

RECUERDOS, {Souvenirs}

Ronald Rael & Virginia San Fratello

RAEL SAN FRATELLO ARCHITECTS

But when one draws a boundary it may be for various kinds of reasons. If I surround an area with a fence or a line or otherwise, the purpose may be to prevent someone from getting in or out; but may also be part of a game and the players be supposed, say, to jump over the boundary; or it may show where the property of one man ends and that of another begins; and so on. So if I draw a boundary line that is not yet to say what I am drawing it for. — Wittgenstein¹

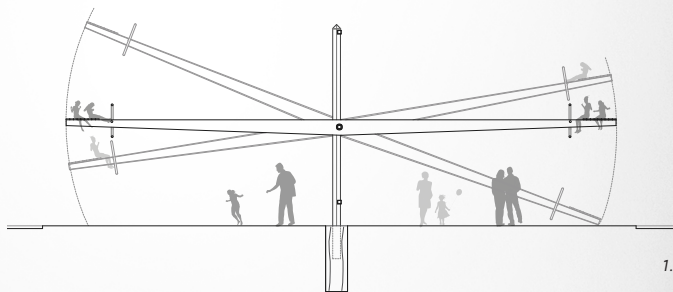


Fig 1. Teeter Totter Wall Section

Fig 2. The trade and labor relationships between the U.S. and Mexico are in a delicate balance, as witnessed in the Teeter Totter Wall

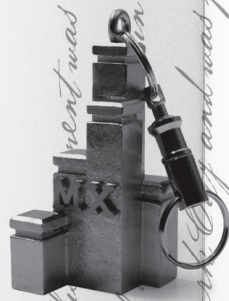
Fig 3. Cross-border volleyball game at Friendship Park, CA and Tijuana, MX

RECUERDOS, {Souvenirs}

On this journey along the border, a series of souvenirs, or *recuerdos*, a word which has the dual meaning describing both the tangible objects and the images we store in our memory, are collected. The liminal spaces that forged these moments along the wall were created by The US Secure Fence Act of 2006, which funded the single largest domestic building project of the twenty-first century. It financed approximately 800 miles of fortification dividing the US from Mexico at a cost of up to \$16 million dollars per mile.² The construction of this wall has transformed large cities, small towns, and a multitude of cultural and ecological biomes along its path. The wall was envisioned for a *tabula rasa* defined by former Department of Homeland Security Secretary Michael Chertoff who was given the unprecedented power by President George W. Bush to waive any and all laws to expedite the wall's construction.³ Ultimately, 30 laws were waived or suspended for the construction of the wall, including important environmental, wildlife, and Native American heritage protections. Ignoring the diverse contexts found along the border raises critical questions of ecology, politics, economics, archaeology, urbanism, and eminent domain, and radically redefines the territories of the *frontera*.

Una biblioteca binacional, construida en la línea divisoria, transforma el muro fronterizo en un lugar donde las ideas pueden cambiar.

Published by U.S. Border Patrol



*Handpocket Architecture,
37 E. Seventh Street
New York, NY 10003*



*The monument was made
of
your life and was placed
here to commemorate
the border.*



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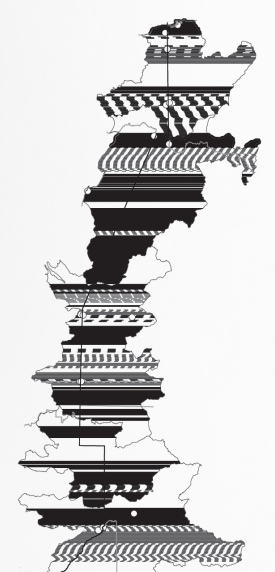
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Fig 4.,5. In 1891, prior to the construction of the wall, a boundary commission was created to assume the task of re-marking the border with a series of monuments. Border Monument Keychains, for which there is no key, were collected along the journey.

Fig 6. Excerpt from the postcard series

Fig 7. Map of existing fence types along the U.S. - Mexico Border



- Double Wall
- - 18' Steel
- 10' Steel
- - - 13' - 16' Steel Mesh
- Vehicular Barricade
- - - Virtual Wall
- Under Construction/Proposed

7.

TYOLOGIES

The over 800 miles of U.S. - Mexico border wall is organized in single, double, triple or more layers depending on the topography, incidence of crossings and available patrol resources. The wall is fabricated from steel, wire mesh, concrete and older sections are constructed of re-purposed Vietnam-era Air Force landing strips. It makes use of high-tech surveillance systems—aerostat blimps, subterranean probes, and heat sensors. Walls can be defined by the following typologies:

PEDESTRIAN {*peatonal*}

Constructed to prevent pedestrian crossing and often has a high transparency for surveillance.

VEHICULAR {*vehicular*}

Designed to withstand the impact of a large vehicle, often with a heavy concrete base.

HYBRID {*híbrido*}

Contains features of both pedestrian and vehicle walls.

LEEVE {*dique*}

Used along rivers to control flooding and prevent illegal crossings.

NATURAL {*natural*}

Rivers, deserts, temperature extremes, rough terrain are all considered natural barriers.

