

A11

Sustainability / Resilience Plan

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SUSTAINABILITY / RESILIENCE PLAN

Team 1HWY1 recognizes the importance of a holistic design approach that embraces the long term sustainability and resilience of the community as a core design goal. In order to achieve this, our consultant team is leveraging proven sustainable design methodologies to understand:

- Where we are?
- Where we want to go?
- Where are the opportunities?
- And How do we get there?

Through this first principles approach, our team is able to maximize the synergies between strategies, ensuring that optimal sustainable and resilient design strategies are incorporated in a cost effective manner.



• Creating a healthy community

In addition to the more traditional aspects of sustainability that are captured through energy / water efficient design and the other aspects of the CalGreen code, we recognize that a truly sustainable community is also one that actively enhances the health of the patrons. Our team will incorporate a variety of strategies that will enhance the wellness of the community including maximizing the walkability of the development and the use of the sea breeze to enhance air quality and reduce the ambient temperature, making the idea of walking to your destination as pleasant and appealing as possible. Our team's sustainability team are recognized globally in this approach to sustainable planning, with recent deployments including Marina Bay in Singapore and the development of the Samsung Smart City platform.

• A sustainable community partner

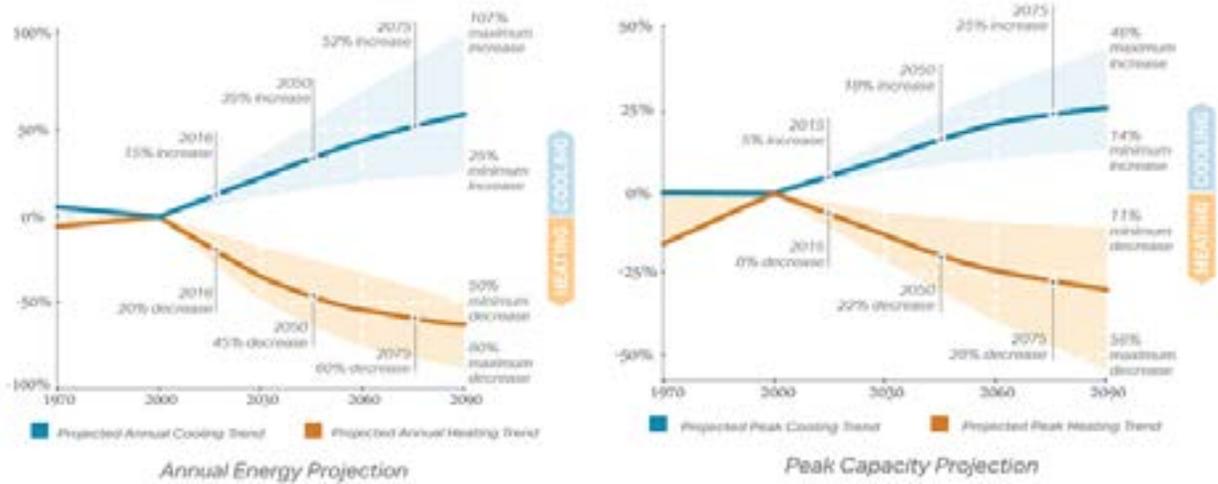
- o *Green Port Initiative:* Our team is excited to see the proactive approach that the Port is taking to drive sustainability within the Tideland, and is committed to maximizing the opportunities provided by the Green Business Network to ensure that the development can be leveraged as an example to other tideland tenants.
- o *Supporting San Diego's Net Zero Goal:* We are committed to supporting the City of San Diego's Net Zero goal and will endeavor to achieve Net Zero capable wherever economically viable.

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CLIMATE CHANGE

One of the fundamental first steps in developing a resilient community design is to understand the local environment and how it is likely to change over the coming year. Through this process, we are able to ascertain whether proven strategies of today will be more or less effective in the future and whether new opportunities will become viable.

Leveraging our past experience in the analysis of climate change and adaptation in the local San Diego area, our team has begun this process of identifying opportunities and potential design considerations that are associated with the increase in average temperature, including the potential use of the tidal Bay water as a source of cooling for the development.



