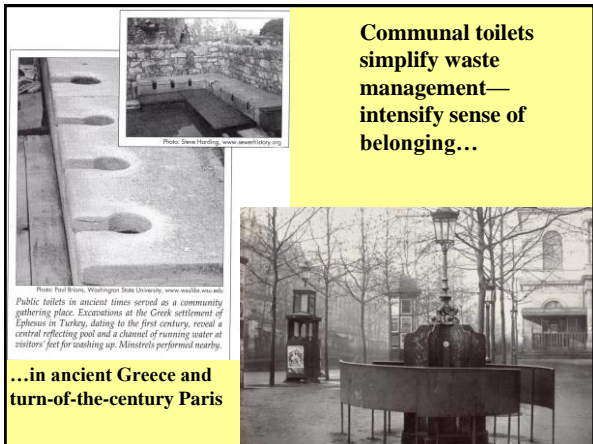




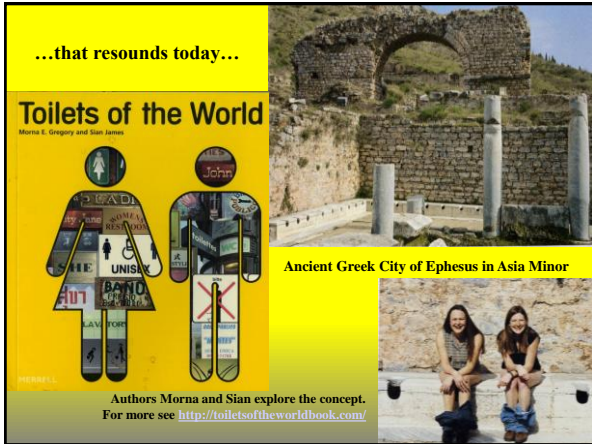
1



2



3



4



5



6



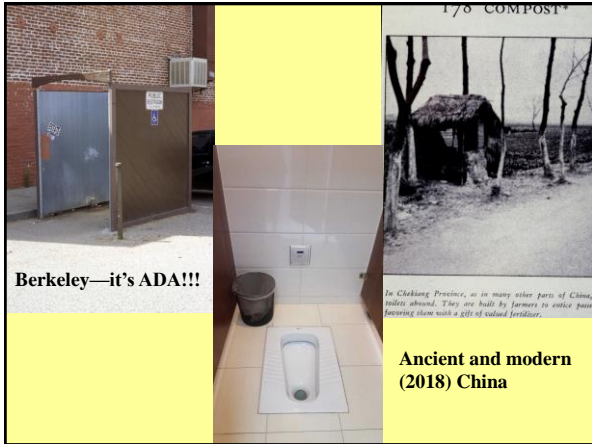
7



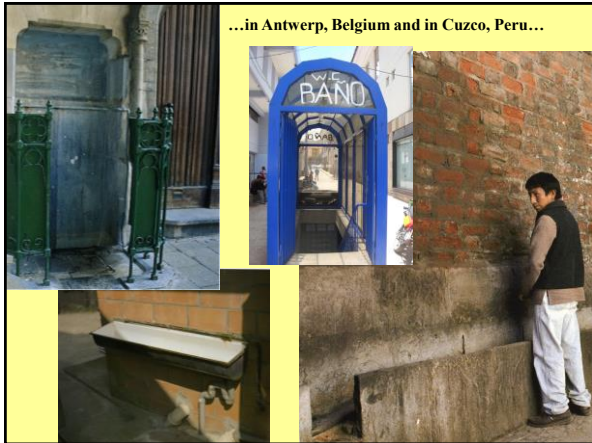
8



9



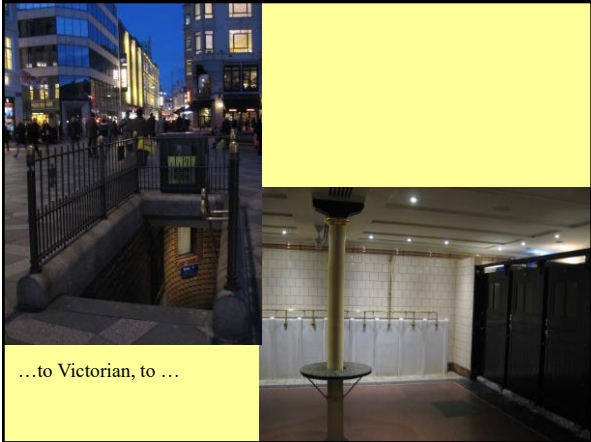
10



11



12



13



14

The Plumber Protects the Health of the Nation

Amos Shindler

**Conservation:
Low-flush to no flush**

Regular Toilet 5-7 GPF
vs.
Niagara's Toilet Devices 1.6 GPF

	Regular Toilet	Niagara's Low Flush Toilet	Savings
Gallons Per Flush	5 to 7 gallons	1.6 gallons	4.4 gallons
	6 x 11	1.6 x 11	
11 Flushes Per Day	66 gallons (median)	17.6 gallons	48.4 gallons
Over 365 Days	24,090	6,424	17,666
Cost for Water, Wastewater Treatment (\$2.00/1000 Gal)	\$48.18	\$12.84	\$35.34 Annually

15

Toilets use about 25% of the total indoor domestic water.



That's about 20 gallons/day.

Each person is responsible for about 5 flushes per day.

Since January 1994, low-flush (1.6 gallons/flush) is required by code in the U.S.

16

Table 2. Household Water Savings from Toilet Replacement

Vintage of old toilet	Toilet water use gal [gpi]	Uses per day ¹	Daily household use ² Gallons [liters]	ANNUAL HOUSEHOLD SAVINGS	
				Repl. with 1.6 gal toilet ³ Gallons [liters]	Repl. with 1.0 gal toilet ³ Gallons [liters]
1994-present	1.6 [6]	5.1	21.3 [81]	9,340 [35,300]	2,950 [11,200]
1980-94	3.5 [13]	5.1	47.1 [178]	11,800 [44,400]	12,300 [46,500]
	4.0 [15]	5.1	53.9 [204]	14,300 [53,900]	17,200 [65,100]
	4.5 [17]	5.1	60.6 [229]	16,700 [63,200]	19,700 [74,400]
1950-80	5.0 [19]	5.1	67.3 [255]	19,200 [72,500]	22,100 [83,700]
