

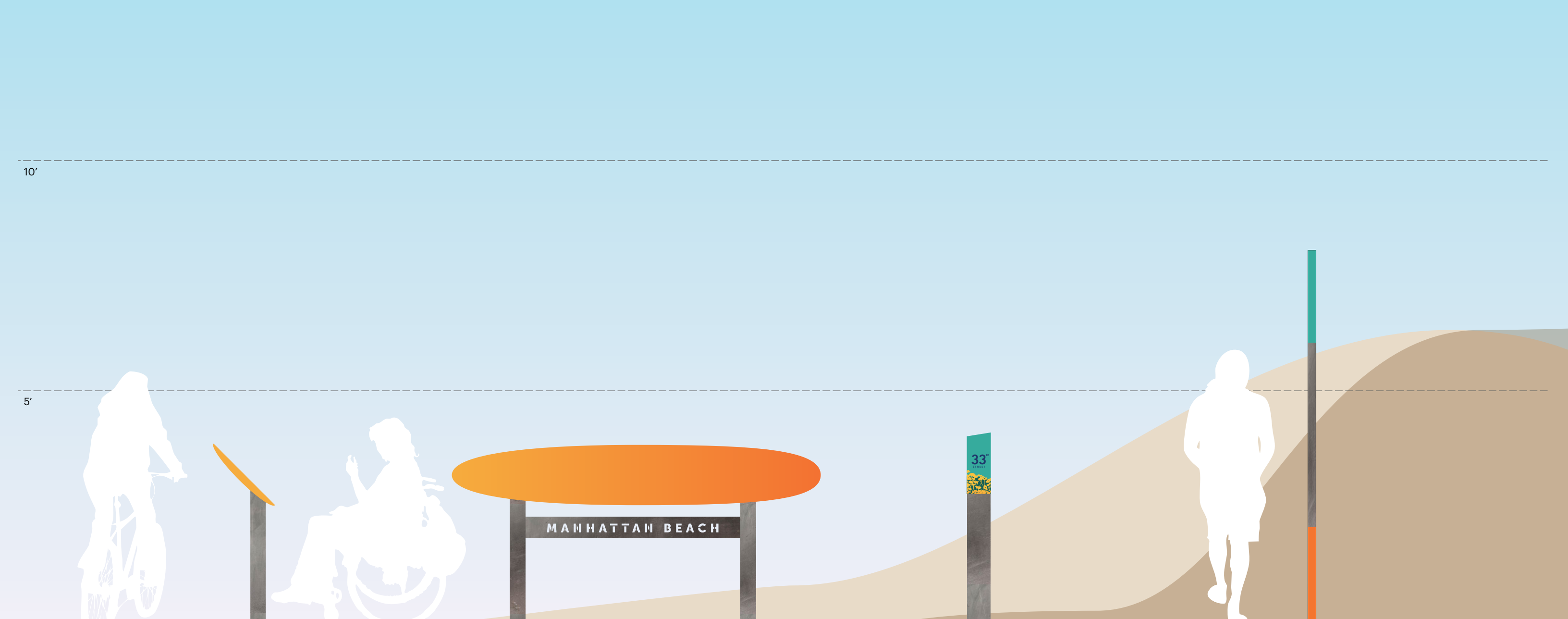
Manhattan Beach Dunes Restoration Project