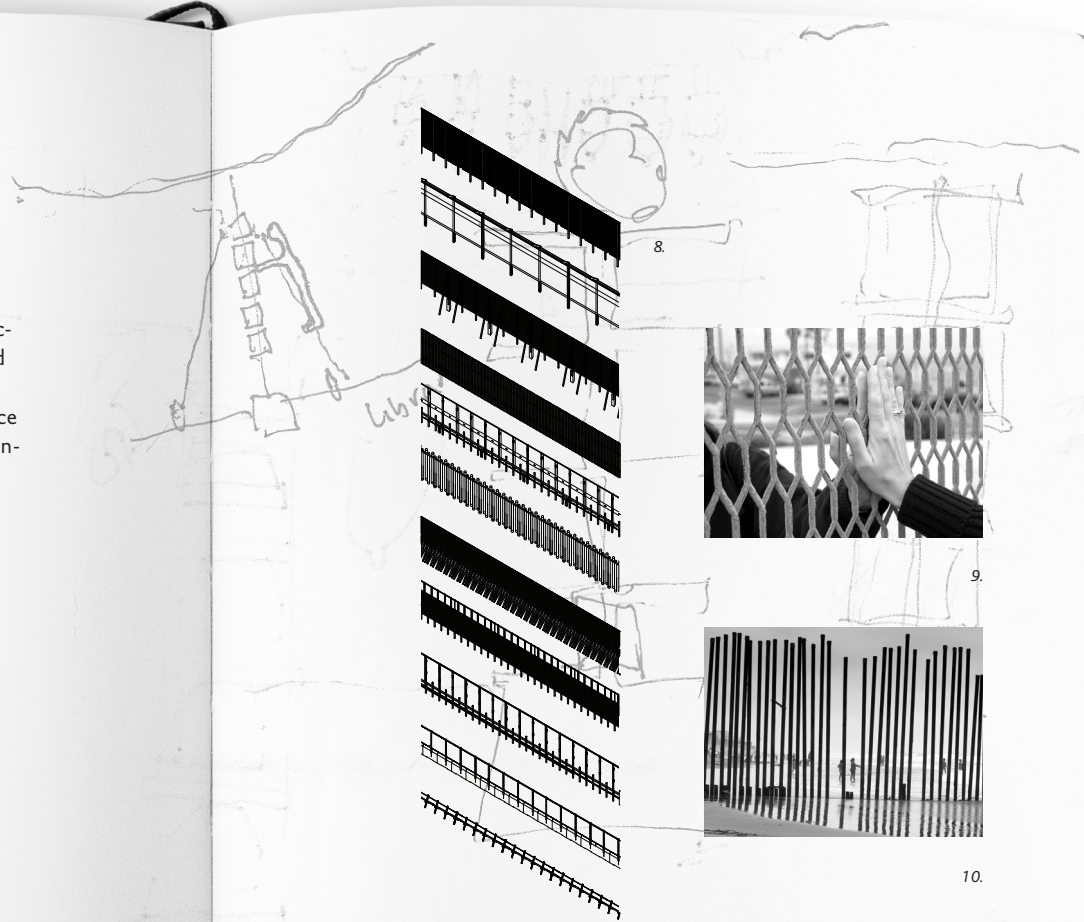
VIRTUAL {*virtual*}

Employ technologies such as motion detection, radar, sonar, infrared, wifi and photography.

Fig 8. Typical wall types along the U.S. - Mexico Border

Fig 9. "Pedestrian Walls" divide families, communities and social networks

Fig 10. Porosity and transparency are common characteristics of the barrier



The concept of “national security” governs and militates construction and design of the wall as the success of the wall has been measured in the numbers of intercepted illegal crossings. However, the wall, at such prices, should be thought of not only as security, but also as productive infrastructure—as the very backbone of a borderland economy and ecosystem. Coupling the wall with viable infrastructure, focusing on water, solar energy, and urban social infrastructure, is a pathway to security and safety in border communities and the nations beyond them. This proposition is for a wide array of retrofits and new typologies for the US-Mexico border wall that build on existing conditions and seek to ameliorate problems created by the physical divider.

OBSERVATIONS

On this journey along the wall, it is discovered that the wall is fraught with a wide range of uses beyond a security infrastructure because:

The Wall is a common wall like those where special laws govern walls shared by neighboring properties. When a neighbor alters the common wall if it is likely to affect the property on the other side. Although each wall has two sides, altering a wall on one side will affect the wall and the space on the other side.

The Wall is an attractor. The current border wall is meant to keep people out and away, but instead, it serves as an attractor that engage both sides in a common dialogue.

The Wall is temporary and is constructed with the consideration that it will eventually be removed or reconsidered—creating a post-border wall condition that must reconcile the liminal space it once defined.

Over 700 miles of barrier have been constructed since 2006 at a cost of \$3.4 billion. Additionally, the new wall has already been breached over 3,000 times, incurring \$4.4 million in repairs. The construction and maintenance costs are estimated to exceed \$49 billion over the next 25 years and there are several hundred more miles of wall construction recently proposed.⁴ While recent statistics show a 50 percent drop over the past two years in the number of people caught illegally entering the United States from Mexico, human rights groups put the number of deaths during attempted crossings at its highest since 2006—almost 6,000 deaths have occurred since 1994.⁵



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Fig 11. The construction of the fence dividing the Tohono O'odham Nation unearthed remains from a Native American burial site.

Fig 12. Families embrace through the barrier. Photo courtesy of Sandy Huffaker

DESIGN

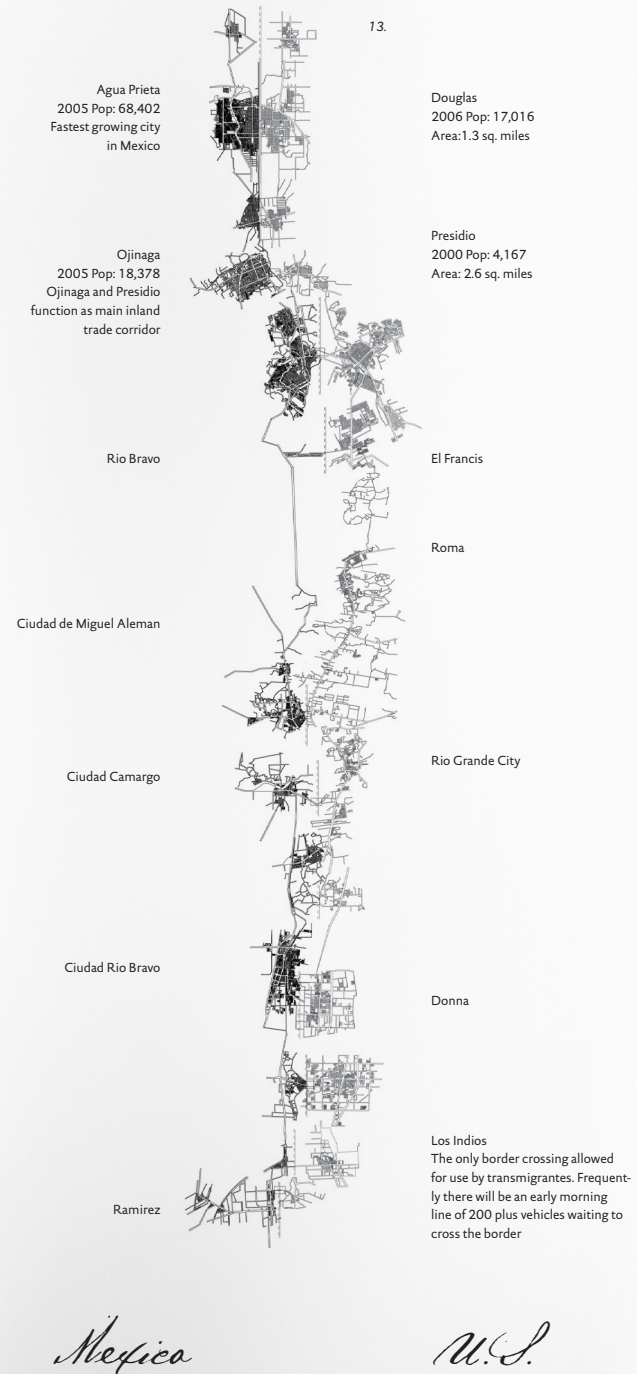
For the most part, architects and designers have stayed away from the border security issue. Ricardo Scofidio said about architects involvement in a border fence project, "It's a silly thing to design, a conundrum. You might as well leave it to security and engineers." ⁵ Rem Koolhaas, who studied the Berlin Wall, made the following observation:

"the Wall was not really a single object but a systemit was one wall that always assumed a different condition." ⁶

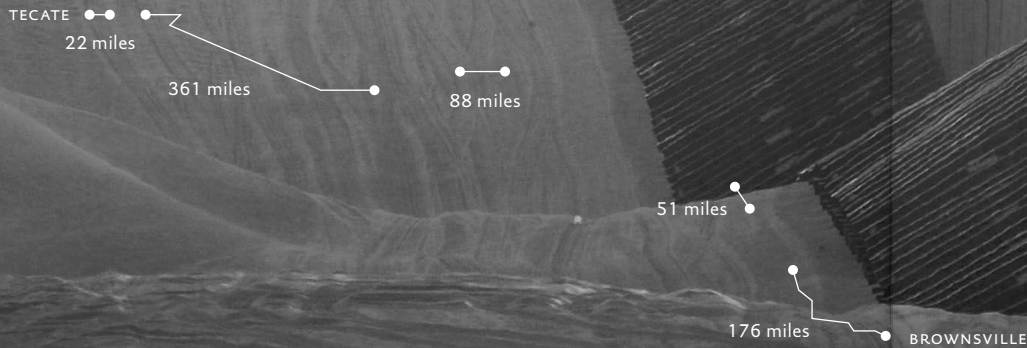
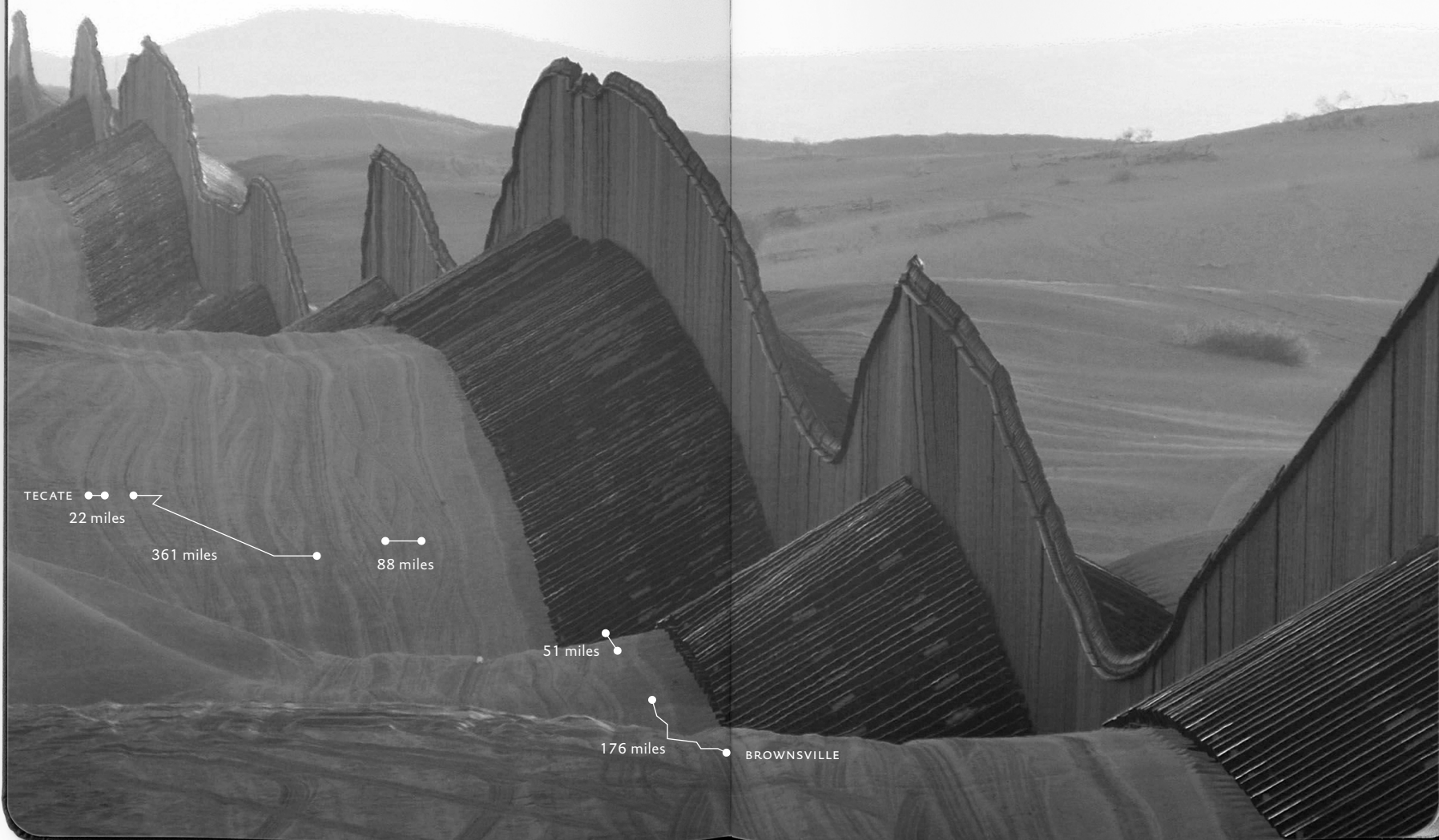
This is also true for the US-Mexico wall. It has created a paradoxical territory of horror, transformation, and flux, but at a much larger scale. It divides rivers, farms, homes, public lands, cultural sites, wildlife reserves, and migration routes, and was planned to cut through a university.