	5.5 [21]	5.1	74.1 [280]	26,500 [100,000]	29,500 [112,000]
Pre-1950	7.0 [26]	5.1	94.2 [357]	49,400 [187,000]	65,000 [246,000]

1. Time periods approximate
2. Data from American Water Works Association Research Foundation study, "Residential End Uses of Water"
3. Based on average of 2.64 persons per occupied household

Source: Data from Handbook of Water Use and Conservation by Amy Vickers
Environmental Building News - January 2004

12

Table 3. Water Savings from Toilet Replacement in a 50-Person Office

Vintage of old toilet	Toilet water use gal [gpi]	ANNUAL WATER USE ¹		ANNUAL COMPANY-WIDE SAVINGS ²	
		Per male Gallons [liters]	Per female Gallons [liters]	Repl. with 1.6 gal toilet ³ Gallons [liters]	Repl. with 1.0 gal toilet ³ Gallons [liters]
1994-present	1.6 [6]	416 [1,575]	1,250 [4,720]	49,400 [187,000]	15,600 [59,000]
1980-94	3.5 [13]	910 [3,469]	2,730 [10,300]	62,400 [236,000]	78,000 [295,000]
	4.0 [15]	1,040 [3,940]	3,120 [11,800]	75,400 [285,000]	91,000 [344,000]
	4.5 [17]	1,170 [4,430]	3,510 [13,300]	88,400 [335,000]	104,000 [394,000]
1950-80	5.0 [19]	1,300 [4,920]	3,900 [14,800]	101,000 [384,000]	117,000 [443,000]
	5.5 [21]	1,430 [5,410]	4,290 [16,200]	140,000 [531,000]	156,000 [590,000]
Pre-1950	7.0 [26]	1,820 [6,890]	5,460 [20,700]	187,000 [704,000]	212,000 [800,000]

1. Time periods approximate
2. Based on daily toilet use of 1 time per day for males and 3 per day for females; 260 work days per year
3. Assumes 25 males, 25 females

Source: Data from Handbook of Water Use and Conservation by Amy Vickers
Volume 13, Number 1 - Environmental Building News

13

You can do the math!

