CHAMIZAL ESTADIO DE LA COMUNIDAD
Chamizal community stadium
U.S. - MEXICO BORDER
The US-Mexican border over centuries
Accelerated through the fear from the attacks of 9/11 and all what followed, the so-called "Western Society" is constructing the greatest wall ever build on this planet. On different building sites on all five inhabitable continents, walls, fences and high-tech border surveillance are under construction in order to secure the citizens and their high quality of life within this system.

The fall of the Berlin Wall was described as the historical moment that marks the demolition of world's last barrier between nation states. Yet it took the European Union only six years to create with the Schengen Agreement in 1995 a new division only 80km offset to the east of Berlin. Together with the wall in Israel, the US-Mexican border, the Australian Coast Defence and the DMZ in Korea, it makes part of a worldwide system that contains an exclusive society (14% of world's population) with an average income of €2.500,-/month versus the ones in front of the wall with an average income of only €150,-/month.

Walled World

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage of World's Income</th>
<th>Percentage of World's Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>western</td>
<td>73%</td>
<td>14%</td>
</tr>
<tr>
<td>eastern</td>
<td>27%</td>
<td>86%</td>
</tr>
</tbody>
</table>

The United States–Mexico barrier consists out of several separation barriers designed to prevent illegal immigration into the United States. The 3,140 km border between the United States and Mexico traverses a variety of terrains, including urban areas and deserts. The barrier is located mainly in the urban sections of the border which include San Diego, California and El Paso, Texas. Between 1998 and 2004, 1,954 persons are officially reported to have died along the US-Mexico border. On May 17, 2006 the U.S. Senate approved a possible extension what could be 600 km of triple layered-fencing and a vehicle fence.

Greenland and the Faroe Islands are integrated in the Schengen Zone with the exception of the Free Movement of Persons aquis.

Future Schengen Border

Schengen Border is an agreement among European states which allows for common policy on the temporary entry of persons and a border system. A total of 26 countries – including all European Union states except the Republic of Ireland and the United Kingdom, but including non-EU members Iceland, Norway, and Switzerland – have signed the agreement and 15 have implemented it so far.

The Republic of Ireland and the United Kingdom did not sign the Schengen Agreement but take part in the Schengen co-operation and use the Schengen Information System for law enforcement purposes.

The West Bank barrier is a physical barrier being constructed by Israel consisting of a network of fences with vehicle-barrier trenches surrounded by an on average 60 meters wide exclusion area and up to 8 meters high concrete walls. As of January 2006 the length of the barrier as approved by the Israeli government is 670 kilometers. Approximately 36% has been constructed, 25% is under construction, 20% has been approved but construction has not yet begun, and the remaining 19% awaits final approval.

The Demilitarized Zone (or DMZ) in Korea is a strip of land running across the Korean Peninsula that serves as a buffer zone between North and South Korea. The DMZ was created in the ceasefire of July 27th 1953 and cuts the Korean Peninsula roughly in half. It is 248 km long and approximately 4 km wide.

The West Bank barrier is a physical barrier being constructed by Israel consisting of a network of fences with vehicle-barrier trenches surrounded by an on average 60 meters wide exclusion area and up to 8 meters high concrete walls. As of January 2006 the length of the barrier as approved by the Israeli government is 670 kilometers. Approximately 36% has been constructed, 25% is under construction, 20% has been approved but construction has not yet begun, and the remaining 19% awaits final approval.

A walled world

reference: TD-Architects.eu, retrieved on 11-12-2014
The border divides
US-Mexico border perception
The US-Mexican border
Border region compared to the Netherlands
Border region defined by five ecoregions
Research of hard and soft data - combined into an atlas
Ecoregion scale
Research of hard and soft data - combined into an atlas
City scale
NEIGHBORHOOD SCALE

Research of hard and soft data - combined into an atlas

Neighborhood scale
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region
Roadtrip to the border region: crossing the border
Border typology

- Walled border
- Natural border
TRIP + ATLAS

ELEGANT SUSPICION
THE BORDER AREA IS A REGION WHERE PEOPLE FROM TWO NATIONS FUNCTION AS ONE, BUT ARE OBSTRUCTED BY THE BORDER FENCE AND POLITICS.
Research resulted into a regional masterplan
Regional plan: a myriad of organisations
Regional plan: a new government for the border region
United transborder federation visa: crossing the border within minutes
United transborder federation visa: travelling within the border state zones
Capital of the new border government: El Paso (US) / Cd. Juarez (MEX)
Let’s Move initiatives to reverse America’s obesity epidemic.

