CHAPTER 09

APPENDIX

9.1 - *existing site assessment quadrant studies*

9.2 - *cost estimate concept drawings*

9.3 - *cost estimate*

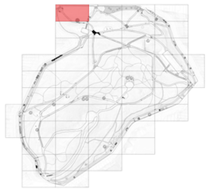
9.4 - *urban forestry report*

9.5 - *civil engineer supplemental report for asphalt concrete paving and stormwater management concepts*

9.6 - *habitat ecologist report*

9.7 - *recommended planting list*

9.1 - existing site assessment quadrant studies



Panel 1 is located in the North-east of the park, on the corner of Haight and Buena Vista Avenue East including the historic west entry, saphlat paving and perimeter sidewalks.

1. Log perimeter around formal entrance planting.

2. Willow fence and erosion wattle around main entrance planting.

3.Spalling and cracking in asphalt at entrance stairway.

4.Trenching in asphalt path.

5.Historic brick sidewalk detail in disrepair and weeds growing.

6. Asphalt near historic cobble and drain cracking and spalling.

7. Staircase concrete cracking.

8. Erosion on side of main trail.

9.Asphalt spalling.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

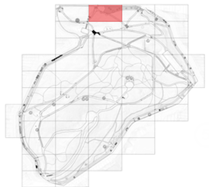
BUENA VISTA PARK EXISTING SITE ASSESSMENT

AREA 1 - HAIGHT ST. & BUENA VISTA AVE. W ENTRANCE

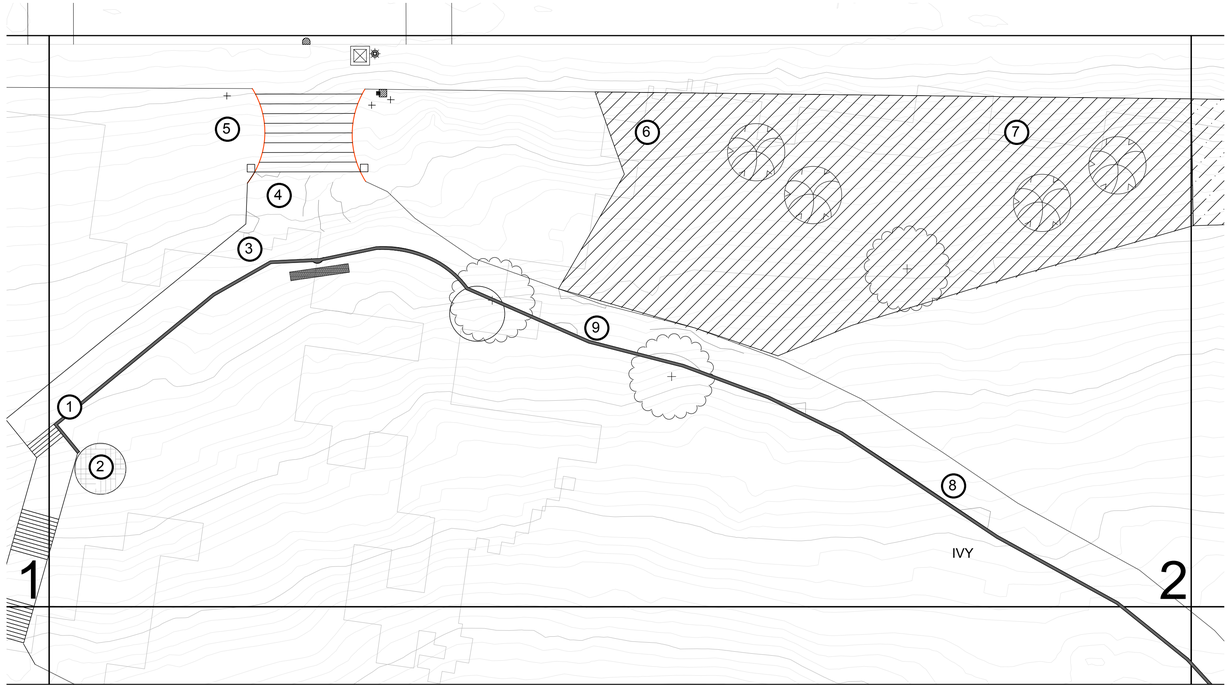
MILLER COMPANY landscape architects

SAN FRANCISCO, CA

AUGUST 22, 2019



KEY PLAN



Panel 2 serves as another main entrance off Haight Street adn Lyon Street. The main stair case is cracking and much of the asphalt at the entrance is failing. Planting and erosion problems exist through this section.

1. Wooden steps in disrepair. Edges eroding.

2. Erosion causing breakage of curb. Sediment spilling onto trail.

3.Spalling and cracking in asphalt at entrance stair-way.

4.Asphalt in disrepair at top of stair.

5.Log perimeter of formal hedge planting on Haight Street entrance.

6. Erosion - This area has been recently planted.

7. Erosion - This area has been recently planted.

8.Spalling in asphalt.

9.Edges cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

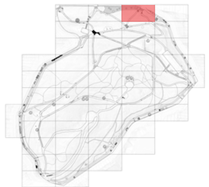
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



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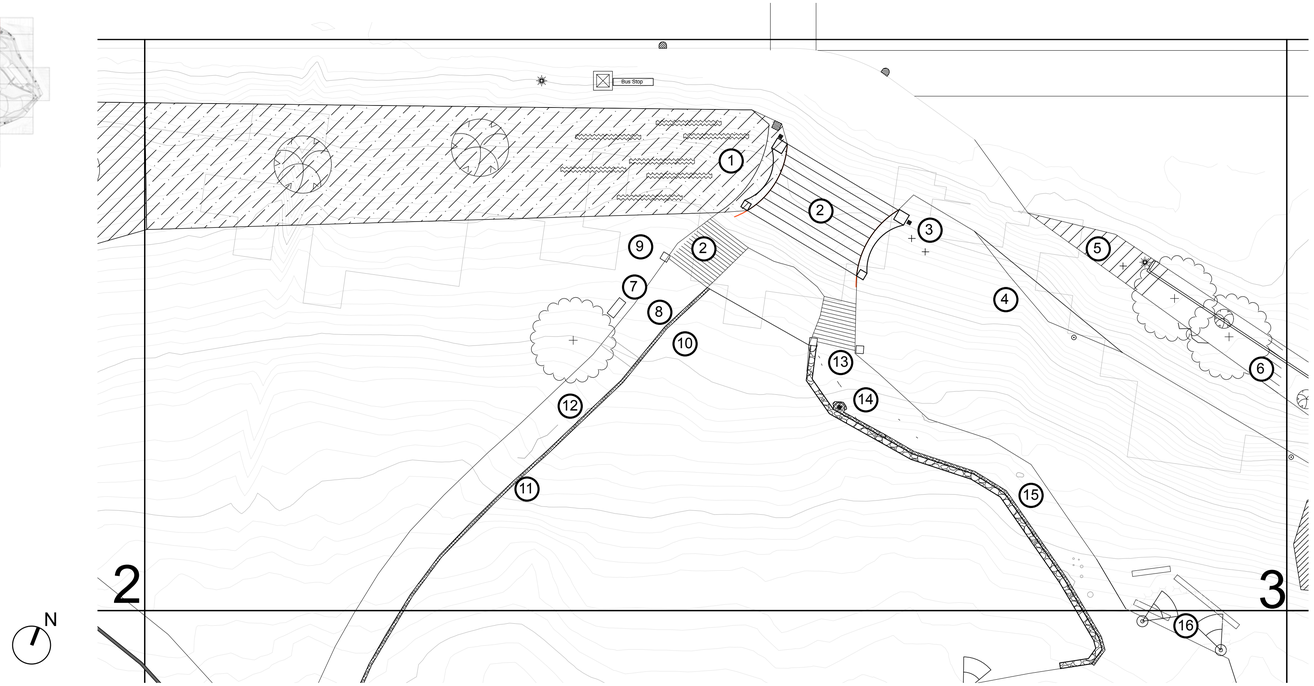


Panel 3 is at the three-way intersection of Haight Street, Baker Street, and Buena Vista Avenue East. Panel 3 includes extremely steep terrain and subsequent erosion issues and a need for planting and asphalt repairs.

1a. Temporary erosion control at entrance with logs and wattles.

1b. Erosion control wattles at entrance.

2a. Historic wall and stair separating due to erosion.

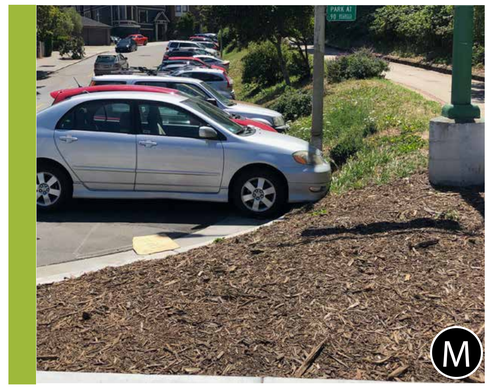
2b. Broken edge at stairs.

2c. Walls separating from stair and footing at column is exposed.

3a.Erosion control near drain at entrance.

3b. Existing signage.

4. Overgrown perimeter plantings.



5. Mulched area with no planting.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

BUENA VISTA PARK EXISTING SITE ASSESSMENT

AREA 3 - HAIGHT ST. & BAKER ST. ENTRANCE

MILLER COMPANY landscape architects

SAN FRANCISCO, CA

AUGUST 22, 2019

6. Informal stone stair and sparse planting.

7. Back flow preventer in enclosure and sparse planting.

8. Asphalt paving and edge deteriorating.

9. Sparse planting and erosion at entry slope.

10. Overgrown weeds at top of entry stairs

11. Historic drainage gutter falling apart.

12a. Spalling and cracking in asphalt.

12b. Spalling and cracking in asphalt.

12c. Asphalt paving spalling at stair transition

13. Asphalt paving spalling at stair transition

14. Asphalt paving failing at historic drain inlet.

15a. Asphalt paving failing at historic drain inlet.

15b. Alligator cracking in asphalt paving.

15c. Asphalt paving edge failing.

16. View opportunity

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

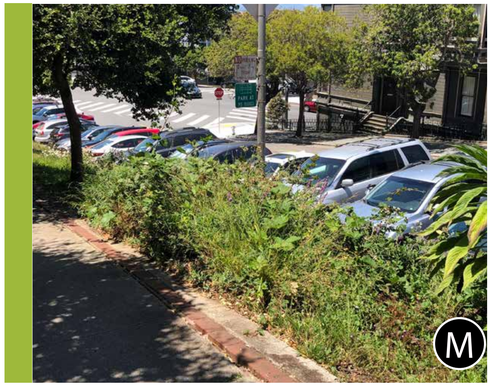
H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 4 includes exterior plantings and steep interior topography.

1. Pride of Madeira invasive plantings.



2. Inconsistent hedge.

3. Steep topography causing erosion. Ivy plantings serving as erosion control.

4. Bare perimeter. Opportunity for planting.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 5 includes a secondary entrance off Buena Vista Avenue East. Terrain and trails at this entrance are extremely steep.

1. Major cracking in asphalt on edges.

2. Asphalt failing near edges.

3.Unmarked secondary trail leads to tennis court in Panel 12.

4.Steep terrain leading to street level.

5.Asphalt cracking near edges.

6. Curb leading to the trail.

7. Separation between concrete paving and historic brick details filled with weeds.

8.Asphalt failing on edges.

9. Invasive plantings adjacent to pathway.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

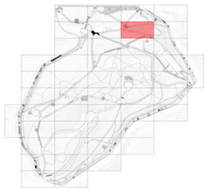
BUENA VISTA PARK EXISTING SITE ASSESSMENT

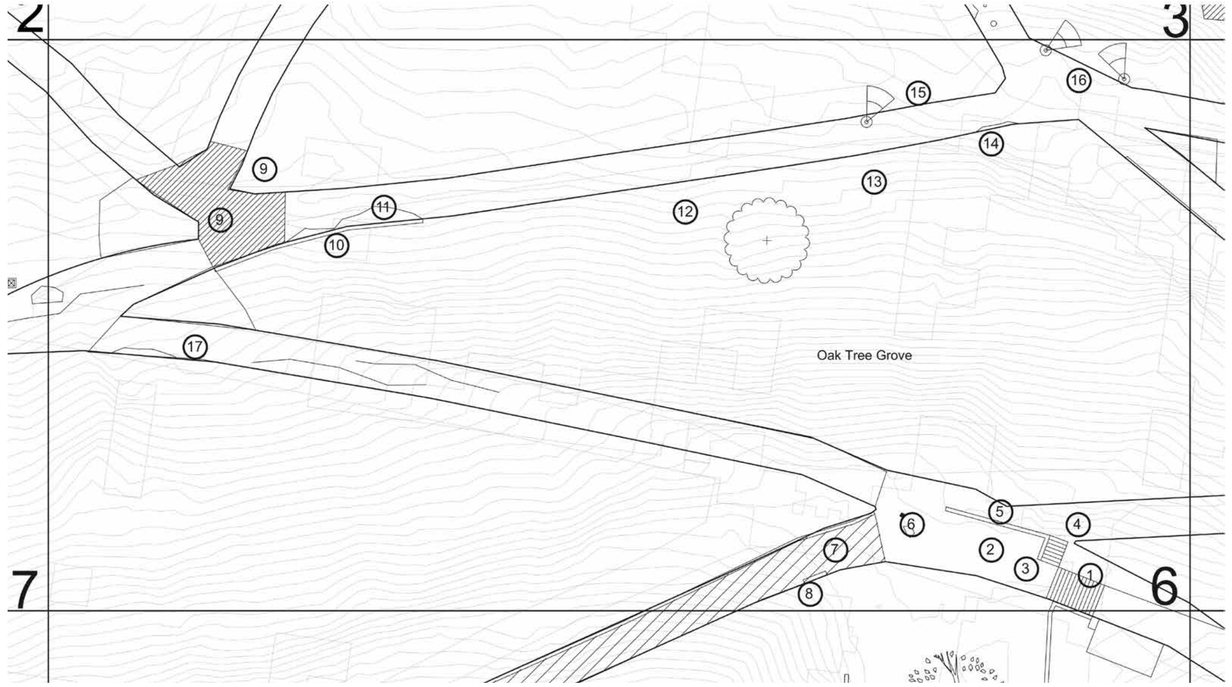
SAN FRANCISCO, CA

AREA 5 - BUENA VISTA AVENUE WEST ENTRANCE

MILLER COMPANY
landscape architects

AUGUST 22, 2019





Panel 6 includes to major trail way intersections in need of repair and/or replacement and the utility area.

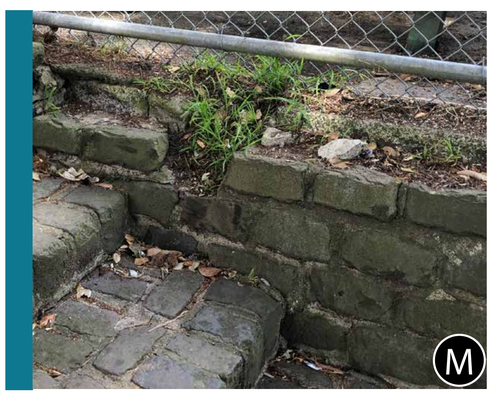
1. Historic stone staircase to bathroom.

2.Maintenance area looking from stone staircase.

2. Asphalt cracking in maintenance area.

2. Picnic table at maintenance area and lower stairs.

2. Chainlink fence guardrail and lower stone stairs.



2. Stone wall failing at lower stairs.

3. Lower stone stairs.

4. Damage to corner of stone staircase column.

5. Asphalt spalling near base of stone retaining wall.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

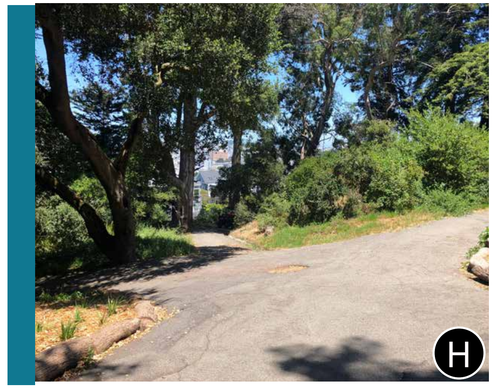
M Medium risk and opportunity

L Low risk and opportunity

6. Drain inlet with stone border.

7. Wide spread spalling at path intersection.

8. Bench and asphalt pathway cracks.



9a. Asphalt spalling and cracking at pathway intersection

9b. Steep slope at pathway intersection and log header for plant protection.

9b. Pathway intersection and log header for plant protection.

10. Overgrown weeds and planting and failing stone wall.

11. Asphalt paving spalling

12. Invasive ivy planting.

13. Oak Grove.

14. Asphalt edge failing

15. Overgrown planting and weeds.

16. Great view.

16. Great view.

17. Asphalt paving cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

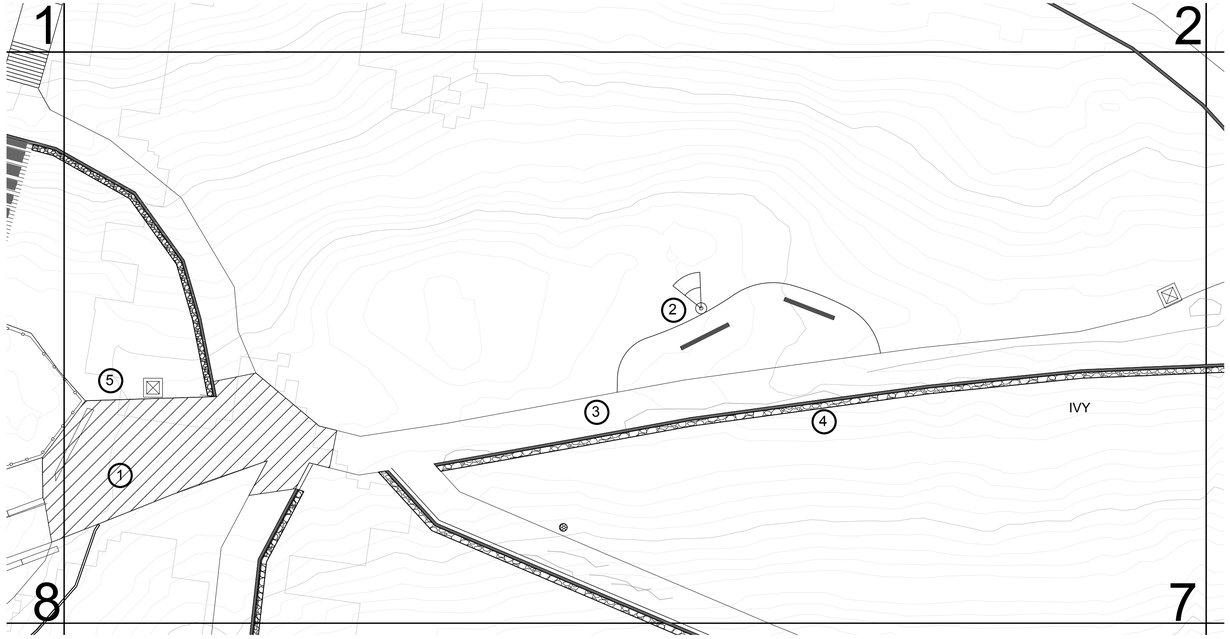
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 7 includes a major primary trail intersection in need of repairs and/replacement.

1a. Major primary trail intersection in need of repairs.

1b. Cracking between asphalt layers.

1c. Major primary trail intersection in need of repairs.

1d.Cracking cement. Start of wood wall. Durability concerns.

1e.Asphalt cracking near edges.

2. View opportunity.

3. Asphalt paving spalling.

4.Invasive Ivy plantings.

5.Temporary staging area with welded wire fence.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

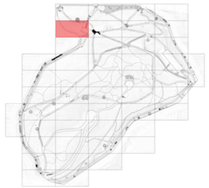
Water Management + Erosion Control

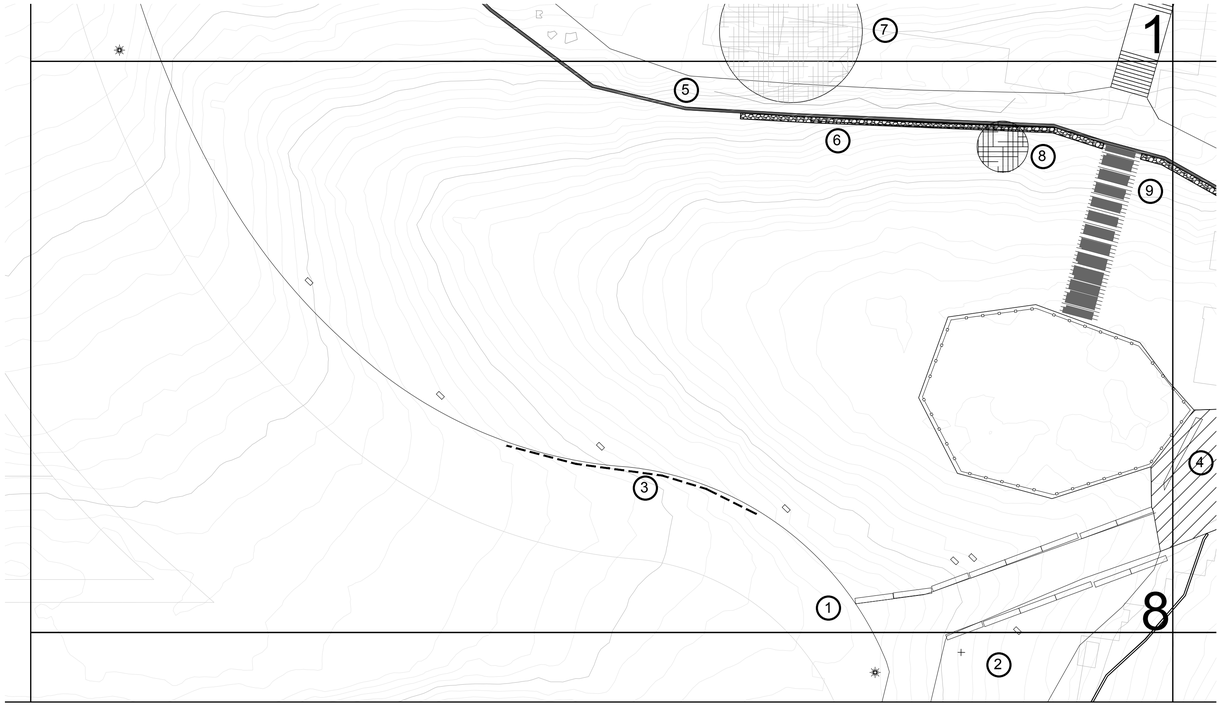
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 8 includes exterior side walk, internal trail, and the majority of the playground.

1.Buena Vista Avenue East entrance.

2. Entrance planting.

3. Edge cracking.

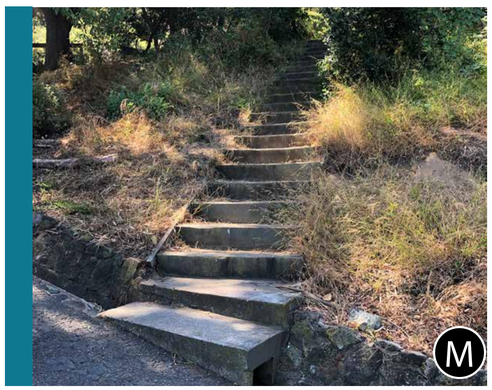
4. Random curb. Playground in need of update.

5. Crack in the middle of asphalt.

6. Historic wall failing.

7. Erosion.

8. Erosion causing stone wall collapse.



9. Stair leading to playground.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

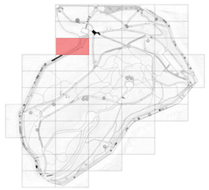
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



6
7
8
9

Panel 9 includes the exterior sidewalk along Buena Vista Ave. W. and part of the entrance.

1. Wooden retaining wall. Long term durability in question.

2. Drought tolerant and native planting and ADA path.

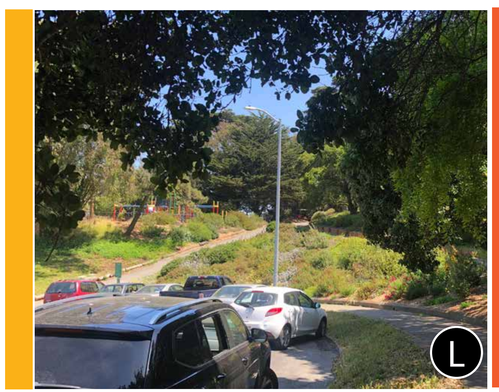
2. Drought tolerant and native planting and ADA path.

3. ADA accessible ramp landing and wood wall.

4. Steps to pathway.

5. Oak Trees. Wattles for erosion control. Pathway leads to dog path.

6. Historic Brick Separating.



7. Street light. Opportunity for pedestrian lighting.

8. Wood wall and grasses.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

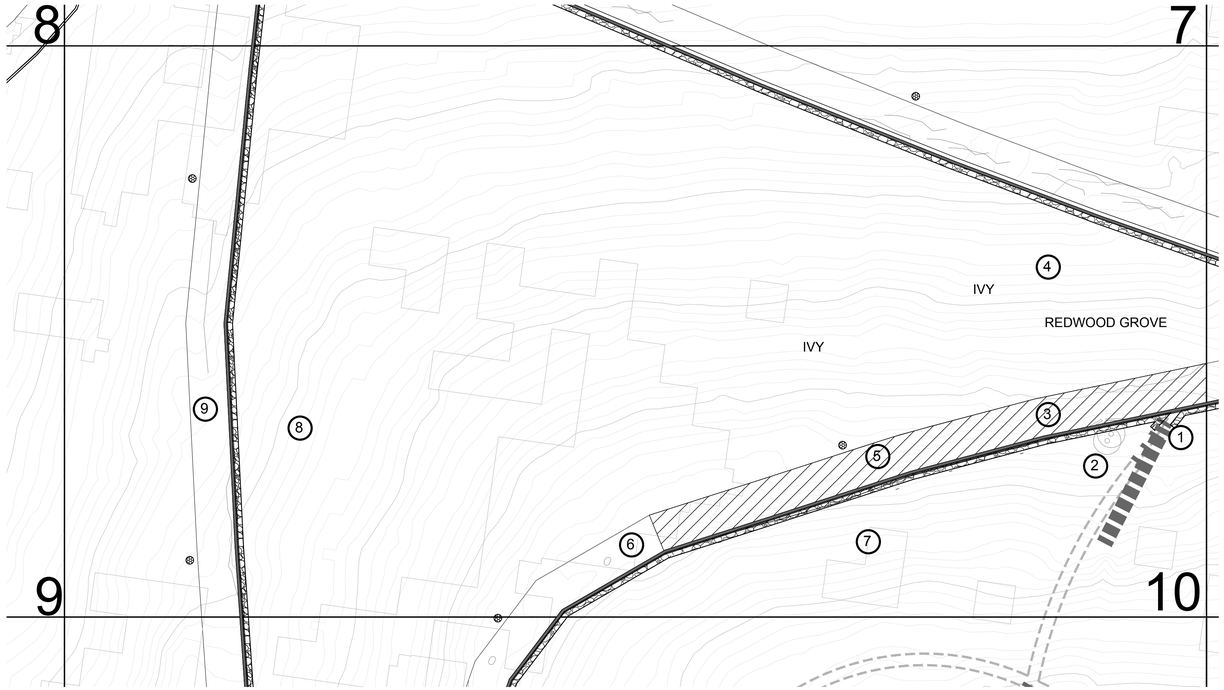
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 10 includes internal trails and many areas of erosion and opportunities for plantings.

1. Historic stone stair.

2. Large redwood causing wall failure.

3.Asphalt edge cracking.

4.Invasive ivy ground cover.

5.Asphalt replacement.

6. Spalling.

7. Tree root exposed due to erosion.

8.Potential planting opportunitiy.

9. Asphalt cracking and spalling.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

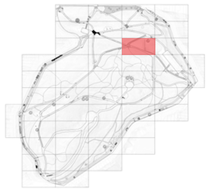
Water Management + Erosion Control

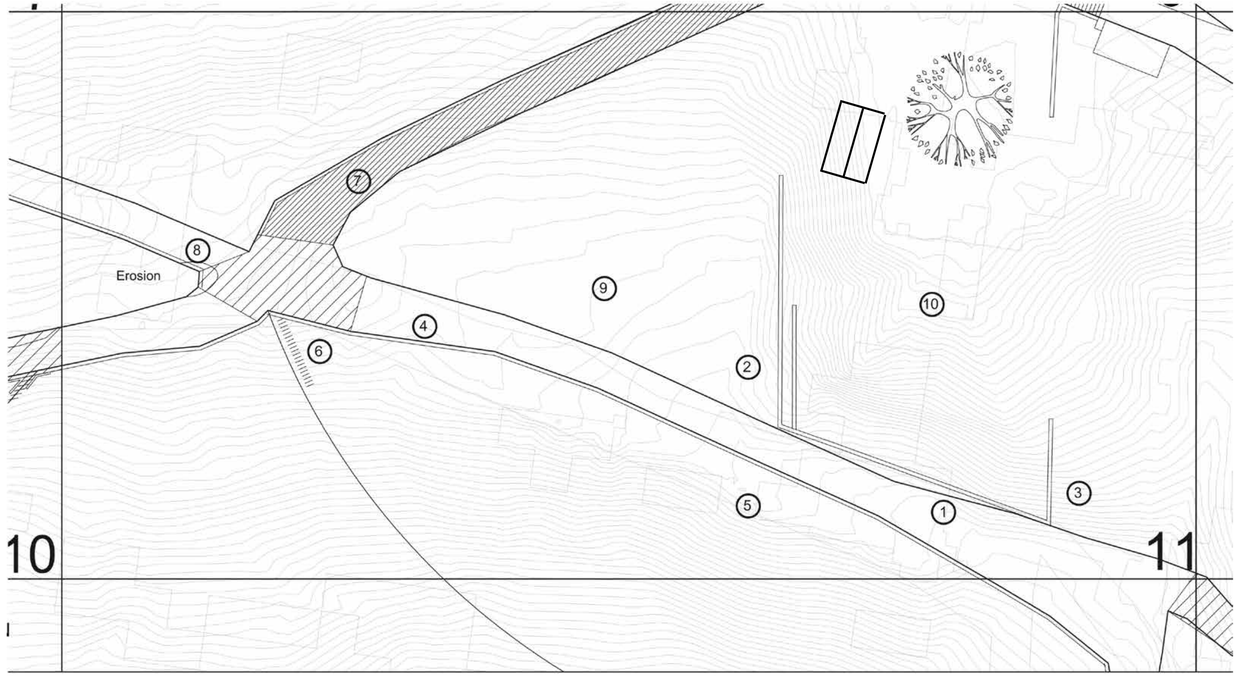
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 11 is experiencing significant erosion causing the major retention wall around the utility area to slide down the hill. Pathway and intersection are in need of repair and/or replacement.

1. Retaining wall sliding down face of hill.

2.North-West side of retention wall and rusted chain-link fence.

3. South-West side of utility retention wall. Extreme erosion and subsequent structural sliding.

4.Asphalt addition.

5.Wide-spread dead ivy.

6. Over grown and deteriorated historic stair.

7. Asphalt trail in disrepair - cracking, erosion, spalling, deteriorating edge.

8.Planting opportunity.at corner

9. Grove and flat mulch area.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

10. Entrance from panel 5.

10. Historic staircase at bathroom.

10. Retaining wall in back of bathroom. Maintenance storage and staging area.

10. Organic debris at base of cypress tree.

10. Shipping container as storage.

10. Steep face of cliff.

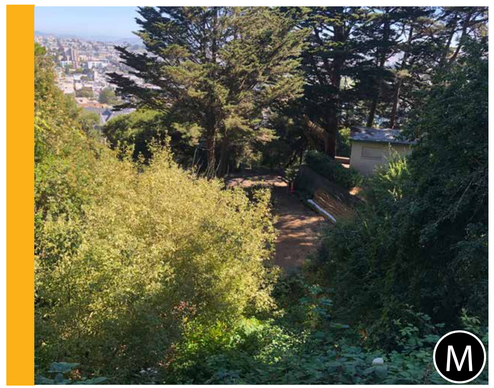
10. Closeup: Failing retaining wall.

10. Retaining wall area.

10. Failing chain-link fence.

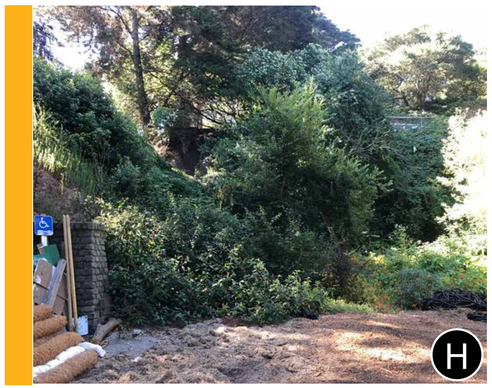
10. Retaining wall on West side failing.

10. Steep slope and stone wall covered with icy and poison oak.



10. View from top of retaining wall.

10. View of top of retaining wall from the bottom.



10. Staging area.

10. View from top of retaining wall.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 12 includes the upper corner of the tennis court, a main trail leading to the utility area, and an impromptu trail that follows a ridge line connecting to another main trail. Perimeter plating and sidewalks along Buena Vista Avenue East included.

1. Asphalt cracking.

2. Asphalt in need of update and drinking fountain.

3a.Historic stair entrance.

3b.Historic stair and wall/column separating.

4.Wooden retaining wall. Durability questionable.