17

...but >1.6 gallon flushers persisted in 2008...

Enough with the Flushing

The Dedham-Westwood Water District in Massachusetts wants people to stop flushing their urinals, and the district hopes that offering rebates on waterless urinals will entice them to stop. The rebates, directed at commercial customers, come on top of rebates offered to residents who use low-flow toilets and front-loading, water-saving washing machines.

The waterless urinals hook directly to conventional drain lines but do not require a flushing mechanism. Before draining, urine flows through a cartridge containing a sealant liquid that blocks out odors.

For existing businesses that replace traditional urinals with the waterless ones, the water district will offer a \$200 rebate. In new construction projects, the water district will provide a \$100 rebate per urinal. And the financial benefits also extend beyond the rebate.

Less water flowing through the sewer system means reduced costs, and the water district is making the rebates available with future developments in mind.

In the past two years, the water district has provided residents with options to pick up rebates by installing water-efficient toilets that use no more than 1.6 gallons per flush and front-loading washing machines, which conserve water.


The water district gives a \$50 rebate for the toilets and a \$100 rebate for the washing machines. By spring, the water district plans to begin offering 55-gallon rain collection barrels for the subsidized price of \$50, which residents can use to water lawns.

For more information about the district's water saving plans, write to them at Dedham-Westwood Water District, 50 Elm Street, P.O. Box 9137, Dedham, MA 02027-9137, or call 781-329-7090 Monday through Friday from 8:30 a.m. to 4 p.m. You also may visit their Web site at www.dwwd.org.


18

UPPERCUT™

Lav-Toilet combo



Dual flush valve toilet



25

NEOREST® 550H DUAL-FLUSH TOILET, 1.0 & 0.8 GPF



LIST PRICE: \$5,500

Cyclonic flush = less water/flush;
Electrolized water = cleans @ use;
Hydrotech glaze = water slides off + it's photocatalytic, cleaned by UV lamp in lid

Features

- SanaGloss
- Cyclone Flushing System
- Automatic Lid Opening and Closing
- Automatic Flush
- Air Deodorizer
- Heated Seat
- Remote Control Operated
- ewater+
- Nightlight

26

...and you can get by with 1/2 gallon...ULF



Sandy & Rhea's Lopez Island



The Two-Quart Toilet in a sleek new design

Microphor



Green Gulch Zen Center Guest House Van der Ryn

27

A **FRESH**
APPROACH
to Sustainable Design

Uses 1 gal. @ 3 days

SLOAN HYBRID URINALS with Jetrinse[®] Solution Technology

The new Sloan Hybrid Urinals deliver unmatched performance while saving thousands of gallons of water every year.

These innovative fixtures preserve the efficiency and enhance the functionality of waterfree design by combining a world-class multi-patented urinal cartridge with our revolutionary Jetrinse Solution Technology.

The result: Your urinal and drain line remain clean, hygienic, odor-free and clog-free.

31

Urine gets its own drain!
No flush needed if you just pee.

Sustainability

The Toilet that Dreams of Saving the World

Designed by Austrian firm EOOS for Lauren, the Savet toilet separates urine from other waste, creating an opportunity to produce eco-friendly fertilizer and save waterways from algal blooms.

Usually when you design a toilet you just focus on the form and maybe the performance, but nobody is asking where the water is coming from and where it goes," says Gramel. Credit: Way Land

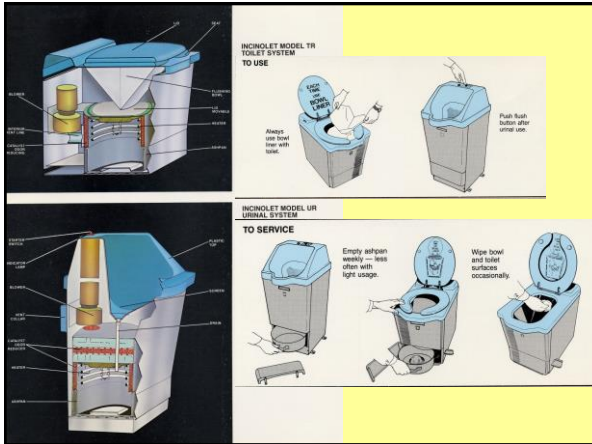
32

INCINOLET
ELECTRIC
INCINERATING
TOILET
SYSTEMS

The most advanced flush through since the 18th and 19th centuries. INCINOLET

...and toilets without sewers...

