water from their roofs, directing the water shed, via prominent gutters and rain chains, to a small planter with the intention of evoking the regional importance of water and its ephemeral presence in the arroyos endemic to the region. Ceilings and seating areas are finished with Ipe wood.

The east shelter encompasses the sidewalk, requiring pedestrians to walk through the shelter. The west shelter is compact and justified to the street edge. The project was completed in fall 2012.

Funding: $69,948 Town of Marana
AzCA Playground: Funded Outreach Project | 2011-12 | delivered through arc451f11, independent studies and volunteers

The AzCA Playground project is a design-build challenge undertaken by a fifth-year studio in the School of Architecture at the University of Arizona. The studio was charged with designing and constructing a 5000sf playground for children 2-5 years of age. The playground is for the Arizona’s Children Association and is located on their campus in the City of South Tucson.

A public playground is a microcosm of the dialectical relationship between the cultures of risk and security. It is a physical manifestation of society’s values, and therefore holds a unique position in the constructed environment. It facilitates physical activity, stimulates the imagination and offers the opportunity for children to socialize. It is a venue for play, the work of children.

Pedagogically the project was conceived to provide students an educational experience that is analogous to professional practice and comprehensive in scope. The project opened with a pre-design phase. Student teams researched child psychology, early childhood educational theories and philosophies, playground history and global precedents, site analysis and playground codes and design guidelines mandated by the US Consumer Product Safety Commission. Performance criteria were defined as a result of the research: multi-use, multi-sensory, encourage movement, encourage social interaction, and stimulate the imagination through abstraction and complexity.

Students developed iterative schematic designs. Once the adopted design was vetted against the budget our team proceeded with shop drawings, fabrication and construction. The project was executed entirely by students from excavation, concrete walls, fabric formed concrete panels, steel climbing frames and barrier fabrication. Our team received great support in the form of knowledge, materials and equipment from numerous community entities. The project completed in December 2012.

Funding: $45,369 Communities Putting Prevention to Work Grant, $7000 Jeff Kozak, $7000 SOA.
**Interstitial Installation:** College Service Project, Internal Funding | 2012 | delivered through arc402s12

The Interstitial Installation project is a design-build challenge undertaken by a fourth-year studio in the School of Architecture at the University of Arizona. The project, located at the College of Architecture and Landscape Architecture, required the redevelopment of the interstitial spaces on the 2nd and 3rd floors between the original building and the 2007 expansion. The existing seating area was inadequate and uninspiring. The studio began with a survey of the CALA community and in response developed a program that required multiple modes of use: several individuals, multiple small groups and the ability to accommodate a full studio section for a review.

The students worked in teams to develop multiple iterative schematic designs. Each iteration increasingly responded to technical, budgetary and schedule feasibility. The adopted design is comprised of a serpentine bench, table, chalkboard and satellite element. The form of the seating area is nested about the perimeter of the interstitial area, accommodating existing egress and circulation paths, access to balcony vistas and a standpipe. The structure of the benches is comprised of a series of inverted pyramids. If they were configured in a straight line, they would lack stability. The bench therefore assumes a serpentine geometry to adapt to the site context and provide adequate stability. The width of the benches vary to accommodate various sitting forms and seating configurations. Each fixed seating area is complimented by a satellite element that can serve as a low table or bench that can be moved to further adapt the system. The color schemes of the powder coat finish were selected by survey of the CALA community. The finished tops are removable, enabling refinishing in the future.

The design embraces, but doesn’t mimic, the expressive functional language of the context and its passive transformation in response to the changing solar conditions.

The project was designed and fabricated by students in a six-week period and within the $6000 budget provided by the School of Architecture.

**USE:** the installation is designed in response to user surveys, accommodating multiple individuals, small group discussions and large group presentations while preserving vistas and circulation paths.

**COMPONENTS:** the structure is comprised of inverted pyramids, rendered in steel tubes and spheres; stability is achieved through a serpentine configuration. The seating surfaces are rendered in powder coated steel tubes.