Final Sign Package

The Bay Foundation

03/11/2021

RIOS



Primary Interpretive Signage
Coastal Resilience

Secondary Interpretive Signage
Flora & Fauna

Dune Height Indicators

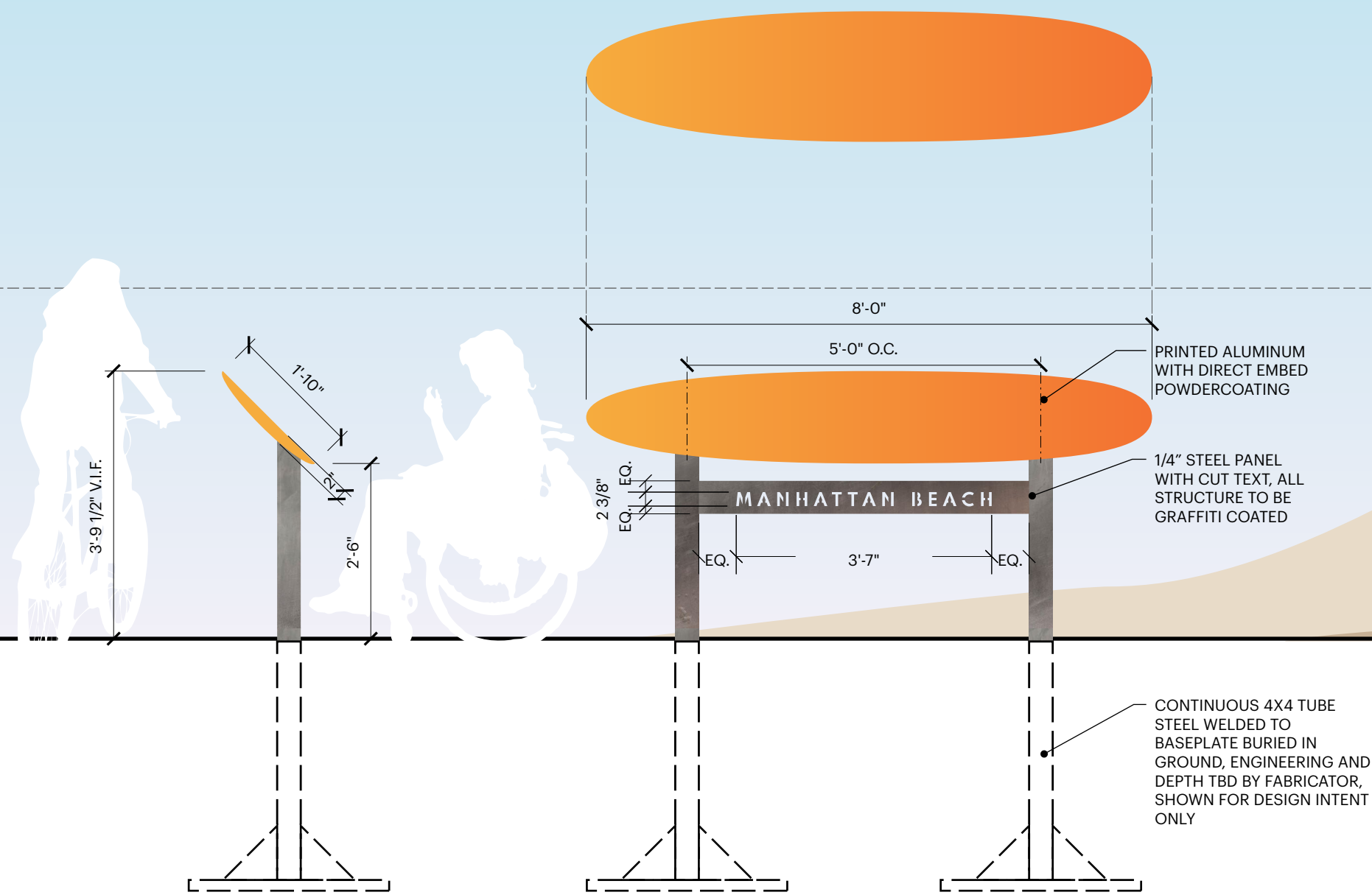
1/2" = 1'

FORMAT

Interpretive Sign Family

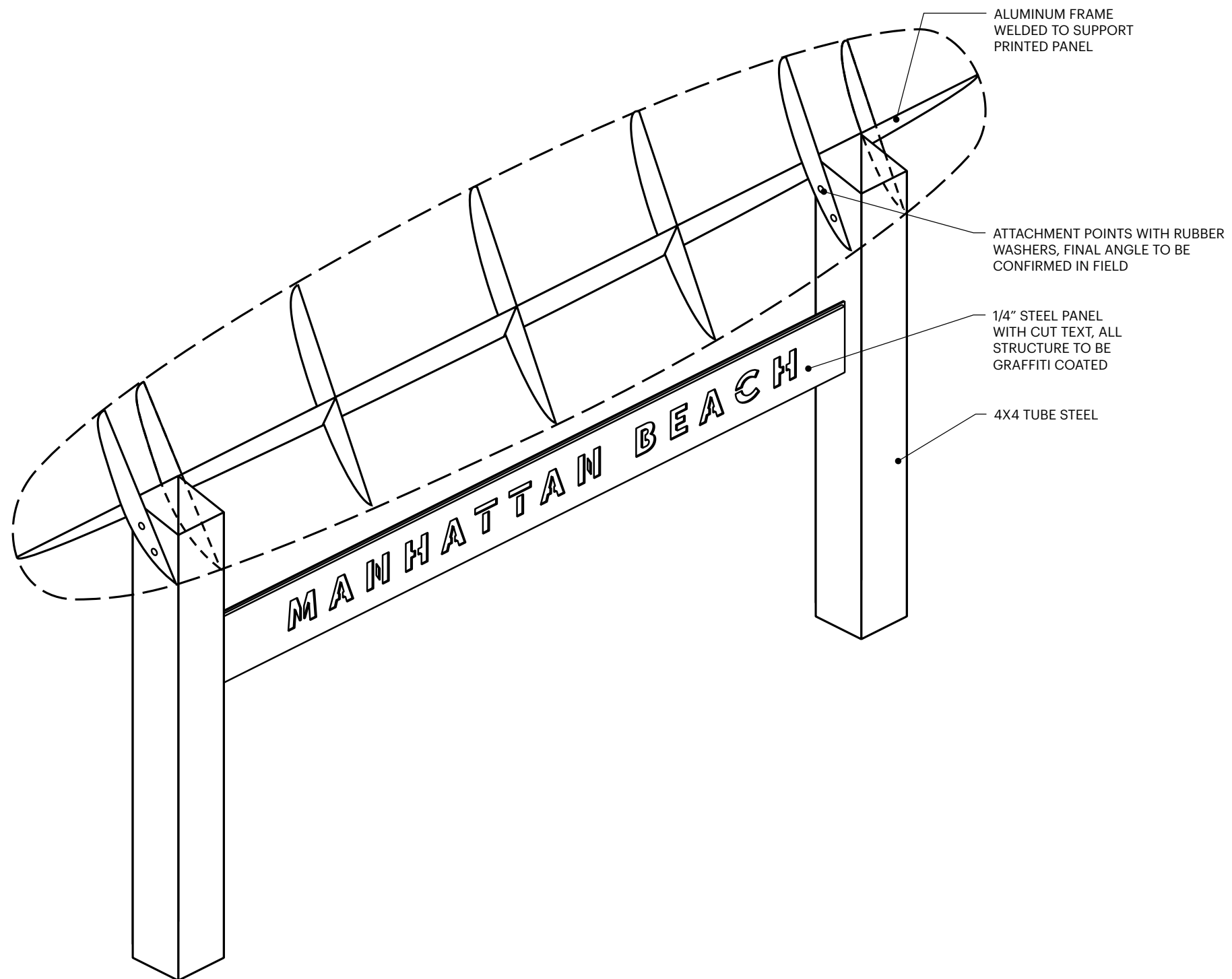
10'