33



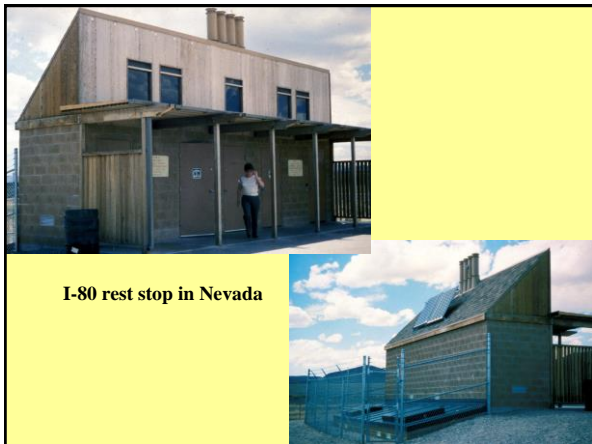
34

Composting Toilets

Rules:

- Vent to outside
- Add vegetables
- Needs basement
- Keep warm
- Harvest @ 2 years

35



36

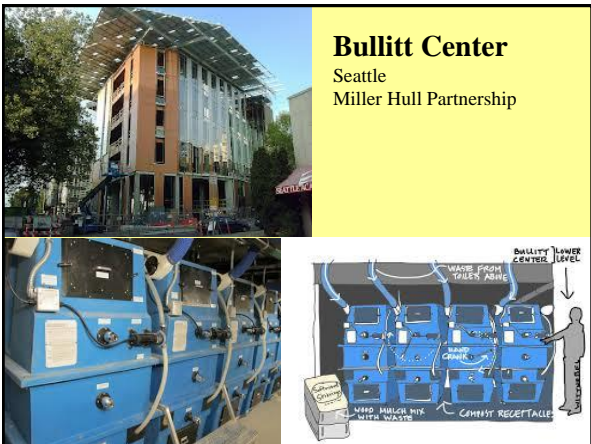


37



C.K. Choi Building
University of British Columbia
Matsuzaki Wright

38

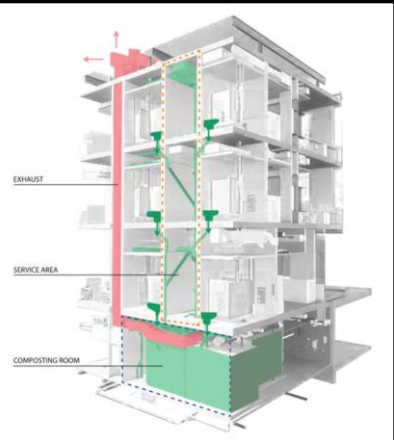


Bullitt Center
Seattle
Miller Hull Partnership

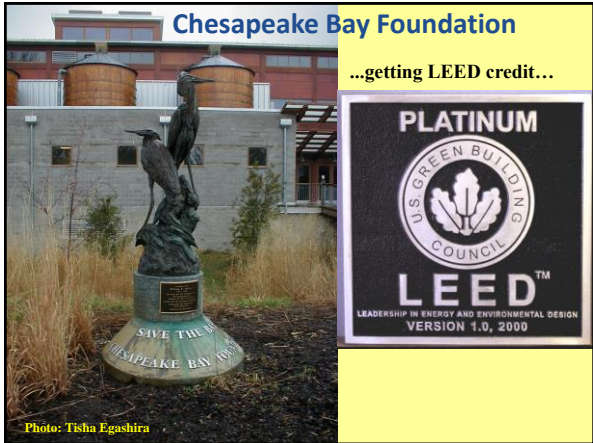
39

Schematic for multi-story composting toilets.