San Diego is likely to see a 10% increase in cooling over the next 10 years



Sea Level Rise

Similarly, we are leveraging our recent work on climate adaptation within San Diego, along with the lessons learned from similar efforts in both

Long Beach and San Francisco, to understand the potential impact that our evolving climate may have on the local coastline and sea level, which will allow us to subsequently design both the development infrastructure and individual buildings to minimize the impact of this climate risk.

Recent studies suggest that the Southern California coastline, including San Diego, is likely to be significantly impacted by climate adaptation and sea level rise over the next century. Specifically to San Diego, it is expected that over the next few decades the greatest cause for concern will be an increase in the kind of flooding that the region already experiences due to waves, storm surge, El Nino events, and very high tides. Starting around mid-century, the Bay may become more vulnerable to regularly occurring inundation of certain locations and assets, some of which are being planned and built

today. Concurrent to this increase with this increase in extreme events it is also anticipated that the Southern California coastline, including San Diego, is likely to experience a 2-3ft increase in peak sea level by the end of the century.

The most vulnerable sectors in the San Diego Seaport community include stormwater management, wastewater collection, shoreline parks and public access, transportation facilities, commercial buildings, ecosystems and electrical infrastructure. In recognition of these increasing flooding risks, our team will continue to develop our design with an emphasis placed on preparing for more common and more severe extreme events. Strategies that are being considered by the team at the San Diego Seaport include:

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- Reconfiguring the ground plane to make the flood path in an extreme event more predictable and reduce potential damage. This will likely include the incorporation of floodable zones into the development, which will be facilitated by both vegetative open space and the provision of parking podiums that can be sacrificed if necessary with minimum long term impact.
- Locating primary facilities outside of the zone that would be impacted by the potential 3ft sea level rise.
- Upgrade of grade level electrical infrastructure, including transformers, to allow for temporary flooding by salt water.
- Elevate primary building HVAC, electrical and IT equipment to upper floors to minimize impact of flooding events. This will include the location of central cooling equipment, electrical switchgear, generators and IT data facilities. Additionally, we are looking at alternative strategies for the provision and distribution of energy within the Seaport development.
- Design of stormwater and sewer systems to minimize the risk of the systems backing up and the release of contamination either within the development or to the ocean. To achieve this, the systems will be developed with sufficient attenuation capacity to accommodate any surges resulting from extreme events.

UNDERSTANDING THE POTENTIAL

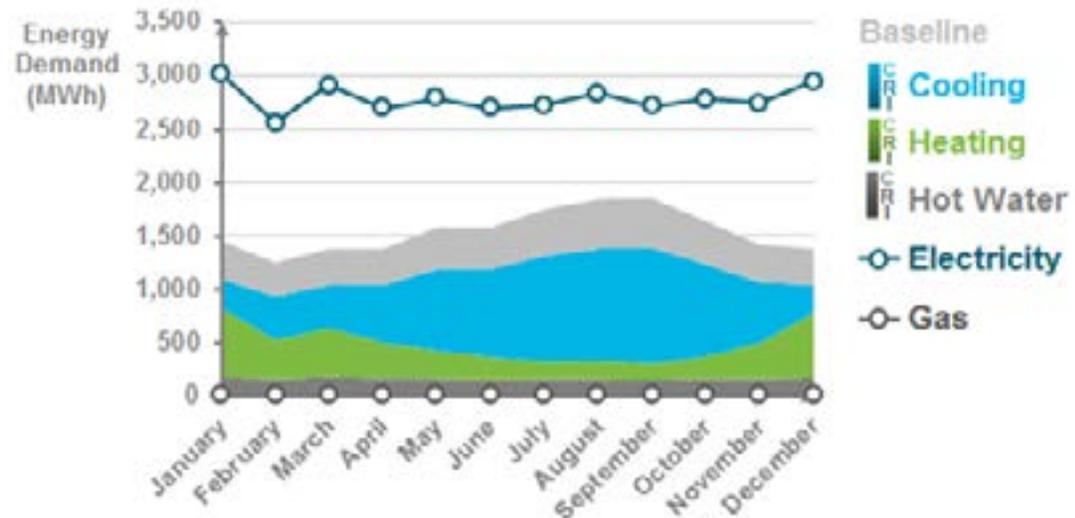
In addition to understanding the inevitable influence that the local environment will have on the long term success of our development, our team believes that in order to maximize the sustainable potential within the development we need to take a holistic look at the water and energy needs of the facility.