5'



1/2" = 1'
FORMAT

Interpretive Signage: Long Board



FORMAT

Interpretive Signage: Long Board



GOALS OF RESTORATION
 Natural beaches allow vegetation to grow and dunes to form. Native dune plants are specially adapted to help build dunes that are healthy and provide habitat for shorebirds and other wildlife. Healthy dunes create a more resilient coast by protecting our built environment from flooding caused by sea level rise and storms.

HOW ARE DUNES FORMED?
 1. Native plants play an important role in forming dunes by stabilizing the sand with their extensive roots and trapping wind-blown sand.
 2. As wind blows sand across the beach, plants and fences trap the sand and form dunes. Dunes keep the sand on the beach and help prevent coastal erosion.
 3. As dunes grow, they form a natural defense against flooding caused by coastal storms and sea level rise.

OBJETIVOS DE RESTAURACIÓN AMBIENTAL
 Las playas naturales permiten que la vegetación crezca y se formen dunas de arena. Las plantas nativas o autóctonas están especialmente adaptadas para ayudar a construir dunas que son saludables y proveen un hábitat para las aves costeras y la vida silvestre. Las dunas saludables protegen las costas contra las inundaciones causadas por el aumento del nivel del mar y las tormentas.

¿CÓMO SE FORMAN LAS DUNAS?
 1. Las plantas autóctonas juegan un papel importante en la formación de dunas. Ellos estabilizan la arena con sus extensos raíces y atrapan la arena sopada por el viento.
 2. A medida que el viento sopla arena a través de la playa, las plantas y cercas atrapan la arena y forman dunas. Las dunas mantienen la arena en la playa y previenen la erosión costera.
 3. A medida que las dunas crecen, ellas crean una barrera física contra las inundaciones causadas por las tormentas costeras y el aumento del nivel del mar.

BACKDUNE
 Back dunes are on sandy soils that are more protected from the wind and occur due to their position behind the foredunes. Because this area is more stable, the soil has more nutrients that support a greater diversity of native plants. Additionally, this habitat type supports birds, pollinators such as bees and butterflies, and other wildlife.

DUNA TERCERA
 Las dunas terciarias se producen en suelos arenosos que están más protegidos del viento y son debido a su posición detrás de las dunas secundarias que crecen más cerca. Debido a que esta área es más estable, el suelo tiene más nutrientes que soportan una mayor diversidad de plantas autóctonas. Además, este tipo de hábitat soporta aves, polinizadores como abejas y mariposas, y otras especies silvestres.

FOREDUNE
 Foredunes are the part of a sand dune system that is closest to the ocean. Foredunes are very dynamic habitats, constantly changing from sand blowing, sand moving, and ocean exposure. Only the most resilient pioneer plants can survive.

DUNAS PRIMARIAS / PRIMARIAS
 Las dunas primarias son dunas que se encuentran en el océano. Las dunas primarias son hábitats muy dinámicos, que cambian constantemente por el viento, el movimiento de la arena y la exposición al mar. Solo las plantas pioneras más resistentes pueden sobrevivir.

Protecting Our Coastlines

Protegiendo nuestras costas

HISTORIC DUNES
 Where you are standing now used to be part of the largest and most important dune system in coastal Southern California. Sometimes called the El Segundo sand hills, these dunes covered 98 square miles of land extending from Redona Creek through Manhattan Beach. Dunes reached up to 150-foot high, forming a dune ridge, while older, gentler dunes extended further inland.

HUMAN IMPACT
 Most of the historic dunes have been reduced by urban development, leaving the shoreline with limited areas of native vegetation. Many changes affect the way the shore now responds to coastal processes: sand delivery to the shore has been altered by dams, large areas of pavement in the watershed cause surface run-off, and extreme modification of stream channels carry flood waters rapidly to the ocean. Artificial structures, such as jetties, breakwaters and seawalls now alter the interaction of waves with the coast, interfering with natural sand accumulation. Restoring dunes and natural processes will help protect the coast and buffer the impacts of sea level rise and climate change.