**FABRICATION AND INSTALLATION:** students developed mock-ups, shop drawings and completed the fabrication and installation on time and within budget.
The bus shelter prototype project is a design-build challenge undertaken by a fifth-year research studio in the School of Architecture at the University of Arizona. The studio was charged with designing and constructing an adaptive modular system for regionally specific bus shelters. The region is subject to seasonally high temperatures and intense sunlight; extreme environmental conditions that inhibit broad utilization of the current bus shelter network. Current shelter designs adopted by the local transportation authority are designed about economy or vanity and universally fail to consider the comfort of the occupants in these unique environmental conditions. Through this project the studio is attempting to instill dignity in the use of local public transportation for the current ridership which is decidedly transit dependent. The new prototypical system design was adapted to site conditions representing the four cardinal orientations and resulted in the construction of four shelters.

Pedagogically the project was conceived to provide students an educational experience that is analogous to professional practice. Comprehensive in scope, the project opened with a pre-design phase comprised of an analytical survey of all existing local bus shelter types, written surveys and interviews of riders. A performance based program was developed, inclusive of all building, transit and accessibility regulations. Four sites were selected from the bus network’s 2252 stops. The final prototypical system design was derived from fifteen initial schematic designs and refined to ensure its ability to effectively adapt to the four cardinal orientations. The design development utilized physical and digital modeling to generate environmental and experiential simulations. Students were responsible for all aspects of the project delivery including design, development, consultant coordination, construction documents, shop drawings, material acquisition, fabrication techniques, cost estimation, project scheduling and construction logistics.

Funding: $20,000 Communities Putting Prevention to Work Grant, $3000 Drachman Institute
This project is the design, fabrication and installation of a contractionless wind tunnel for House Energy Doctor and Environmental Control Systems Laboratory at the College of Architecture, Planning and Landscape Architecture at the University of Arizona. I worked in collaboration with principal investigator Dr. Nader Chalfoun and paid student employees David Koenst and Andre Rodrigue. My responsibilities included a leadership role in design and development and fabrication.

We began the project by researching wind tunnel precedents and analyzing the wind tunnel performance criteria established by Dr. Chalfoun. As a result of an iterative design process we developed a design comprised of six modules: 1. Fan unit that draws air through the tunnel. 2. Transition module that mediates the cross-sectional geometry of the tunnel to that of the fan unit. 3. Testing module that accommodates the subject model, including means to view the model in the round and rotate the model 360 degrees about a single plane and emit visual analytical media. 4. Development module to introduce properties to the airflow. 5. Flow Management module to straighten the air in preparation for development. 6. Air intake module to collect external ambient air. The assembled wind tunnel is 32' long and has a cross-sectional area of 16sf and consists of steel frames, removable wood panels and a testing module fenestrated in the round. The modular design allows disassembly such that each module can be removed for maintenance and alteration. The wind tunnel is also equipped with external armatures to accommodate lighting, analytical and documentation equipment.

The CAPLA wind tunnel is a powerful empirical instrument that expands the laboratory capabilities and tradition of the building technology curriculum of the School of Architecture. We are now, one of only three architecture schools in the nation to own and operate a contractionless wind tunnel.
Biblioteque Ste. Genevieve, Henri Labrouste, Paris, France

This project is the renovation of a four-thousand square foot territorial style adobe residence built in the 1940’s and located in central Tucson, AZ. The clients are a lawyer and writer returning to Arizona after having lived for many years on the east coast. They are discerning, informed and were very engaged in the project from programming through construction administration.

Considering the property’s status on the Historic Registry, the renovation was restricted to areas of the house that were not visible from the street. The renovation was conceived to respect the existing features to remain including adobe brick, saguaro rib and exposed beam ceilings through surgical preservation and the articulation of new interventions and adaptations. Although distinct, new design components were conceived to relate and interact with the existing conditions through parallel systems of order and texture.

The project involved a substantial millwork package comprised of 17 different units in 9 rooms. The new millwork is rendered in cnc fabricated plywood carcasses and faces, and outfitted with laser-cut and brake formed steel pulls. The millwork is scored to aesthetically unify the highly specific and irregular program. The scoring is rooted in the rustic kitchen millwork the clients were adamant on preserving. In order to express this textural export, the existing rustic millwork was expanded with reclaimed materials reconfigured to render niches for art, appliances and additional storage. This adapted millwork reconfigures the orientation of the boards in a playful manner that qualifies and liberates the relentless verticality of the existing tongue and groove character. The new millwork is stained only on the exterior surfaces to emphasize the veneer and is revealed where niches occur and the custom pulls are recessed into the routered face panels to expose the end grain of the laminated plywood. Out of a sense of economy and in order to establish hierarchy the millwork was designed with varying degrees of intensity; where secondary spaces such as guest bedrooms are rendered with paint grade materials and tertiary such as laundry spaces are rendered smooth, free of scoring.

