

Making New York City Hurricane Sandy Proof



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History of Hurricanes



Saffir-Simpson Scale

Category	Wind Speed	Pressure (millibars)	Storm Surge	Damage
1	74-95 mph	>979	4-5 feet	minimal
2	96-110 mph	979-965	6-8 feet	moderate
3	111-130 mph	964-945	9-12 feet	extensive
4	131-155 mph	944-920	13-18 feet	extreme
5	>155 mph	<920	>18 feet	catastrophic

Tracking Hurricane Sandy



Hurricane Sandy Damages

- 7.5 million people lost power
- 230+ people died
- Storm surges were 14 ft above the average low tide



Storm Surge Protection

- Hurricane and Storm Risk Reduction System (HSRRS)
- New Orleans, Louisiana



Barrier Islands

- Fire Island, NY



Flood Gates

- Oosterscheldekering
- North Sea
- Netherlands

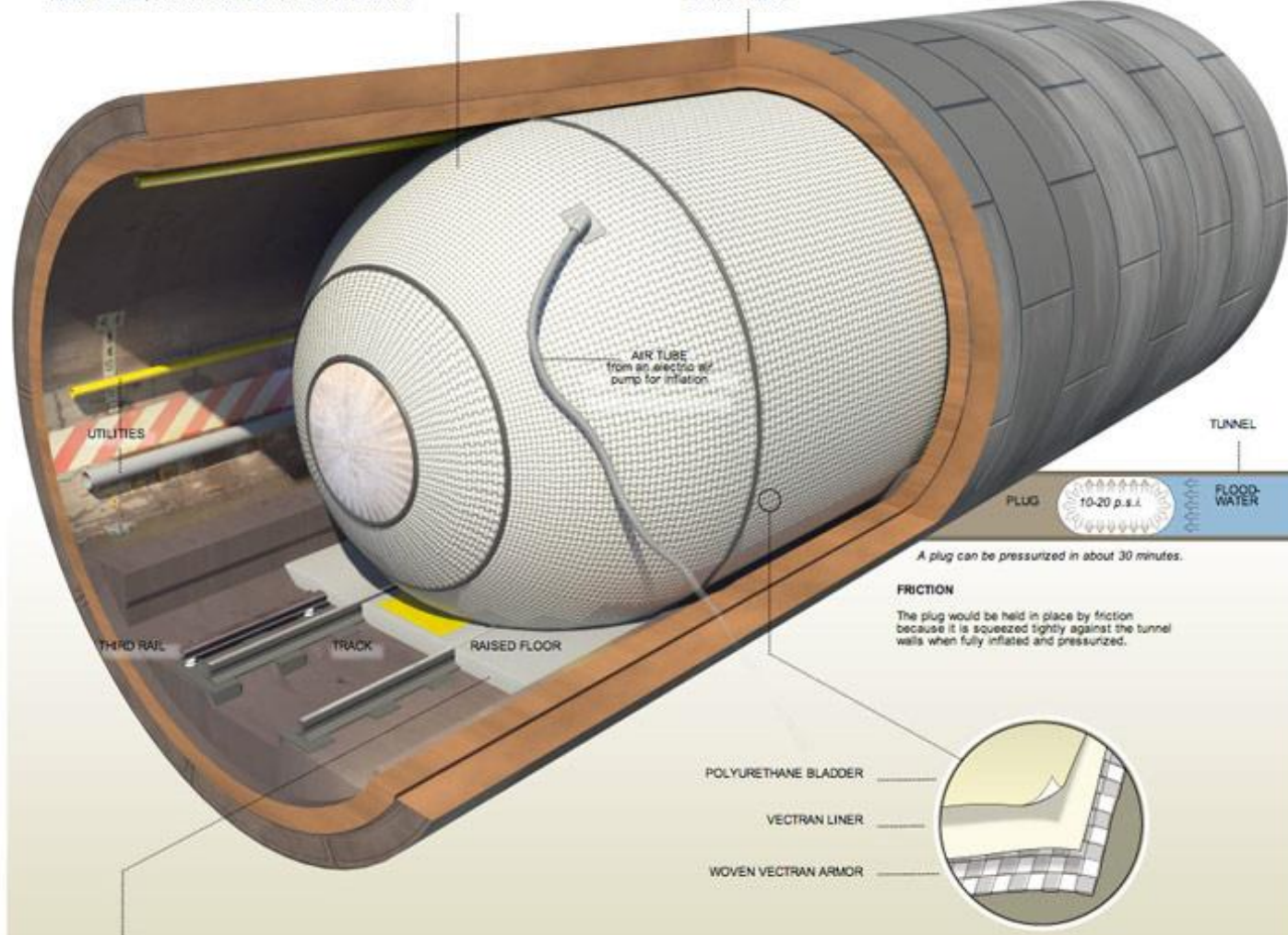


Flood Protection of Tunnels



INFLATED PLUG, 32 FEET LONG AND 16.2 FEET IN DIAMETER

SUBWAY TUNNEL



The Big U



Social Infrastructure



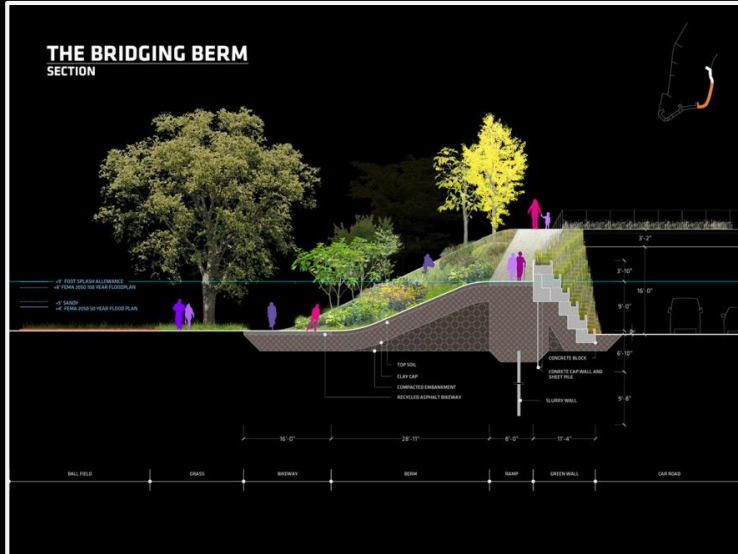
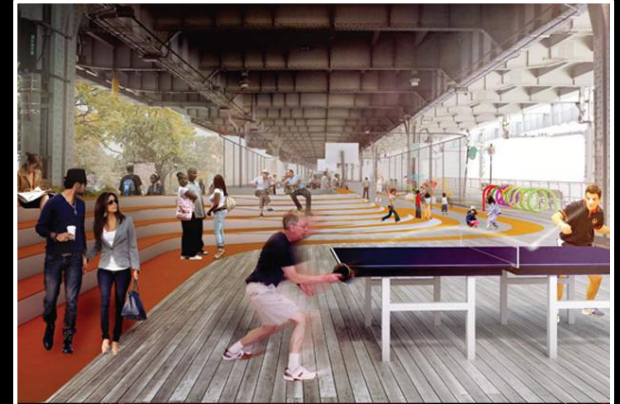
BIG BENCH



BATTERY



BERM



THE BIG "U"

TAILOR-FIT, SOCIAL INFRASTRUCTURE!



RESILIENCY INFRASTRUCTURE

PEOPLE!

RESILIENCY INFRASTRUCTURE

PROGRAM

RESILIENCY INFRASTRUCTURE

COMMUNITY



ROBERT MOSES

JANE JACOBS

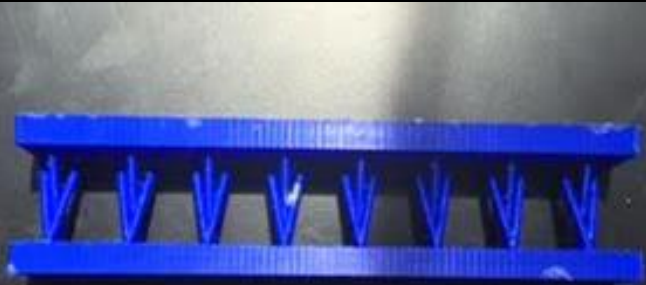
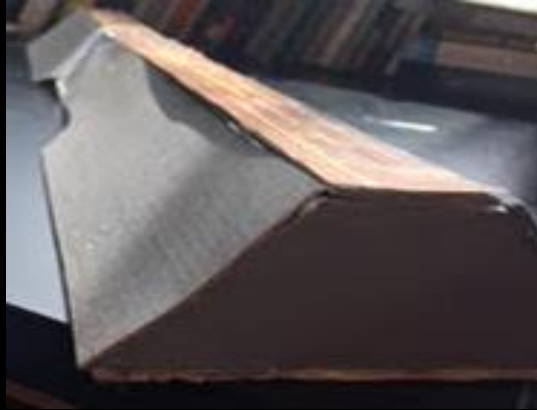
Storm Surge Protection Model