While the wall is always constructed on US soil, in many places it is constructed as far as two miles away from the actual territorial border. Removed from the market economy, this land in between the political boundary of the United States and the security barrier loses its productive value. Estimates suggest that there are approximately 40,000 acres of US land that will lie on the Mexican side of the border wall—an area equal to twice the size of Manhattan. To counter this economically neutralized land, the security infrastructure must be put to work through contextual engagement and investment.

Fig 13. Sister Cities along the border drawn as contiguous megacity



The \$40 million "floating fence", or "sand dragon" is built atop the sand dunes in the dusty, hot land between Yuma, Arizona and Calexico, California. As sand builds up along its edges, sections of fence can be lifted by a machine and placed back on top of the sand, so the fence never loses its height. The almost seven miles of floating fence cost about \$6 million per mile to build.



WATER INFRASTRUCTURE

The border wall has already proven to be an effective, if accidental, water collection system. Water from desert rains typically drain across the border—yet in areas such as the port of entry at Sonoyta and Organ Pipe Cactus National Monument, or in the Ambos Nogales, the fence acts as a dam, causing flooding and environmental damage. Border walls also block animals from food and water sources, which leaves them especially vulnerable in times of drought. When water collection is considered proactively, it can become a system with transformative consequences for the desert communities along the border.

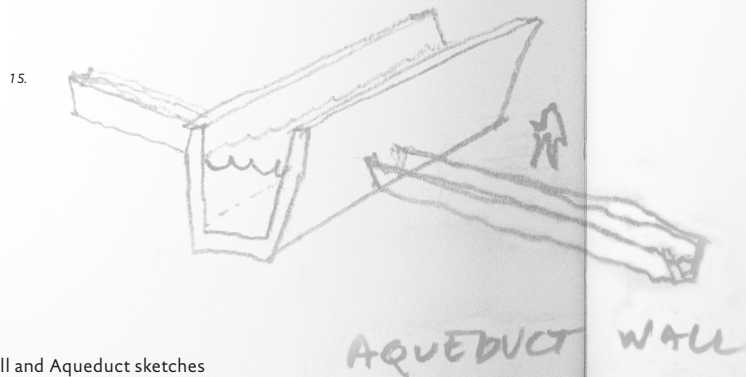


Fig 14., 15. Trough Wall and Aqueduct sketches

Fig 16. Deer are blocked from their natural migration routes in search of water near Arizona's Riparian National Conservation Area

Fig 17. Flooding in Nogales, AZ and Heroica Nogales, MX



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WATER TREATMENT: CALEXICO, CA - MEXICALI, MX

The New River is considered the most polluted river in the United States.⁷ It flows north from Mexicali and crosses the border at Calexico. New River toxicity is comprised of chemical runoff; pathogens like tuberculosis, hepatitis, and cholera; and fecal coliform bacteria, which at the border checkpoint far exceeds US-Mexico treaty limits. The New River then flows through the Imperial Valley, which is a major source of winter fruits and vegetables, cotton, and grain. While the Secure Fence Act of 2006 was enacted, according to President Bush, to “help protect the American people” from illegal immigration, drug smuggling, and terrorism, the New River represents a far more dangerous flow north from Mexico in need of containment.⁸

A wastewater treatment wall located in the two-mile-long wasteland that buffers Mexicali from the Imperial Valley is a solution to the “illegal entry” of toxins to the US.

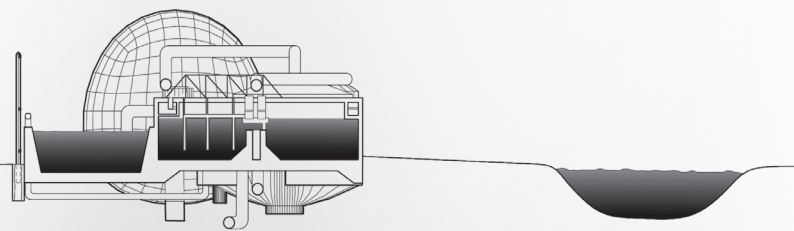
The pollution problem is expected to worsen as Mexicali’s population, already at 1.3 million, continues to expand without adequate infrastructure. For \$33 million, the same cost as the wall that divides Calexico and Mexicali, it is possible to construct a wastewater treatment facility with the capacity to handle 20 million gallons per day of effluent from the New River. This proposed facility is composed of a linear pond filtration and purification system, creating a secure border infrastructure. The by-product of the wastewater treatment facility would include methane and water, a combination that could power a series of lit, green corridors, creating a healthy, social infrastructure that could join these growing border cities.

Fig 18. Wastewater treatment plant cleans toxins from the New River

Fig 19. Wastewater treatment plant section



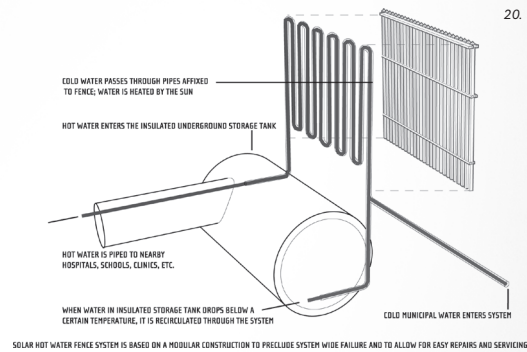
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HOT WATER: DOUGLAS, AZ - AGUA PRIETA, MX

In urban environments, the border wall can be coupled with hot water production, creating low-cost additional resources that supplement the infrastructure of rapidly growing border cities. The massive steel walls are enormous heat absorbing agents, and they could easily be retrofitted with panels that produce hot water, which is a much-needed amenity in border cities. The hot water could then be used in markets, clinics, hospitals and schools.