Santa Monica City Hall Annex



40



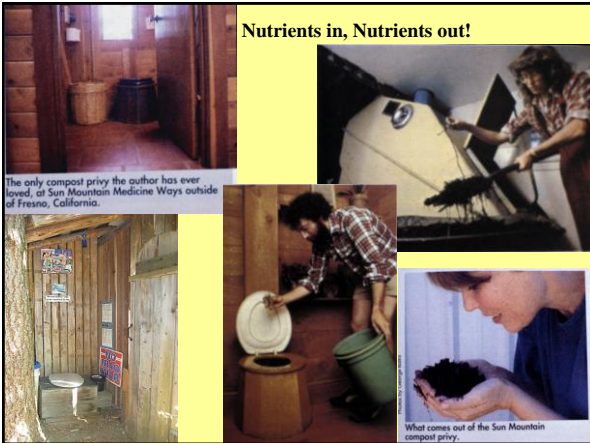
41



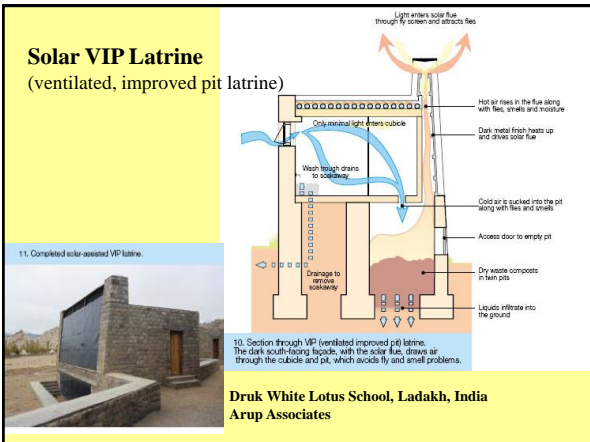
42



43



44



45

AMAYADORI
 I sought for this small architecture to exceed the boundaries of a public toilet to become a "place" in the urban landscape that provides immense public value.
 Using this clear and simple reasoning for the concept of this structure, I chose to utilize a circle floorplan with a spanning roof and engawa. It was vital for me to make a space that was comfortable and safe.
 Visitors can move inside a cylindrical wall of vertical louvers to feel the comfort of the wind and light from the surrounding environment.
 A feeling of safety will be emphasized by the free and centripetal circulation which passes through to the other side. This toilet tucked away in the greenery that is Jingu-Dori Park will be known as "Amayadori." (taking shelter from rain)

TADAO ANDO

49

Norway has built what may be the world's most beautiful public toilet

Urred Rest Area, Gildeskål, Norway

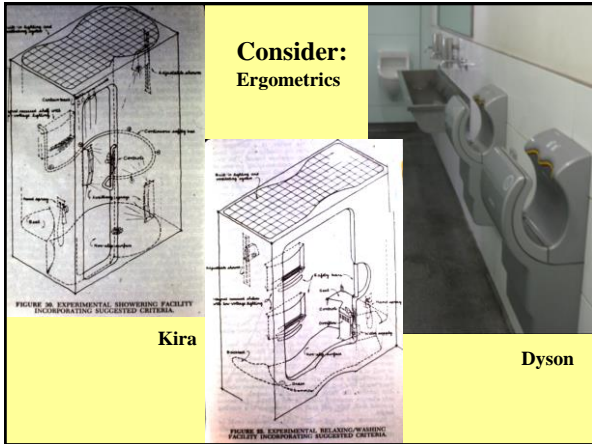
50

Consider:

- Minimum size
- ADA
- Sight lines

• Doorway should have a minimum clear opening width of 32" (813)
 • Door should not swing into the required clear floor space.

51



52




53




54

Sustainable Restroom Enhancements
 We are installing new water saving fixtures and other environmentally friendly products.