DUNAS HISTÓRICAS
 Donde usted está de pie solía ser parte del sistema dunar más grande e importante en la costa del sur de California. A veces llamadas las colinas de arena El Segundo, estas dunas cubrieron 98 millas cuadradas de tierra que se extendió desde Redona Creek a través de Manhattan Beach. Las dunas alcanzaron hasta 150 pies de altura, formando una cresta de dunas, mientras que las dunas más antiguas y suaves se extendieron más hacia el interior.

IMPACTO HUMANO
 La mayoría de las dunas históricas han sido reducidas por el desarrollo urbano, dejando la costa con áreas escasas de vegetación nativa. Muchos cambios han afectado las maneras en que la costa responde a procesos costeros hoy en día: el depósito natural de arena a la orilla ha sido alterado por las represas, grandes áreas de pavimento en la cuenca que causan el desbordamiento de la superficie, y la modificación extrema de los canales de los arroyos que transportan aguas de manantiales rápidamente al océano. Las estructuras artificiales, como los rompeolas y los muelles alteran la interacción entre las olas y la costa, interfiriendo con la acumulación natural de arena. Restaurar las dunas y los procesos naturales ayudará a proteger la costa y disminuir los impactos del aumento del nivel del mar y del cambio climático.

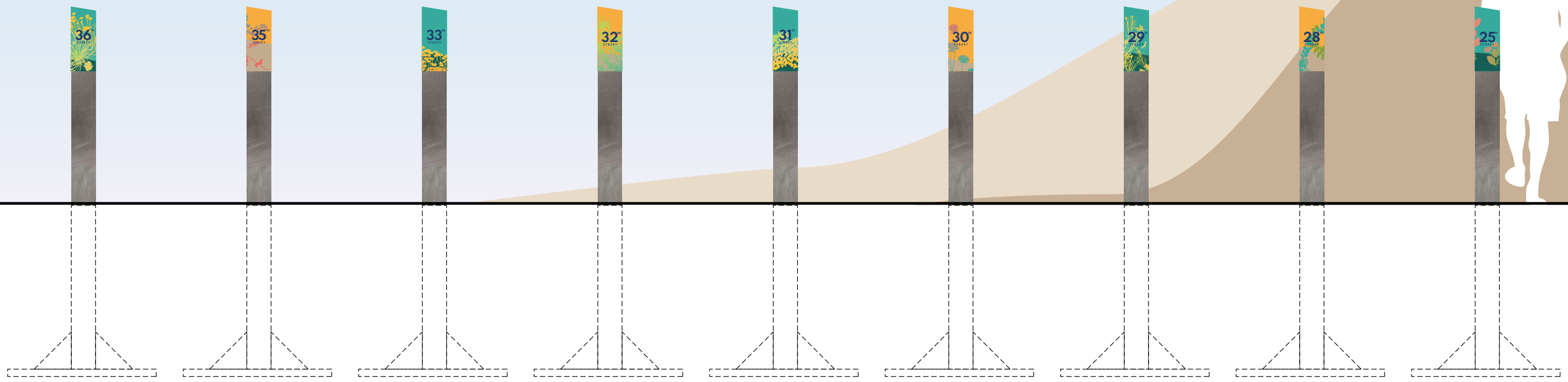
LAND ACKNOWLEDGMENT We recognize and acknowledge that we are on the land of the Gabrielino-Tongva people who have lived and continue to live here. We pay respects to their elders past and present, and thank them for their strength, generosity, and resilience.

LAYOUT

Interpretive Signage: Long Board Layout

10'

5'