Move! El Paso - Walking Trails is an initiative of the City of El Paso Department of Public Health in collaboration with communities.
**GOAL:** ASSURE THAT THERE ARE SUFFICIENT PREVENTIVE AND HEALTH CARE RESOURCES ON BOTH SIDES OF THE BORDER.

Source: El Paso State article: One People One Community 2010, pag 37
Obesity rates US and Mexico

Overweight
Obesity
Morbid obesity
BMI > 25
BMI > 30
BMI > 40

Overweight
Obesity
Morbid obesity

Men 20+  Women 20+  Boys 5-11  Girls 5-11

USA
Black Asian Hispanic

MEX

Obesity statistics - >80% of people diagnosed with diabetes
‘The prevalence rate for diabetes along the US-Mexican border is **nearly 50% higher** than the rates of the rest of the United States.

‘Adult Americans who are obese now outnumber those who are considered overweight, estimating 67.6 million Americans over the age of 25 are obese and an additional 65.2 million are overweight.’

Causes of diabetes (in most cases > 85%)

1. SES - Socio-economic status
2. Lifestyle (physical activity)
3. Diet
Infectious diseases in the border region:
1. 2 - 4 x greater incidence of Hepatitis A, Measles, Rabies
2. 8 x greater incidence of brucellosis (undulant fever)
3. Tuberculosis (higher prevalence in the border region)

Non-infectious diseases in the border region:
1. Cancer (no significant different rates than US or Mex)
2. Diabetes (in 85% caused by obesity or overweight)
3. Heart failure/strokes (lower prevalence than US national avg)

2010: 234,051 deaths with diabetes certificates (9% of total deaths in the US in 2010)

Border health: Mortality rate per 100,000 population
El Paso (US) / Cd. Juarez (MEX)
Satellite photo (google maps, retrieved 21st June 2015)
El Paso (US) / Cd. Juarez (MEX)
Satellite photo (google maps, retrieved 21st June 2015)
El Paso (US) / Cd. Juarez (MEX)
Chamizal zone

- residential
- commercial
- industry
- civic
- border crossings
- mixed use
- leisure
Concrete ditch today
Besides industry and a large green zone, the chamizal is mostly used for informal sports.
Chamizal area: vast empty plots of land
Chamizal: old stadium is used 4 times a month but doesn’t interact with communities
Chamizal: old stadium is used 4 times a month but doesn’t interact with communities
Chamizal: view towards the stadium
PROPOSAL CHAMIZAL ZONE
CONCEPT
Community sportshub

Communities El Paso

Community sportshub

Communities Cd. Juarez

Ambition: creating a sportshub for the communities of Cd. Juarez and El Paso
Communities Cd. Juarez

Basketball

Soccer

American football

Concerts

Attractor Connecting

Communities stadium

Ambition: Adding attractors and connecting communities
Program sportshub

Method: Program of sportshub/stadium
Community sports

Method: Program of sportshub/stadium
Grand sport events

Method: Program of sportshub/stadium
Urban Farming: 10%
Urban Sports: 40%
Urban Plazas/Parks: 50%

Program community sports

Method: Program of sportshub/stadium
Method: Program of sportshub/stadium
Site in the proposal of the Chamizal Zone
Location of the site in the Chamizal zone
Masterplan: adding residential area and public transport
LEISURE STRIP
SPORT STRIP
BORDER / TRAINTRACKS
U.S.A Mexico
Masterplan: 2 axis
Masterplan: proposed building location
INTERACTIVITY

Continuing on existing initiatives
“10,000 steps a day improves physical and mental wellbeing”

Source: http://www.elpasotexas.gov/moveelpaso

Interactivity: 10.000 steps a day
10,000 steps a day improves physical and mental wellbeing

Source: http://www.elpasotexas.gov/moveelpaso

10,000 steps equals 8 km.