5. Historic brick spreading from walkway.

6. Cypress tree health in question.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

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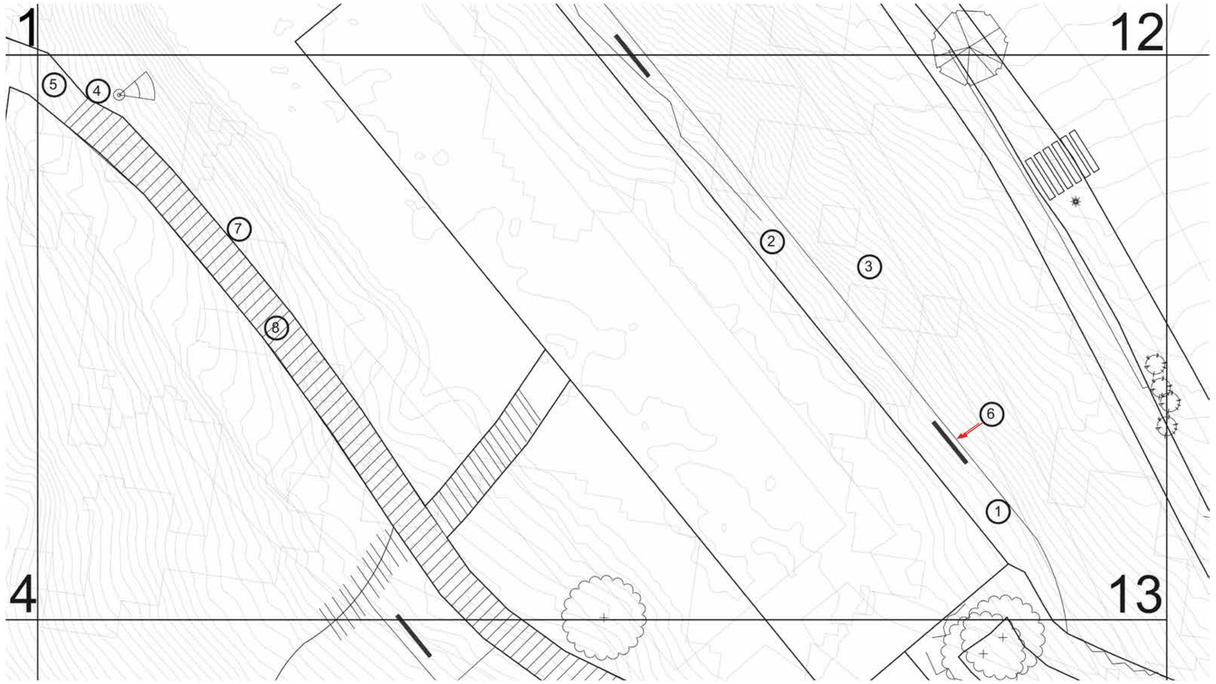
L Low risk and opportunity



Panel 13 includes the majority of the tennis court and surrounding paths, many of which are in need of replacement due to spalling and cracking. Much of the asphalt failure seems to follow topographic elevation lines.

1. Asphalt pathway and chain link fence in good condition. 10’ wide pathway along side of tennis courts not included in CAD lines

2.Asphalt cracking following topography line.

3.Invasive Ivy planting.

4.View from the top of tennis court trail.

5. Asphalt damage.

6.Two green wooden 14-foot benches on pathway outside of tennis court.

7. Asphalt deteriorating edge condition.

8.Additional asphalt cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 14 includes interior primary and tertiary pathways.

1. Large tree causing asphalt upheaval.

2. Cracking at intersection.

3. Wall cracking due to erosion.

4. Log as perimeter failing due to erosion.

5. Minor cracking along edges.

6. Large dead tree trunk causing extreme damage to historic wall, drain, and asphalt.

7. Historic wall failing.

8. Edge cracking.

9. Planting needed.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

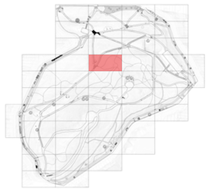
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 15 includes main pathways, secondary trails, and the dog run entry.

1. Sandbags as erosion control.

2a. Asphalt in intersection cracked.

2b.Asphalt failing.

3a.Dog run entrance.

3b.Dog run entrance.

3c.Dog run.

4. Planting opportunity.

5a. Tree root exposed due to erosion.

5b. Potential planting opportunity.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

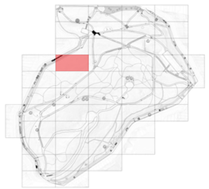
Water Management + Erosion Control

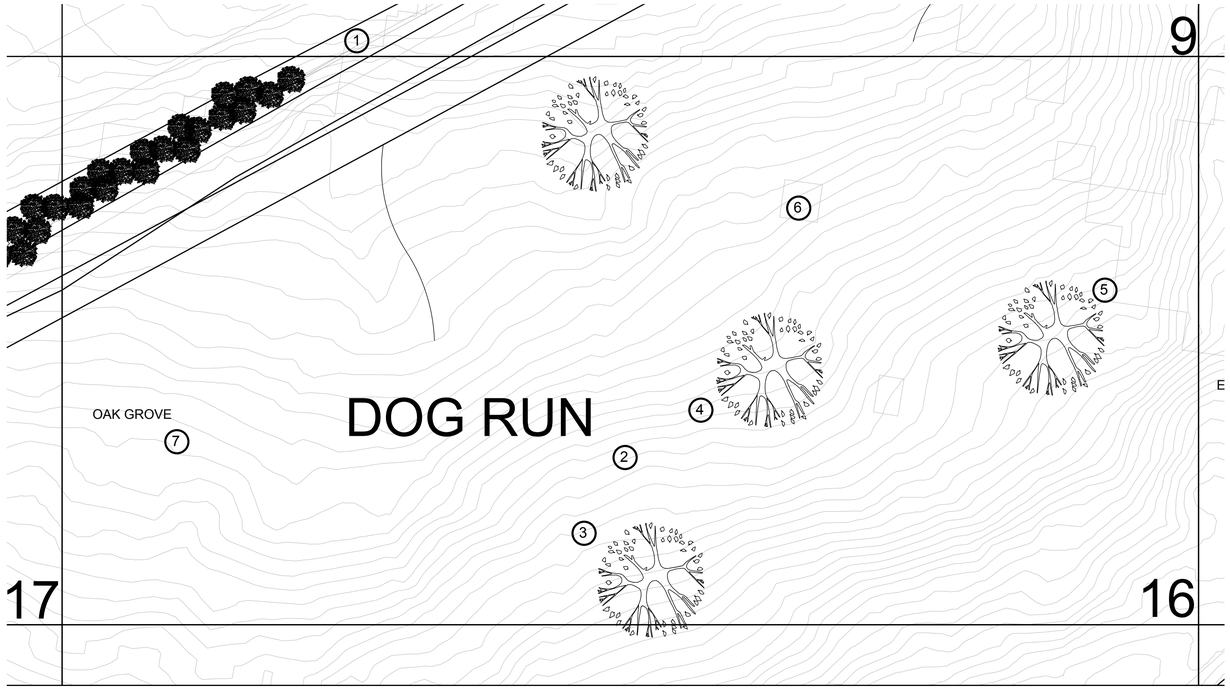
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 16 includes a minor segment of the exterior sidewalk on Buena Vista Avenue West and the majority of the existing dog run.

1. Dendron Bush Poppy

2. Erosion condition in dog patch area.

3. Exposed tree roots due to extreme erosion.

4. Exposed tree roots due to extreme erosion.

5.Sandy soil at dog patch area.

6.Sandy soil at dog patch area.

7. Oak grove at the edge of dog patch.

7. Ivy planting stabilizing soil.

7. Grass planting in oak grove stabilizing soil.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

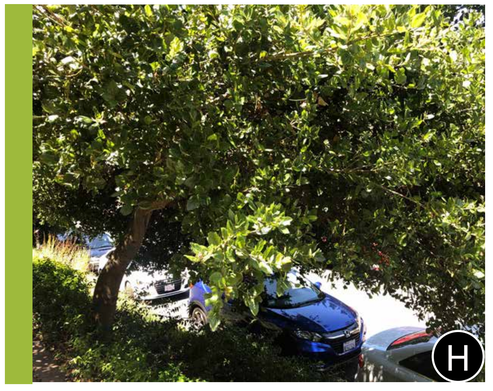
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 17 includes significant exterior plantings.



1. Oak.

2. Stone step. Precedent for additional tertiary entrances.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

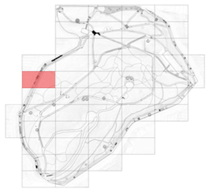
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 18 includes significant exterior plantings.

1.Tree stumps.

2. Historic brick and concrete falling away from path.

3.Stump and planting in poor condition.

4.Concrete and wood stairs at perimeter. Inconsistent with other perimeter stairs.

5a. Extreme erosion.

5b. Extreme erosion.

6. Mayten tree.

7. Unhealthy oak.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

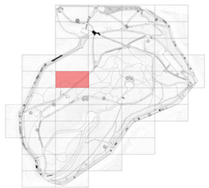
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 19 includes a main interior pathway, secondary trails through the dog run, a sunny clearing, and deteriorating walls and stairs.

1a. Ivy.

1b. Sunny clearing.

2. Asphalt edge crumbling.

3. Fallen log as stair edge.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

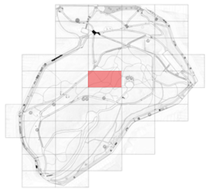
Water Management + Erosion Control

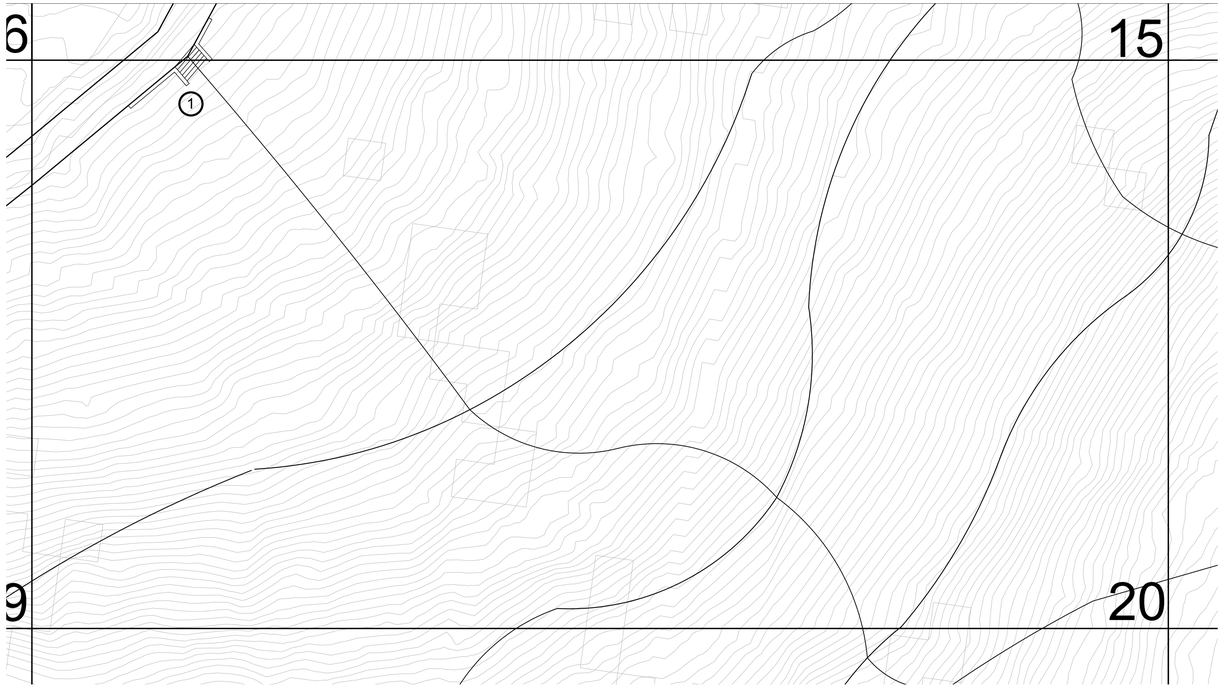
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 20 includes secondary interior trails.

1a. Sandbags as erosion control.

1b. Historic stone cracking.

1c. Weeds on stair case.

1d. Sandbags as erosion control.

1e.Stair case in need of repair.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

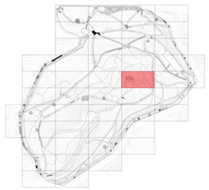
Water Management + Erosion Control

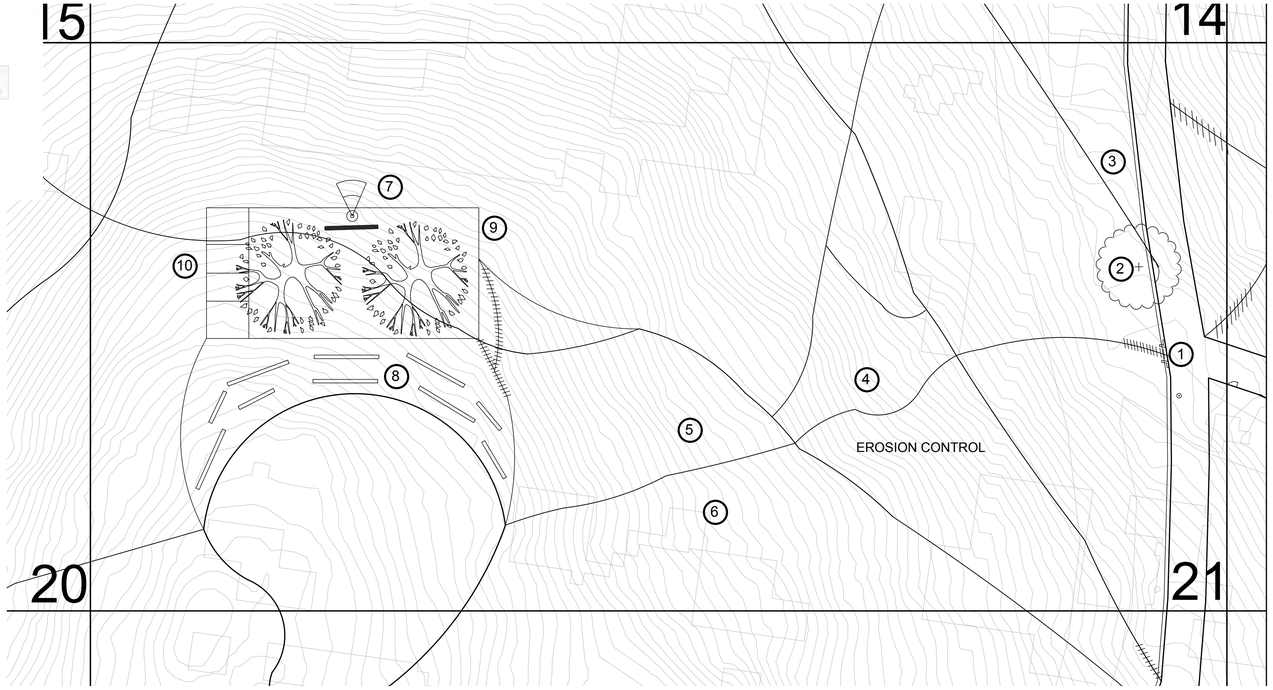
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 21 is located in the heart of the park and includes a network of secondary foot trails, an overlook, and steep terrain causing significant erosion.

1. Stair retaining wall deteriorating.

2.Tree causing significant retaining wall damage.

3. Log as erosion control.

4. Waddles as erosion control.

5a. Exposed tree roots due to erosion.

5b. Exposed tree roots.

5c. Close-up erosion control.

6.Erosion control through tertiary trails.

7. View of downtown.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

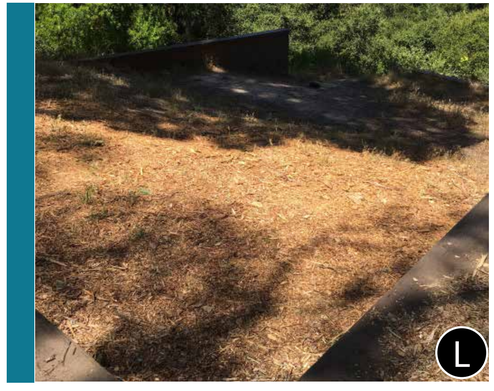
M Medium risk and opportunity

L Low risk and opportunity

8. Waddles.

9a. Overlook retaining wall.

9b. Overlook retaining wall.



10a. Overlook retaining wall.

10b. Overlook retaining wall.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 22 meets 23 at the intersection of 2 primary trails shortly after SW main entrance. Includes primary and secondary trails and lowest corner of tennis courts.

1. Asphalt paving to tennis court in disrepair: cracking, sinking, uneven edging, etc.

2. Large redwood roots causing cracking in asphalt.

3. Asphalt edge cracking leading down to street level.

4. Tree growing in pathway causing asphalt failure.

5. Asphalt failures.

6. Ivy patch is considered invasive. Potential to re-place with a more native planting selection.

7.Erosion control needed. Asphalt sliding causing cracking and creating dangerous condition.

8. Corner of retention wall is unfinished.

9. Asphalt cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

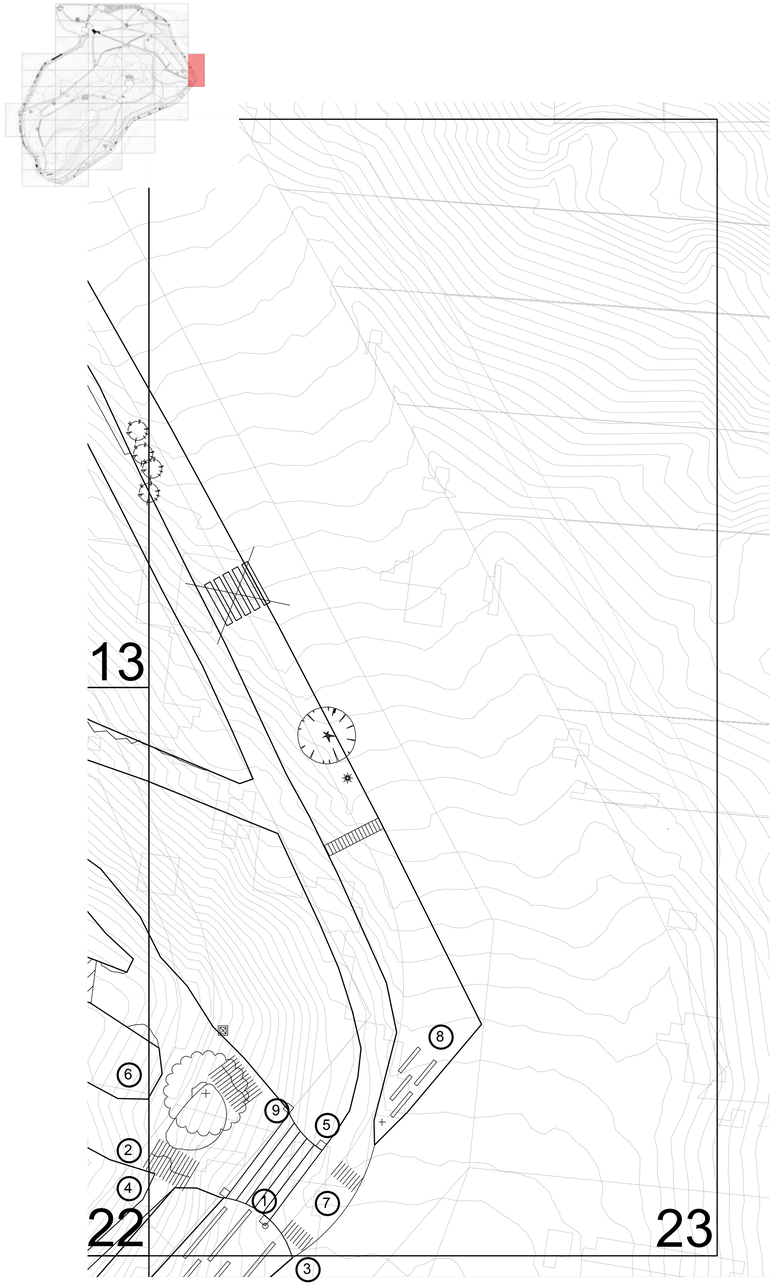
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 23 is located in the South-east corner of the park on Buena Vista Avenue East between Buena Vista Terrace and Duboce. It includes a historic main entrance, exterior, and interior paths.

1. Left entrance column chipped substantially on corner.

2. Severe crack in middle of both second tier stairs. Mismatched repair.

3. Uneven stair

4. Waddles as erosion control to the left of the main stair.

5. Existing signage

6. Tree #134 - roots causing asphalt cracking near base.

7. Wood curb deteriorating

8. Makeshift erosion control implementation

9. Stair is separating from footing. Cracking semi-repaired with mismatched color.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

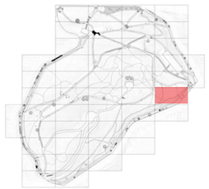
Water Management + Erosion Control

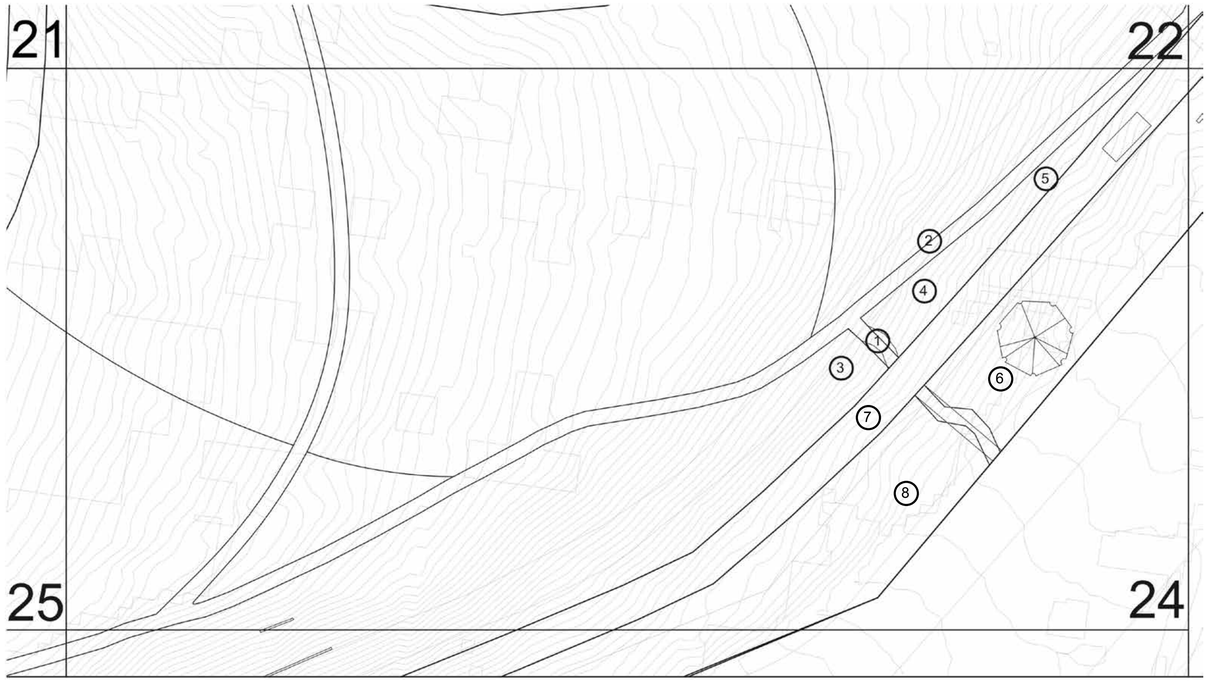
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 24 includes exterior sidewalks and an updated staircase to interior paths.

1a. Overgrown stair case and major erosion problem with sand flowing down the streets during downpour.

2. Erosion problem at sandy social path.

3. Exposed drip lines and erosion.

3. Exposed PVC pipe along stairs.

4. Erosion and plant in poor condition.

5. Rusted enclosure at back flow preventer.

6. Trees splitting and deteriorating.

7. Brick pavers strip separating from sidewalk.

8. Perimeter planting in need of consistency.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

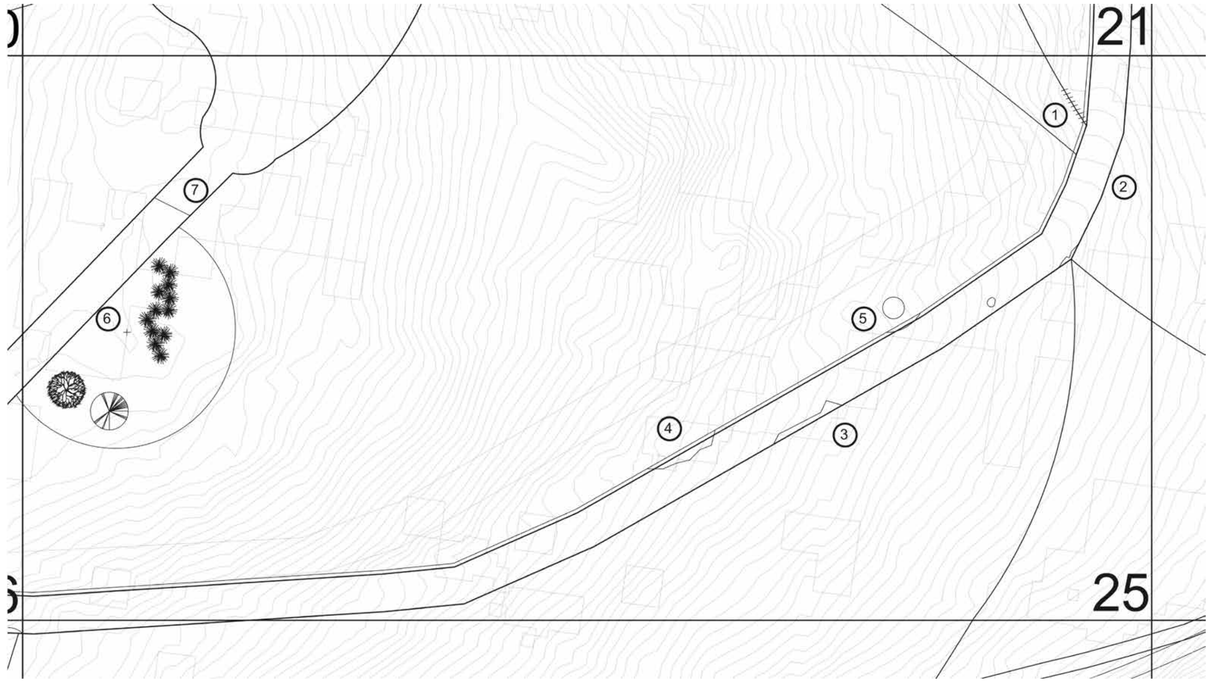
BUENA VISTA PARK EXISTING SITE ASSESSMENT

SAN FRANCISCO, CA

AREA 24 - EXTERIOR SIDEWALK AND PLANTING

MILLER COMPANY
landscape architects

AUGUST 22, 2019



Panel 25 includes a main interior pathway and a landing including coyote advisory signage.

1. Wood stair. Historic retaining wall failing.

2. Asphalt cracking.

3.Asphalt failing near edge of sidewalk.

4.Moderate cracking and spalling near retaining wall.

5a.Decaying trunk causing wall failure.

5b. Decaying tree trunk.

6. Existing coyote signage.

7. Asphalt ends and dirt pathway starts.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

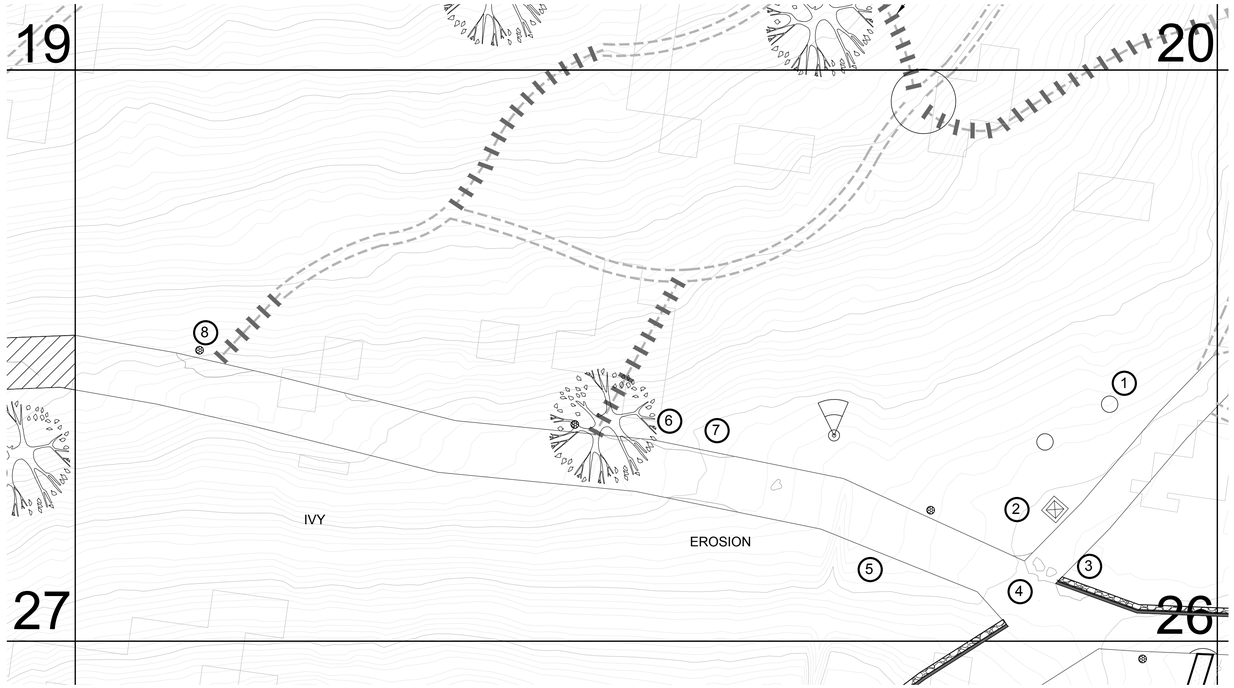
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 26 includes a main interior path and many tertiary trails into the center of the park.

1. Tree trunk.

2. Trash can.

3.Extreme cracking near base of wall.

4.Extreme asphalt spalling.

5. Erosion.

6a.Monterey cypress growing into pathway.

6b. Monterey cypress growing into pathway.

7. Asphalt cracking at edge.

8. Extreme asphalt cracking at the top of step.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

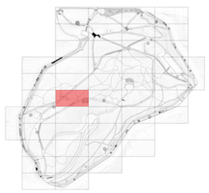
BUENA VISTA PARK EXISTING SITE ASSESSMENT

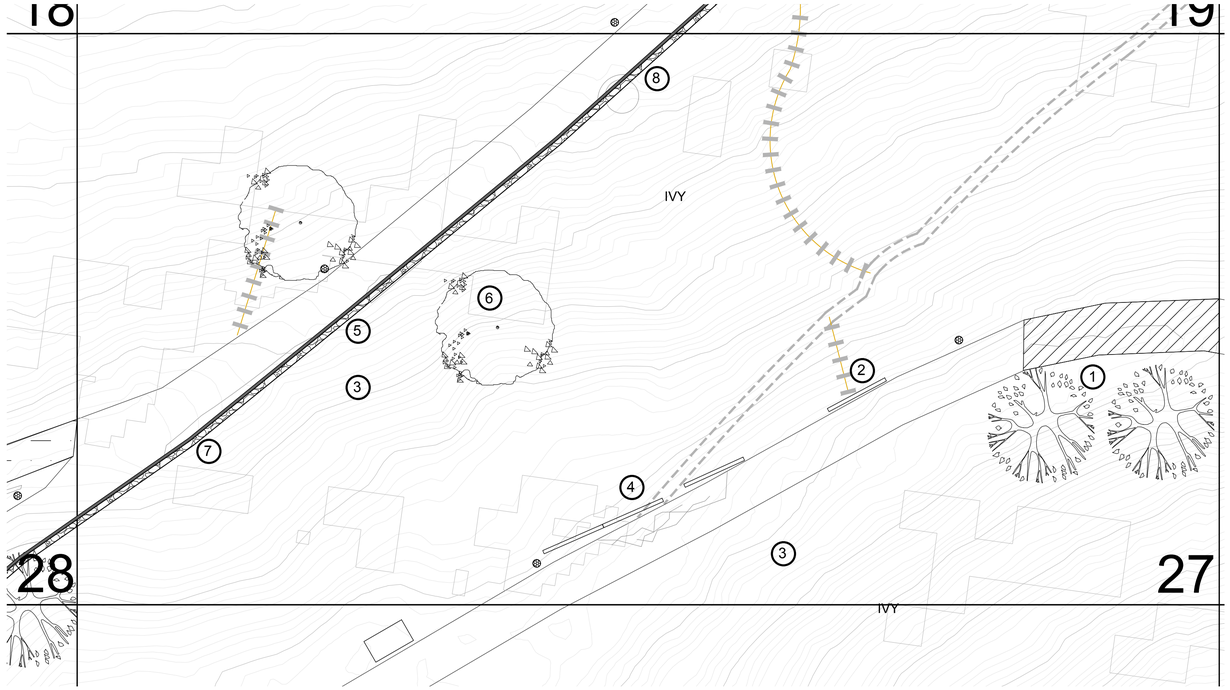
SAN FRANCISCO, CA

AREA 26 - INTERIOR PATHS

MILLER COMPANY
landscape architects

AUGUST 22, 2019





Panel 27 includes interior pathways,secondary trails, extreme grade change, asphalt cracking, and historic wall failures.

1a. Asphalt cracking due to Monterey cypress.

1b. Monterey cypress causing asphalt cracking below.

2a. Edge of asphalt pathway failing. Waddle inserted as erosion control.

2b.Close-up of cracking asphalt and erosion control.

3.Significant erosion and vegetation damage.

3. Central west forest in need of reforestation and planting.

4. Central west interior trails in need of repair and reforestation and planting.

5. Asphalt failure at base of wall.

6. Erosion causing exposed cypress tree roots.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

7. Edge of asphalt failing near base of wall.

8a. Historic wall failure.