Boardwalk Barrier



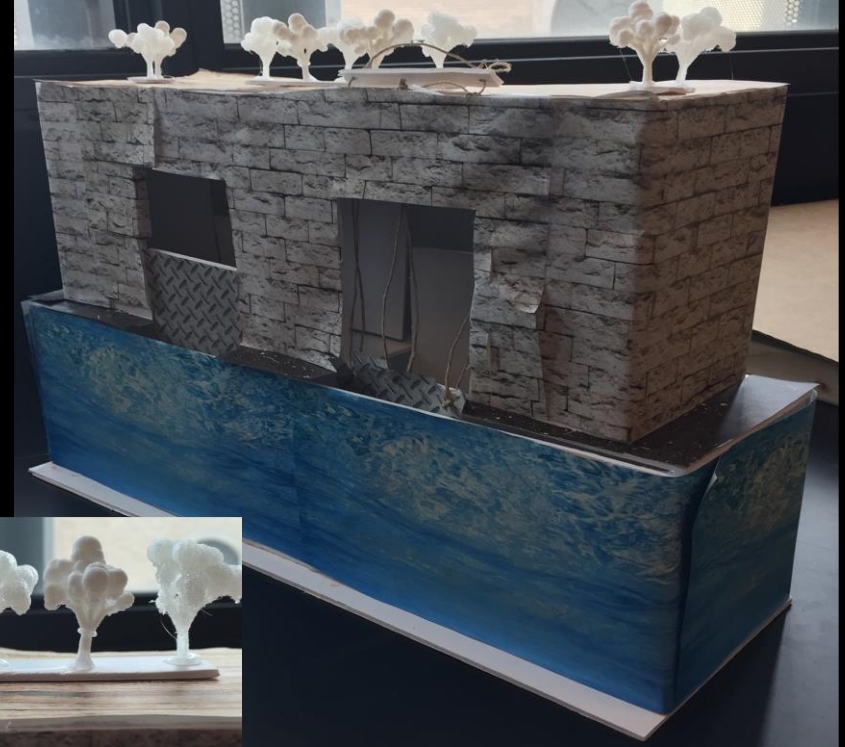
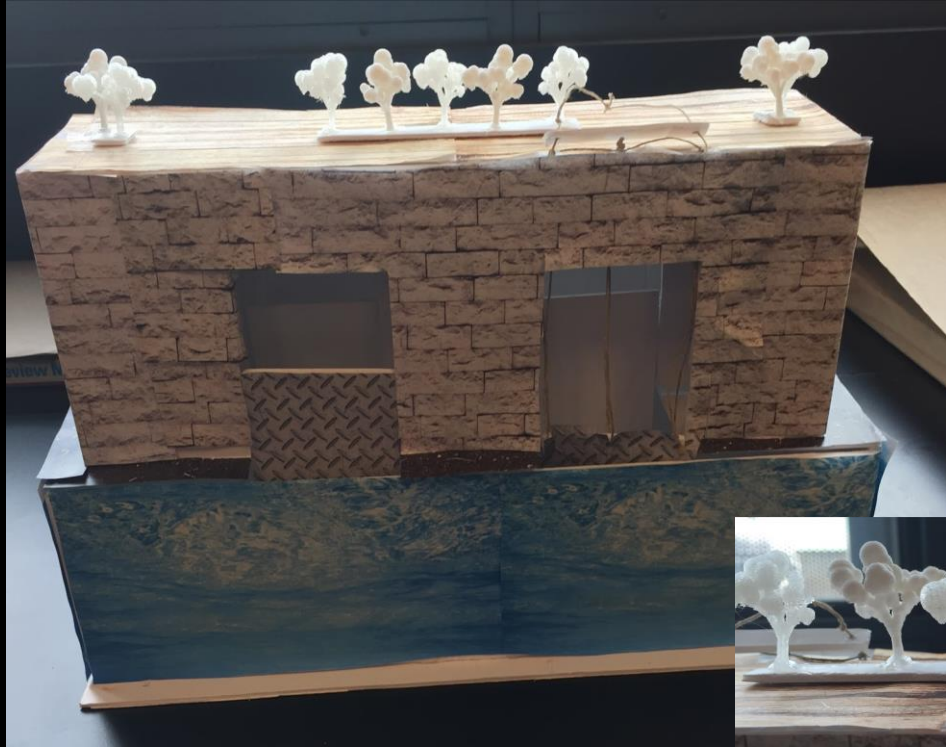
Emergency Gate-And-Dike System (EGADS)



The HELP System



Red Hook Wall and Park



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Questions?