SeaTac Experiment 2014
Dyson



55

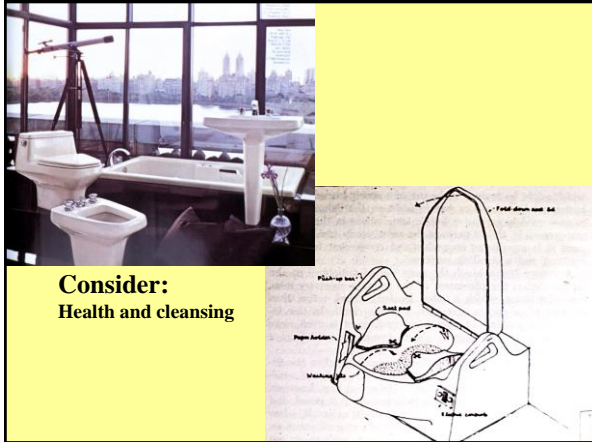
Consider: Style



56

Thomas Robertson catalog vs. Philharmonic Dining Room, Liverpool, UK

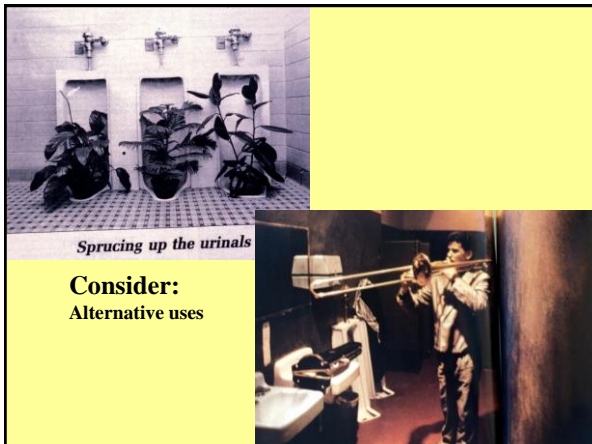
57



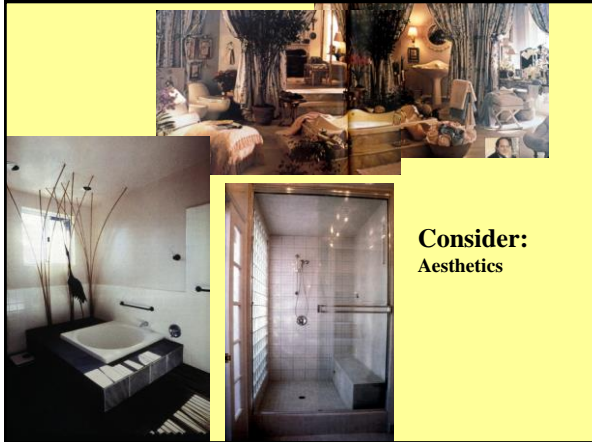
58



59



60



**Consider:
Aesthetics**

61



**Consider:
Ecological Issues**


Bronx Zoo Eco-Restroom

CAT Composting Toilet

Street urinal-compost-to-flowers, Paris

62

**Consider:
High Moral Ground**



Soybean No-Flush Urinals

A line of environmentally friendly, no-flush urinals is available from Waterless. The composite urinals are constructed from 30 percent soybean resin with a design similar in appearance and function to the company's other high-performance models, according to the manufacturer.

Declare.

Ultramax™ II 10' One-Piece Toilet- PVC Free
TOTO USA
Final Assembly: Morrisville, CA, USA
Site: Waterless, NY, USA
Field of Use: Outdoor, Commercial/Residential In-Use
Emission, Low-VOC (100%)

Ingredients

Ceramic: Ceramic Body (Morrisville, CA), Ceramic Glaze; Toilet Parts: Polypropylene, Acrylonitrile Butadiene Styrene, Polypropylene, Stainless Steel, Zinc Alloy (Zamak 3), Brass, Polybutylene Terephthalate, Ethylene Propylene Diene Monomer, Silicone Rubber, Thermoplastic Elastomer, High-Density Polyethylene, PAH Polymer, Chlorinated VPI

USBC Temp Exemption TO-234 Chlorine in Rungless Flush Levers

Living Building Challenge Criteria:


100% Recycled	100% Recycled
VOC Content: 0%	VOC Emissions: CDMA Compliant
DeclareScan Status	USBC Seal: Not Applicable
	USBC Compliant
	Declare