Our Team is leveraging AECOM's SSIM tool kit to begin this process, allowing us to evaluate the overall development energy and water footprint and test a number of scenarios during the early planning phases that will set us up for success at both the individual parcel and overall development level.

Energy

In line with San Diego's Net Zero Energy goals, it is essential that the Shoreline development is built on a solid foundation for energy efficiency and that in turn, opportunities are identified to look at a development level to further reduce the impact of the community on the local energy infrastructure.

Through our commitment to passive design strategies that take advantage of the local San Diego climate, combined with the use of high efficiency lighting and HVAC strategies, it is anticipated that the peak electrical demand of the community can be reduced significantly. As shown in the above provide our initial analysis suggests that through our integrated approach we can reduce the peak electrical demand associated with the development by approximately 2 MW.



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Similarly, the energy efficient design strategies will reduce the annual energy consumption associated with the development.

Our team is committed to the development of energy efficient buildings, and will strive to achieve Net Zero Capable solutions where economically viable. While these parcel level strategies will inevitably benefit the overall environmental footprint of the development, we believe that it is when we look at the development as a whole that the opportunities to maximize the sustainable potential of the development.

Our team has identified a number of potential strategies that we will continue to explore that we believe could enhance the community not only environmentally but by reducing its reliance on the local utility infrastructure and as such enhancing the resilience of the community.

- **Microgrid**

- o *Thermal MicroGrid:* through s recent analysis of sea water solutions in both California and Guam, our team will investigate the viability of leveraging the proximity to the Bay and the access to the tidal water flow to implement a thermal micro-grid, through which the seawater is used as the primary source of heating and cooling for the community. Not only does this have a significant benefit to the overall energy consumption associated with HVAC, which based upon the climate change analysis noted above is likely to increase significantly over the life of the buildings, but it also reduces what is likely to be the largest single water consumer within the development – cooling towers. In addition

to leveraging the Bay, we would also look to maximize the thermal symbiotic relationship that can be achieved between the non-coincidental thermal energy needs of the various building uses – hotels needs hot water when the adjacent commercial buildings are pre-cooling in advance of the working day and as a result are looking to reject heat.

- o *Electrical MicroGrid:* similar to the thermal microgrid, our team recognizes that advancements in onsite energy generation technology, coupled with potential changes in California legislation regarding microgrids, provide a unique opportunity to enhance the resiliency of the development, and its tenants. Our team's energy and sustainability specialists have recently embarked on one of the California Energy Commissioning's microgrid pilot projects for Berkeley, and will leverage the insight gained through that process in their evaluation of micro-grid opportunities within the development.

In both the cases of thermal and electrical microgrid, our team will endeavor to ensure that whenever economically viable, steps are taken to facilitate the future flexibility and ability to embrace micro-grid strategies in the future.

- **Water Conscious Community Design**

- o *Balancing water needs and sources:* In recognition of California's growing drought issues and water conservation requirements, our team will leverage SSIMw Water Balance model fully understand the water needs within the community and the ability to cascade water to match the potable needs with new

water and re-use water onsite. Our team has successfully used this methodology with a number of major private developers in Southern California to inform strategies from the use of water efficient fixtures to the collection and reuse of black and grey water on site, and will leverage this knowledge to inform our analysis of the opportunities that the large amount of potential grey water generation from the hotel and residential components of this development present. Through this process, we anticipate achieving at least a 30 percent reduction in potable water use within buildings and at least a 50 percent reduction in irrigation water consumption.