Interactivity: 10,000 steps a day
"10,000 steps a day improves physical and mental wellbeing"

Source: http://www.elpasotexas.gov/moveelpaso

10,000 steps equals 8 km.

Dividing the 10,000 steps in smaller routes

Interactivity: 10,000 steps a day
Interactivity at all scales
MEDELLIN
4 SPORT SCENARIOS

Giancarlo Mazzanti | Felipe Mesa | 2010
Program Medellin: four sports scenarios
Four coliseums for events and sportclubs (paid)

Program Medellin: four sports scenarios
Covered roof creates public recreational activities

Program Medellin: four sports scenarios
Program Medellin: Perforated facades to blur the interior with exterior activities
Program Medellin: Interior view of the gymnastics coliseum
Facade creates interaction of interior and exterior spaces

Program Medellin: diagram
4x sportshall

2 x void

1x circulation

Event space

Main square

Concept: building elements
Wind direction

Concept: natural ventilation
Concept: solar studies - creating optimal shade for sports
Concept: building configuration according to studies
Circulation route connecting building with context

Concept: circulation routing connecting building with context
Defining open and more closed facades
Concept: shaping
Fixed seating capacity
Outdoor seating (grass)

Concept: seating capacities
Fixed and retractable seating
Outdoor seating (grass)

Main guiding concept: extentable tribunes
Community sportscenter and stadium in one building
Tennis court
Maximum and optimum viewing distances

51 meter from corners
Maximum viewing dist.

30 meter from centre
Optimum viewing dist.

Football (soccer) field
Maximum and optimum viewing distances

190 meter from corners
Maximum viewing dist.

150 meter from corners
Optimum viewing dist.

90 meter from center
Assumed viewing dist.

Source:

Research into sightlines and seating angles
Optimal angle for spectators

Calculation riser ‘N’:

\[ N = \frac{(R+C)(D+T)}{D} - R \]

N = riser in meter
R = height between eyes and field
C = sightline (typically 0.15 m, for wheelchairs 0.9m)
D = distance from eye to point of view on field.
T = depth of seating row

Source:
Result of calculation riser: most ideal tribune layout

Research into sightlines and seating angles

Source:
Options

1. Tribune | Sportfield | Outdoor event
2. Tribune | Sportfield | Outdoor event
3. Tribune | Moveable sportfield | Outdoor event
4. Tribune | Sportfield | Outdoor event
5. Retractable tribune | Sportfield | Outdoor event

Chosen

Tribune | Sportfield
---|---

Research into retractable seating
COMMUNITY SPORTS HUB - DAY
Sportstrip: connecting bikepaths throughout both cities
Sportsstrip hosts multiple types of sports, crossborder
Sportsstrip hosts multiple types of sports, crossborder Park feeling
Sportsstrips intersects with border park
Stadium interacts with both the sportsstrip as the borderpark
Program: Entrances and foyer
Program: Stairs to lower level
Program: Types and location of kind of sports

- Solo tennis and squash
- Tennis
- Basketball
- Event field: soccer
- Gymnastics
- Climbing wall
- Gym and cross fit
- Aquatic sports
Program: Mechanics, staff, storage and first aid
Program: Circulation route and entrances
Program: Seating area and outdoor seating
Program: Retractable seating area

Capacity

- Fixed seating: 10,215
- Outdoor seating (grass): 5,200
- Retractable seating: 3,360

Total seating capacity: 18,775
JOURNEY OF A VISITOR | ATHLETE
MAIN SQUARE | ENTRANCE
Approaching the main entrance

Movement: approaching the main entrance
Movement: entering the circulation route
CIRCULATION ROUTE
Approaching from the sports strip

Movement: approaching from the sports strip
Approaching from the border park (north)

Entering the circulation route

Movement: approaching from the border park
Movement: getting some information in the foyer
Watching a game
WATCHING A GAME
Approaching from the borderpark (south)

Movement: approaching from the borderpark (south)
BORDERPARK ENTRANCE (SOUTH)
Movement: watching an aquatic sportsgame
AQUATIC SPORTS
Movement: visiting the gym
GYM AND CROSSFIT
INTERACTIVE
CIRCULATION ROUTE
Ramp entrance for super-athletes
Speed monitoring on running and cycling tracks