8b. Large tree trunk causing historic wall failure.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

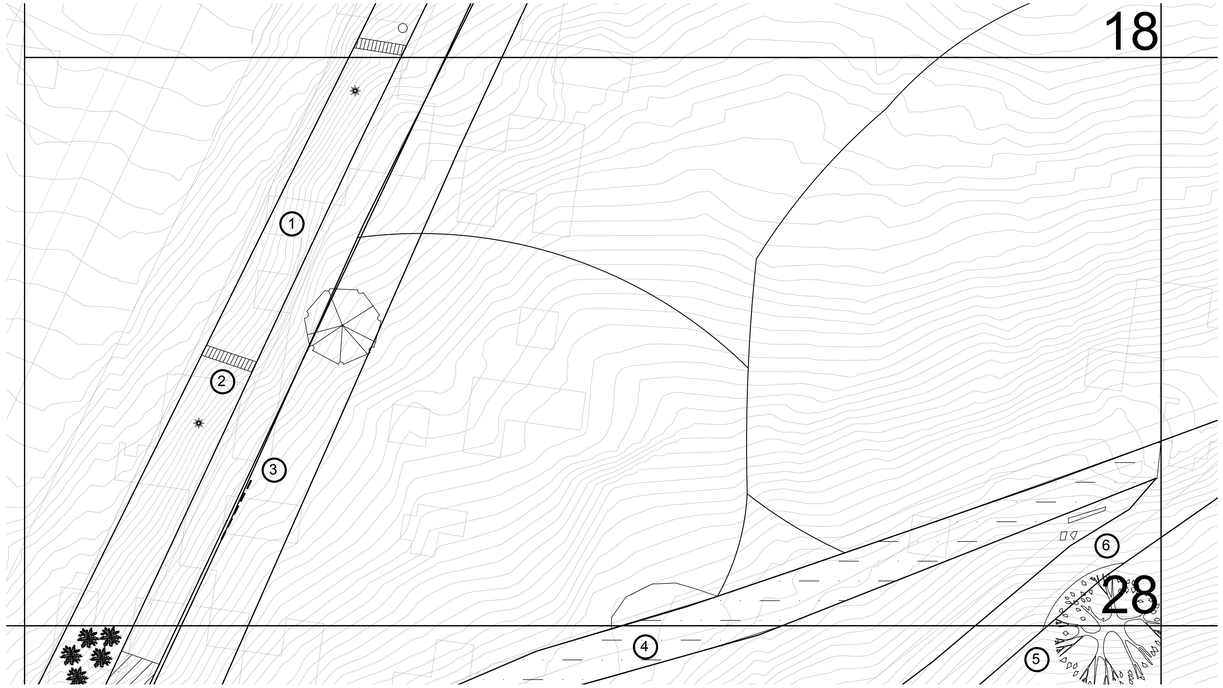
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 28 is located on the West side of the park and includes exterior sidewalks and plantings and interior trails.

1a. Weedy planting in need of update.

1b. Weedy planting in need of update.

2. Exterior wooden stair in need of repair.

3. Historic brick and concrete failing.

4a. Unpaved sand pathway.

4b. Erosion resulting in pile of sand.

5a. Huge tree causing extreme retention wall failure.

5b. Asphalt cracking at the base of tree and failing wall.

6. Asphalt spalling and random pieces of concrete.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

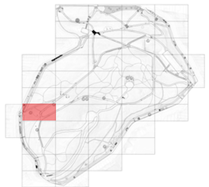
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 29 is located on the West side of the park across from Fredrick Street and includes the main pathway from the Fredrick Street Main Entrance, secondary trails, and areas of significant erosion.

1a. Erosion at entrance.

1b. Erosion at entrance.

2. Asphalt crack.

3a. Erosion exposing tree roots.

3b. Erosion at base of over-look.

3c. Erosion at base of over-look.

4a. Wood stair. Durability questionable.

4b. Top of wood stair is uneven and dilapidated.

5. Asphalt paving stops and trail continues unpaved to intersect

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

6a. Deteriorating wood barrier.

6b. Deteriorating wood barrier.

7a. Deteriorating wood barrier.

7b. Deteriorating wood barrier.

7c. Deteriorating wood barrier.

8. Asphalt cracking.

9a. Crack on column.

9b. Erosion.

10a. Asphalt cracking at the base of wall.

10b. Asphalt patching and cracking.

11. Irregular asphalt edge.

12a. Erosion.

12b. Erosion and retention wall.

12c. Erosion.

13. Spalling at base of wall.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

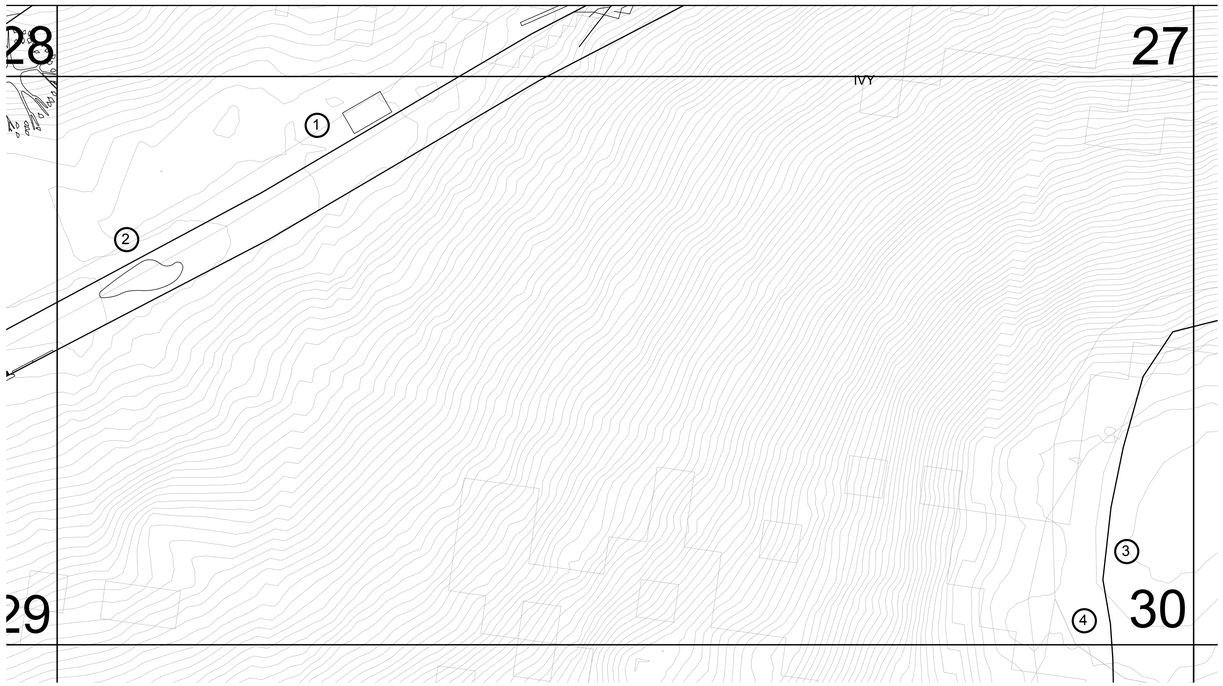
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 30 is located in the interior of the park and includes a primary pathway and part of the main lawn.

1. Curb

2a. Random granite broken pillar.

2b. Random granite broken pillar.

3. Asphalt paving cracking and weeds growing.

4b. Invasive Echium plants. Planting opportunity.

4b. Weeds. Planting opportunity.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

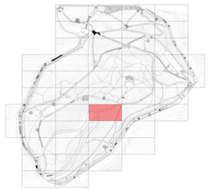
Water Management + Erosion Control

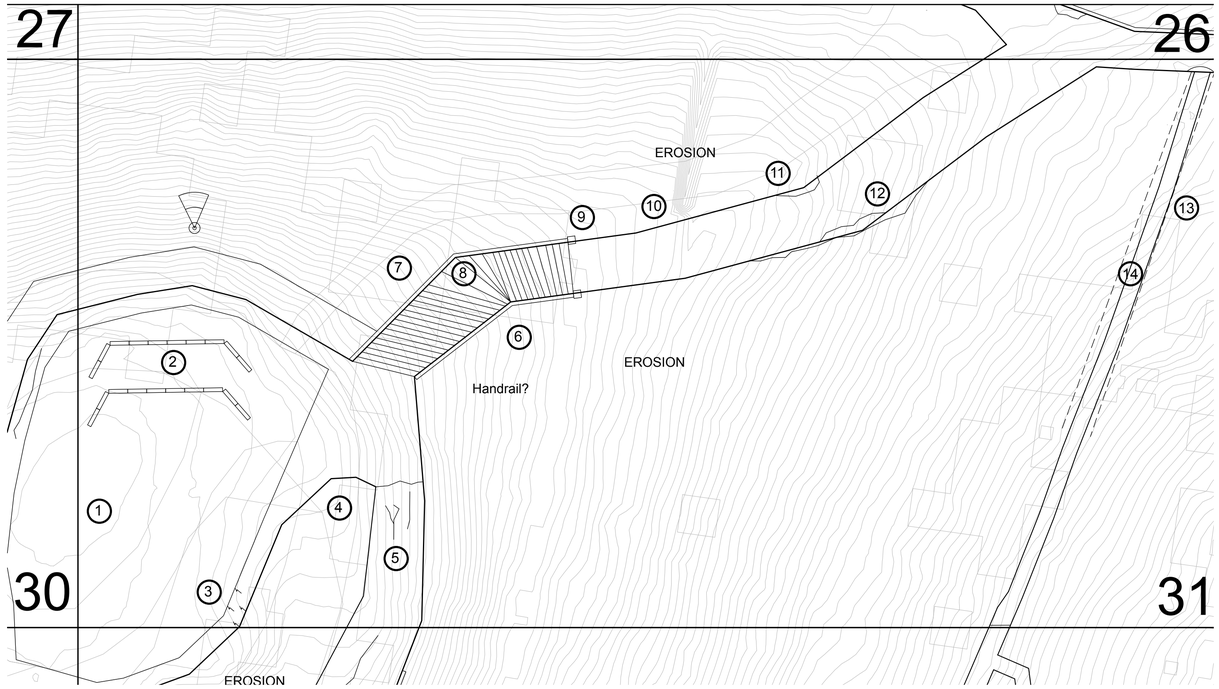
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 31 includes the majority of the main lawn and adjoining primary pathways.

1. View of the main lawn and towards north.

2. Granite curbstone seating and view. Planting can be enhanced by removing invasive species.

2. Planting at perimeter of lawn. Planting opportunities for enhancements by removing invasive species.

2. Granite curbstone seating and view. Planting can be enhanced by removing invasive species.

2b. Cracking asphalt.

3a. Cracking asphalt.

3b. Cracking asphalt.

4. Log curbs.

5. Asphalt cracking at both firelane and pedestrian pathway.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

BUENA VISTA PARK EXISTING SITE ASSESSMENT

SAN FRANCISCO, CA

AREA 31 - MAIN LAWN AND PRIMARY PATHWAYS

MILLER COMPANY landscape architects

AUGUST 22, 2019

6a. Erosion.

6b. Erosion.

7. Large tree strump in need of removal.

8. Historic stone steps.

9. Column damaged and repaired.

10. Historic trench in need of weeding and repair.

11. Asphalt edge cracking. Erosion causing drop.

12. Cracking at edge.

13. Wire fence failing and resin paving cracking.

14. Resin paving cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

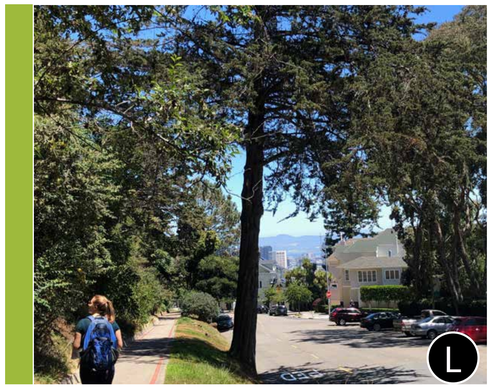
M Medium risk and opportunity

L Low risk and opportunity

Panel 32 includes an exterior path.

1. Bench under tree. Perimeter transition.

2. Concrete cracking.



3. Tree at perimeter planting strip in poor health.

4. Small plum tree at perimeter planting strip.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

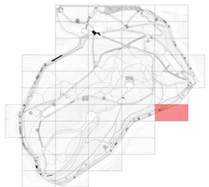
Water Management + Erosion Control

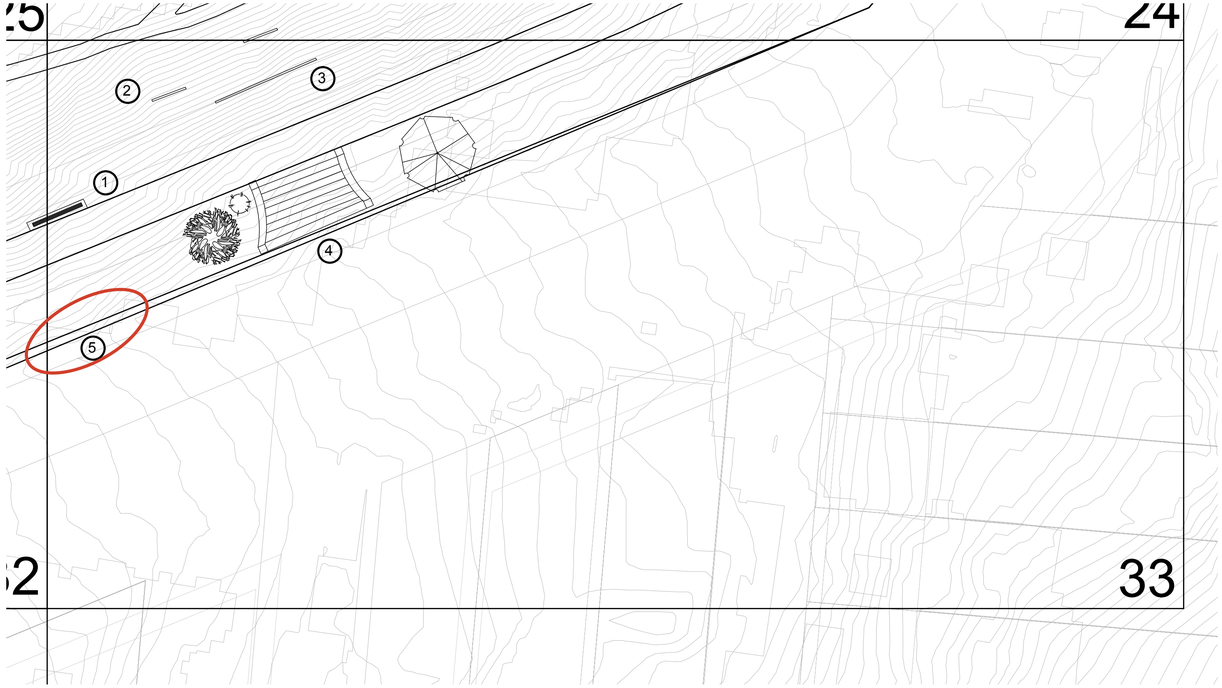
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 33 includes a historic secondary stair, wooden retaining walls as erosion control, and bench.

1. Bench.

2. Wooden retaining wall beginning to fail due to erosion.

2. Wood retaining wall failing.

3. Wood curb at tree root. Planting opportunities at slope.

4. Historic stairs in need of repair. Drought tolerant planting from left to right: Pineapple Guava, ceanothus.

5. Erosion perimeter planting. Wood curb failing.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

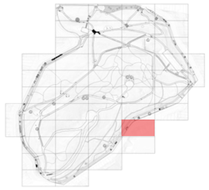
Water Management + Erosion Control

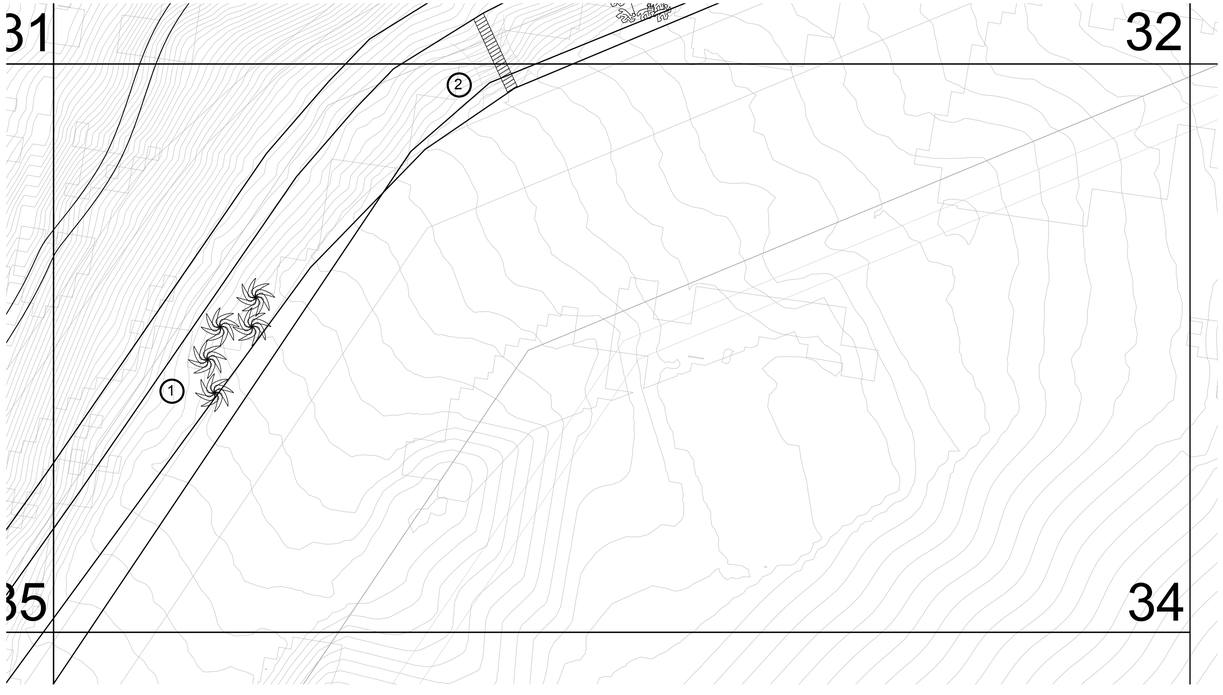
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 34 includes a tertiary stair entrance and inconsistent plantings in need of removal.

1. Unhealthy tree in need of removal.

2. Concrete stairs with wood header and handrail. Inconsistent with the rest of the perimeter stairs.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

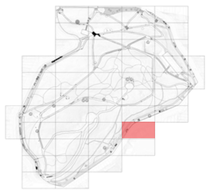
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 35 includes updated ADA accessible pedestrian trails, exterior paths, and a main pathway for emergency vehicle entrance.

1. Trashcan. Cracking asphalt. Perimeter mulching.

2. Erosion.

3. ADA accessible pathway.

4. Cracking asphalt.

5. Cracking asphalt.

6. Planting needed.

7. Wooden retaining walls deteriorating.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

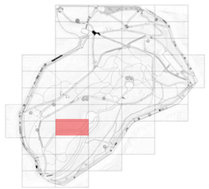
Water Management + Erosion Control

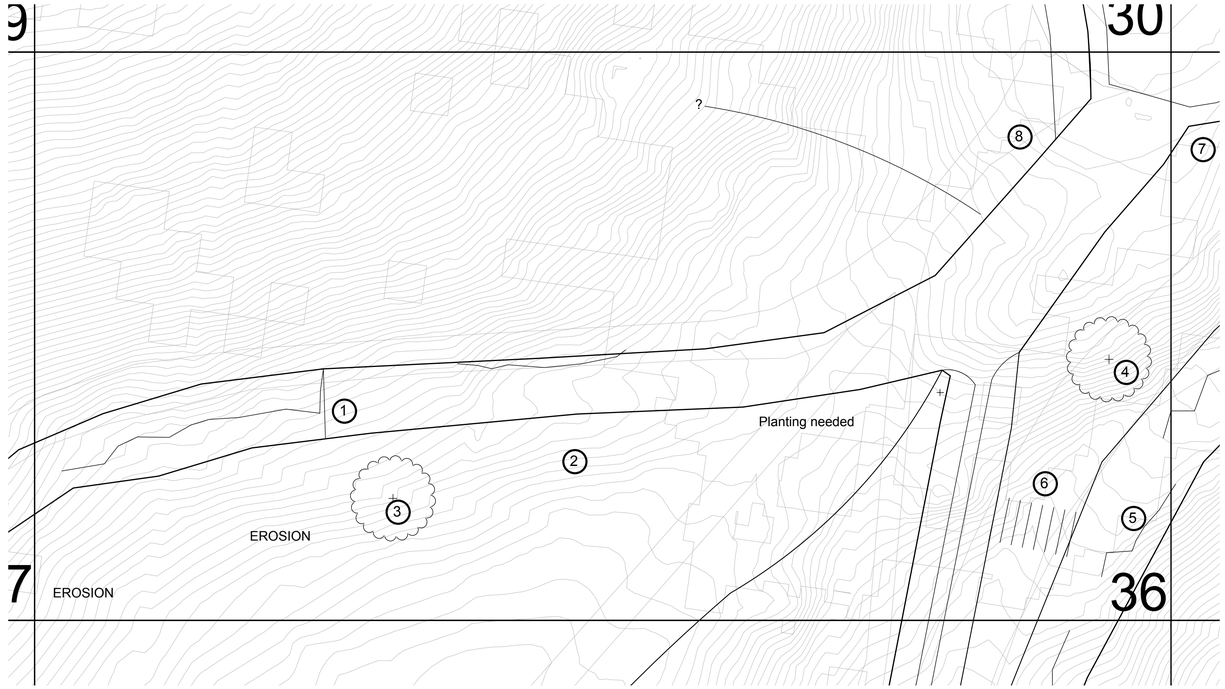
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 36 includes primary and secondary trails that connect to the main lawn.

1. Uneven asphalt.

2. Erosion causing tree roots to be exposed.

2. Erosion.

3. Tree in poor health.

4. Tree causing asphalt cracking.

5. Minor cracking along edges.

6. Wood stair covered with weeds.

7. Educational signage.

8. Pine tree in poor condition.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 37 includes multiple interior trails begin affected by steep grade and erosion.

1. Uneven edge.

2. Log as erosion control edge.

3. Cypress causing asphalt cracking.

4. Inconsistent edge.

5. Pine causing asphalt upheaval.

6. Erosion - downhill

7. Erosion - uphill. Planting opportunities.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

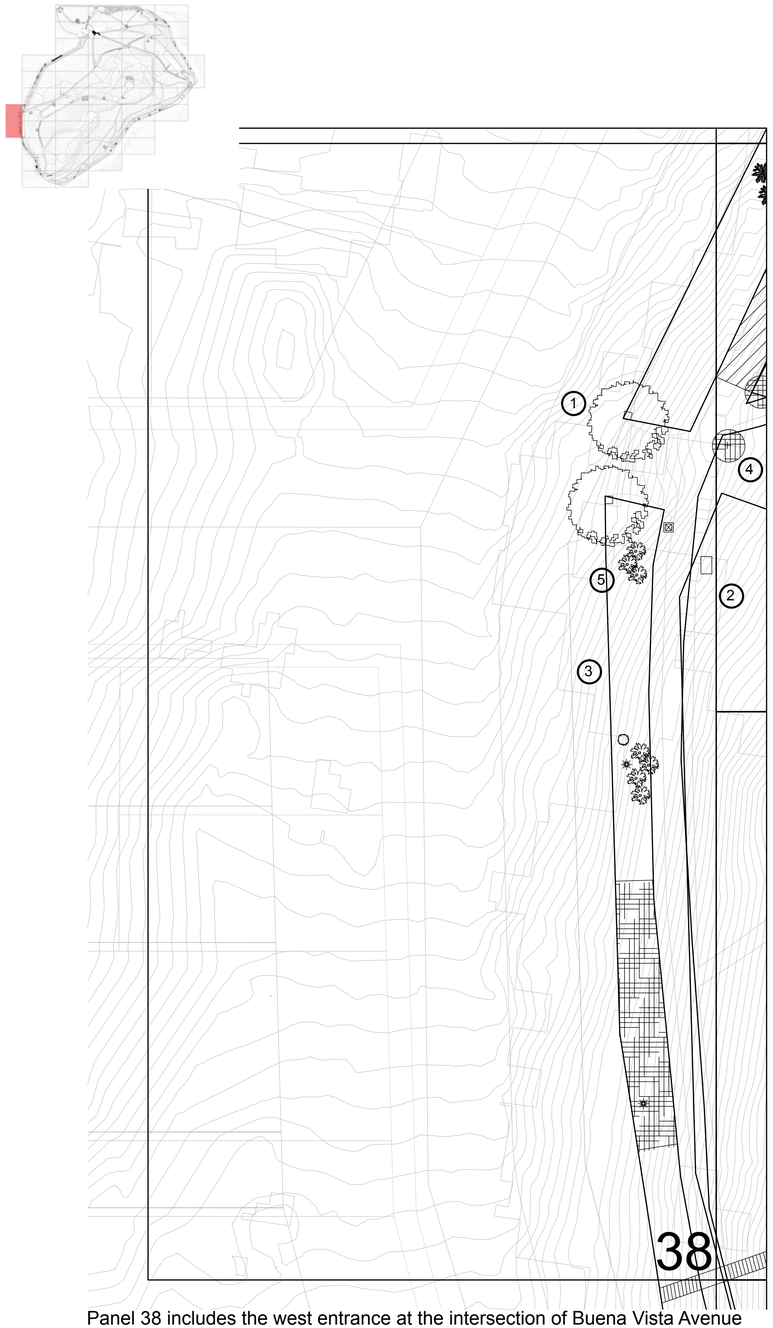
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 38 includes the west entrance at the intersection of Buena Vista Avenue West & Fredrick Street. Entrance infrastructure is failing and experiencing significant erosion.

1a. Overgrown tree root and cracking at base of historic stairs.

1b. Cracking at base of stair (right).

1c. Large Juniper tree at entry.

2. Existing signage and erosion.

2. Erosion.

3. Wooden perimeter deteriorating.

4a. Cracking asphalt at entrance.

4b. Cracking asphalt.

5. Perimeter planting with invasive species

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

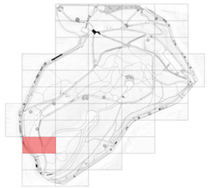
Water Management + Erosion Control

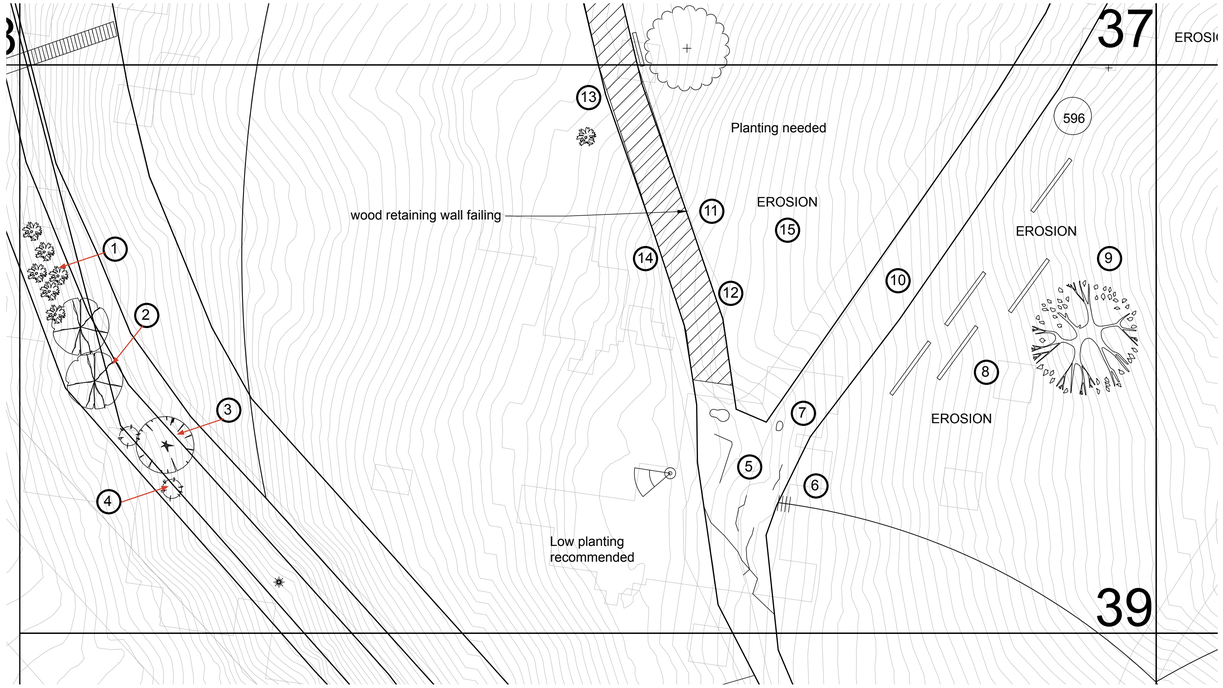
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 39 includes exterior plantings and sidewalks along Buena Vista Ave. West, interior trails, and significant grade change and erosion.

1. Woody mexican sage in need of maintenance.

2. Plum tree in poor condition.

3. Crab apples.

4. Random perimeter planting.

5. Asphalt cracking at intersection.

6. Wooden stair. In need of maintenance or replacement.

7. Spalling.

8. Waddles as erosion control.

9. Cypress in need of maintenance.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

10. Paving in poor condition.

11. Wood curb wall failing.

12. Edge condition failing.

13. Edge condition failing.

14. Inconsistent curb.

15. Erosion potentially by foot traffic.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 40 includes the interior fire access trail.

1. Updated secondary pathway entrance.

2. Erosion between main and pedestrian pathways. In need of planting.

3. Wood bench needs update.

4. Erosion.

5. Salvia planting.

5. Salvia planting in need of maintenance.

6. Asphalt fire access road cracking.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

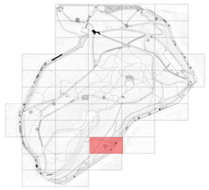
Water Management + Erosion Control

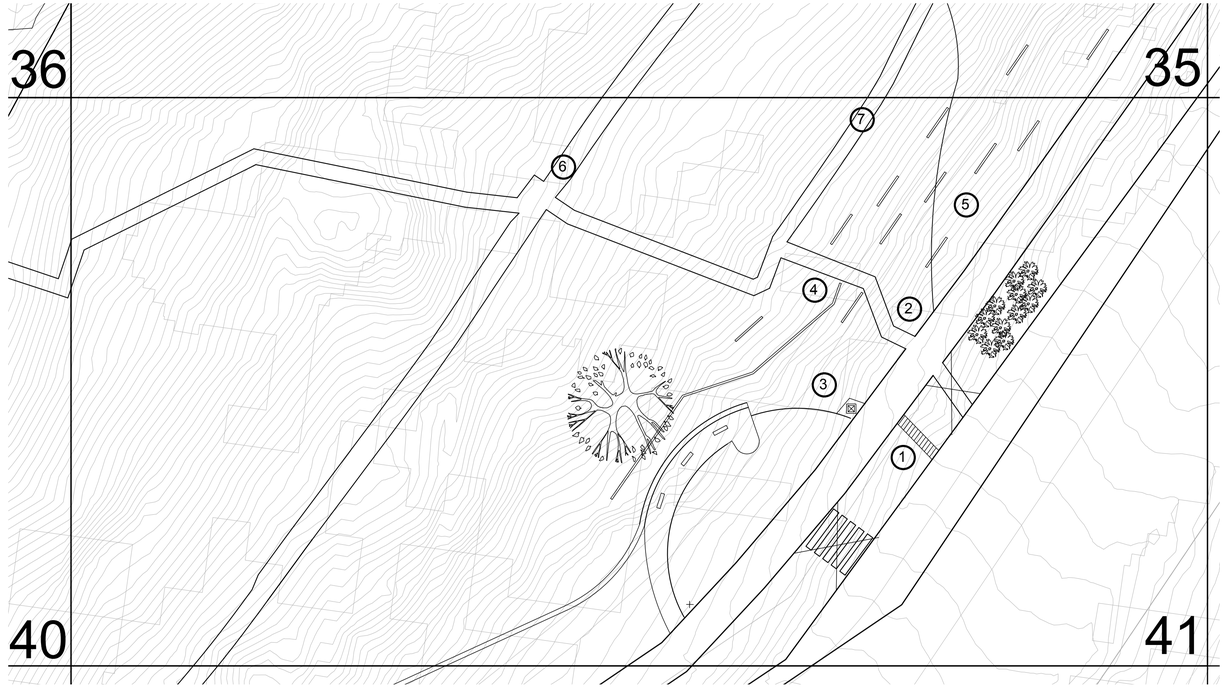
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 41 includes the recently updated ADA lawn.

1.Wood and concrete stairs at perimeter. Material of perimeter stairs are inconsistent with rest of stairs.

2. Updated stair with handrails to ADA aramp.

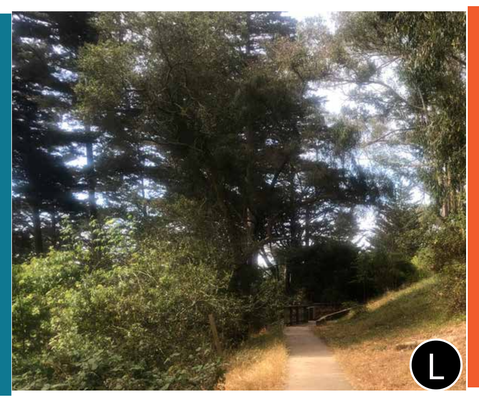
3. Trashcan.