LIFE SAFETY: PRESIDIO, TX - OJINAGA, MX

When water collection is coupled with solar energy, it also offers a key component for the establishment of life safety beacons along the border. The principal cause of death among migrants attempting to cross the border illegally is dehydration. Solar generated electricity could power beacons that inform border patrol of both immigrants or American citizens who find themselves in danger in the harsh extremes of the southern deserts. The photovoltaic panels would also be designed to collect water runoff; to power atmospheric water extractors; or to pump water from wells or rivers that could be stored, purified and dispensed as needed to distressed crossers in the desert. Engaging the water dispenser, or even approaching the life safety beacon would alert border patrol. Such devices could also ameliorate the effects that access to water has on wildlife, who find themselves unable to travel their natural routes in search of water.

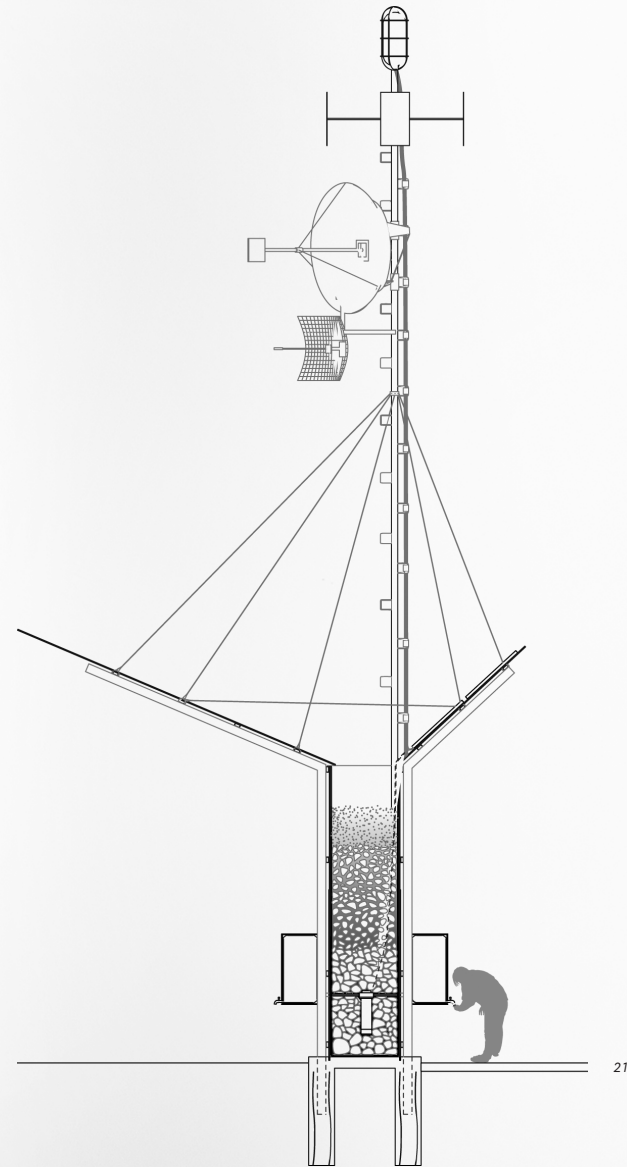


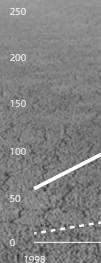
Fig 20. Hot water wall system

Fig 21. Life Safety Beacon section

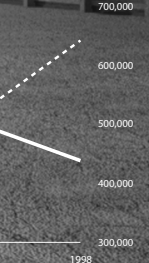


Solar horizon

Number of deaths



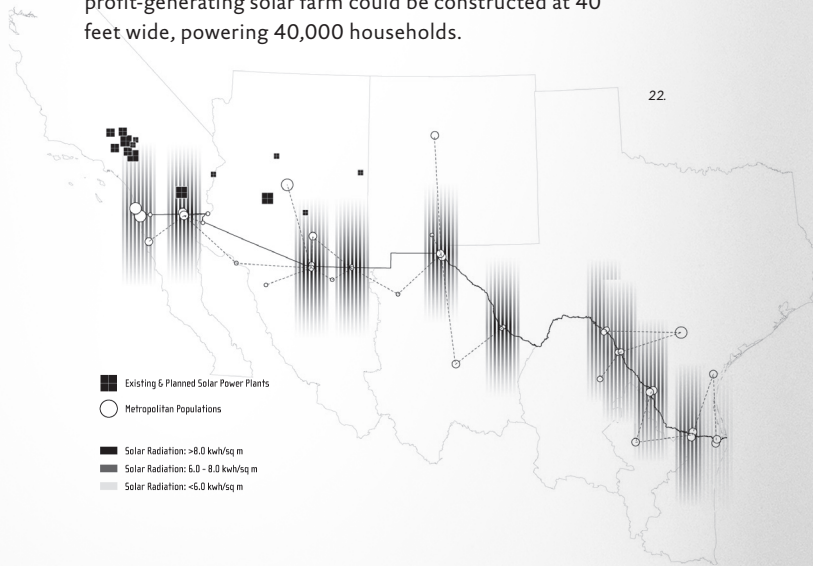
Number of apprehensions



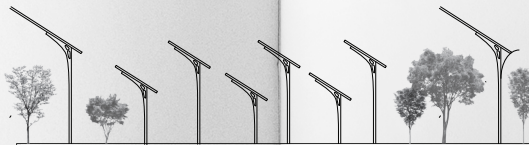
--- Deaths
— Apprehensions

SOLAR INFRASTRUCTURE

Building upon the installation of photovoltaics along the border, it is important to note that the most untapped potential for solar development in the United States lies along the US-Mexico border. Solar farms, in turn, are highly secure installations. Re-allocating funds used to construct and maintain the border wall for the construction of energy infrastructure along the border creates scenarios that, in many instances, are more secure than the existing wall, and simultaneously provide solar energy to the Southwest. The stretch between Nogales and Douglas saw 87 miles of border wall construction at a cost of \$333.5 million, while the largest solar farm in the world, the Olmedilla Photovoltaic Park in Spain, cost \$530 million. For \$333.5 million, 54 miles of profit-generating solar farm could be constructed at 40 feet wide, powering 40,000 households.