Connecting to the park wifi enables people to use GPS and Lap paces

Circulation route: A smart route
Weighing and heart rate machines along the circulation route

Water stations on the sport strip and along the circulation route

Circulation route: An healthy route
Circulation route: A route for more than just athletes
Entrance circulation route from sportsstrip
Entrance circulation route from borderpark
INTERIOR MATERIALITY
Colour derives from sports
Colour derives from sports
STRUCTURE
Adding 13 columns

Column diameter: 1500mm

Structure: adding 13 columns
Structure: Roof spaceframe

Spaceframe height near connection: 3600 mm

Height: avg. 30 meter
Adding a tensile bar to create balance
Tensile bar to Tie column, supporting the circulation route and being able to resist hard high winds.
To support the circulation route, it is being connected with tensile bars creating even more balance to the main structure.
Seating area stabilizes the structure

Column diameter: 1500mm
Concrete slabs serve as solids

circular columns
width: 1500mm

cement slabs
d=500

Concrete slabs serve as solids
Steel structure (combination of UPN and IPE profiles) to create a strong and stable structure for the seating area
Plan scale 1:50 | structural walls support main structure stability
Section scale 1:50 | structural walls support main structure stability
Steel structure (combination of UPN and IPE profiles) to create a strong and stable structure for the seating area.
Column
Length: 35,000mm
Diameter: 1500mm

Column build up
Given:

Average column length: 35.000 mm
Buckling length: \( 1/30 \cdot l \rightarrow 25.000 \) mm
Total forces spaceframe roof + additional weight/forces (snow, wind) = 2 kN + 2 kN = 4 kN
Total roof surface area: 29.529 sqm
Chosen steel: high quality steel = 250 = \( \sigma \)
Total amount of columns = 13

\[
F = \text{Total forces per column} = \frac{4 \text{kN} \cdot 29529}{14} = \frac{118116 \text{kN}}{14} = 9085 \text{kN}
\]

\[
A = \text{Needed inner diameter according to } F = \frac{F}{\sigma} = \frac{9085}{250} = 36343 \text{ mm}^2
\]

\[
d = \text{Column outer diameter} = 1500 \text{mm}
\]

\[
d_i = \text{Column inner diameter} = \frac{A}{\pi d} = \frac{36343}{3.14 \cdot 1500} = 7.7 \text{ mm}
\]

\[
I_x = I_y = \frac{\pi(d^4 - d_i^4)}{64} = 10049 \cdot 10^6 \text{mm}^4
\]

Buckling force per column = \[
\frac{\pi^2 \cdot d \cdot l}{\text{buckling length}^2} = \frac{\pi^2 \cdot 210 \cdot 10^3 \cdot I_x}{25.000^2} = \frac{\pi^2 \cdot 210 \cdot 10^3 \cdot \frac{\pi(d^4 - d_i^4)}{64}}{25.000^2} > 5F
\]

Buckling force per column = \[
\frac{\pi^2 \cdot 210 \cdot 10^3 \cdot \pi(1500^4 - 7.7^4)}{25.000^2} = 33290 \text{ kN} = 3.66 F
\]

We want the buckling forces to be at least 8 F.

\[8F = 72680 \text{ kN} = \frac{\pi^2 \cdot 210 \cdot 10^3 \cdot I_x}{25.000^2} \rightarrow I_x = \frac{8F \cdot 25.000^2}{\pi^2 \cdot 210 \cdot 10^3} = \frac{21974148000}{\pi^2 \cdot 210 \cdot 10^3} = \frac{\pi(1500^4 - d_i^4)}{64}
\]

\[
d_i = \text{Column inner diameter} = 17.2 \text{ mm}
\]
Given:

Average column length: 35.000 mm
Buckling length: $\frac{1}{30} \cdot l \rightarrow 25.000$ mm
Total forces spaceframe roof + additional weight/forces (snow, wind) = $2 \cdot kN + 2 \cdot kN = 4 \cdot kN$
Total roof surface area: 29.529 $sqm$
Chosen steel: high quality steel = $250 = \sigma$
Total amount of columns = 13