GOLDEN YARROW
Eriophyllum confertiflorum

PINK SAND VERBENA
Abronia Umbellata

GIANT COREOPSIS
Leptosyne Gigantea

BEACH BUR
Ambrosia chamissonis

BEACH EVENING PRIMROSE
Camissoniopsis Cheiranthifolia

SEA CLIFF BUCKWHEAT
Eriogonum parvifolium

MOCK HEATHER
Ericameria ericoides

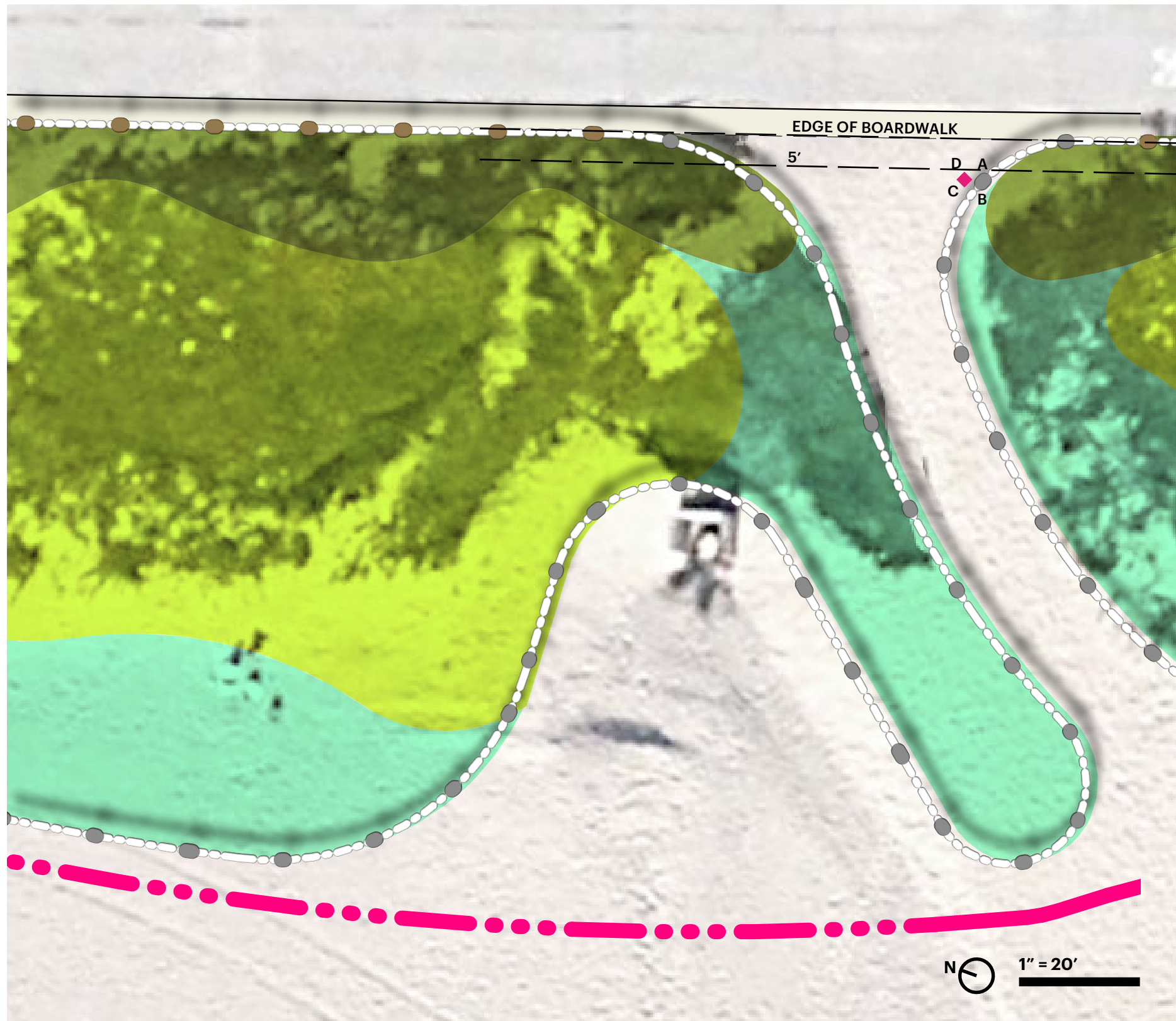
BEACH SALT BUSH
Atriplex leucophylla

RED SAND VERBENA
Abronia Maritima

1/2" = 1'

SERIES

Interpretive Signage: Secondary



- Signage always placed on the south side of the path entry
- Minimum 5' from boardwalk
- Angle in line with adjacent fencing

GIANT COREOPSIS
Lepidosaphis Gigantea
 The coastal leucoglossid is found throughout Central and Southern California including the Channel Islands and Guadalupe Island, Mexico. It can grow up to two meters tall, and may appear dry in the summer but blooms the remainder of the year.