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Fig 22. Solar potential map

Fig 23. Border Solar Park section

Fig 24. Nogales Fence, 1929

Fig 25. Nogales Solar Wall today



According to the U.S. Dept. of Energy, One square foot of land along the U.S.-Mexico border can generate up to 260 kilowatts of electricity in one year - enough to power a household dishwasher for a year.

SOCIAL INFRASTRUCTURE

While most of this journey has been focused on public utility-style resources, the importance of social improvements along the border should be stressed. Exercise and eating, for example, are social activities where networks between people with common interests are formed. Social capital, a concept that refers to the value of social relations and the role of cooperation and confidence to achieve collective or economic results, can be produced by such networks and is a core element in the fabric of communities: social capital can produce safety and security, friendship and community, civic identity and economic value. Over time, social capital builds “social infrastructure,” in the form of parks and other civic amenities—a key element in the health of communities. One of the most devastating consequences of border wall security is the division of communities, cities, neighborhoods, and families—the erosion of social infrastructure. Despite this, sports have served as a way to cope with the realities of the wall.

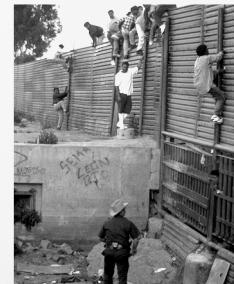
CLIMBING WALL: OTAY MESA, CA | TIJUANA, MX

“Show me a 50-foot wall and I’ll show you a 51-foot ladder...” – Janet Napolitano

This comment has become a mantra for describing the fence’s inadequacies as various techniques are used to surmount the wall. Artist Judi Werthein has created special shoes called *Brincos* (jumpers) – “crossing trainers” – designed to help illegal immigrants negotiate the sometimes deadly terrain they encounter when crossing the border from Mexico to the U.S. Various makeshift platforms/ ramps have also been erected to allow cars to drive over the border fence. With the Climbing Wall, the act of climbing the fence becomes not more difficult, but more challenging, as it employs rock climbing wall profiles with various routes and grading.



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Fig 26. The Climbing Wall creates challenges on both sides for surmounting the barrier

Fig 27. Since its construction, the wall has been breached over 3000 times

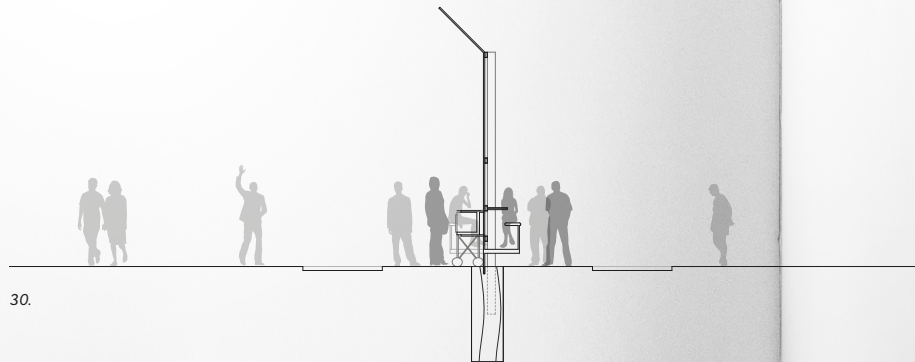
Fig 28. Brincos: shoes designed for traversing the border

TORTILLA WALL: FRIENDSHIP PARK, CA | TIJUANA, MX

Casual exchange is not uncommon across the border wall. Friendship Park was one of the few places on the border where people from Mexico and the U.S. could meet and talk across the frontier. Families would set up beach chairs on both sides of the fence for picnics, lovers would clasp fingers through the mesh and embraces from family and friends through holes in the fencing could occur. Commercial exchanges also took place, albeit illegally, even between thirsty and overheated U.S. Border Patrol agents and humble *raspado* salesmen on the other side. The Tortilla Wall is the name given to the 14 mile section of wall between the Otay Mesa Border Crossing and the Pacific Ocean. Sections of this wall accommodate food carts built into the wall. The proximity to the wall and the security overhang create shade. Seating is built into the wall and food, conversation or a bi-national meals can occur across the border.



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Fig 29. A piece of tortilla is passed through the fence

Fig 30. Tortilla Wall section

Fig 31. The wall becomes a point of exchange for cross-border dialogue

Fig 32. Built-in food carts on the Tortilla Wall

LINEAR PARK: CALEXICO, CA | MEXICALI, MX

Using the border as an armature for a linear urban park through certain urban geographies could offer pedestrian and bicycle routes through the city. The linear park, in turn, could increase adjacent property values and the quality of life on both sides of the border while providing an important green corridor through the city. Border towns lack the infrastructure that allows them to be sustainable, healthy cities and a border wall that integrates pedestrian transportation networks within the city, while promoting border security and decreasing automobile emissions. Trails support an active lifestyle that improves health. Physical activity helps prevent heart disease, diabetes, osteoporosis, obesity, colon cancer and depression. An increase in physical activity can save millions in health care spending. Tourism and recreation-related spending on items such as bicycles and in-line skates are just a few of the ways a bicycle path wall can positively impact community economies. Several of the social infrastructure proposals presented thus far could also be organized along this park.



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Fig 33. Bicycle/Pedestrian Wall in Calexico, CA and Mexicali, MX