$F = \frac{4 \cdot kN \cdot 29529}{14} = \frac{118116 \cdot kN}{14} = 9085 \cdot kN$

$A = \frac{F}{\sigma} = \frac{9085}{250} = 36343 \; mm^2$

$d = $ Column outer diameter = 1500mm

$d_i = $ Column inner diameter = $\frac{A}{\pi d} = \frac{36343}{3.14 \cdot 1500} = 7.7 \; mm$

$I_x = I_y = \frac{\pi (d^4 - d_i^4)}{64} = 10049 \cdot 10^6 \; mm^4$

Buckling force per column = $\frac{\pi^2 \cdot \sigma \cdot l}{\text{buckling length}^2} = \frac{\pi^2 \cdot 210 \cdot 10^3}{25.000^2 \cdot \frac{\pi (1500^4 - 7.7^4)}{64}} > 5F$

Buckling force per column = $\frac{\pi^2 \cdot 210 \cdot 10^3 \cdot \frac{\pi (1500^4 - 7.7^4)}{64}}{25.000^2} = 33290 \cdot kN = 3.66 \cdot F$

We want the buckling forces to be at least 8 F.

$8 \cdot F = 72680 \cdot kN = \frac{\pi^2 \cdot 210 \cdot 10^3 \cdot I_x}{25.000^2} \rightarrow I_x = \frac{8F \cdot 25.000^2}{\pi^2 \cdot 210 \cdot 10^3} = 21974148000 = \frac{\pi (1500^4 - d_i^4)}{64}$

$d_i = $ Column inner diameter = $17.2 \; mm$

Column calculation
Detail: connection main columns to foundations
Detail: connection UPN beams with main columns
Prefabricated concrete slabs finish the seating area, giving it even more stability.
Steel star-element as intermediate between column and roofing system
5 tribunes, 13 columns bearing the roof structure
5 tribunes, 13 columns bearing the roof structure
5 tribunes, 13 columns bearing the roof structure
Thermal expansion
(-10 / + 50 °C)
0.0749 meter

Length
104 meter

Spaceframe divided into four parts
Detail: connection main columns to spaceframe
Spaceframe covered with panel system
2 panel types

Roof/ceiling panel system
Three types of panels: closed, glass and solar panels

White aluminium (closed) panels
White solar panels SOLAXESS SUISSE
Frosted glass panel

Three types of panels: closed, glass and solar panels
Solar panels: total of 18.380 sqm providing 15315 kWh
- 15315 kWh providing energy to 925 households -

Roofplan panel system
Openings situated to create random interior light effects
Solar panels: total of 18.380 sqm providing 15315 kWh
- 15315 kWh providing energy to 925 households -

Roofplan panels: the view
Detail: roof glass panel
Facade creates interactivity
Facade and interior perforated panels
Interior perforated panels blend public and private zones.

- Athlete area
- Public area
- Changing rooms
- Athlete corridor
- Public corridor
- Public toilets
Roof openings
outlet for hot air

Perforated facade promotes ventilation

Perforated facade promotes ventilation
Each roof component collects water to secondary system

Footprint building: 25050 sqm
Total avg. annual rainwater collecting: 5.7 million liters
This will be enough to water the event field 44 times annually.
Rainwater collecting: zoom in panel

Aluminium panels

Water towards collecting area
Detail: roof edge

Water collecting and rails for maintenance and tv-records
Rails circulation route
Rails around event field
Rails around seating area
Entrance to rails

Maintainance: rails inner roof
Rails circulation route
Rails around event field
Rails around seating area
Entrance to rails

H = 1/12 L

H = 2 x 1/12 L

Maintainance: accessibility inner roof
Maintenance: accessibility inner roof via circulation route
Three facade systems.

A. Elevated circulation route (mostly closed)
B. Event field (open)
C. Closed
Portals | openings in the facades
Portals | openings in the facades
Night: basement level partly closed
Night: basement level partly closed
Aquatic center nighttime
Aquatic center winter: iceskating and icehockey
INTERACTION
MOTIVATION
HEALTHIER COMMUNITIES
Project at multiple levels as a starting point to increase health in the border region