TOP



SIDE A



SIDE B



SIDE C

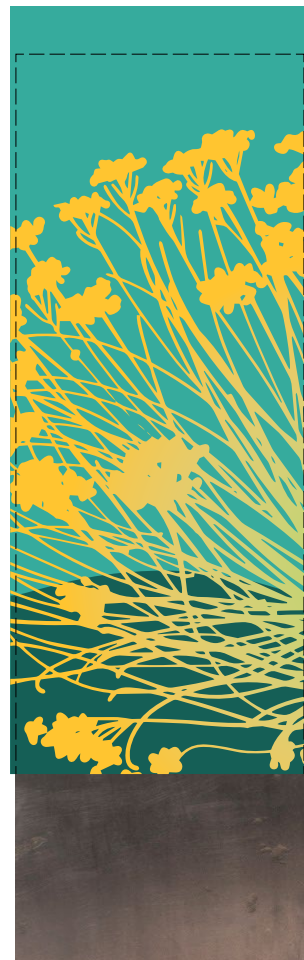


SIDE D

Typical Sign Format shown as example

SERIES

Interpretive Signage: Secondary Placement

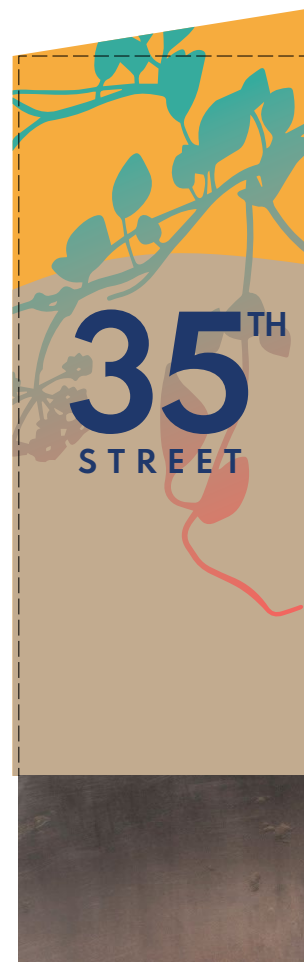


GOLDEN YARROW
Eriophyllum confertiflorum
 This native plant can be found from San Francisco Bay all the way to Baja California, and is pollinated by butterflies and bees.

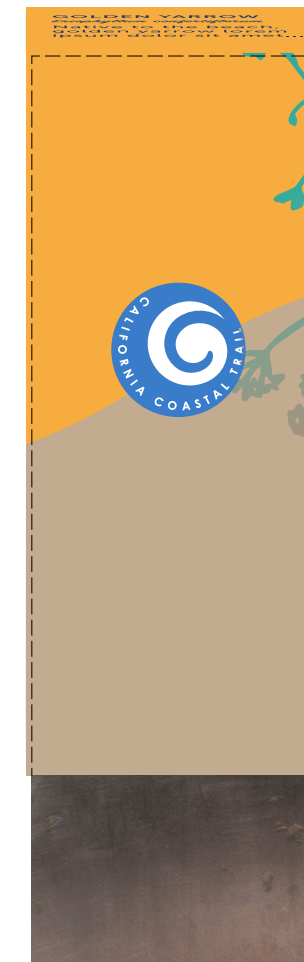


3" = 1'
 CONTENT

Interpretive Signage: 36th Street Layouts



PINK SAND VERBENA
Abronia Umbellata
 Native to the western US, Pink Sand Verbena blooms on the sand dunes throughout most of the year. It is pollinated by moths and butterflies.



3" = 1'
 CONTENT

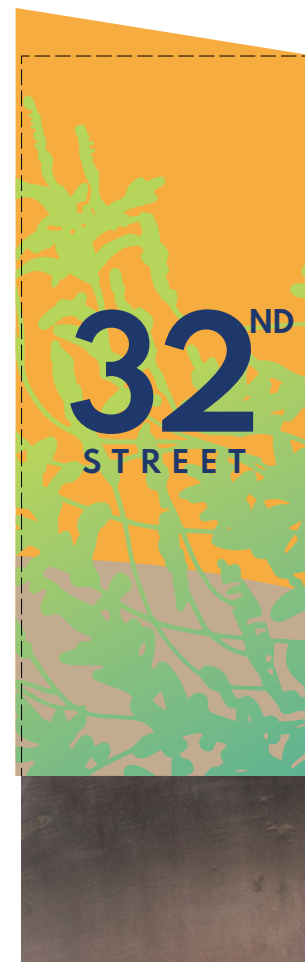
Interpretive Signage: 35th Street Layouts



**GIANT
COREOPSIS**
Leptosyne Gigantea
This coast-loving plant is found throughout Central and Southern California, including the Channel Islands and Guadalupe Island, Mexico. It can grow up to two meters tall, and may appear dry in the summer but blooms the remainder of the year.

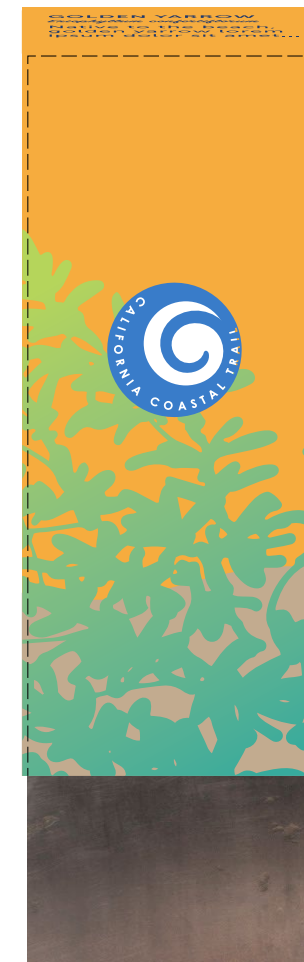
3" = 1'
CONTENT

Interpretive Signage: 33rd Street Layouts



BEACH BUR
Ambrosia chamissonis

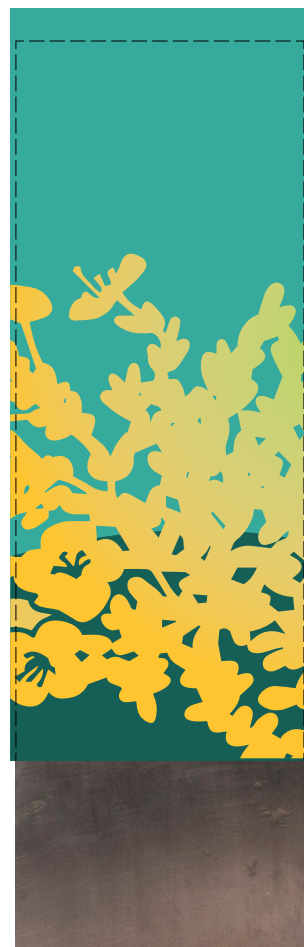
A type of ragweed, each tiny flower of the Ambrosia develops into a small, spiked bur from which it gets its name. Living on beaches up and down the West Coast, the Beach Bur supports moth and butterfly communities.