4. Back flow preventer. Base exposed due to erosion.

5. Erosion control wood wall.

5. Wooden retaining walls starting to fail due to erosion.

5. Wooden retaining walls starting to fail due to erosion.



6. ADA path connecting to stairs. Planting opportunities.

7. Social path with chainlink fence. Erosion on East side.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

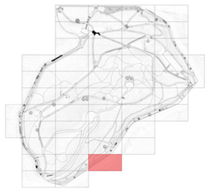
Water Management + Erosion Control

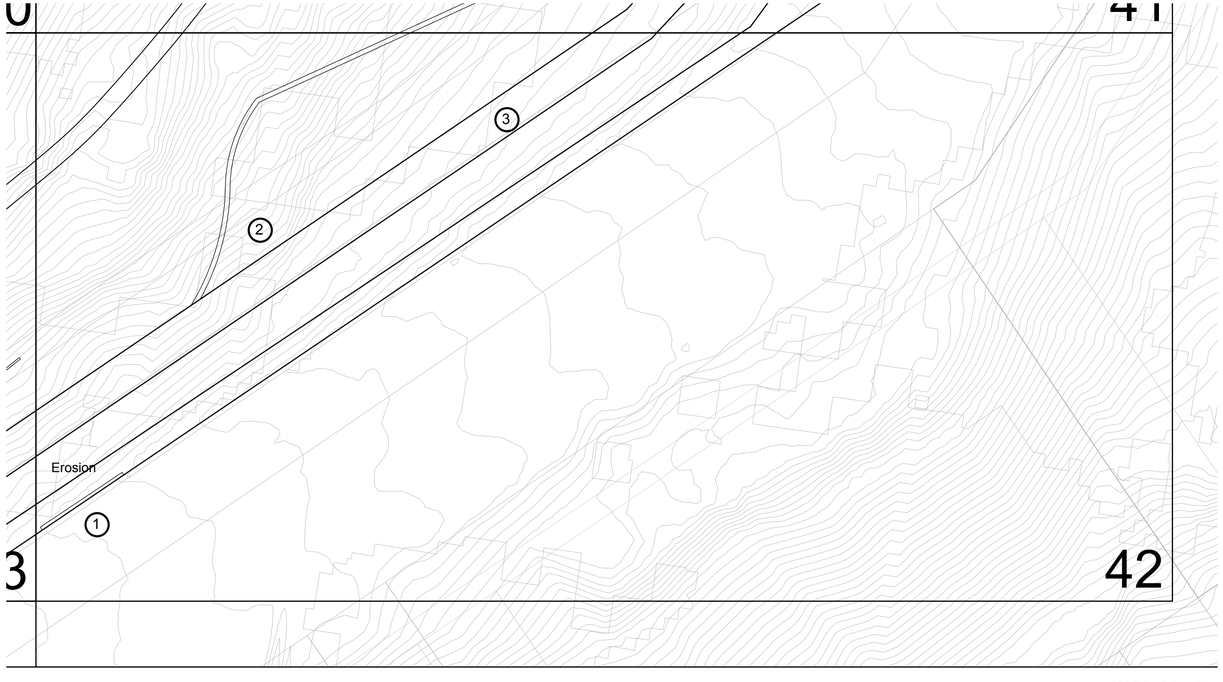
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 42s located along Buena Vista Ave. East between Upper Terrace and Park Hill Ave. and includes exterior sidewalk, plantings, and the beginning of ADA accessible clearing and seating.

1. Wood timber retaining wall.

2. ADA accessible lawn area.

3. Weeds growing in pavement cracking at perimeter sidewalk.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

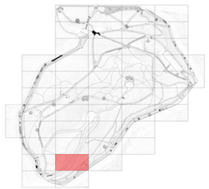
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 43 includes exterior sidewalks, plantings, a primary pathway from the Southern entrance, and secondary trails.

1. Aged wood retaining wall.

2. Utility box

3a. Wood retaining wall at Oak Tree.

3b. Wood retaining wall starting to fail.

4. Erosion at perimeter landscape area.

5. Hillside landscape in need of new planting. ADA pathway above.

6. Wood retaining wall starting to fail.

7. Asphalt paving upheaving and cracking.

8. View window.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

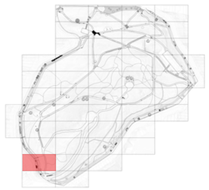
Water Management + Erosion Control

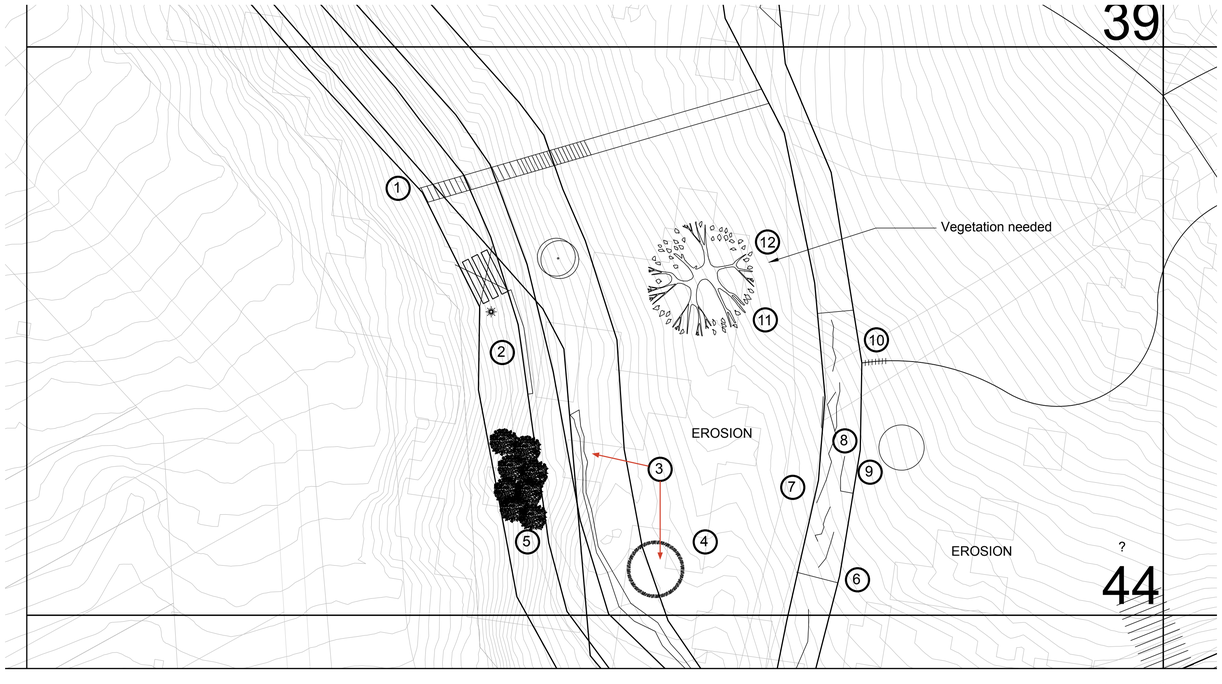
Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity





Panel 44 includes exterior sidewalk, plantings, erosion control (using Shot-Crete), interior pathways, and stairs along Buena Vista Ave. W.

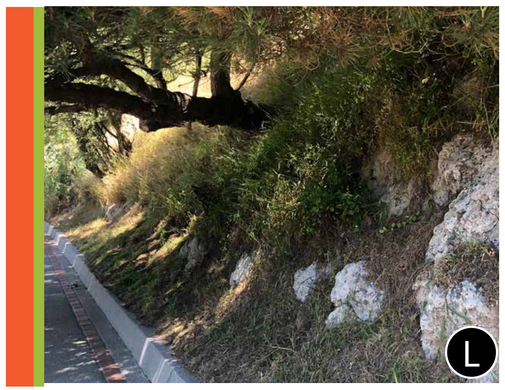
1. Wood and concrete stair.

2. Historic brick sliding down hill.

3a. Shot-Crete retaining wall.

3b. Stump being held back by Shot-Crete.

3c. Shot-Crete retaining wall.



3c. Shot-Crete retaining wall and tree roots.

3c. Shot-Crete retaining wall and tree roots.

4. Shrub planting in need of maintenance.

5. Shrub planting in need of maintenance.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

6a. Erosion in need of planting.

6b. In need of planting at edges.

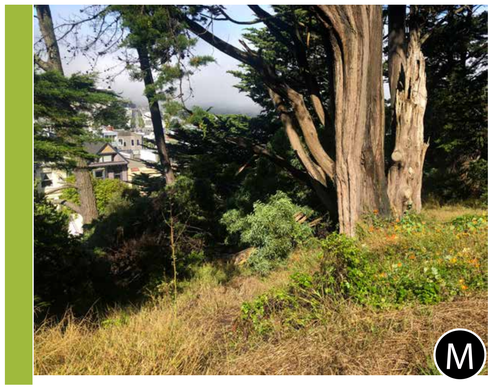
7. View. Invasive Echium planting.

8a. Asphalt cracking.

8b. Asphalt cracking.

9. Asphalt paving upheaving by tree root.

10. Wood stair edge failing.



11. Cypress tree in poor condition.

12. Planting needed.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

Panel 45 is located on the southern most point of the park and includes the main ADA accessible entrance at the three-way intersection of Buena Vista Ave. West, Buena Vista Ave. East, and Fredrick Street.

1. Stone retaining wall.

2. Catch basin - stone, mortar, and sandbags.

3a. Back flow preventer.

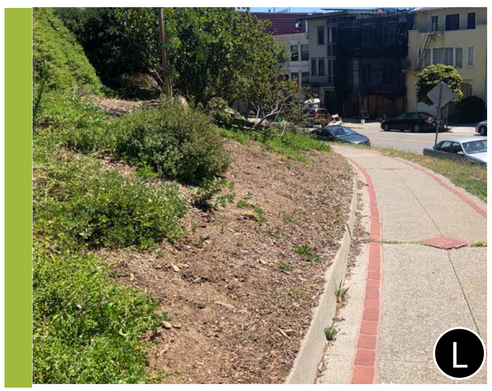
3b. Additional native plantings needed.

4. Asphalt paving cracking.

5. Wood bollards leaning.

6. Woody Mexican Sage plant in need of pruning.

7. New stone and wood retaining wall.



8. Additional native planting needed.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

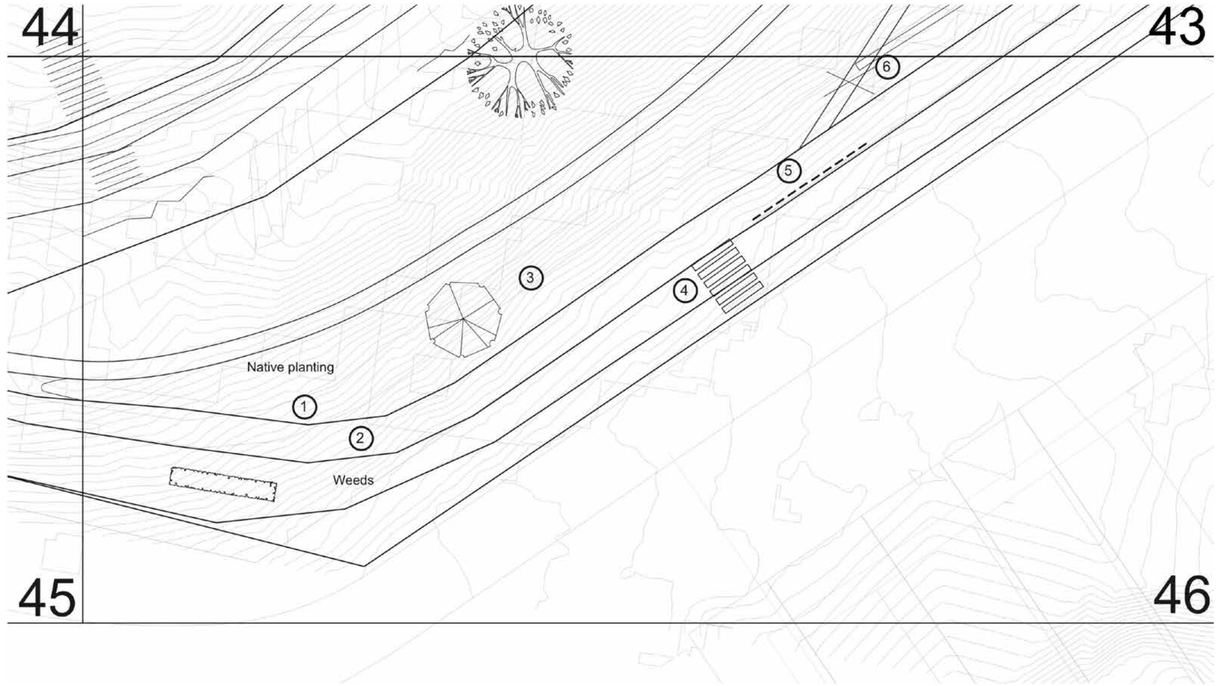
Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity



Panel 46 includes exterior sidewalk and plantings.

1.Native planting area in need of additional planting.

2. Historic brick cracking and weeds growing.

3a. Native plantings.

3b. Additional native planting needed.

4. Wood steps. Durability questionable.

5a.Historic brick inconsistent repair and edging failing.

5b. Historic brick edge seperating and concrete paving cracking.

6. Old wood retaining wall in need of repair.

Circulation + Hardscape

Forestry Management + Habitat Enhancement Planting Opportunities

Water Management + Erosion Control

Others

H High risk and opportunity

M Medium risk and opportunity

L Low risk and opportunity

9.2 - cost estimate concept drawings

BUENA VISTA PARK
NEEDS ASSESSMENT AND COST ANALYSIS
BUENA VISTA & HAIGHT ST, SAN FRANCISCO, CA 94117
COST ANALYSIS

SHEET INDEX

SITE MAP

NOT TO SCALE N

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IN PARTNERSHIP WITH
BUENA VISTA NEIGHBORHOOD ASSOCIATION
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MLEE CORPORATION
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(415) 693-0236

CONTEXT MAP

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	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

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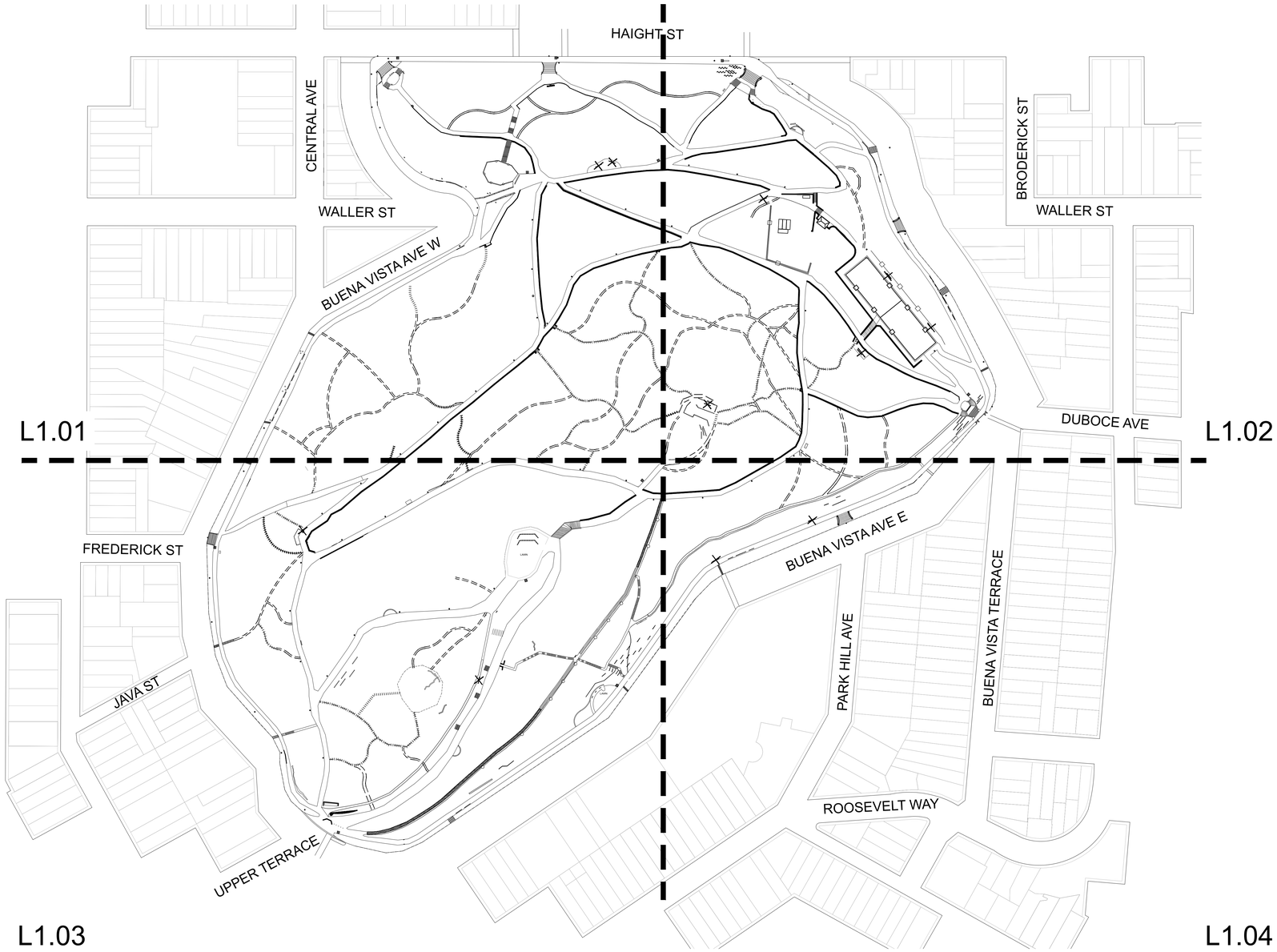

EXISTING AND DEMOLITION LEGEND

SYMBOL	TYPE	NOTE
PAVING AND STAIRS		
	ASPHALT PAVING REPLACEMENT	
	RESIN PAVING PATH	
	BOARDWALK PATH	
	PARK TREAD PATH	
	CONCRETE PATHWAY W/ BRICK PAVER	
	EARTH PATH	
	RUSTIC STAIRS	
	HISTORIC BRICK EDGE SEPARATION	
	PAVEMENT DETERIORATION	
	REMOVE AND ABANDON (E) AC PAVING	
FURNITURE		
	SHIPPING CONTAINERS	
	FALLEN TREE LOGS	
	BENCH	
	TRASHCAN	
	DRINKING FOUNTAIN	
	STREET LIGHT	
WALLS AND FENCING		
	HISTORIC STACKED STONE WALL	
	HISTORIC COBBLESTONE WALL	
	CYCLONE FENCE	
	WOOD FENCE W/ WELDED WIRE MESH PANEL	
	TIMBER CURB AT PERIMETER	
DRAINAGE		
	HISTORIC GUTTER	
	DRAIN INLET / CATCH BASIN	
	DRAIN SWALE	
EROSION CONTROL		
	(E) COIR SWATTLE	

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Sheet Title:
EXISTING AND DEMOLITION SITE PLAN

Date:	03/13/20
Scale:	
Drawn:	MN
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Job:	1911
Sheet:	

L1.00

HAIGHT STREET

CENTRAL AVENUE

WALLER STREET

BUENA VISTA AVENUE WEST

REMOVE STAIRS AND PRESERVE RETAINING WALLS

CROSSWALK TYP.

CONCRETE WALL

CONCRETE AND BRICK SIDEWALK DAMAGED

(E) HISTORIC DRAIN INLET, TYP.

REMOVE EARTH PATH TYP.

REMOVE STAIRS

REMOVE FAILING HISTORIC WALLS AND PRESERVE HISTORIC GUTTER

REMOVE WOOD STAIRS

REMOVE PLAYGROUND AND CYCLONE FENCING

REMOVE WOOD LOG CURB

PRESERVE EXISTING WOOD RETAINING WALL AND ACCESSIBLE ASPHALT PAVING

CONCRETE AND BRICK SIDEWALK DAMAGED

ABANDON EARTH PATH TYP.

DEMO DOG RUN ENTRY SIGN

REMOVE STONE STAIRS

REMOVE AND ABANDON RUSTIC STAIRS TYP.

DOG RUN WITH EROSION PROBLEMS SAND / EARTH SURFACE WITH EROSION WATTLES

CONCRETE AND BRICK SIDEWALK DAMAGED

REMOVE FALLEN TREE

ABANDON EARTH PATH TYP.

REMOVE WOOD STAIRS

REMOVE ALL TIMBER CURB AT PERIMETER CURB

TREE TRUNK CAUSING WALL FAILURE

REMOVE AND ABANDON RUSTIC STAIRS

REMOVE AND ABANDON RUSTIC STAIRS TYP.

SEE L1.03

SEE L1.02

REMOVE STAIRS AND PRESERVE RETAINING WALLS

(E) HISTORIC DRAIN INLET, TYP.

REMOVE WOOD WALL

REMOVE EARTH PATH TYP.

REMOVE EARTH PATH TYP.

REMOVE ASPHALT PATH TYP.

REMOVE (E) BENCHES

HISTORIC WALL DAMAGE CAUSED BY REDWOODS

REMOVE AND ABANDON RUSTIC STAIRS TYP.

ABANDON EARTH PATH TYP.

REMOVE AND ABANDON RUSTIC STAIRS TYP. -27 TOTAL STEPS

DAMAGED WALL AND STAIRS

REMOVE AND ABANDON RUSTIC STAIRS TYP. -69 TOTAL STEPS

ABANDON EARTH PATH TYP.

REMOVE AND ABANDON RUSTIC STAIRS TYP. -109 TOTAL STEPS -INCONSISTENT EDGE

ABANDON EARTH PATH TYP.

ABANDON EARTH PATH TYP.

REMOVE AND ABANDON RUSTIC STAIRS TYP.

REMOVE AND ABANDON RUSTIC STAIRS TYP.

REMOVE RUSTIC STAIRS TYP. (47 TOTAL STEPS)

SEE L1.02

SEE L1.03

N

SCALE: 1" = 30'

0' 30' 60' 90'

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	03/13/20	REVISED C.E. SET

Sheet Title:

EXISTING AND DEMOLITION NORTHWEST

Date:	03/13/20
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Job:	1911
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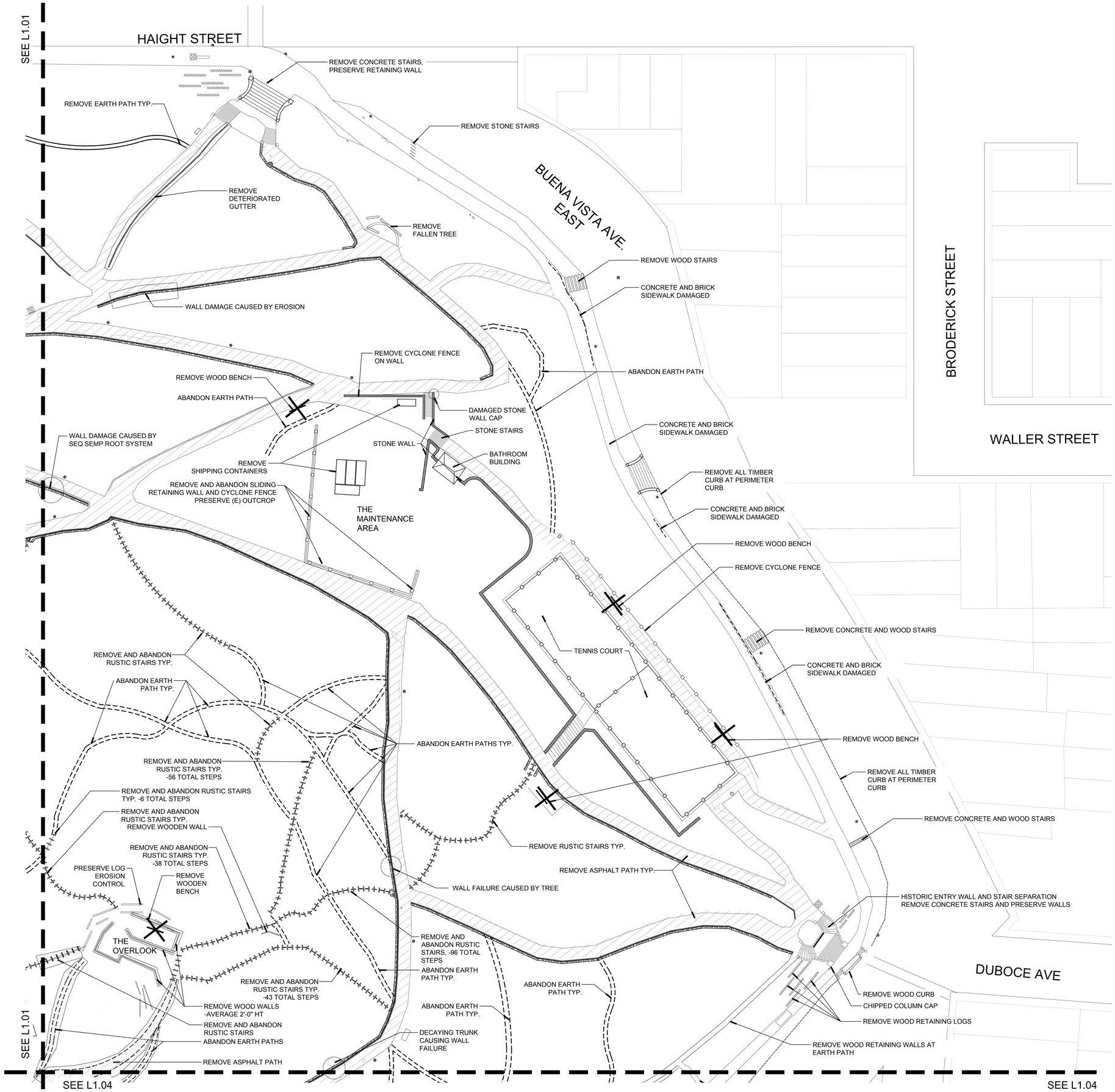
L1.01



N

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0' 30' 60' 90'

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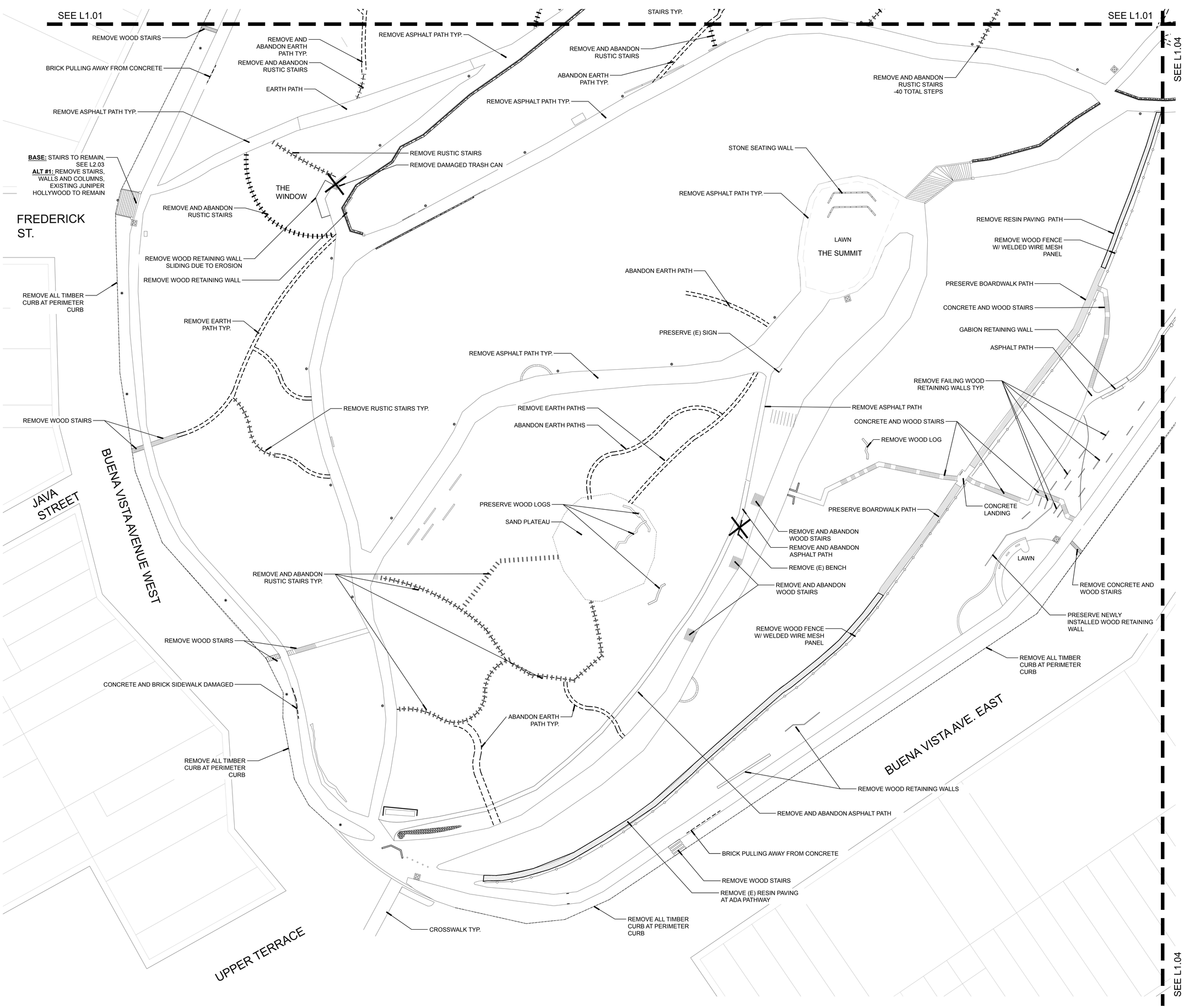
	03/13/20	REVISED C.E. SET

Sheet Title:

EXISTING AND DEMOLITION NORTHEAST

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L1.02



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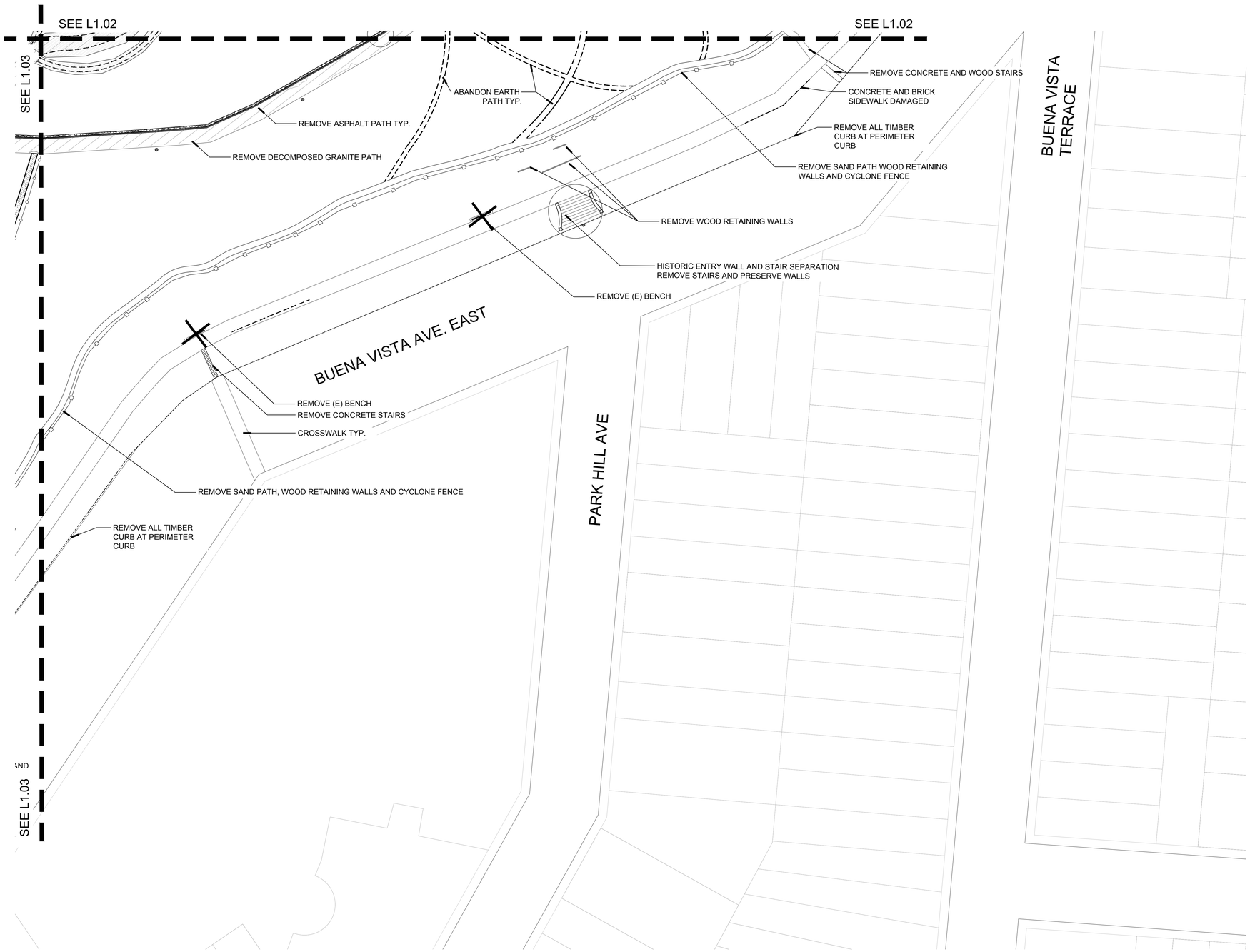
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

EXISTING AND DEMOLITION SOUTHWEST

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L1.03



N

SCALE: 1" = 30'

0' 30' 60' 90'

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	03/13/20	REVISED C.E. SET

Sheet Title:
EXISTING AND DEMOLITION SOUTHEAST

Date:	03/13/20
Scale:	
Drawn:	MN
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Job:	1911
Sheet:	

L1.04

HARDSCAPE LEGEND

SYMBOL	TYPE	DETAIL SHEET
PAVING AND STAIRS		
	ASPHALT PAVING REPLACEMENT- T.I. 5.5	L2.05 - 1
	ASPHALT PAVING REPLACEMENT - T.I. 6.0	L2.05 - 1
	ASPHALT PAVING - (N) - T.I. VARIES	
	CONCRETE PAVING W/ BRICK PAVERS	
	PARK TREAD PAVING	
	BOARDWALK PATH	
	RUSTIC STAIRS - (E)	
WALLS		
	HISTORIC STACKED STONE WALLS - (E)	
	HISTORIC COBBLE WALLS - (E)	
	SHOTCRETE WALL - (E)	
	STONE WALLS	L2.05 - 4
	GABION WALL	
	GRAVITY BLOCK WALL	
	SUTTER WALL	L2.06 - 3
	RUSTIC FENCE	L2.05 - 2
	METAL FENCE	L2.06-6
GUTTER		
	HISTORIC GUTTER (E)	
	ROCK WELL	L2.05 - 1
PROGRAM		
	REPURPOSED LOG	L2.07 - 2
	REPURPOSED WOOD STUMPS	L2.07 - 2
	EXERCISE STRUCTURE	L2.07 - 2

HARDSCAPE NOTES

- ALL INTERIOR ASPHALT PATHS TO BE REPLACED
  -- EXCLUDES RECENTLY COMPLETED ACCESSIBLE ASPHALT PATH TO PLAYGROUND
- REPLACE 10% OF ALL EXISTING SIDEWALKS
- REPLACE ALL EXISTING RUSTIC STAIRS WITH NEW TIMBER TREADS
- COST ESTIMATE FOR STREET BULBOUT SHALL BE ESTIMATED AS A SEPARATE LINE ITEM.