© 2014 WATERLESS. ALL RIGHTS RESERVED. WATERLESS.COM/USBC-DECLARATION

Living Building Challenge compliant

←

Recycled ↓



**Real Goods
Van der Ryn**

63



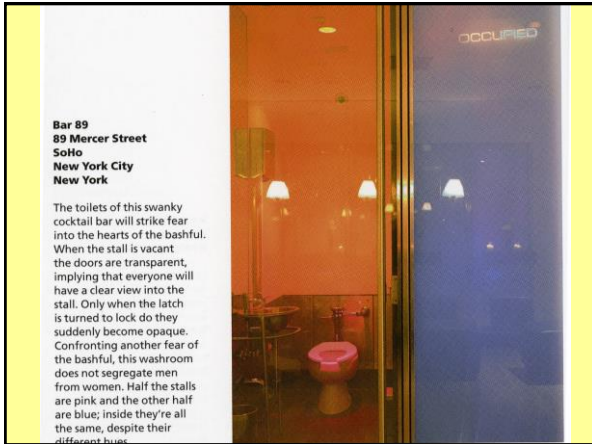
64



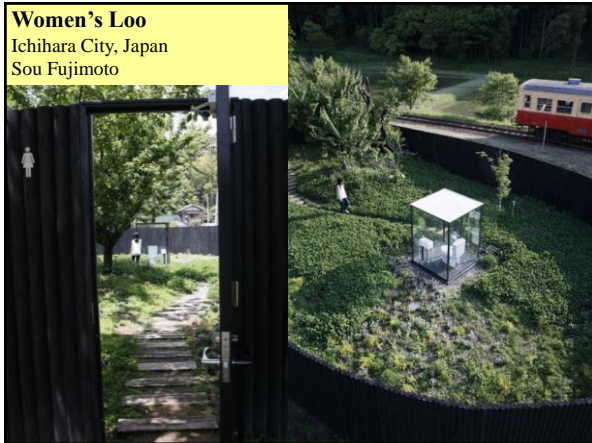
65



66



67



68



69

**Sex-segregated
toilets are a
product of the
Victorian era.**



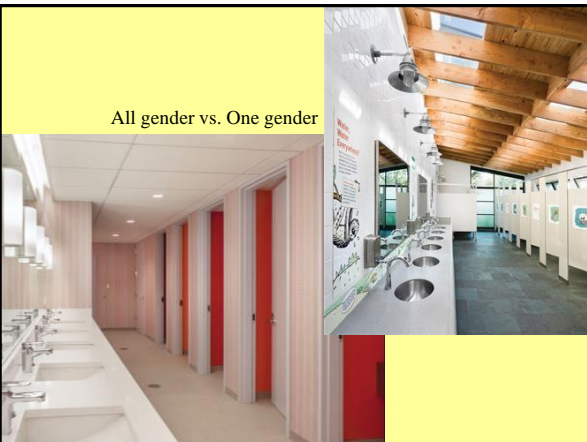
'Since at least the 1990s, under the mantle of "universal design", architects have rightly moved towards desegregating toilet facilities, on the grounds that they are less exclusionary and can accommodate the widest possible range of users in safety and dignity. Re-enshrining binary sex-segregated toilets in the Building Regulations today would be a clear step backwards in accessibility terms.'

70



**Proposals for all gender loos:
Grant High School &
University of Oregon**
—Mahlum Architects

71

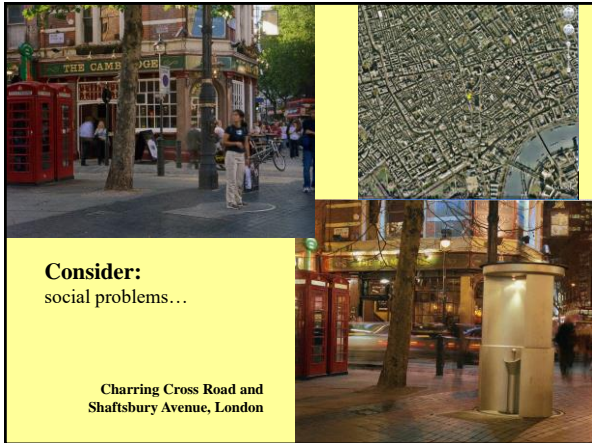


All gender vs. One gender

72



76



77



78



79



80