3" = 1'

CONTENT

Interpretive Signage: 33rd Street Layouts



**BEACH EVENING
PRIMROSE**
Camissonopsis Cheiranthifolia

The low form and swinging stems of the Beach Evening Primrose make it particularly suited to the windy conditions of coastal dunes. The four-petaled blooms may close at night, but open again every morning.



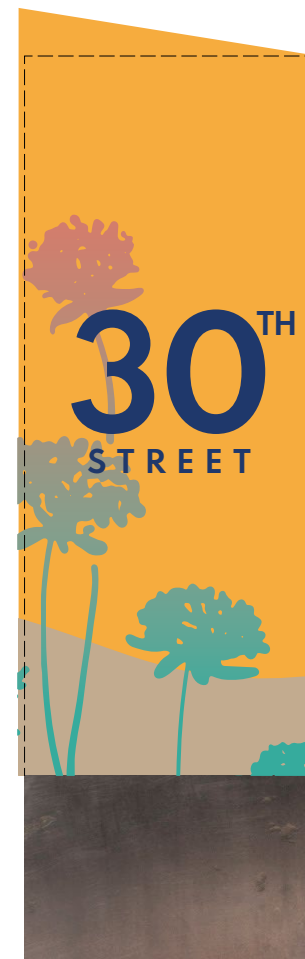
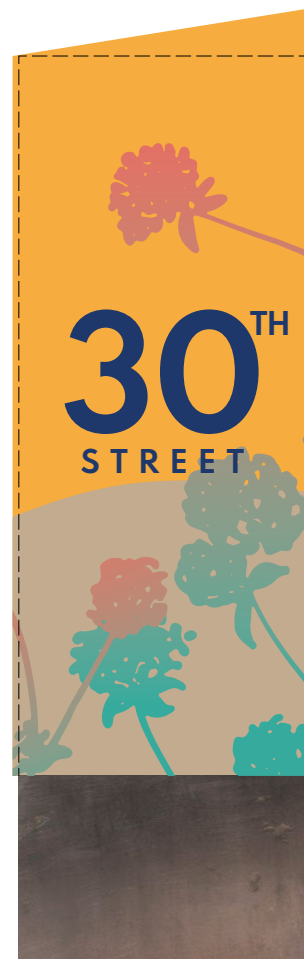
3" = 1'

CONTENT

Interpretive Signage: 31st Street Layouts

**SEA CLIFF
BUCKWHEAT**
Eriogonum parvifolium

Found on both bluffs and dunes throughout California's coasts, these tiny flowers play an important role in California's ecosystem by hosting a wide variety of pollinating butterflies, including endangered species.



3" = 1'
CONTENT

Interpretive Signage: 30th Street Layouts



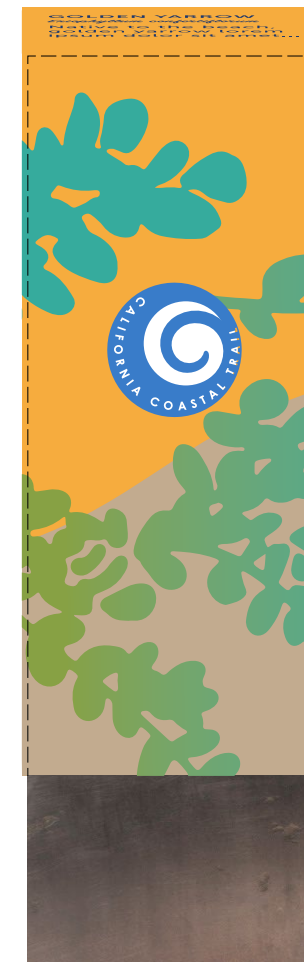
MOCK HEATHER
Ericameria ericoides

This shrub may look like heather, but it prefers our sandy dunes to garden soil. Also known as California Goldenbush for its colorful blooms, Mock Heather attracts bees and butterflies as it blooms into the fall.