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	03/13/20	REVISED C.E. SET

Sheet Title:

HARDSCAPE SITE PLAN

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L2.00

HAIGHT STREET

CENTRAL AVENUE

WALLER STREET

BUENA VISTA AVENUE WEST

HISTORIC ENTRY WALL AND STAIR SEPARATION: INSTALL NEW CONCRETE STAIRS, DOWEL TO (E) CONCRETE WALL. FILL SOIL AGAINST (E) WALL. RESTORE (E) HISTORIC WALLS AS FOLLOWS: 1) STRUCTURAL RETROFIT (UNDERPINNING, SUPPORT FOOTING, BUTTRESSING, TO BE ASSESED FURTHER BY STRUCTURAL ENGINEER) 2) REPAIR CRACKS AND RESURFACING 3) ADD HANDRAILS AT STAIRS

HISTORIC ENTRY WALL AND STAIR SEPARATION: INSTALL NEW CONCRETE STAIRS, DOWEL TO (E) CONCRETE WALL. FILL SOIL AGAINST (E) WALL. RESTORE (E) HISTORIC WALLS AS FOLLOWS: 1) STRUCTURAL RETROFIT (UNDERPINNING, SUPPORT FOOTING, BUTTRESSING, TO BE ASSESED FURTHER BY STRUCTURAL ENGINEER) 2) REPAIR CRACKS AND RESURFACING 3) ADD HANDRAILS AT STAIRS

SEE L2.02

1 L2.05 A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP.

5 L2.06 REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING

PRESERVE (E) HISTORIC DRAIN INLET

PRESERVE (E) HISTORIC DRAINAGE CHANNEL

HISTORIC DRAIN INLET

1 L2.05 A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP.

1 L2.05 A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP.

CONCRETE STAIRS WITH CURB WALLS

2' HIGH STONE WALL TO MATCH HISTORIC STONE WALL

REPLACE HISTORIC WALLS

3 L2.05 RUSTIC STAIRS AT (E) LOCATION TYP.

2 L2.05 RUSTIC FENCE

1 L2.05 A.C. PAVING AT (E) LOCATION -T.I. 6.0 TYP.

5 L2.06 REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING

1 L2.08 PLAYGROUND RENOVATION

1 L2.05 ROCK WELL AT ASPHALT PAVING, TYP.

1 L2.08 18" HIGH CONCRETE RETAINING WALL

CONCRETE COLUMNS

WIDEN ASPHALT PAVING AT INTERSECTION

REMOVABLE BOLLARDS

1 L2.08 PLAYGROUND ENTRY ENHANCMENT

5 L2.06 REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING

1 L2.05 A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP.

2 L2.07 CONCRETE EXTENSION 1'-6" WIDE AND **BASE:** 30" TALL CONCRETE RETAINING WALL **ALT #4:** 30" COBBLESTONE RETAINING WALL **ALT #5:** 30" TALL 6X6" TIMBER RETAINING WALL

REPAIR HISTORIC STONE WALL FROM TREE DAMAGE

1 L2.05 A.C. PAVING AT (E) LOCATION -T.I. 6.0 TYP.

2 L2.05 3'-6" RUSTIC FENCE

1 L2.05 ROCK WELL AT ASPHALT PAVING, TYP.

2 L2.06 PARK TREAD PATH

3 L2.05 RUSTIC STAIRS, TYP.

BIOSWALE W/ PLANTING

2 L2.07 CONCRETE EXTENSION 1'-6" WIDE AND **BASE:** 30" TALL CONCRETE RETAINING WALL **ALT #4:** 30" COBBLESTONE RETAINING WALL **ALT #5:** 30" TALL 6X6" TIMBER RETAINING WALL

2 L2.05 RUSTIC FENCE / TIMBER WALL AT PATH, TYP.

DOG RUN AREA W/ (E) SAND SURFACE

4 L2.07 CONCRETE STAIRS WITH HANDRAILS **ADD ALT #3:** STREET BULB-OUT

2 L2.05 3'-6" RUSTIC FENCE

REPAIR HISTORIC STONE WALL AND STAIRS

2 L2.06 PARK TREAD PATH

5 L2.06 REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING

2 L2.07 CONCRETE EXTENSION 1'-6" WIDE AND COBBLE STONE RETAINING WALL

2 L2.06 PARK TREAD PATH

3 L2.06 SUTTER WALL

2 L2.05 3'-6" RUSTIC FENCE

2 L2.06 PARK TREAD PATH, TYP.

3 L2.05 RUSTIC STAIRS, TYP.

2 L2.05 RUSTIC FENCE / TIMBER WALL AT PATH, TYP.

3 L2.05 RUSTIC STAIRS, TYP.

2 L2.06 PARK TREAD PATH, TYP.

REPAIR STONE WALL FROM DAMAGE

4 L2.07 CONCRETE STAIRS WITH HANDRAILS **ADD ALT #3:** STREET BULB-OUT

2 L2.06 PARK TREAD PATH

1 L2.05 A.C. PAVING AT (E) LOCATION -T.I. 6.0 TYP.

3 L2.05 RUSTIC STAIRS, TYP.

2 L2.06 PARK TREAD PATH, TYP.

2 L2.05 RUSTIC FENCE / TIMBER WALL AT PATH, TYP.

SEE L2.03

SEE L2.02

PARK TREAD P

SEE L2.03

SEE L2.04

N

SCALE: 1" = 30'

0' 30' 60' 90'

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	03/13/20	REVISED C.E. SET

Sheet Title:

HARDSCAPE NORTHWEST QUADRANT

Date:	03/13/20
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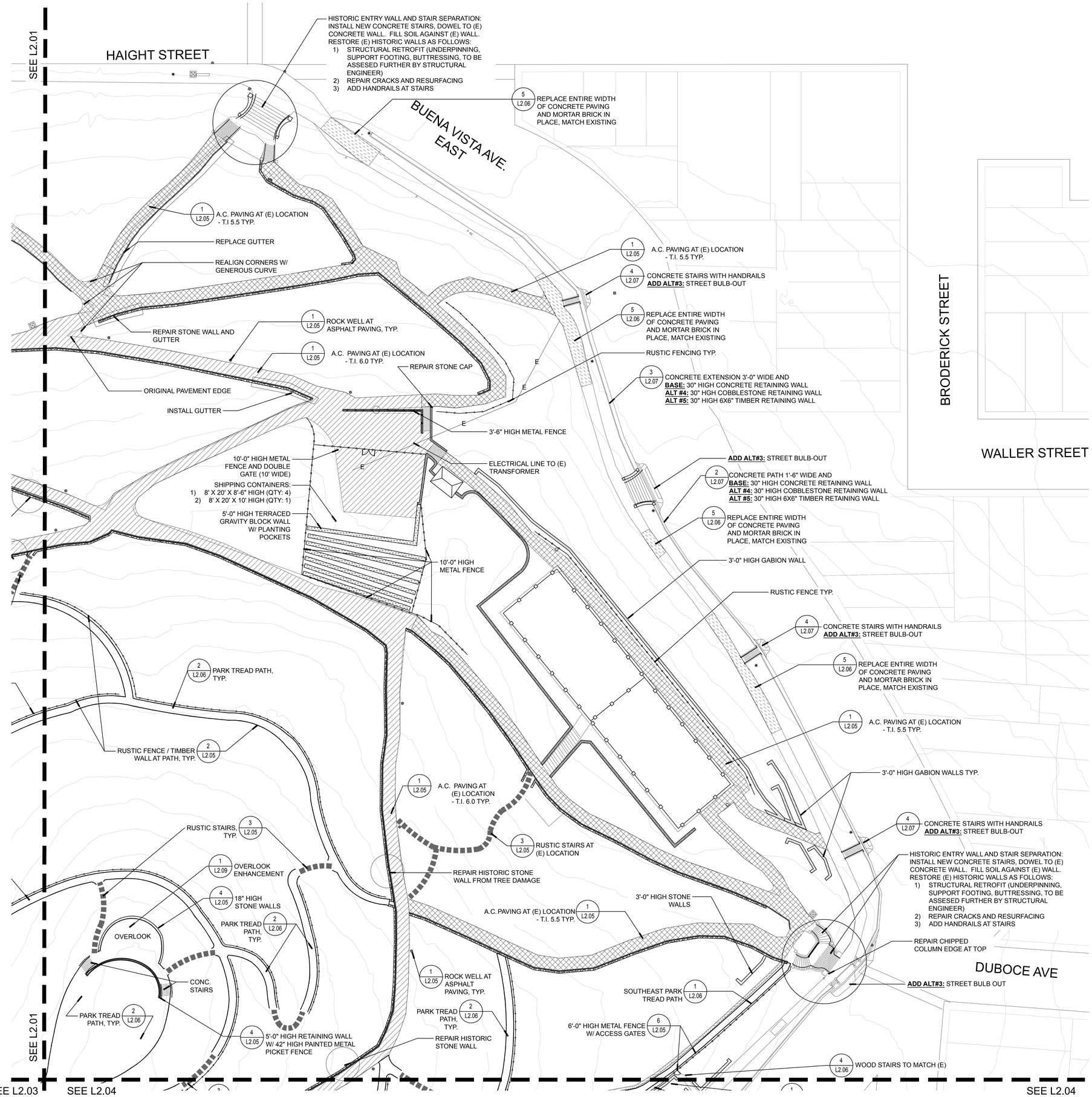
L2.01



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HARDSCAPE NORTHEAST QUADRANT

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Sheet:	

L2.02

N

SCALE: 1" = 30'

0' 30' 60' 90'

SEE L2.01

SEE L2.01

SEE L2.02

SEE L2.04

CONCRETE STAIRS WITH HANDRAILS (4 L2.07)
ADD ALT #3: STREET BULB-OUT

CONCRETE EXTENSION 1'-6" WIDE AND (2 L2.07)
ASE: 30" HIGH CONCRETE RETAINING WALL
-T #4: 30" HIGH COBBLESTONE RETAINING WALL
ALT #5: 30" HIGH 6X6" TIMBER RETAINING WALL

A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP. (1 L2.05)

PROTECT TREE DURING CONSTRUCTION.

ADD ALT#3: NEW STREET BULB-OUT

FREDERICK ST. ENTRY (5 L2.07)
BASE: HISTORIC ENTRY WALLS AND STAIRS REPAIR- INSTALL NEW CONCRETE STAIRS, DOWEL TO (E) WALLS AS FOLLOWS: 1) STRUCTURAL RETROFIT (UNDERPINNING, SUPPORT FOOTING, BUTTRESSING, TO BE ASSESSED BY STRUCTURAL ENGINEER), 2) REPAIR CRACKS AND RESURFACE
3) ADD HANDRAILS AT STAIRS

ALT #1: FREDERICK ST ENTRY REPLACEMENT WITH TAPERED CONCRETE STAIRWAY, CURB WALL, COLUMNS AND STREET BULB OUT, SEE DETAIL.

BUENA VISTA AVENUE WEST

PARK TREAD AT (E) LOCATION (2 L2.06)

RUSTIC STAIRS (3 L2.05)

A.C. PAVING AT (N) LOCATION - T.I 5.5 TYP. (1 L2.05)

WINDOW ENHANCEMENT - STONE WALL WITH METAL RAILING (2 L2.09, 5 L2.05)

STONE WALL ABOVE HISTORIC STONE WALL

TIMBER WALL AT PATH, TYP. (2 L2.05)

PARK TREAD PATH (2 L2.06)

CONCRETE STAIRS WITH HANDRAILS (4 L2.07)
ADD ALT #3: STREET BULB-OUT

RUSTIC STAIRS AT (E) LOCATION TYP. (3 L2.05)

JAVA STREET

WIDEN ASPHALT PAVING AT INTERSCTION

ROCK WELL AT ASPHALT PAVING, TYP. (1 L2.05)

CONCRETE EXTENSION 1'-6" WIDE AND COBBLE STONE RETAINING WALL (2 L2.07)

RUSTIC STAIRS AT (E) LOCATION TYP. (3 L2.05)

ROCK WELL AT ASPHALT PAVING, TYP. (1 L2.05)

RUSTIC FENCE / TIMBER WALL AT PATH, TYP. (2 L2.05)

A.C. PAVING AT (N) LOCATION - T.I. 6.0 TYP. (1 L2.05)

A.C. DIKE TYP.

PARK TREAD PAVING (2 L2.06)

ALT #2: ADULT FITNESS EQUIPMENT (2 L2.08)

RUSTIC STAIR TYP. (3 L2.05)

PARK TREAD TRAIL, TYP. (2 L2.06)

CONCRETE STAIRS WITH HANDRAILS (4 L2.07)
ADD ALT #3: STREET BULB-OUT

REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING (5 L2.06)

SHOTCRETE WALL
NEED INVESTIGATION BY STRUCTURAL ENGINEER

UPPER TERRACE

REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING (5 L2.06)

CONCRETE EXTENSION 1'-6" WIDE AND (2 L2.07)
BASE: 30" HIGH CONCRETE RETAINING WALL
ALT #4: 30" HIGH COBBLESTONE RETAINING WALL
ALT #5: 30" HIGH 6X6" TIMBER RETAINING WALL

ROCK WELL AT ASPHALT PAVING, TYP. (1 L2.05)

A.C. PAVING AT (E) LOCATION -T.I. 6.0 TYP. (1 L2.05)

PARK TREAD PATH, TYP. (2 L2.06)

REALIGN CORNERS W/ GENEROUS CURVE

A.C. PAVING AT (E) LOCATION - T.I 5.5 TYP. (1 L2.05)

3'-6" HIGH METAL FENCE (6 L2.05)

PARK TREAD PATH, TYP. (2 L2.06)

A.C. PAVING AT (E) LOCATION - T.I 5.5 TYP. (1 L2.05)

A.C. PAVING AT (E) LOCATION -T.I. 6.0 TYP. (1 L2.05)

6'-0" HIGH METAL FENCE W/ ACCESS GATES (6 L2.05)

3'-6" HIGH METAL FENCE (6 L2.05)

A.C. PAVING AT (E) LOCATION - T.I. 5.5 TYP. (1 L2.05)

A.C. PAVING AT (E) LOCATION - T.I 5.5 TYP. (1 L2.05)

WOOD STAIRS TO MATCH (E) (4 L2.06)

4' HIGH STONE RETAINING WALL TYP.

3'-6" HIGH METAL FENCE (6 L2.05)

RUSTIC FENCE TYP. (2 L2.05)

CONCRETE STAIRS WITH HANDRAILS (4 L2.07)
ADD ALT#3: STREET BULB-OUT

PARK TREAD PATH, TYP. (2 L2.06)

3'-6" HIGH METAL FENCE (6 L2.05)

BUENA VISTA AVE. EAST

BASE: 30" HIGH CONCRETE RETAINING WALL
ALT #4: 30" HIGH COBBLESTONE RETAINING WALL
ALT #5: 30" HIGH 6X6" TIMBER RETAINING WALL

3'-0" STONE RETAINING WALL TYP.

REPLACE ENTIRE WIDTH OF CONCRETE PAVING AND MORTAR BRICK IN PLACE, MATCH EXISTING (5 L2.06)

CONCRETE STAIRS WITH HANDRAILS (4 L2.07)
ADD ALT#3: STREET BULB-OUT

SEE L2.04

N

SCALE: 1" = 30'

0' 30' 60' 90'

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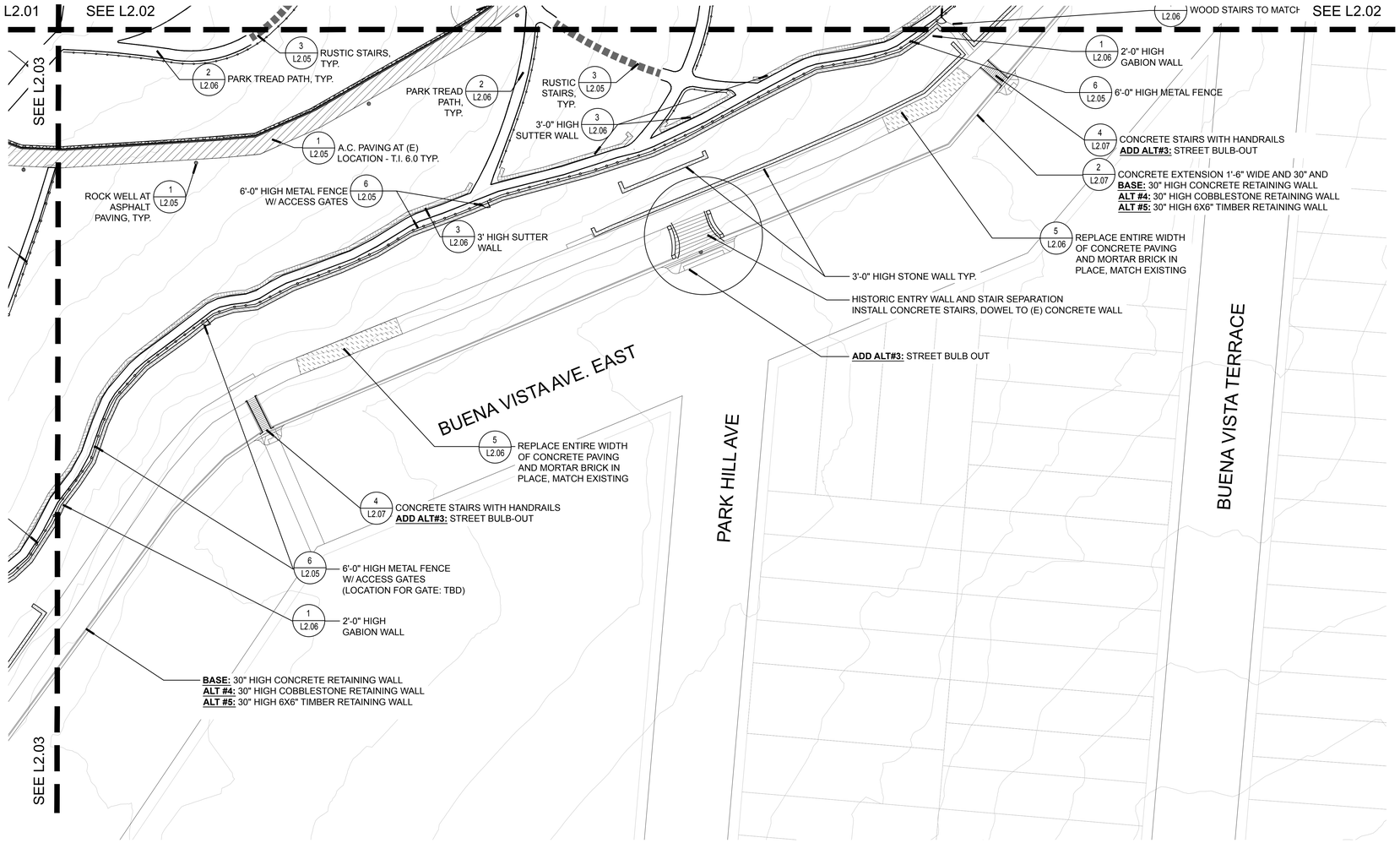
L2.03



N

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HARDSCAPE SOUTHEAST QUADRANT

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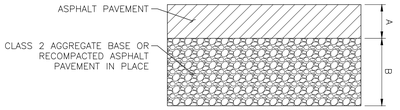
L2.04



T.I.	INSTALLATION METHOD 1 A AC (IN)	INSTALLATION METHOD 1 B NO BASE (IN)	INSTALLATION METHOD 2 A AC (IN)	INSTALLATION METHOD 2 B RECYCLED AC COMPACT IN PLACE (IN)	INSTALLATION METHOD 3 A AC (IN)	INSTALLATION METHOD 3 B AB (IN)
~~4.5~~	~~4~~	~~0~~	~~3~~	~~2~~	~~3~~	~~2~~
5.5	5.5	0	4.5	2	3	5
6.0	7	0	5	2	4	4

COST ESTIMATOR TO PROVIDE COST FOR INSTALLATION METHOD 2

T.I.	DESCRIPTION AND NOTES
~~4.5~~	~~USE AT PEDESTRIAN TRAFFIC AREA WITH LIGHT MAINTENANCE VEHICLE ACCESS (TORO)~~
5.5	USE AT TRAFFIC AREA WITH MEDIUM/HEAVY MAINTENANCE VEHICLE ACCESS (TRUCKS)
6.0	USE AT TRAFFIC AREA WITH HEAVY/FIRE VEHICLE ACCESS

INSTALLATION METHOD	DESCRIPTION AND NOTES
1	MILLING OF 1/4"-1/2" OF THE EXISTING PAVEMENT SURFACE AND OVERLAY WITH ASPHALT PAVEMENT, SEE COMPUTATION ABOVE.
2	ASPHALT PAVEMENT OVER RECYCLED ASPHALT PAVEMENT CRUSHED AND COMPACTED IN PLACE.
3	ASPHALT PAVEMENT OVER AGGREGATE BASE. IF PRESENT EXISTING AB CAN BE USED, ADDITIONAL AB MIGHT BE REQUIRED TO PROVIDE THE REQUIRED SECTION.

* REFER TO SHERWOOD DESIGN ENGINEER'S MEMORANDUM DATED DECEMBER 3RD 2019

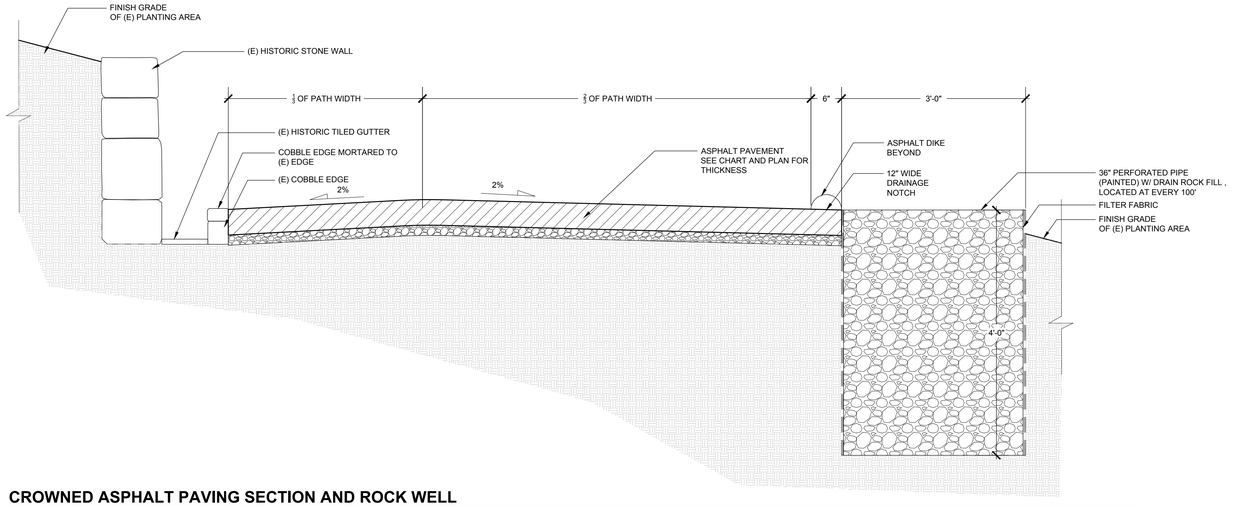
NOTES:

1. ASPHALT PAVEMENT DESIGN IS BASED ON THE FOLLOWING ASSUMPTION :
   A. R=40 FOR NATIVE SOIL (SAND).
   B. R=78 FOR CLASS 2 AGGREGATE BASE.
   C. R=75 FOR COMPACTED RECYCLED ASPHALT PAVEMENT.
   D. RECYCLED COMPACTED AC IN PLACE WILL HAVE A 2" THICKNESS.

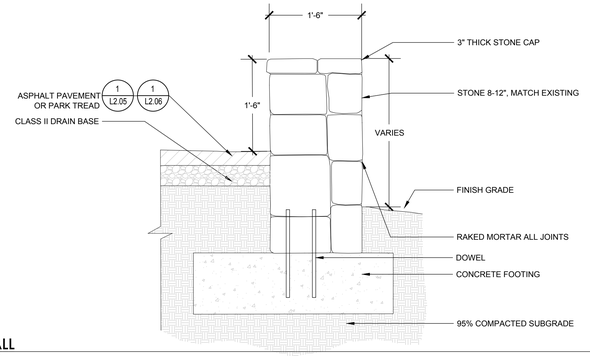
THE PAVEMENT DESIGN IS PRELIMINARY AND THE COMPUTATION WILL BE REVIEWED BASED ON THE GEOTECHINCAL REPORT RECOMMENDATIONS.

T.I.= TRAFFIC INDEX

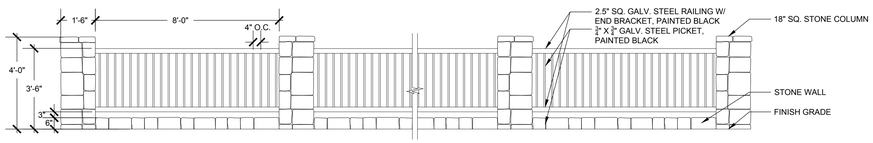
1 ASPHALT PAVING REPLACEMENT AND ROCK WELL
SCALE: 1-1/2" = 1'-0"



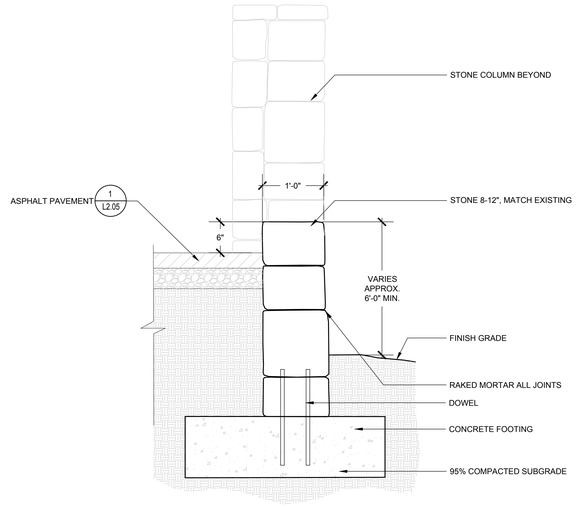
CROWNED ASPHALT PAVING SECTION AND ROCK WELL



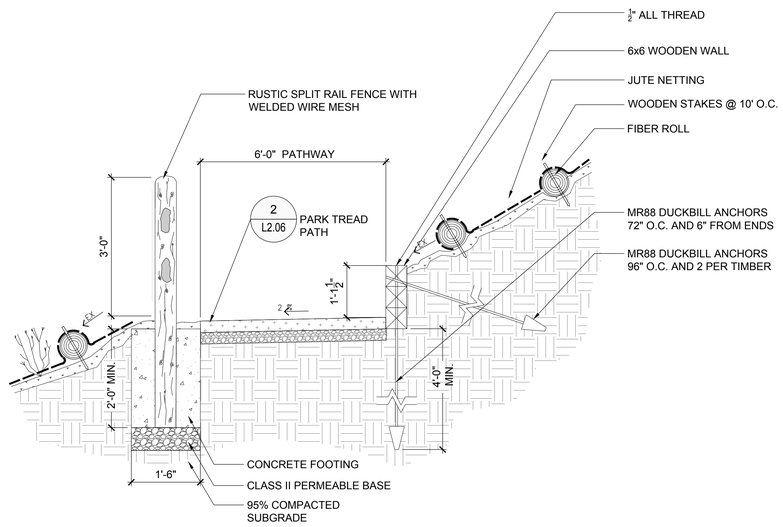
4 STONE WALL
SCALE: 1" = 1'-0"



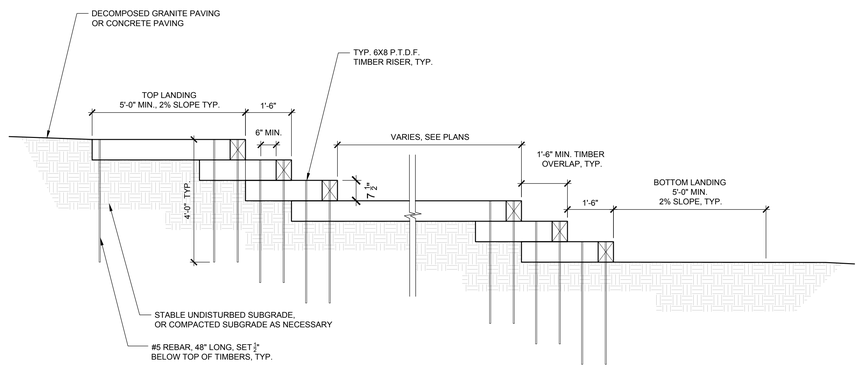
ELEVATION AT WINDOW OVERLOOK



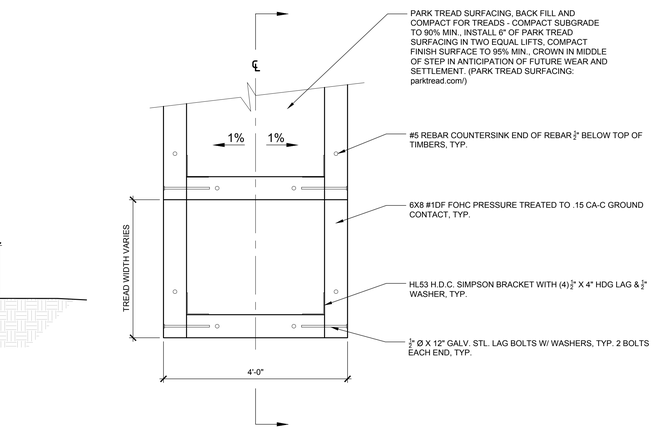
5 STONE WALL AND RAILING AT THE WINDOW
SCALE: 1" = 1'-0"



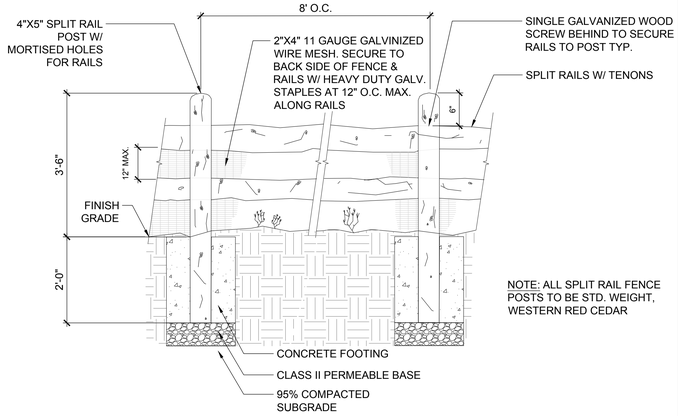
2 RUSTIC FENCE AND TIMBER CURB WALL @ PARK TREAD PATH
SCALE: 3/4" = 1'-0"



3 RUSTIC STAIRS
SCALE: 1/2" = 1'-0"



SCALE: 3/4" = 1'-0"



NOTE: ALL SPLIT RAIL FENCE POSTS TO BE STD. WEIGHT, WESTERN RED CEDAR

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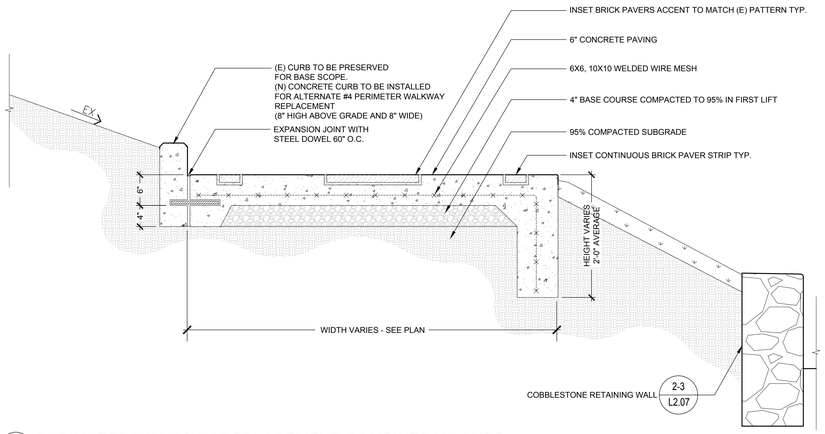
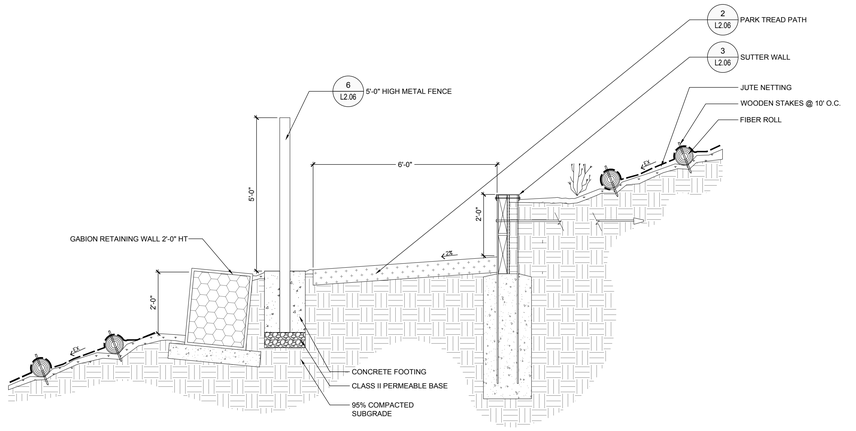
4 EXISTING WOOD STAIRS



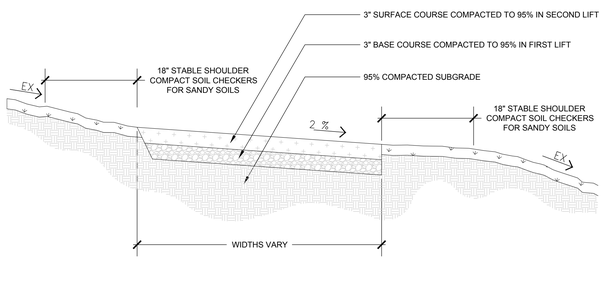
5 PERIMETER WALKWAY REPLACEMENT COMBINED W/ CURB

6 METAL FENCE - EXAMPLE



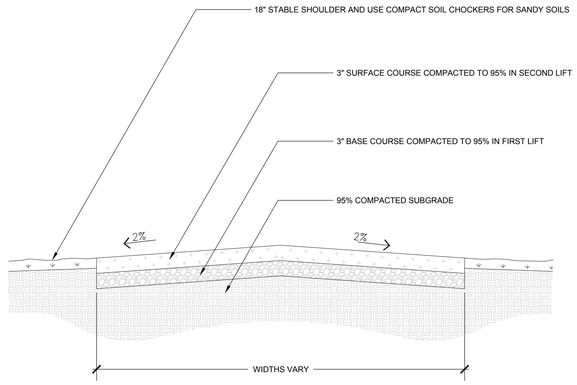
1 SOUTHEAST PARK TREAD PATH

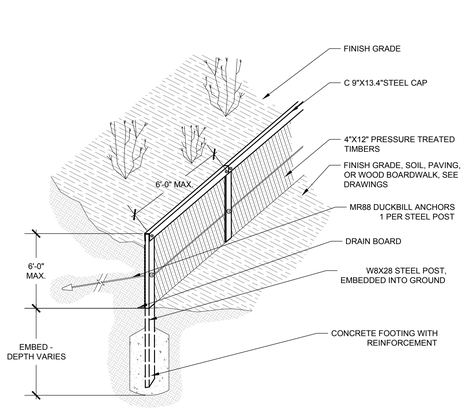
SCALE: 1/2" = 1'-0"



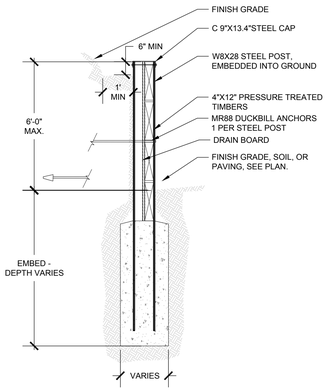
2 PARK TREAD PATH TYP.