Fig 34. Jogging, riding and dog-walking along the security barrier

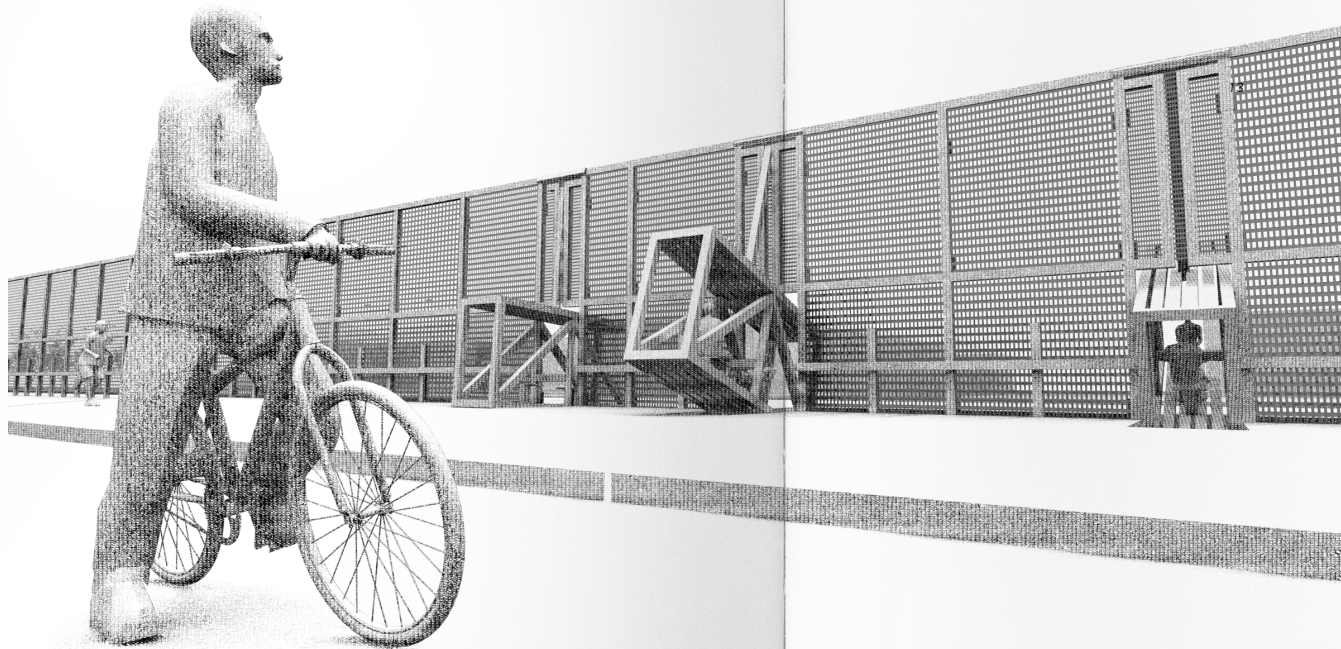
Fig 35. Linear Park with access to green corridors in the sister cities



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SWING WALL: CHAMIZAL NATIONAL MEMORIAL, TX

The Treaty of 1884 went on to maintain that alterations to the border had to result from gradual natural causes. This provision followed the long-established doctrine of international law that when changes in the course of a boundary river are caused by a deposit of alluvium, the boundary changes with the river, but when changes are due to avulsion, the old channel remains the boundary. The river continually shifted south between 1852 and 1868, with the most radical shift in the river occurring after a flood in 1864. By 1873 the river had moved approximately 600 acres, cutting off land that was in effect made United States territory. The newly exposed land came to be known as El Chamizal, and eventually the land was settled and incorporated as part of El Paso. Both Mexico and the United States claimed the land. In 1895, Mexican citizens filed suit in the Juárez Primary Court of Claims to reclaim the land. The Swing Wall allows participants riding on the swing to cross back and forth across the border, but at all times remain securely on their respective sides.

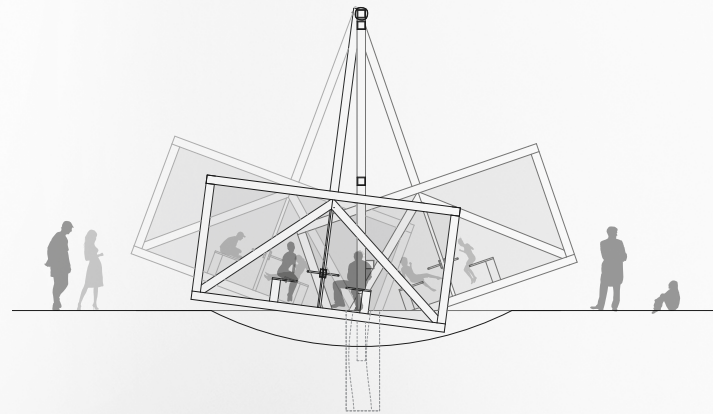
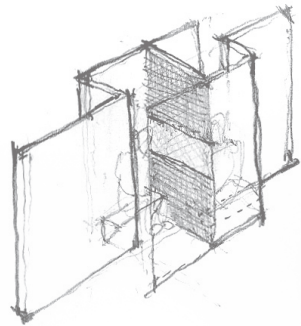
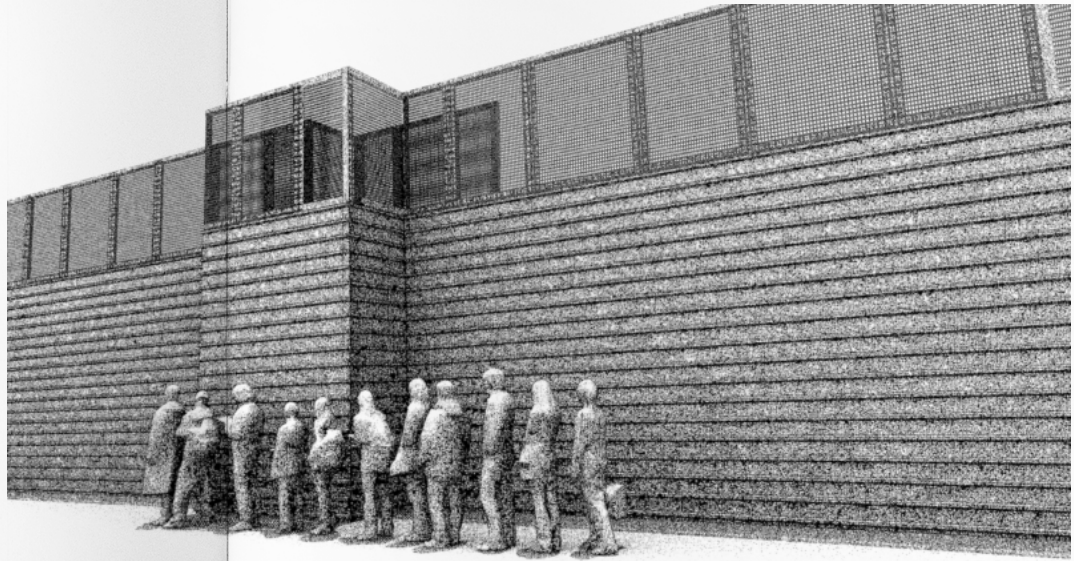


Fig 34. The Swing Wall allows riders to traverse back and forth across the border without leaving their home country

Fig 35. Swing Wall section



CONFESSIONAL WALL



CONFESSIONAL: FRIENDSHIP PARK, CA | TIJUANA, MX

The division created by the wall often heightens border exchanges. In Friendship Park, a beach park that spans both San Diego, CA and Tijuana, Mexico, intimate exchanges are common. Each Sunday afternoon Holy Communion is offered through the fence –increasingly as an act of civil disobedience. Here the fence serves as an opportunity for confession, with both confessor and priest must ask that his trespasses be forgiven as they must transcend the border to perform the rite.

