RISK TO RESILIENCE
RE-IMAGINING THE PUBLIC REALM AS MULTI-FUNCTIONAL INFRASTRUCTURE FOR DISASTER EVACUATION IN TOKYO BAY

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JAPAN WAS ROCKED BY A 9.0-MAGNITUDE EARTHQUAKE THAT CAUSED WIDESPREAD DAMAGE TO THE COUNTRY’S EASTERN COASTAL REGION. THE EARTHQUAKE WAS SO POWERFUL IT MOVED HONSHU, JAPAN’S LARGEST ISLAND, 7.9 FEET EAST AND SHIFTED THE EARTH ON ITS AXIS BY AN ESTIMATED 4 TO 10 INCHES.
DURING TIMES OF CRISIS, COMMUNITIES OFTEN LOOK TO THE PUBLIC REALM.
The country of Japan, situated between the Pacific Plate, Philippines Sea Plate, North American Plate, and Eurasian Plate, is uniquely vulnerable to catastrophic earthquakes and tsunamis.
OVER THE PAST CENTURY, SEVEN SEISMIC EVENTS HAVE CAUSED A SIGNIFICANT LOSS OF LIFE AND PROPERTY ACROSS THE ARCHIPELAGO.
The city of Yokohama, located in the southwestern area of Tokyo Bay, is particularly vulnerable as it partially sits within the alluvial lowlands of the Kanto Plain and has an elevated risk of tsunami inundation.
ELEVATIONALLY THE CITY IS SPLIT INTO TWO ZONES, SEPARATED BY A STEEP BLUFF, A TOPOGRAPHIC CONDITION THAT FURTHER COMPLICATES THE EVACUATION PROCESS.
In an effort to help reduce urban risk in the face of future seismic-related events, this project proposes a decentralized, multi-scalar and layered approach to disaster response by leveraging the public realm.
THE PROJECT USES THE CITY OF YOKOHAMA AS A TESTING GROUND FOR THESE IDEAS AND EXPLORES A RANGE OF DEPLOYMENT SCENARIOS ACROSS THE URBAN LANDSCAPE, FROM THE WATER’S EDGE TO HILLY AREAS FURTHER INLAND.
THE FIRST TACTIC RE-IMAGINES THE CITY’S RELATIONSHIP WITH TOKYO BAY BY DEPLOYING A SERIES OF VEGETATED BERMS AND RIBBONS OF TREES ALONG THE WATER’S EDGE.
DURING A TYPICAL DAY, THIS NEW LANDSCAPE ENRICHES THE COMMUNITY’S EXPERIENCE WITH THE BAY THROUGH INCREASED ACCESS TO THE WATERFRONT, AUGMENTED HABITAT, POP-UP SHOPS, AND FLEXIBLE OUTDOOR ROOMS. DURING DISASTERS, IT DISSIPATES WAVE ENERGY WHILE SERVING AS A VERTICAL REFUGE.
The second tactic, located in lower-lying residential areas adjacent to the waterfront district, involves a community-led easement effort to replace vacant and dilapidated structures in the neighborhood with pocket parks.
DURING A TYPICAL DAY, THESE POCKET PARKS FUNCTION AS LOCAL NEIGHBORHOOD HUBS, AND ARE DESIGNED TO RESPOND TO THE DAILY NEEDS OF RESIDENTS. DURING DISASTERS, THE POCKET PARKS ALLOW FOR WATER TO PASS THROUGH THE NEIGHBORHOOD, REDUCING LOCALIZED FLOOD RISK.
The third tactic, situated along roads between the lower-lying and hilly areas, rethinks the marking of tsunami evacuation routes with small signs. It instead proposes a multi-functional device that incorporates street lighting, siren, emergency lighting, and emergency informational panel.
During a typical day, this wayfinding infrastructure functions primarily as lighting for cars and pedestrians. During tsunamis, this network of devices guides people to safety with directional lighting, augments the municipal siren system, and provides essential emergency information for evacuees.
The forth tactic, located within the hilly neighborhoods above Tokyo Bay, rethinks community parks as longer-term refuge zones for those affected by disasters. Each design element of these public realm spaces are embedded with multiple functions.
ON THE SURFACE, THESE SPACES MAY APPEAR TO BE FAIRLY TRADITIONAL PARKS, WITH WINDING PATHWAYS, WATER FEATURES, SHADE STRUCTURES, AND BENCHES.
During a typical day, the park is used for running, picnicking, and watching local wildlife. During disasters, shade structures offer protection for campers, benches morph into grills, cafes become food and energy hubs, and water features are filtered for drinking.
BY EMBEDDING RESILIENCE INTO THE PUBLIC REALM AT MULTIPLE ELEVATIONS AND SCALES, THIS DECENTRALIZED AND LAYERED APPROACH AIMS TO HELP REDUCE SEISMIC-RELATED RISK ACROSS THE LARGER TOKYO BAY REGION.