SCALE: 1" = 1'-0"

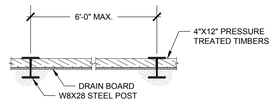




SUTTER WALL PERSPECTIVE



SUTTER WALL SECTION



SUTTER WALL SECTION

3 SUTTER WALL

SCALE: 1" = 1'-0"

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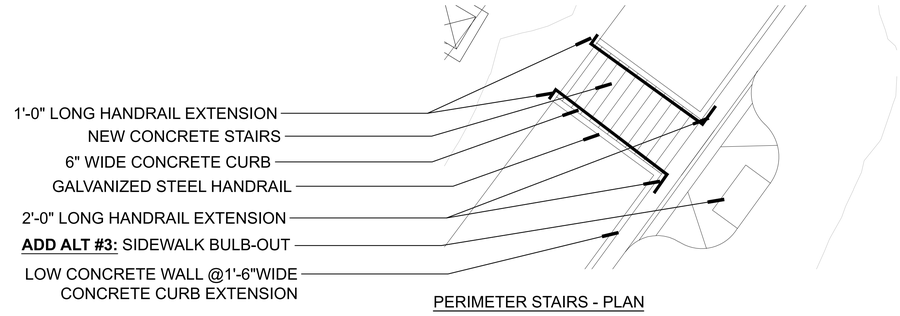
L2.06

STAIR LAYOUT IS SIMPLIFIED AND NO LONGER FLARES. SEE LAYOUT BELOW. COLUMNS TO BE REMOVED.
NOTE THAT THIS RENDERING NEEDS TO BE UPDATED.

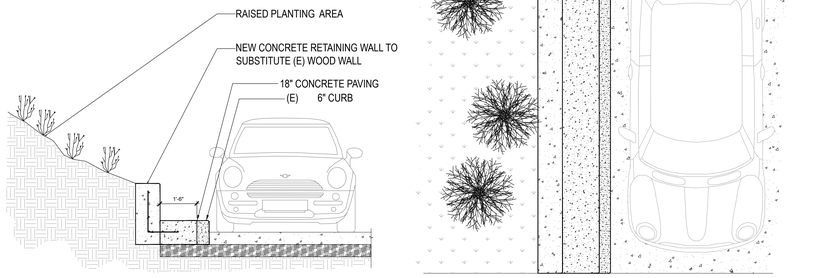


PERIMETER STAIRS - PLAN

4 PERIMETER STAIR ENHANCEMENT - RENDERING AND PLAN

5 ADD ALT #1 - FREDERICK STREET ENTRY STAIR REPLACEMENT

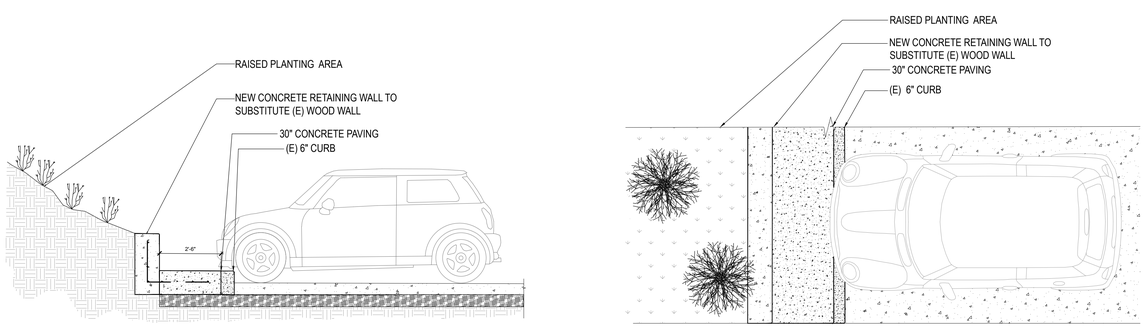
1 PLAYGROUND ENTRY ENHANCEMENT - RENDERING



PAVING EXTENSION SECTION

PAVING EXTENSION PLAN

2 CONCRETE RETAINING WALL AND CONCRETE EXTENSION AT PARALLEL PARKING



PAVING EXTENSION SECTION

PAVING EXTENSION PLAN

3 CONCRETE RETAINING WALL AND CONCRETE EXTENSION AT PERPENDICULAR PARKING

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1 PLAYGROUND RENOVATION - PRECEDENT

2 ADULT FITNESS AREA PRECEDENT - ADD ALT #2 FOR EQUIPMENT ONLY

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REV	DATE	DESCRIPTION
	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DETAILS AND CONCEPT DRAWINGS

Date:	03/13/20
Scale:	
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Job:	1911
Sheet:	

L2.08

1 THE OVERLOOK ENHANCEMENT - RENDERING

2 THE WINDOW ENHANCEMENT - RENDERING

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DETAILS AND CONCEPT DRAWINGS

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Job:	1911

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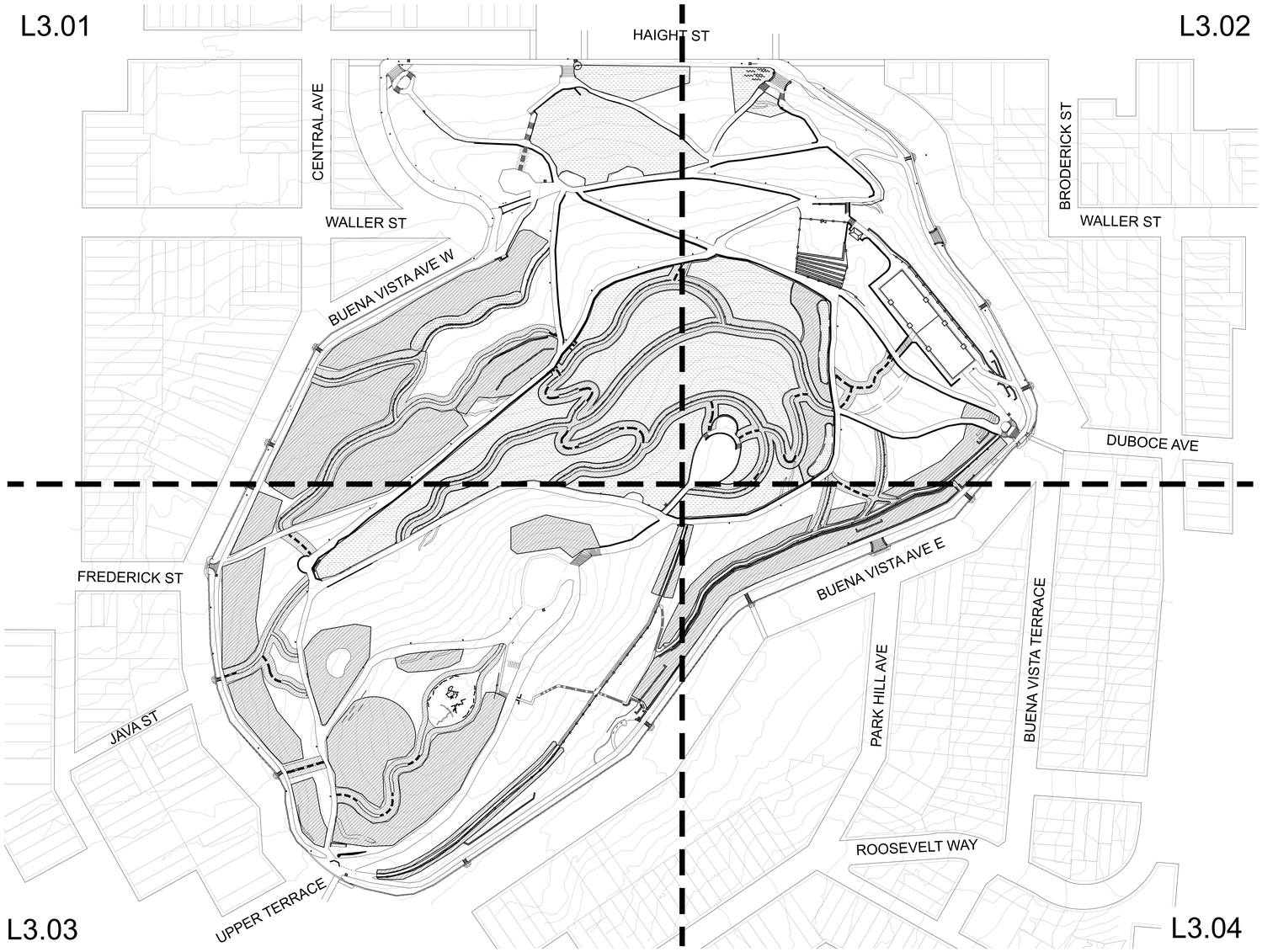
L2.09



EROSION CONTROL LEGEND

SYMBOL	TYPE	PRIORITY	NOTE
PAVING			
EROSION CONTROL FEATURES			
	EROSION CONTROL COIR ROLLS AT STAIR		INSTALL WATTLE AT EVERY STAIR TREAD
	EROSION CONTROL BLANKET AND COIR ROLLS		REFER TO EACH ANNOTATION FOR WATTLE SPACING
	EROSION CONTROL BLANKET		
	RETENTION BASIN / RAIN GARDEN		
	INLINE SWALE/ CASCADING BERM / LEVEL SPREADER		INTENDED TYPE SPECIFIED ON PLAN

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EROSION CONTROL SITE PLAN

Date:	03/13/20
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L3.00

HAIGHT STREET

CENTRAL AVENUE

WALLER STREET

BUENA VISTA AVENUE WEST

INCREASE IN (E) CURB HEIGHT TO PREVENT WATER RUN-OFF INTO SIDEWALK AND DIRECT WATER INTO A CATCHBASIN

1 L3.05 EROSION CONTROL BLANKET

SEE L3.02

1 L3.05 EROSION CONTROL BLANKET

EROSION CONTROL COIR ROLL AT RUSTIC STAIRS, TYP. — 1 L3.06

4 L3.05 RAINWATER GARDEN EXCAVATE SOIL AND REGRADE

1 L3.06 EROSION CONTROL BLANKET AND COIR ROLL @ 5'-0" O.C.

9 L3.05 BIOSWALE

EROSION CONTROL COIR ROLL AT RUSTIC STAIRS AND PATH — 1 L3.06

EROSION CONTROL BLANKET, TYP. — 1 L3.05

1 L3.06 EROSION CONTROL COIR ROLLS AT RUSTIC STAIRS, TYP.

EROSION CONTROL BLANKET AND COIR ROLL @ 5'-0" O.C. — 1 L3.06

EROSION CONTROL COIR ROLLS AT RUSTIC STAIRS AND PATH, TYP. — 1 L3.06

1 L3.06 EROSION CONTROL COIR ROLLS AT RUSTIC STAIRS AND PATH

EROSION CONTROL BLANKET AND COIR ROLL @ 5'-0" O.C. — 1 L3.06

2 L3.05 EROSION CONTROL SWATTLES

ONTROL COIR USTIC STAIRS ND PATH, TYP. — 1 L3.06

EROSION CONTROL COIR ROLLS AT RUSTIC STAIRS AND PATH, TYP.

SEE L3.02

SEE L3.03

SEE L3.03

N

SCALE: 1" = 30'

0' 30' 60' 90'

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EROSION CONTROL NORTHWEST QUADRANT

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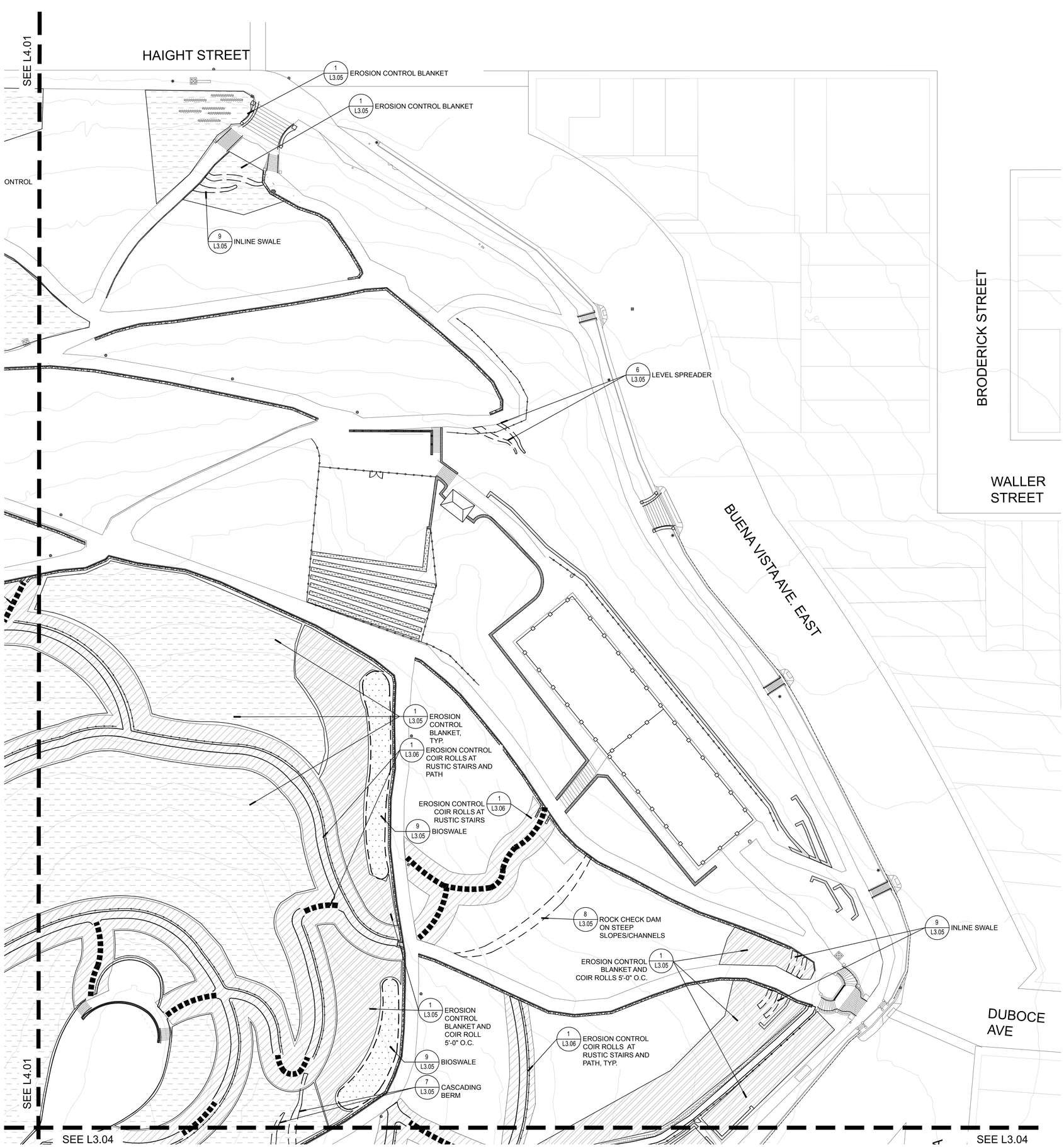
L3.01



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EROSION CONTROL NORTHEAST QUADRANT

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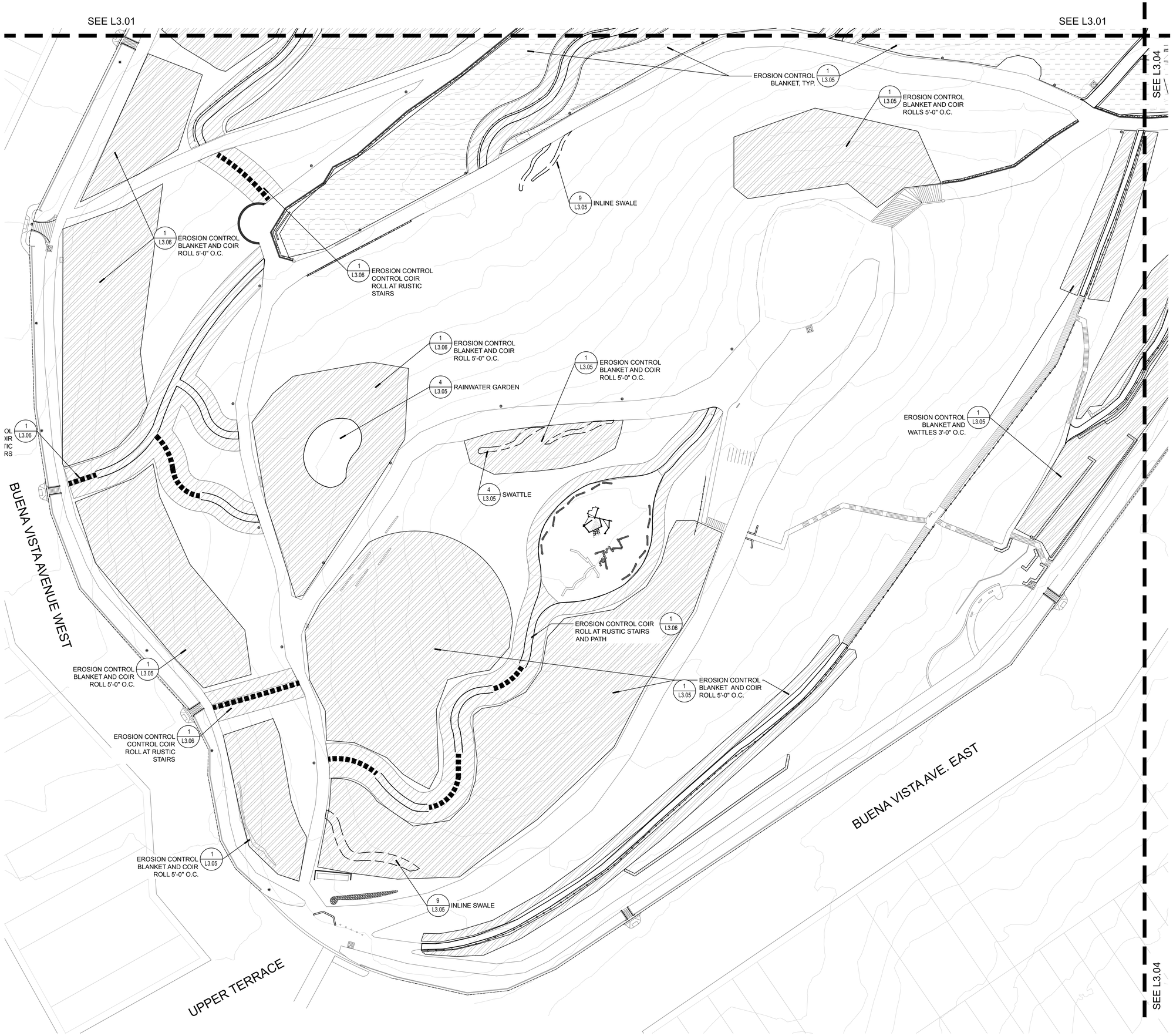
SCALE: 1" = 30'
0' 30' 60' 90'

L3.02



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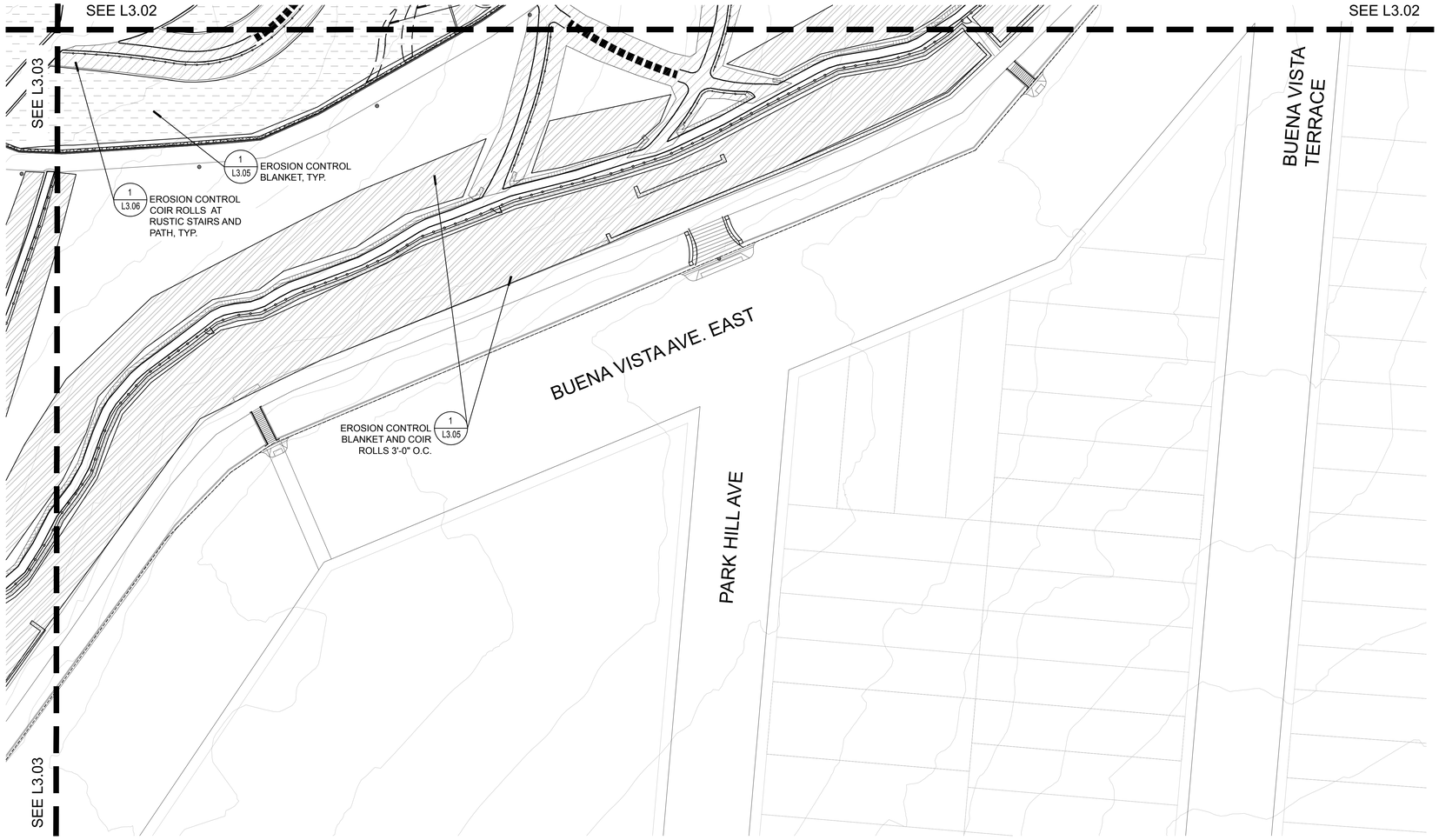
L3.03



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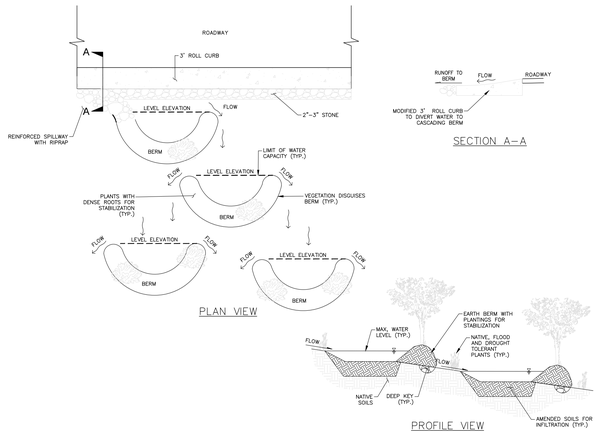
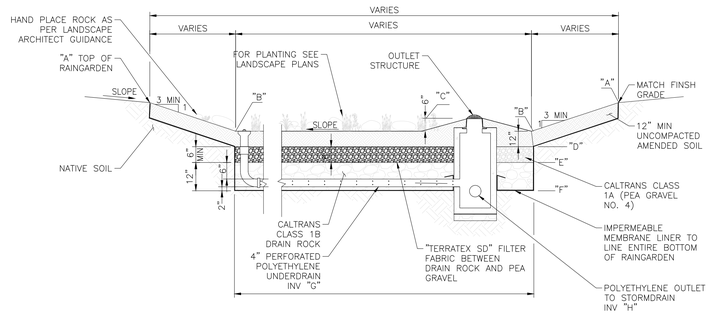
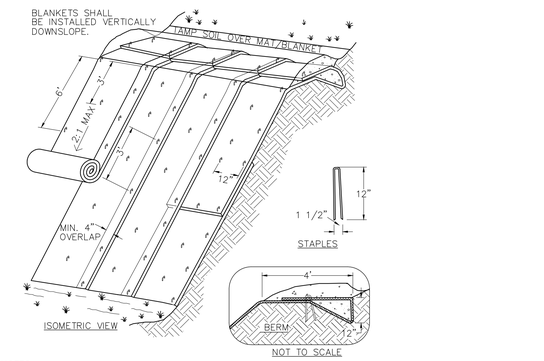
L3.04



7 CASCADING BERM
SCALE: NTS



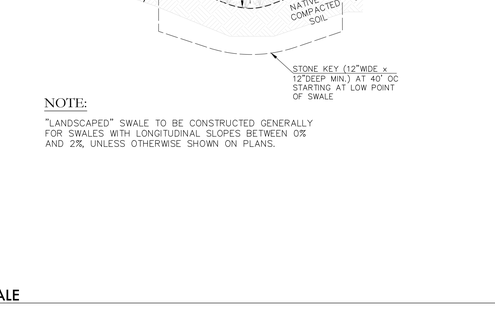
4 RAINWATER GARDEN
SCALE: NTS



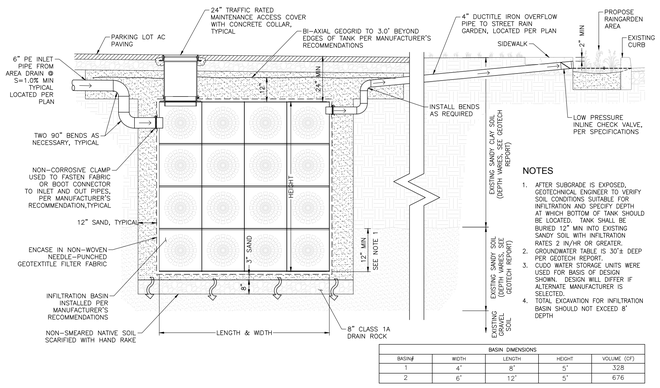
NOTES:

1. FOR EMBANKMENT FACE AND FILL SLOPES, USE DOUBLE-NET STRAW BLANKET. PHOTO DEGRADABLE WITHIN 12 MONTHS.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS AND CLODS LARGER THAN 3", AND ORGANIC DEBRIS. BLANKETS SHALL LAY FLAT ON THE SOIL.
3. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
4. LAY BLANKETS LOOSELY AND STAPLE AS SHOWN TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

1 EROSION CONTROL BLANKET
SCALE: NTS



8 ROCK CHECK DAM / CHANNELS
SCALE: NTS

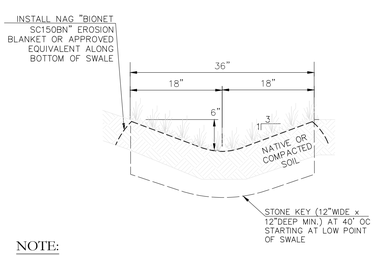


BASIN DIMENSIONS

BASIN#	WIDTH	LENGTH	HEIGHT	VOLUME (CF)
1	4'	8'	5'	328
2	6'	12'	5'	676

5 INFILTRATION BASIN
SCALE: NTS

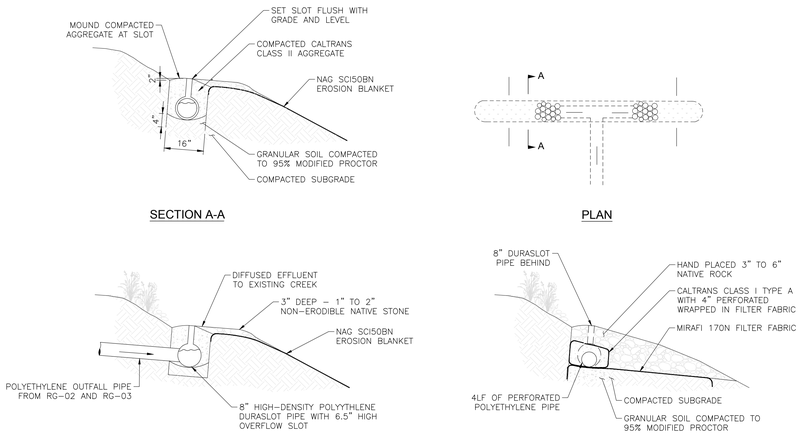
2 EROSION CONTROL SWATTLES (CONTROL WATTLE + SWALE)
SCALE: NTS



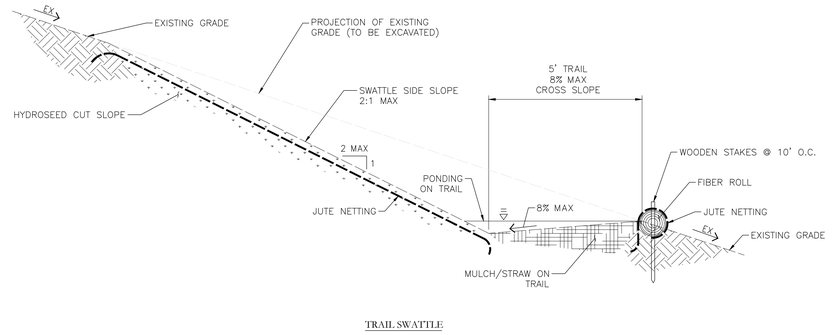
NOTE:

"LANDSCAPED" SWALE TO BE CONSTRUCTED GENERALLY FOR SWALES WITH LONGITUDINAL SLOPES BETWEEN 0% AND 2% UNLESS OTHERWISE SHOWN ON PLANS.