pedestrian and vehicular gates: a system of vertical members bound by horizontal billets originates in the original gates remaining at the entry foyer, it is abstracted and employed in the design for the new gates.

kitchen renovation: scoring logic of new plywood cnc millwork extends from texture of existing and expanded rustic millwork, pulls are laser cut, brake formed with gunmetal finish.
The clients were interested in introducing green technologies. Accordingly, the design includes a comprehensive water harvesting design comprised of a new commercial grade EPDM roof that redirects water to new scuppers and a system of five cisterns located to provide water strategically to the planted areas. The design includes a 4.3kw photovoltaic array.

The project includes new vehicular and pedestrian gates that utilize materials and ordering systems rooted in the original iron gates remaining at the entry foyer. The system of vertical members bound by horizontal billets is abstracted and employed in the new gates.

**master bathroom:** designed to maximize limited space and openness, a glass wall looks out to a private courtyard, offering privacy yet exposure to the natural elements.

**guest bathroom:** millwork is an extension of logic employed throughout the project, scoring provides texture that unifies a specific and irregular program, the orientation of the pulls correspond to the operation of the panels.
This stair was designed in collaboration with Point B Design, an architecture firm located outside Philadelphia that specializes in digital design and fabrication technologies. The stair connects the principal space to a second story ancillary space in a private art gallery. This project is the result of a digital conversation that began with the definition of programmatic and experiential criteria, evolved through the proposition and evaluation of multiple parametric logics.

The final design components were digitally fabricated and field assembled. The stringer, comprised of welded plate steel, is effectively a hollow box beam formed with tapering extremities to express the graduation of the flexural stresses along its length. The treads, risers and handrail standards were fabricated of welded, laser cut plate steel; the screen is of steel rod.
The pedestrian bridge has a 60’ clear span and utilizes form specific beams articulated to express the graduation of moment stress and the specificity of pin connections. In plan the bridge increases in width at the center to create a sense of place and to reflect the subtle camber of the elevation.

The bridge is located in the Rose Neighborhood in Tucson, Arizona. It traverses the rodeo wash bound by West Columbus street to the north and Rose Elementary School to the south. The wash is located within a parcel recently developed as a park with amenities such as walking paths, exercise features and ramadas. The parcel is one half mile long and 200 feet in width. The proportions of the site, its size and its location effectively create a barrier between much of the neighborhood and the school. The existing bridge was in a state of disrepair; unsafe and contributing to an air of neighborhood blight. The proposed design was developed in close collaboration with community representatives. The design was the basis of a neighborhood improvement grant proposal submitted to Pima County in 2005. The proposal was accepted and the project received $305,000 in funding. Structural Grace received the contract for engineering services. The completed design was installed in October of 2009.

This project was designed as an outreach service through the Drachman Institute of the College of Architecture and Landscape Architecture at the University of Arizona. I served as the faculty lead in collaboration with colleague Dale Clifford and students Ryan Meeks and Doug Weibel in the development of the design. We worked closely with Kyrin Alves of Rebuilding Together Tucson, who facilitated the grant writing.
Sexpartite: Sheet Steel Table Base | 2006-07

This table base was designed as an exploration of furniture design about the criteria: geometry, material and ergonomics.

The fundamental concept for the table is based in geometry; a circle in plan considered radially in three and six parts. The legs and arms are comprised of six independent identical pieces, curved and coupled with alternating adjacent pieces to form a continuous woven structure.

Ergonomically it is designed as a dining table specifically for three people. The ergonomic criteria were simple yet critical; the number of occupants determines the numeric basis of the geometry and the diameter of the table top. The vertical and horizontal extents of the legs and arms are calibrated to accommodate the legs of the occupants and to maximize stability.

It is comprised of six angled pieces of 18 gauge mild sheet steel. The pieces are identical and laser cut. A custom brake was fabricated in order to render a specific curvature; the material was secured during the brake forming process by a series of registration pins inserted into holes later used for assembly.

The arms receive the glass table top and the legs receive the surface of the ground with hard rubber tear-dropped pieces nested between the steel sheets and are secured by two pins to prevent rotation.