Fig 36. Confessional Wall detail sketch

Fig 37. Confessors stand in line to confess their crossing of the border illegally

Fig 38. Both confessor and priest transgress the border in the Confessional Wall





The Biblioteca Binacional in Las Ambos Nogales allows transnational exchanges of books, ideas and knowledge in this cross-border book exchange program.

LABYRINTH: FRIENDSHIP PARK, CA | TIJUANA, MX

While a maze refers to a path with multiple choices, a labyrinth is a single path with a specific destination. In the case of migrants traveling from the south, there is only one intended destination, the United States, and the hope for greater opportunities. The wall represents only one of the obstacles that makes the journey difficult to navigate. The Labyrinth Wall compresses those obstructions into a single moment and also represents the enormous expense, complexity and effort in the construction of the U.S.-Mexico Border Wall.

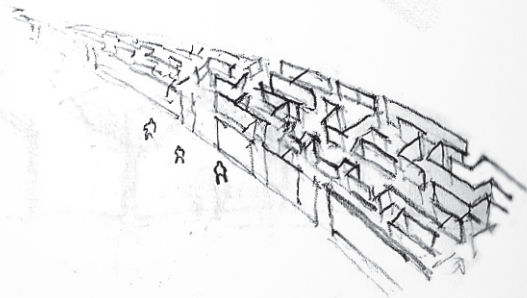
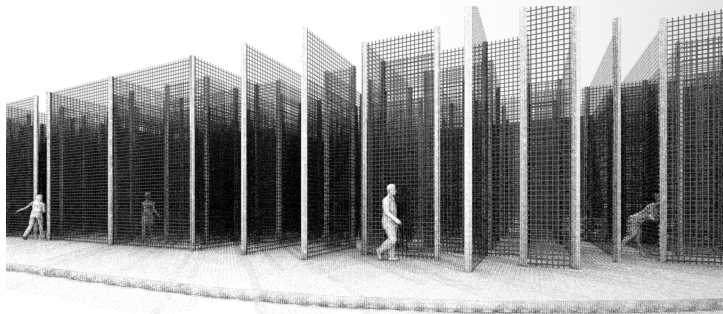
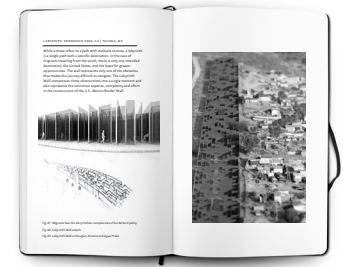
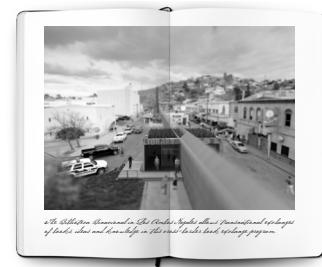


Fig 39. Migrants attempt to move to the labyrinthian complexities of borderland policy

Fig 40. Labyrinth Wall sketch

Fig 41. Labyrinth Wall at Douglas, Arizona and Agua Prieta





“What I seek to convey is the historic truth that the United States as a nation has at all times maintained opposition—clear, definite opposition—to any attempt to lock us in behind an ancient Chinese wall.” (Jan 6., 1941) — Roosevelt¹³



Footnotes

1. Ludwig Wittgenstein quoted in Judith Genova, *Wittgenstein: A Way of Seeing* (London: Psychology Press, 1995), 122.
2. For a previous version of portions of this research, see Ronald Rael, “Commentary: Border Wall As Architecture,” *Environment and Planning D: Society and Space* 29 (2011): 409-420.
3. While there are a number of architectural definitions for “barrier,” Chertoff describes the intervention as a “tool.” See Michael Chertoff, *Homeland Security: Assessing the First Five Years* (Philadelphia: University of Pennsylvania Press, 2009), 42.
4. See Tyche Hendricks, “Study: Price for Border Fence Up To \$49 Billion,” *San Francisco Chronicle*, January 8, 2007.
5. See Spencer S. Hsu, “Border Deaths Are Increasing,” *Washington Post*, September 30, 2009.
6. William Hamilton, “A Fence with More Beauty, Fewer Barbs,” *New York Times*, June 18, 2006.
7. Hans Ulrich Obrist, “Part 1: On Berlin’s New Architecture,” in *Interviews*, vol. 1, ed. Thomas Boutoux (Milan: Charta, 2003), 507-528.
8. See “Report: Faulty Design Turned Border Fence Into Dam,” *Arizona Daily Star*, August 15, 2008.
9. David McLemore, “Texas To See Border Fence Construction Next Year Despite Opposition,” *Dallas Morning News*, December 5, 2007.
10. George B. Frisvold and Margriet F. Caswell, “Transboundary Water Management Game-theoretic Lessons for Projects On the US-Mexico Border,” *Agricultural Economics* 24 (2000): 101-111.
11. George W. Bush, “Introductory Speech at the Signing of the Secure Fence Act,” Washington DC, October 26, 2006.
12. Karl Eschbach, Jacqueline Hagan, and Nestor Rodriguez, *Causes and Trends in Migrant Deaths Along the U.S.-Mexico Border 1985-1998* (Houston, TX: Center for Immigration Research, University of Houston, 2001).
13. Franklin D. Roosevelt, “Four Freedoms,” in *Great Speeches*, ed. John Grafton (New York: Dover Publications, 1999), 93.