3" = 1'

CONTENT

Interpretive Signage: 29th Street Layouts



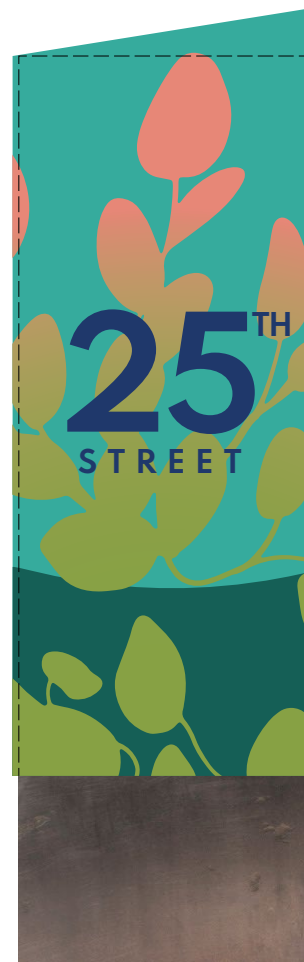
**BEACH
SALT BUSH**
Atriplex leucophylla

The flowers of this low-lying plant develop into fruits containing small seeds, which are snapped up by birds, moths, and butterflies. Also known as Seascale, the saltbush spreads throughout California's dunes.

3" = 1'

CONTENT

Interpretive Signage: 28th Street Layouts



**RED SAND
VERBENA**
Abronia Maritima

This rare and picky plant needs sea spray to grow, being intolerant to fresh water. It grows to form mats that catch both sand and small animals, easily becoming engulfed by healthy growing sand dunes. Its flowers are enjoyed by bees, butterflies, and moths.

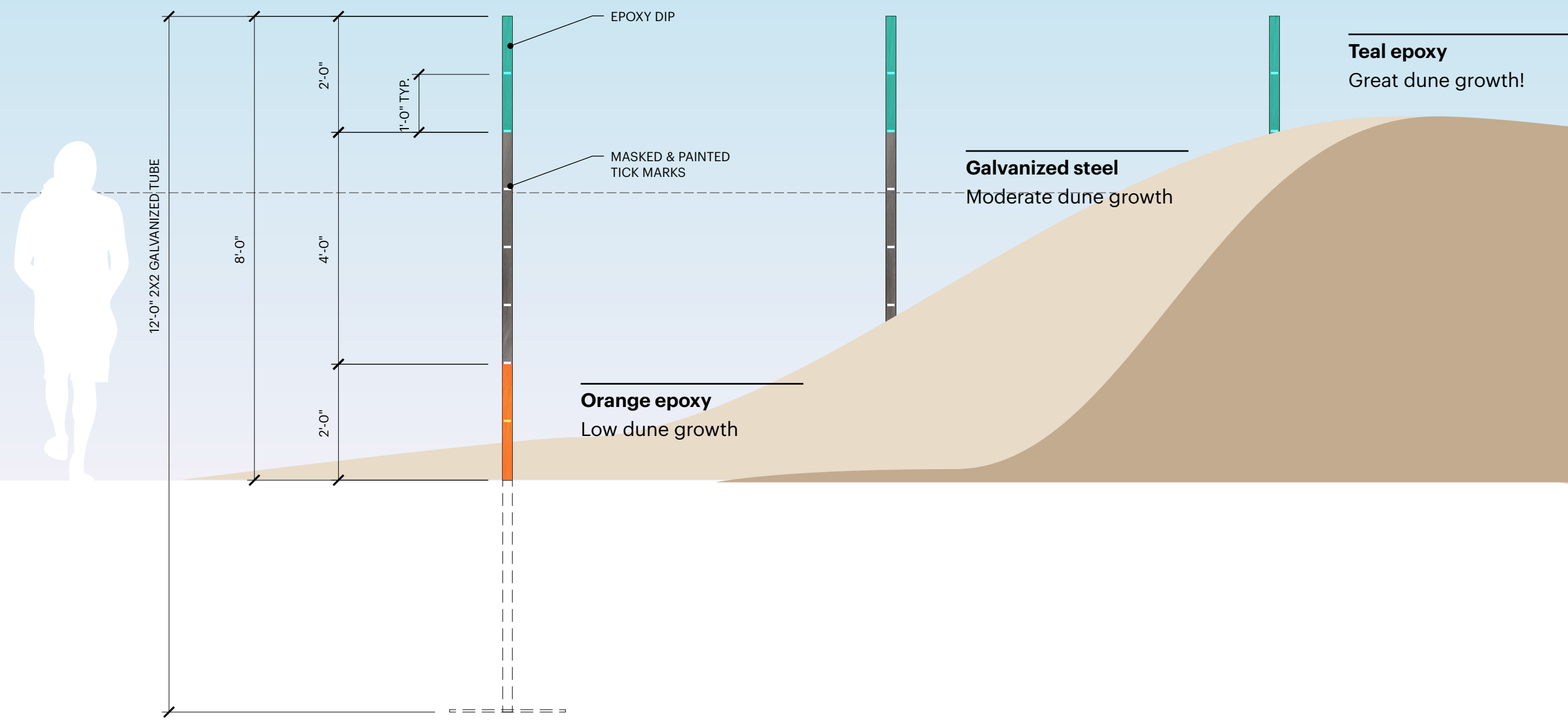
3" = 1'

CONTENT

Interpretive Signage: 25th Street Layouts

10'

5'



1/2" = 1'

FORMAT

Dune Height Indicators