9 INLINE SWALE
SCALE: NTS



6 LEVEL SPREADER
SCALE: NTS



TRAIL SWATTLE

3 TRAIL SWATTLE
SCALE: NTS

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EROSION CONTROL DETAILS AND IMAGES

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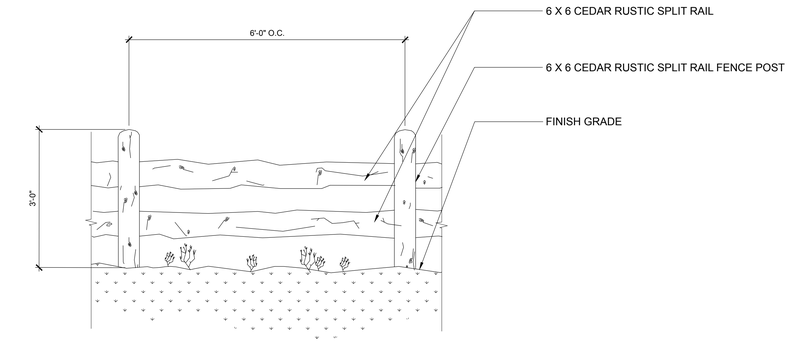
L3.05

1 EROSION CONTROL CONTROL WATTLE AT RUSTIC STAIRS
SCALE: NTS



2 EROSION CONTROL RUSTIC FENCE
SCALE:

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EROSION CONTROL DETAILS AND IMAGES

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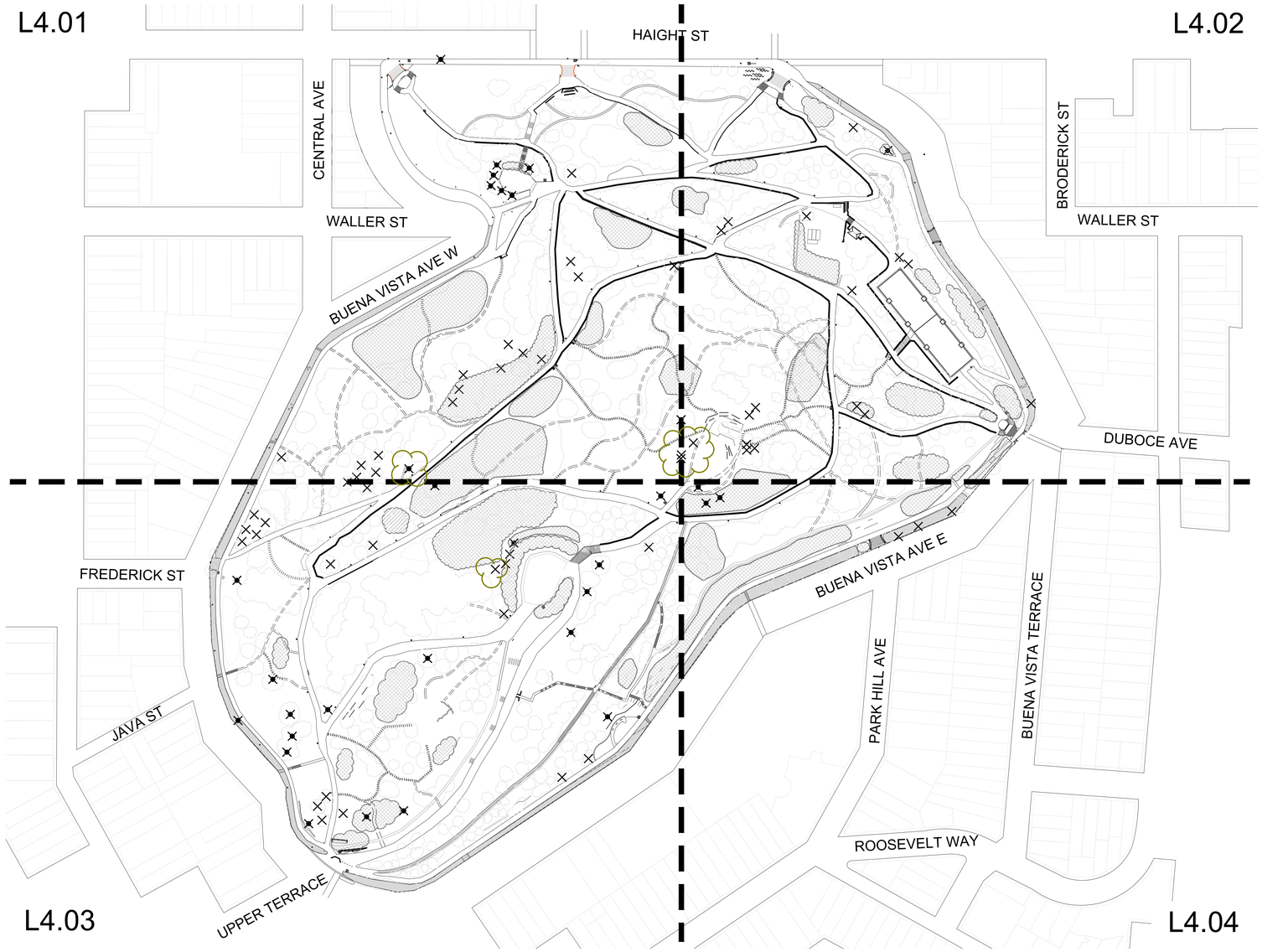
L3.06



URBAN FORESTRY LEGEND

SYMBOL	TYPE	NOTE
ZONES		
	TREE REMOVAL AND PRUNING AREA	REMOVE OR PRUNE SPECIES AS PER PLAN NOTES
	PERIMETER VEGETATION REMOVAL	FOR ALL PERTIMETER PLANTER AREAS, CLEAR AND GRUB ALL VEGETATION, REMOVE PLUM TREES AND INVASIVE PLANTING, PROTECT EXISTING *QUERCUS* (OAK) SPECIMENS
XXX	EXISTING PLANTING	SPECIES SPECIFIED ON PLAN
	EXISTING GROUND VEGETATION	SPECIES SPECIFIED ON PLAN
TREE REMOVAL		
×	UNTAGGED SPECIMEN REMOVAL	SPECIES SPECIFIED ON PLAN
✕	TAGGED SPECIMEN REMOVAL	

URBAN FORESTRY NOTES

1. REMOVE ALL ENGLISH IVY, CAPE IVY, ACACIA, ECHIUM, HIMALIAN BLACKBERRY (CA BLACKBERRY TO REMAIN) AND ALIANTHUS ON SITE.
2. APPLY HERBICIDE AFTER ANY TYPE OF REMOVAL . REFER TO SPECS.
3. REMOVE ALL YOUNG GROWTH PINES AND CYPRESSES WITHIN 70 FEET OF THE ROAD.

ABBREVIATIONS

ARB ARBORIST (HORT SCIENCE) TREE ID
UF URBAN FORESTER TREE ID

TREE REMOVAL

ACCOUNT FOR STUMP GRINDING OF 25% OF REMOVED TREE SPECIMENS. STUMP GRINDING TO BE PERFORMED ON ALL EUCALYPTUS SPP. TREES AND OTHERS (TO BE EVALUATED). 75% OF STUMPSTO REMAIN N PLACE.

LARGE SPECIMEN EUCALYPTUS TREES TO BE MONITORED

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URBAN FORESTRY SITE PLAN

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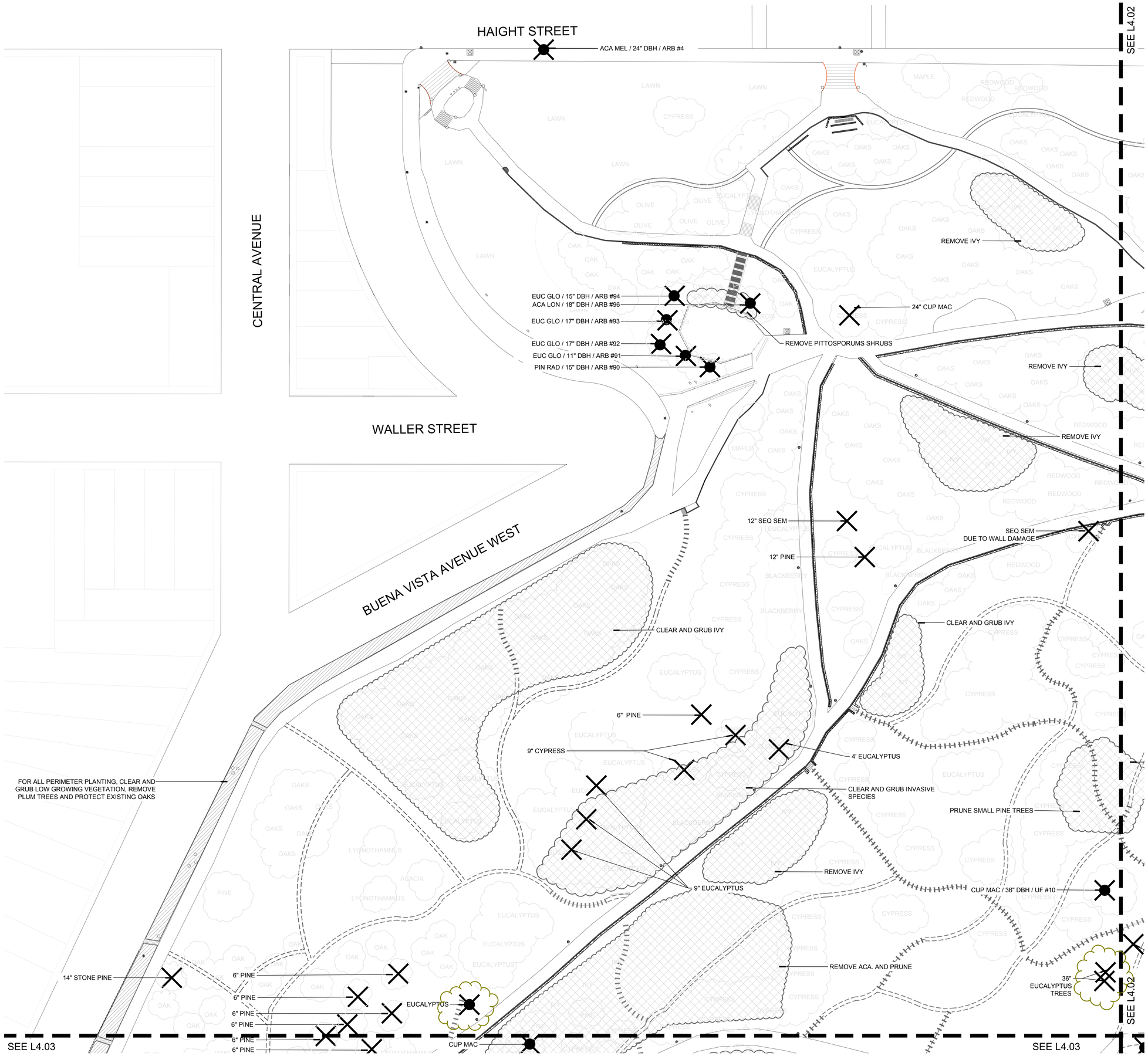
L4.00



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URBAN FORESTRY NORTHWEST QUADRANT

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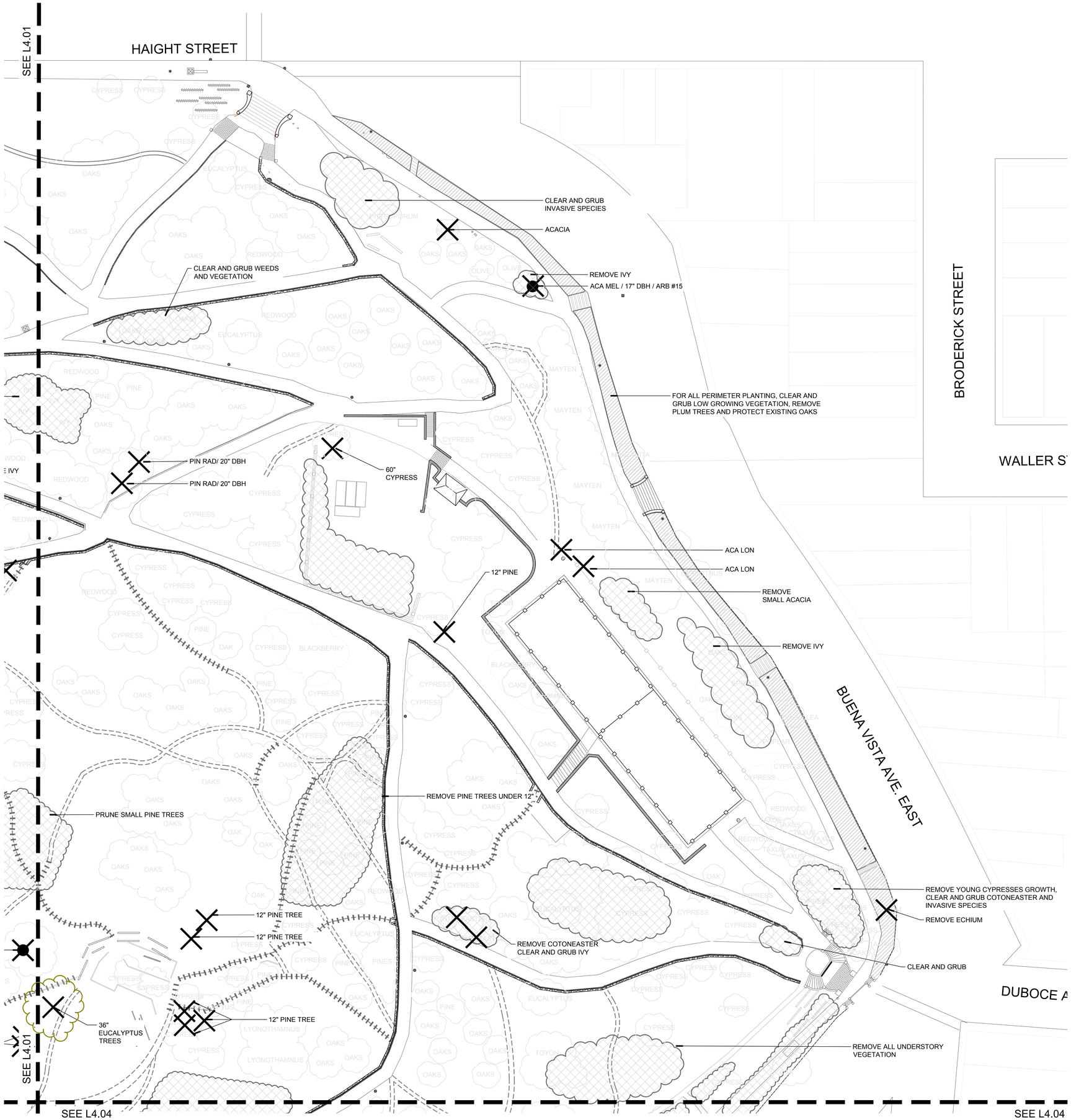
L4.01



N

SCALE: 1" = 30'

0' 30' 60' 90'

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URBAN FORESTRY NORTHEAST QUADRANT

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L4.02

SEE L4.01

SEE L4.01

SEE L4.04

SEE L4.04

FREDERICK STREET

JAVA STREET

BUENA VISTA AVENUE WEST

UPPER TERRACE

BUENA VISTA AVE. EAST

6" PINE

6" PINE

6" PINE

6" PINE

EUCALYPTUS

CUP MAC

6" PINE

6" PINE

6" PINE

6" PINE

6" PINE

PRUNE CUP MAC

PIN RAD

PIN RAD

PIN RAD / 28" DBH / ARB #72

FOR ALL PERIMETER PLANTING, CLEAR AND GRUB LOW GROWING VEGETATION, REMOVE PLUM TREES AND PROTECT EXISTING OAKS

CLEAR AND GRUB HEDERA

CUP MAC / 15" DBH / ARB #125

PIN RAD / 42" DBH / ARB #187

PIN RAD / 27" DBH / ARB #122

ACA LON / 9", 8", 7" & 5" DBH / ARB #64

PIN RAD / 15" DBH / ARB #120

PIN RAD / 28" DBH / ARB #119

CLEAR AND GRUB

PINE

PINE

PINE

PINE

COT / 6" DBH / ARB #58

PIN RAD / 42" DBH / ARB #189

CLEAR UNDERPLANTING AND PRUNE

CLEAR AND GRUB

EUC VIN / 50" DBH / ARB #184

PIN RAD / 45" DBH / ARB #186 & UF #22

PRUNE VEGETATION

CLEAR AND GRUB

PIN RAD / 38" DBH / ARB #175

CYPRESS (POOR CONDITION)

EUC VIN / 50" DBH / ARB #184

12" EUCALPTUS (QTY: 5)

DEAD PINE

PIN RAD / 39" DBH / ARB #153

REMOVE ACA., REMOVE HEDERA AND PRUNE

REMOVE TWO (2) MATURE MONTEREY PINES AND PRUNE AREA

PIN RAD/ 20"DBH

PIN RAD / 25" DBH / ARB #174

REMOVE LOW VEGE./ UF #19

EUC CAM/ 40" DBH / ARB #177 & UF #4

ACA DEC/ UF #18

REMOVE ACACIA

PIN RAD / 28" DBH / ARB #46

ECHIUM

ECHIUM

SCALE: 1" = 30'

0' 30' 60' 90'

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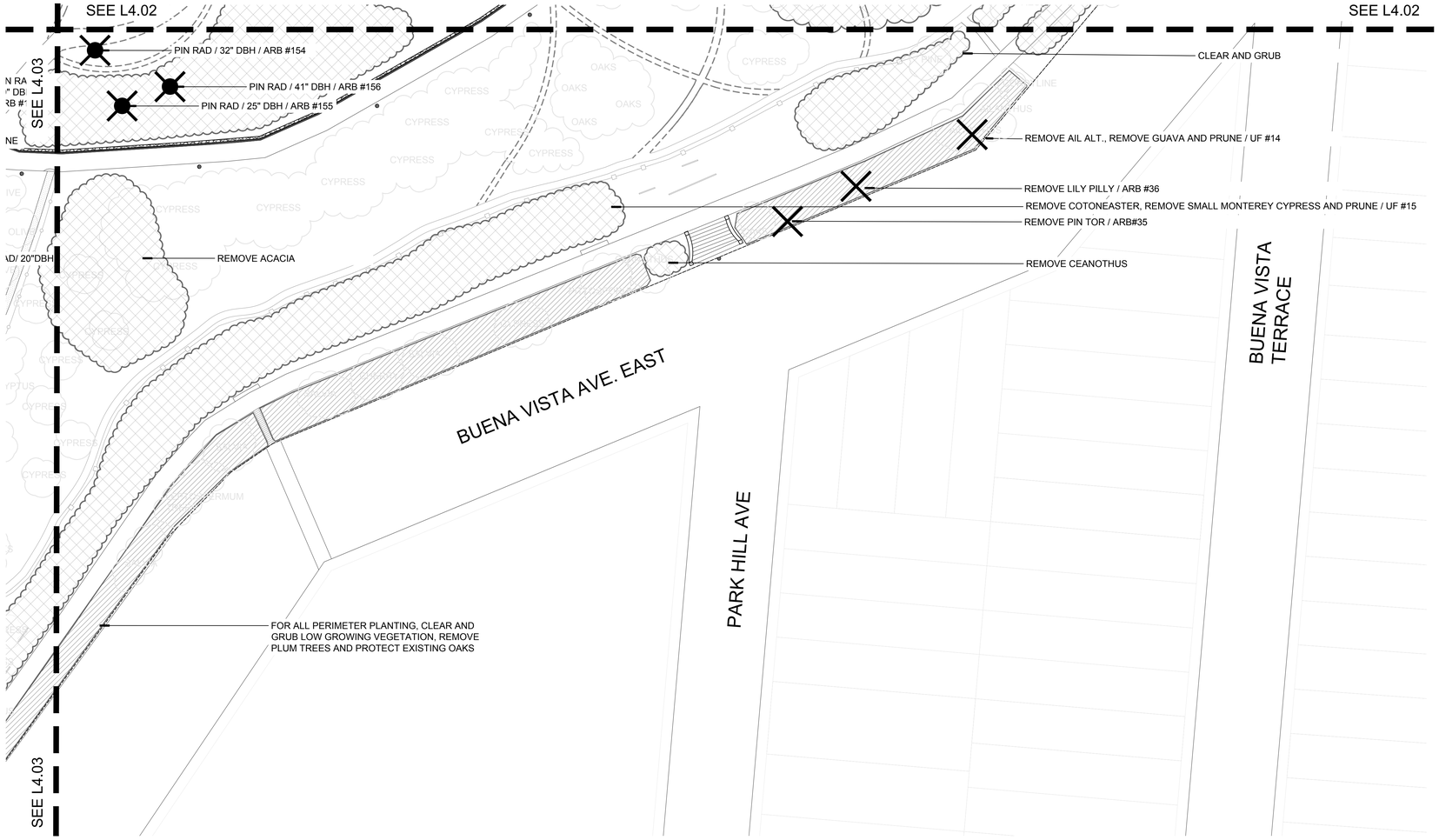
L4.03



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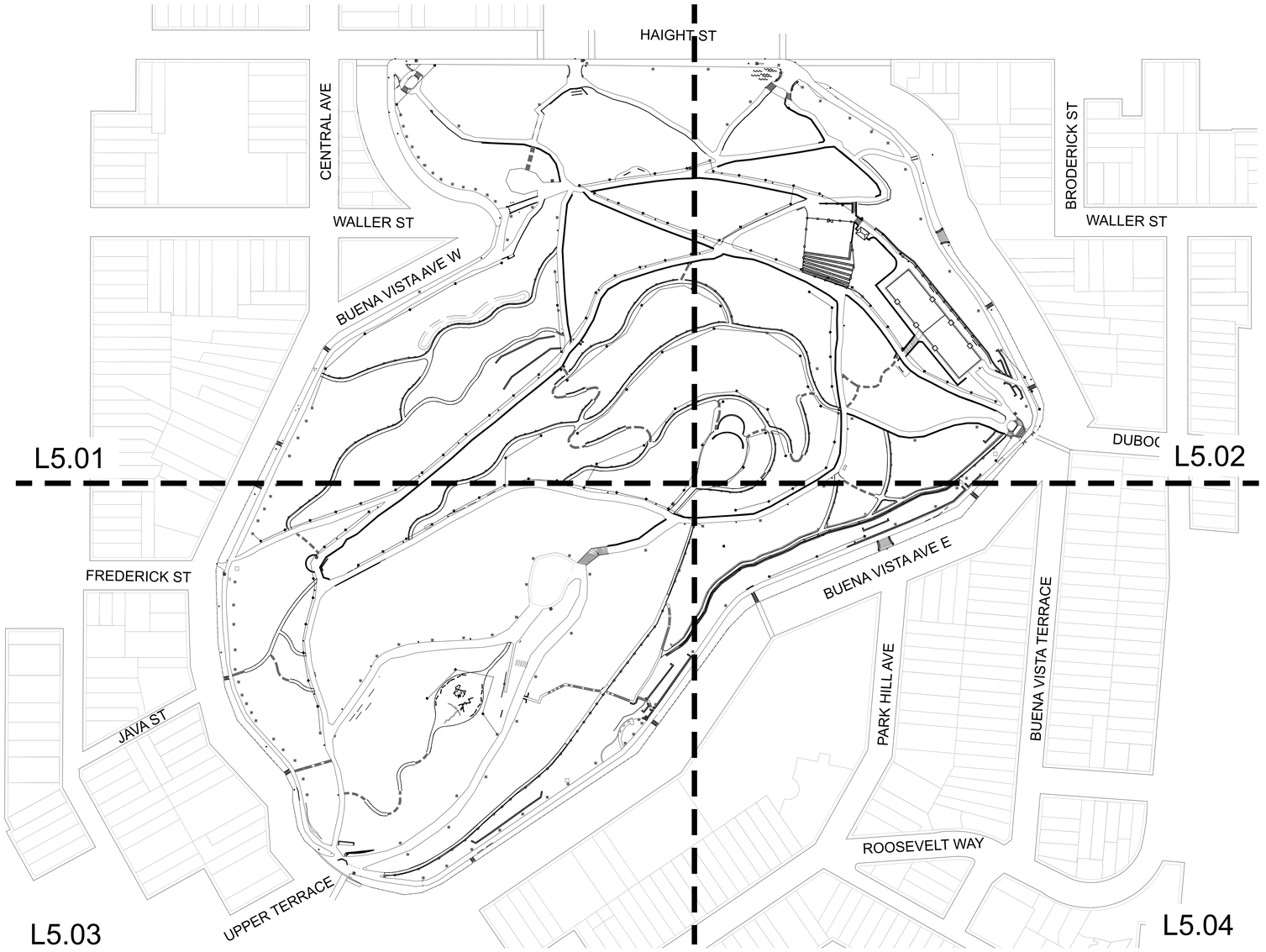
L4.04



IRRIGATION LEGEND

SYMBOL	TYPE	NOTE
ZONES		
	QUICK COUPLER (EXISTING)	
	BACKFLOW (EXISTING)	
	QUICK COUPLER (NEW)	
	MAINLINE	

IRRIGATION NOTES

1. IT IS RECOMMENDED THAT A MAP OF THE ENTIRE EXISTING IRRIGATION SYSTEM BE PRODUCED. IF IT IS DETERMINED THAT SEVERAL BACKFLOW PREVENTERS ARE INTERCONNECTED, RECOMMEND THAT THE SYSTEM BE SEPARATED.

N

SCALE: 1" = 100'

0' 100' 200' 300'

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PURPOSE ONLY

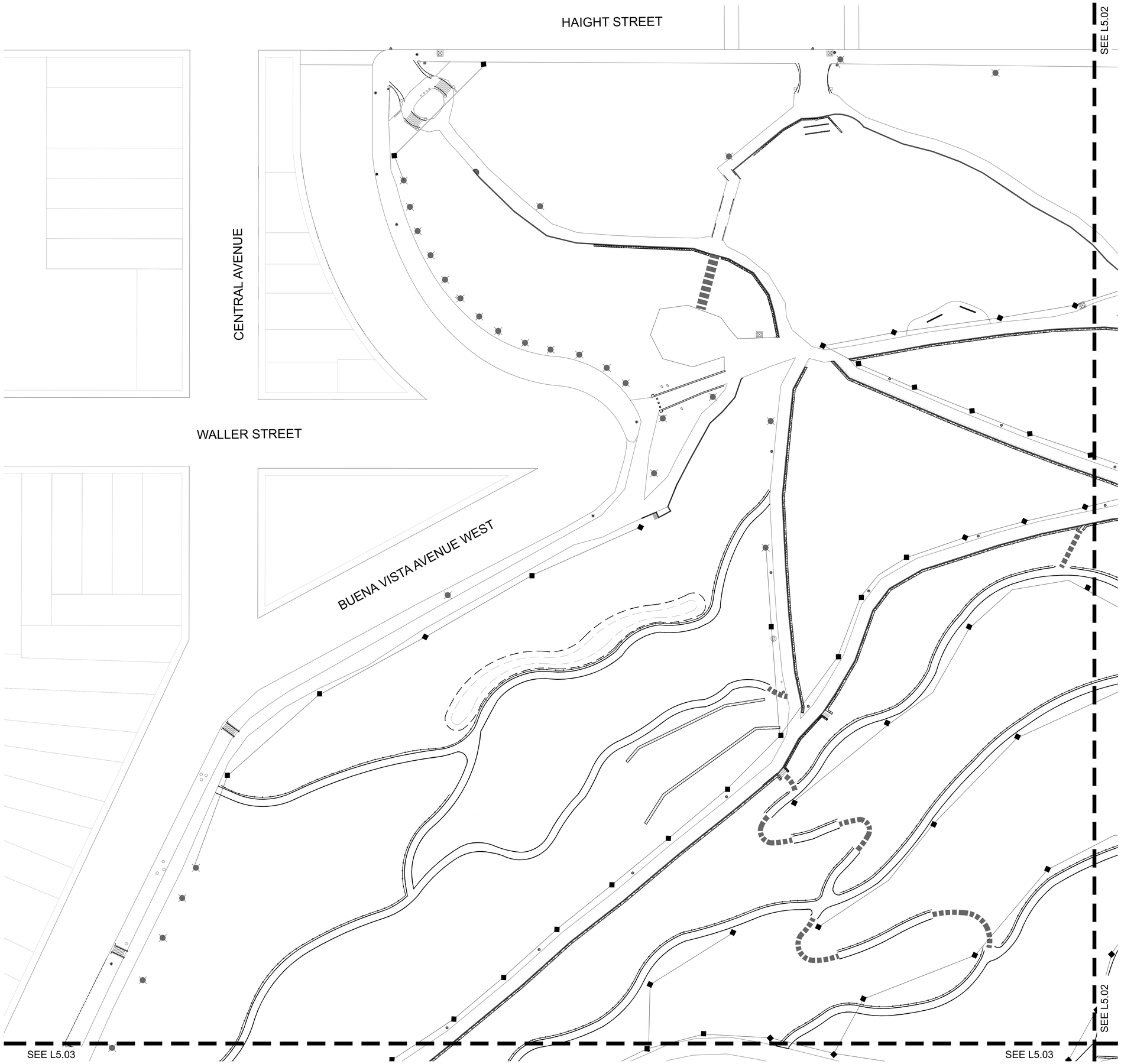
REV	DATE	DESCRIPTION
	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

IRRIGATION SITE PLAN

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L5.00



SCALE: 1" = 30'

0' 30' 60' 90'

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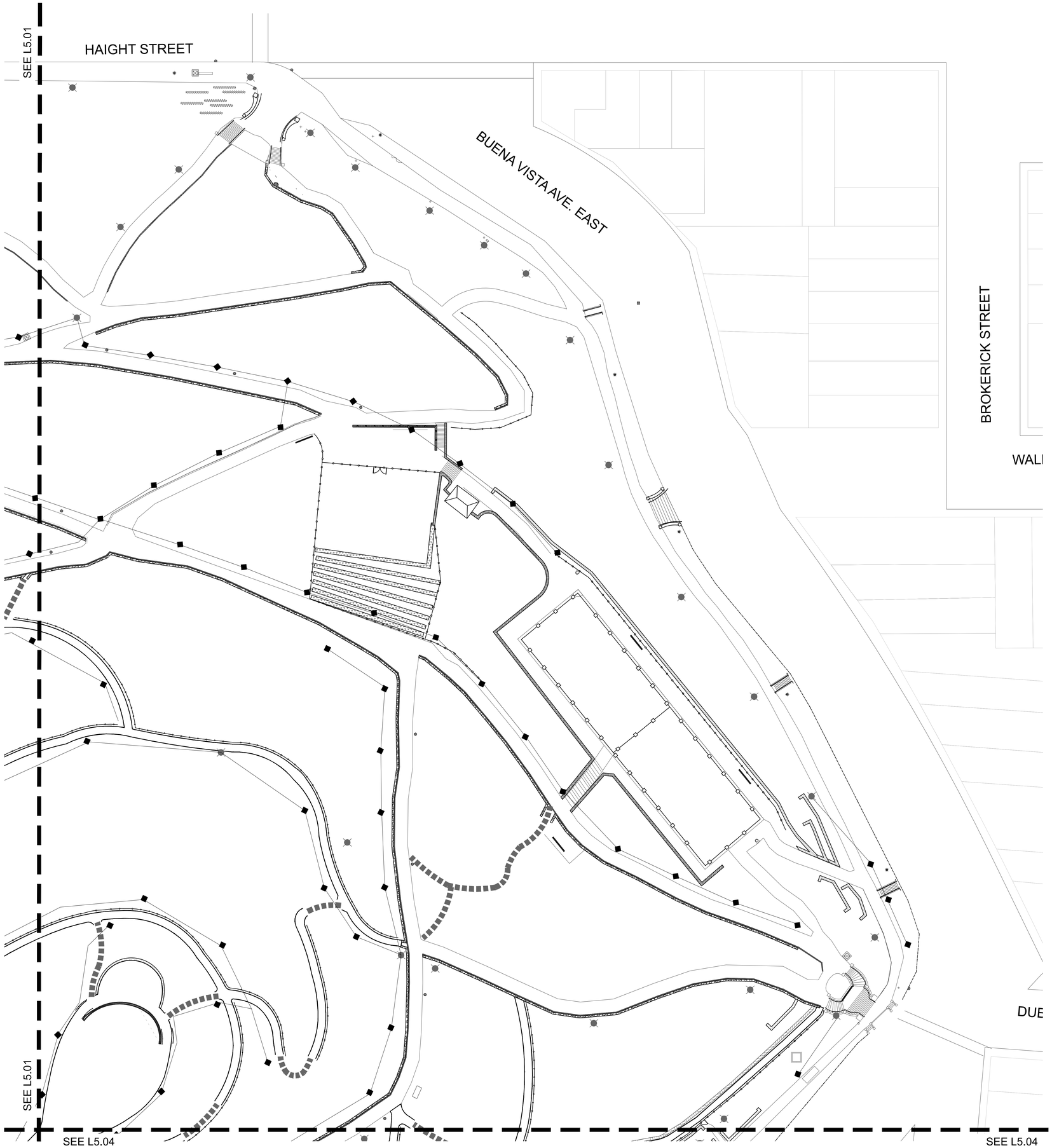
Sheet Title:

IRRIGATION NORTHWEST QUADRANT

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L5.01



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Sheet Title:

IRRIGATION NORTHEAST QUADRANT

Date:	03/13/20
Scale:	
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Job:	1911
Sheet:	

L5.02

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Sheet Title:

IRRIGATION SOUTHWEST QUADRANT

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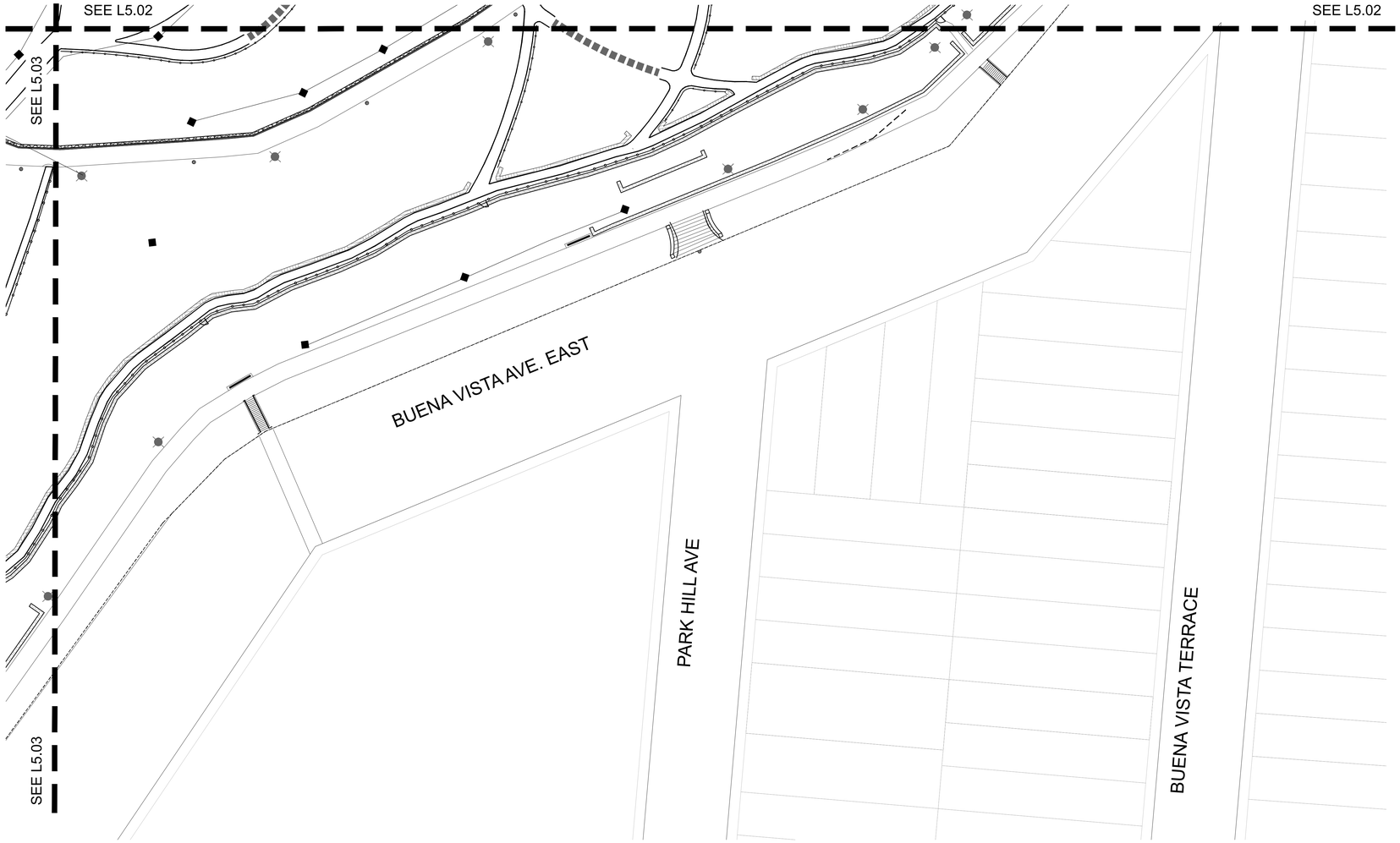
Checked:	JM
Job:	1911
Sheet:	

L5.03



N

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0' 30' 60' 90'

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Sheet Title:

IRRIGATION SOUTHEAST QUADRANT

Date:	03/13/20
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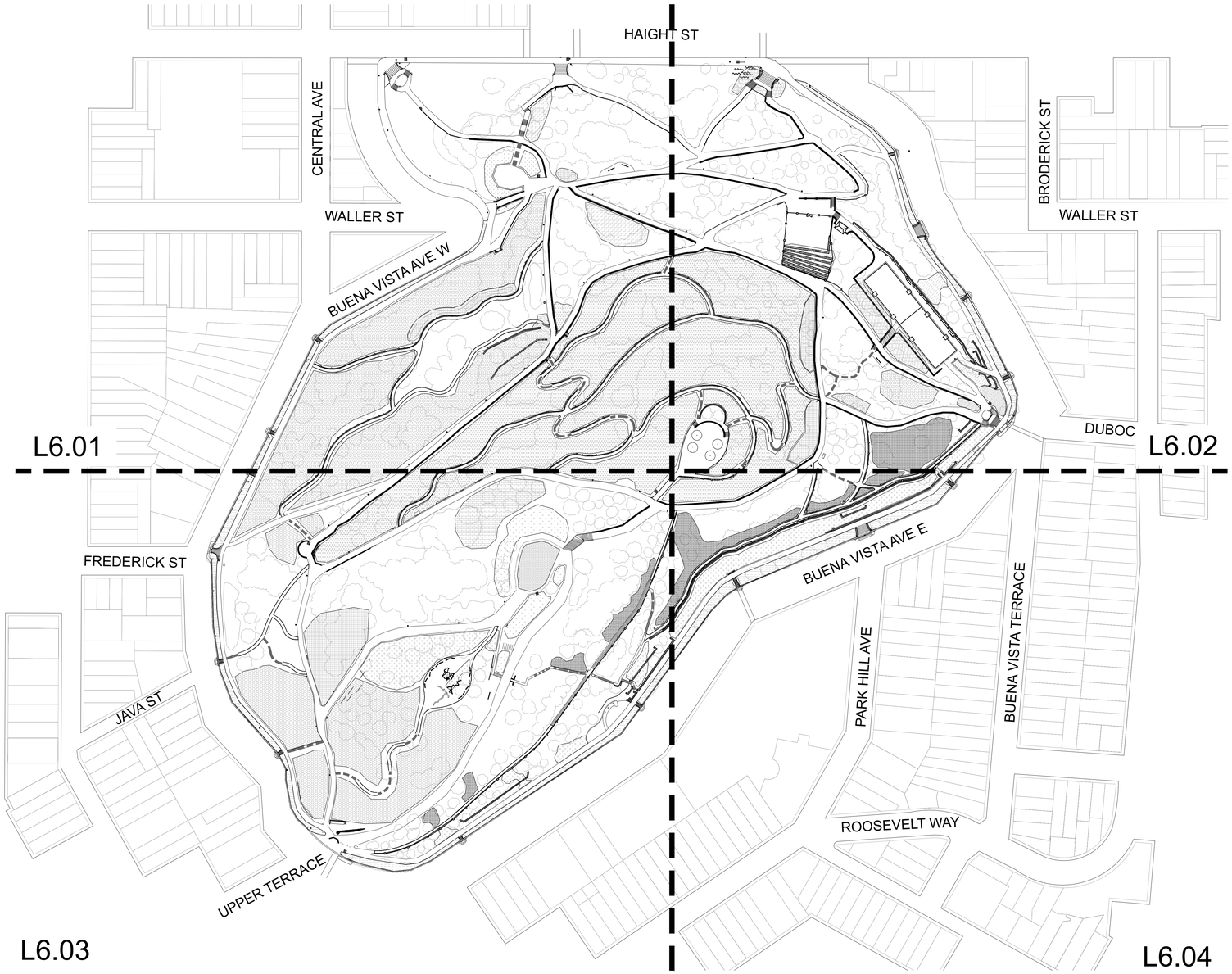
Sheet:	

L5.04



REFORESTATION AND PLANTING LEGEND

SYMBOL	TYPE	NOTE
ZONES		
	NEW PLANTING AREAS	PLANTING PALETTES VARY BASED ON HATCH
	EXISTING LOW GROUND VEGETATION	SPECIES SPECIFIED ON PLAN
	NEW TREE	SPECIES SPECIFIED ON PLAN

REFORESTATION AND PLANTING SCHEDULE

NAME	SYMBOL	ZONES	PLANT TYPE	PLANT SIZE	% OF TOTAL AREA	COMMON NAME	BOTANICAL NAME	DISTANCE O.C.
MANICURED PLAYGROUND		A	TREES	24" BOX	100%	TBD	TBD	20'-0"
			LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	3'-0"
OAK GROVE		B	TREES	15 GAL	20%	TBD	TBD	20'-0"
			LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
MIXED CONIFER GROVE		C1 - C3	TREES	15 GAL	15 TOTAL	TBD	TBD	40'-0"
			GROUND COVER	5 GAL	100%	TBD	TBD	8'-0"
OAK UNDERPLANTING		D1 - D2	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
PERIMETER PLANTING		E1 - E3	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	6'-0"
DROUGHT TOLERANT NATIVES		F1 - F2	SHRUBS	5 GAL	50%	TBD	TBD	4'-0"
			GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
RAINGARDEN PLANTING		G	LOW SHRUBS/ GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
TERRACED PLANTING AREA		H	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
SHADE TOLERANT NATIVES		I	TREES	15 GAL	3 TOTAL	TBD	TBD	20'-0"
			SHRUBS AND GROUNDCOVER	5 GAL	100%	TBD	TBD	4'-0"
DUBOCE ENTRY PLANTING		J	TREES	15 GAL	3 TOTAL	TBD	TBD	15'-0"
			LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	3'-0"
SOUTHEAST SLOPES		K1 - K3	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	6'-0"
NATIVE HABITAT		L1 - L4	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	6'-0"
THE GLADE		M1 - M3	TREES	15 GAL	40%	TBD	TBD	20'-0"
					35%	TBD	TBD	15'-0"
			LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	6'-0"
SUMMIT PERIMETER		N	LOW SHRUBS / GROUND COVER	5 GAL	100%	TBD	TBD	4'-0"
NORTHWEST OF SUMMIT		O	TREES	15 GAL	50%	TBD	TBD	20'-0"
					50%	TBD	TBD	15'-0"
			LOW SHRUBS / GROUND COVER	5 GAL		TBD	TBD	4'-0"

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REFORESTATION AND PLANTING SITE PLAN

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Job:	1911
Sheet:	

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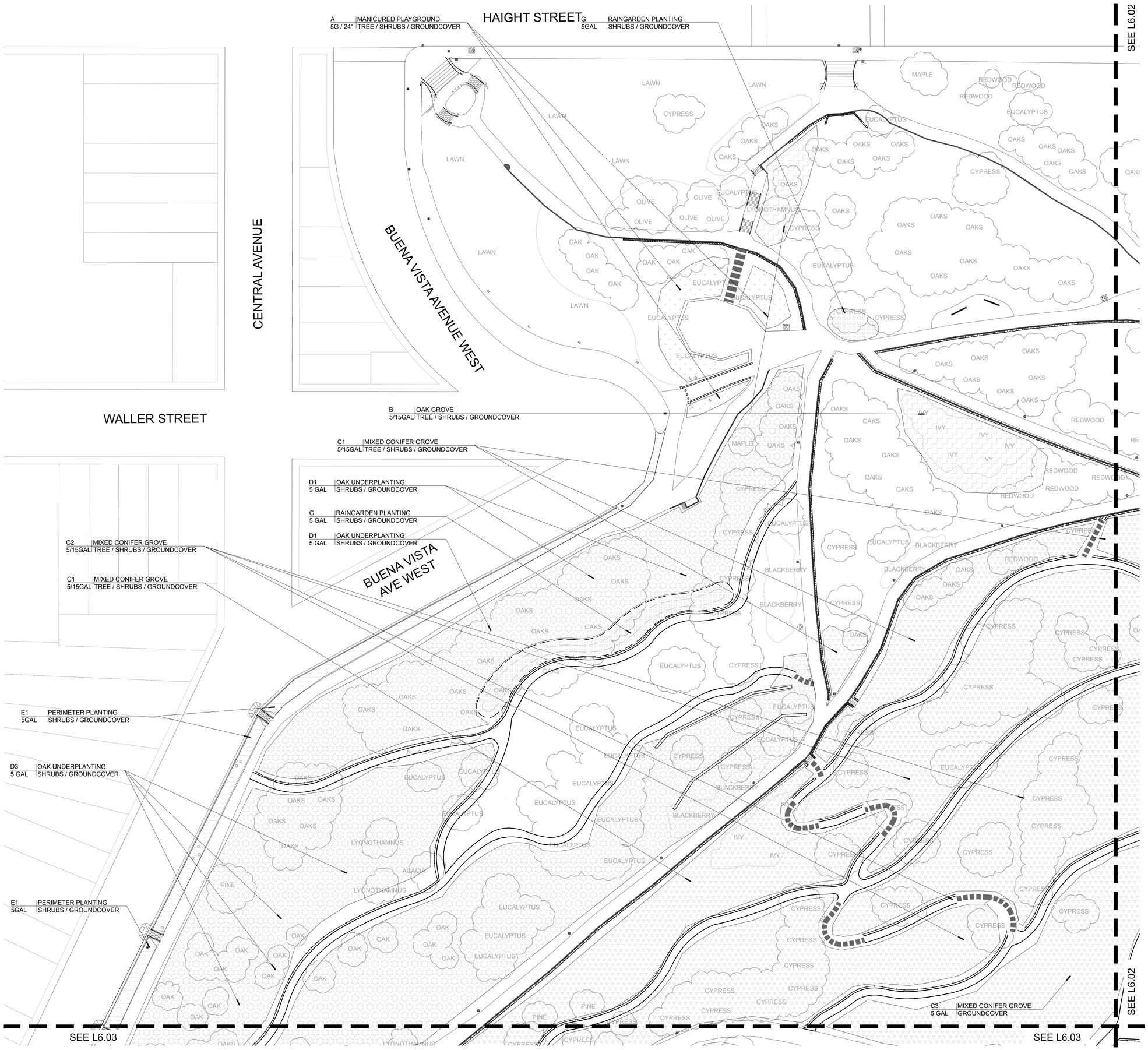

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0' 30' 60' 90'

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REFORESTATION & PLANTING NORTHWEST

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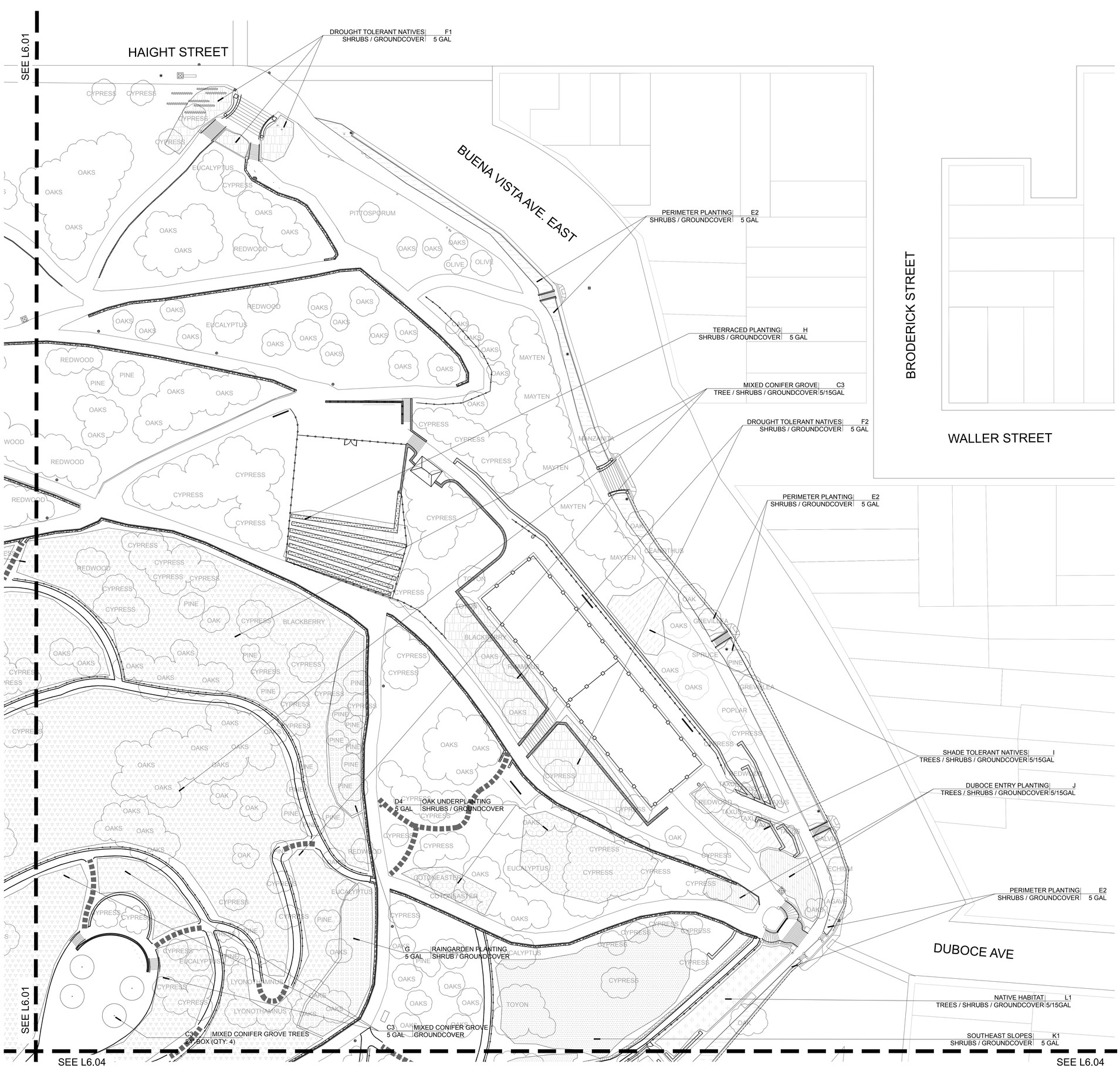
Sheet:	

L6.01



N

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Sheet Title:

REFORESTATION & PLANTING NORTHEAST

Date:	03/13/20
Scale:	
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Job:	1911
Sheet:	

L6.02

SEE L6.01

SEE L6.01

C3 | MIXED CONIFER GRC... | 5 GAL | GROUNDCOVER

SEE L6.04

C1 | MIXED CONIFER GROVE | 5/15GAL | TREE / SHRUBS / GROUNDCOVER

O | NORTWEST OF SUMMIT | 5/15GAL | TREES / SHRUBS / GROUNDCOVER

N | SUMMIT PERIMETER | 5 GAL | SHRUBS / GROUNDCOVER

E1 | PERIMETER PLANTING | 5 GAL | SHRUBS / GROUNDCOVER

FREDERICK ST.

L4 | NATIVE HABITAT | 5 GAL | SHRUBS / GROUNDCOVER

M1 | THE GLADE | 5/15GAL | TREES / SHRUBS / GROUNDCOVER

G | RAINGARDEN | 5 GAL | SHRUBS / GROUNDCOVER

M2 | THE GLADE | 5/15GAL | TREES / SHRUBS / GROUNDCOVER

JAVA STREET

BUENA VISTA AVENUE WEST

E3 | PERIMETER PLANTING | 5 GAL | SHRUBS / GROUNDCOVER

M3 | THE GLADE | 5/15GAL | TREES / SHRUBS / GROUNDCOVER

K3 | SOUTHEAST SLOPES | 5 GAL | SHRUBS / GROUNDCOVER

UPPER TERRACE

REPLACE LAWN AT SUMMIT
SODDED GRASS

BUENA VISTA AVE. EAST

PERIMETER PLANTING | E2
SHRUBS / GROUNDCOVER | 5 GAL

NATIVE HABITAT | L3
SHRUBS / GROUNDCOVER | 5 GAL

PERIMETER PLANTING | E3
SHRUBS / GROUNDCOVER | 5 GAL

SCALE: 1" = 30'

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SEE L6.04

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REFORESTATION & PLANTING SOUTHWEST

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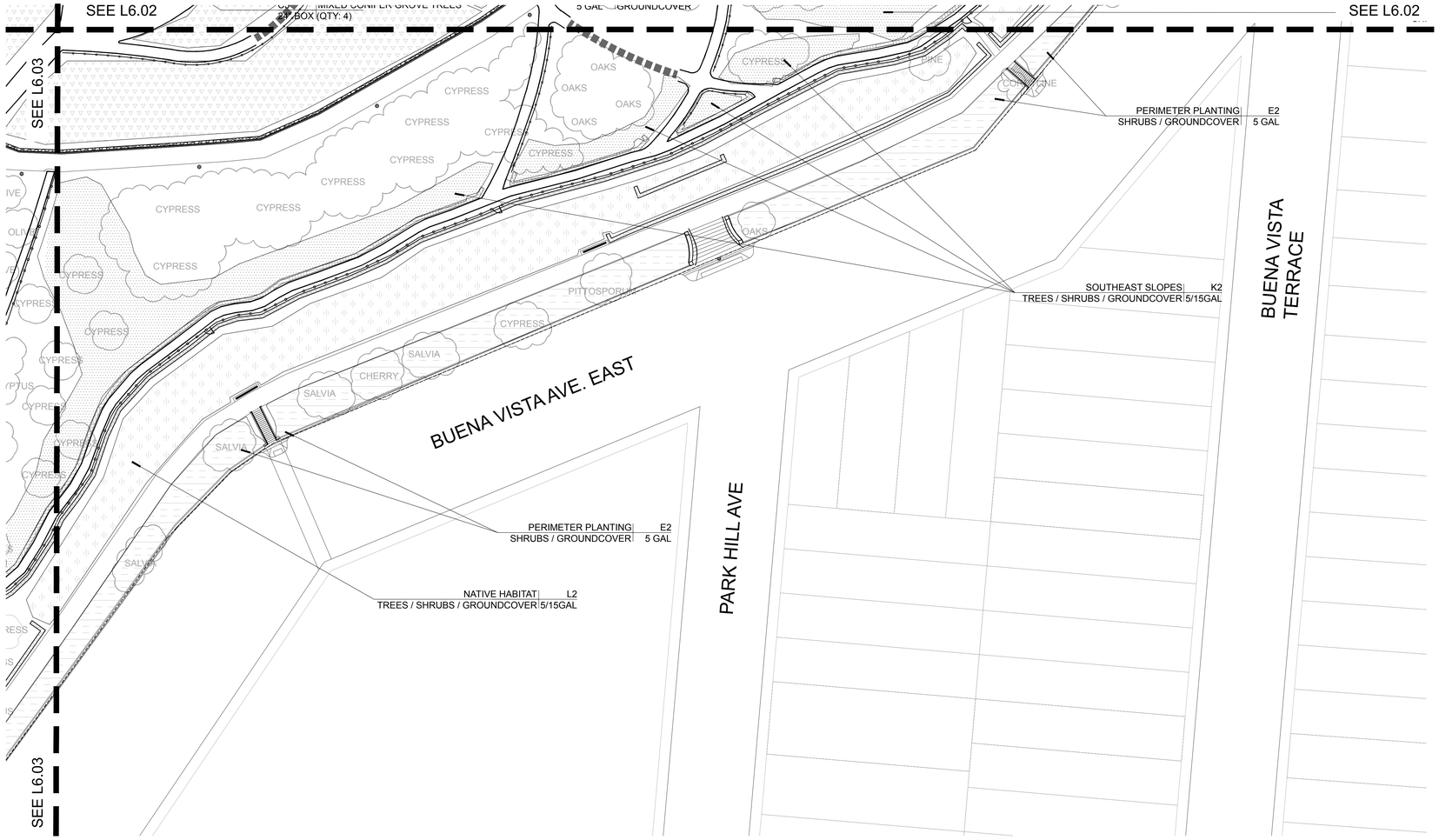
L6.03



N

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0' 30' 60' 90'

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REFORESTATION & PLANTING SOUTHEAST

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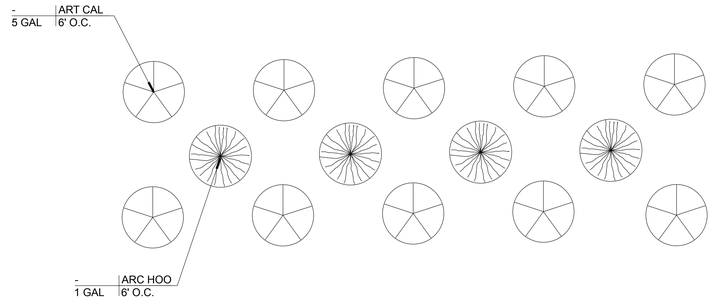
Sheet:	

L6.04

2 PERIMETER PLANTING PALLETTE
SCALE: NTS



1 PERIMETER PLANTING
SCALE: 1/4"=1'-0"

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Sheet Title:

REFORESTATION & PLANTING DETAILS AND DRAWINGS

Date:	03/13/20
Scale:	
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Job:	1911

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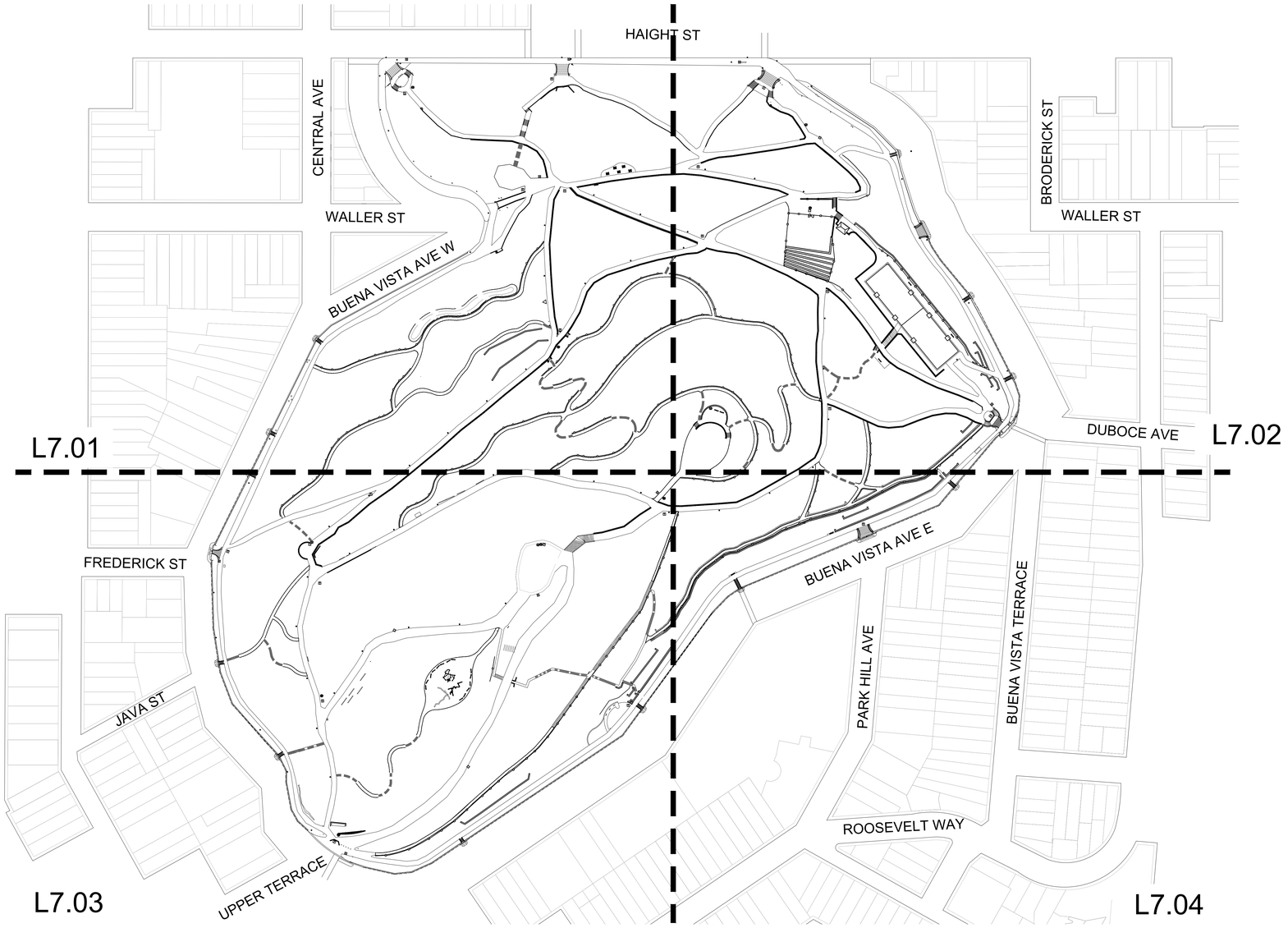
L6.05



WAYFINDING AND SITE FURNITURE LEGEND

SYMBOL	TYPE	NOTE
SIGNAGE		
i	ORIENTATION SIGNAGE	30" X 24" X 32" HIGH SIGNAGE, POWDER COATED ALUMINUM FRAME
E	ECOLOGICAL INFORMATIONAL SIGNAGE	24" X 18" X 32" HIGH SIGNAGE, POWDER COATED ALUMINUM FRAME
H	HISTORICAL INFORMATIONAL SIGNAGE	24" X 18" X 32" HIGH SIGNAGE, POWDER COATED ALUMINUM FRAME
V	VIEW INFORMATIONAL SIGNAGE	24" X 18" X 32" HIGH SIGNAGE, POWDER COATED ALUMINUM FRAME
△	DOG RUN SIGNAGE	12" X 18" X 32" HIGH SIGNAGE, POWDER COATED ALUMINUM FRAME
FURNITURE		
⊠	(E) TRASH RECEPTACLE	
◯	(N) SINGLE BEARSAVER TRASH RECEPTACLE	
◌	DRINKING FOUNTAIN	
▬	NEW BENCH	
▤	NEW PICNIC TABLE	

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WAYFINDING AND FURNISHING SITE PLAN

Date:	03/13/20
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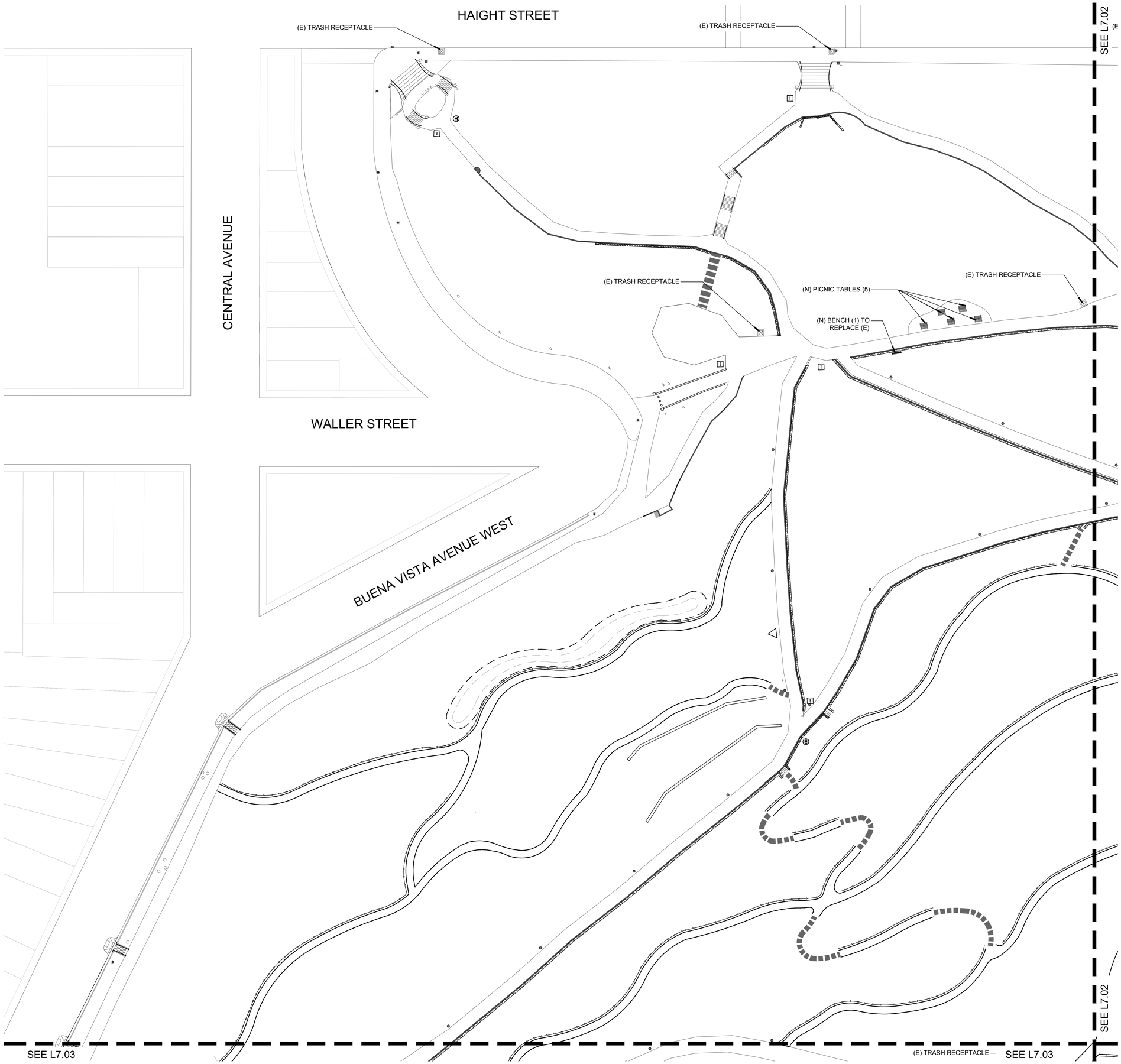
L7.00



N

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0' 30' 60' 90'

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WAYFINDING AND FURNITURE NORTHWEST

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Sheet:	

L7.01

HAIGHT STREET

SEE L7.01

(E) TRASH RECEPTACLE

(N) SINGLE BEARSAVER TRASH RECEPTACLE TO MATCH (E)

(N) SINGLE BEARSAVER TRASH RECEPTACLE TO MATCH (E)

(E) WATER FOUNTAIN

BRODERICK STREET

WALLER STR

BUENA VISTA AVE. EAST

(N) BENCHES (2) TO REPLACE (E) BENCHES

(N) BENCH TO REPLACE (E) ONE

(E) WATER FOUNTAIN

(E) TRASH RECEPTACLE

(E) BENCH

DUBOCE AVE

(N) BENCHES (2)

SEE L7.01

SEE L7.04

SEE L7.04

N

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WAYFINDING AND FURNITURE NORTHEAST

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L7.02

SEE L7.01

SEE L7.01

SEE L7.04

SEE L7.04

BUENA VISTA AVENUE WEST

BUENA VISTA AVE. EAST

UPPER TERRACE

REPLACE (E) TRASH RECEPTACLE WITH (N) SINGLE BEARSAVER TRASH RECEPTACLE TO MATCH (E)

(E) TRASH RECEPTACLE

(E) TRASH RECEPTACLE

REFURBISHED (E) HISTORICAL TREE PLANTING SIGNAGE

(N) SINGLE BEARSAVER TRASH RECEPTACLE TO MATCH (E)

(E) TRASH RECEPTACLE

(E) TRASH RECEPTACLE

(E) BENCHES

(N) SINGLE BEARSAVER TRASH RECEPTACLE TO MATCH (E)

(E) TRASH RECEPTACLE

SCALE: 1" = 30'

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WAYFINDING AND FURNITURE SOUTHWEST

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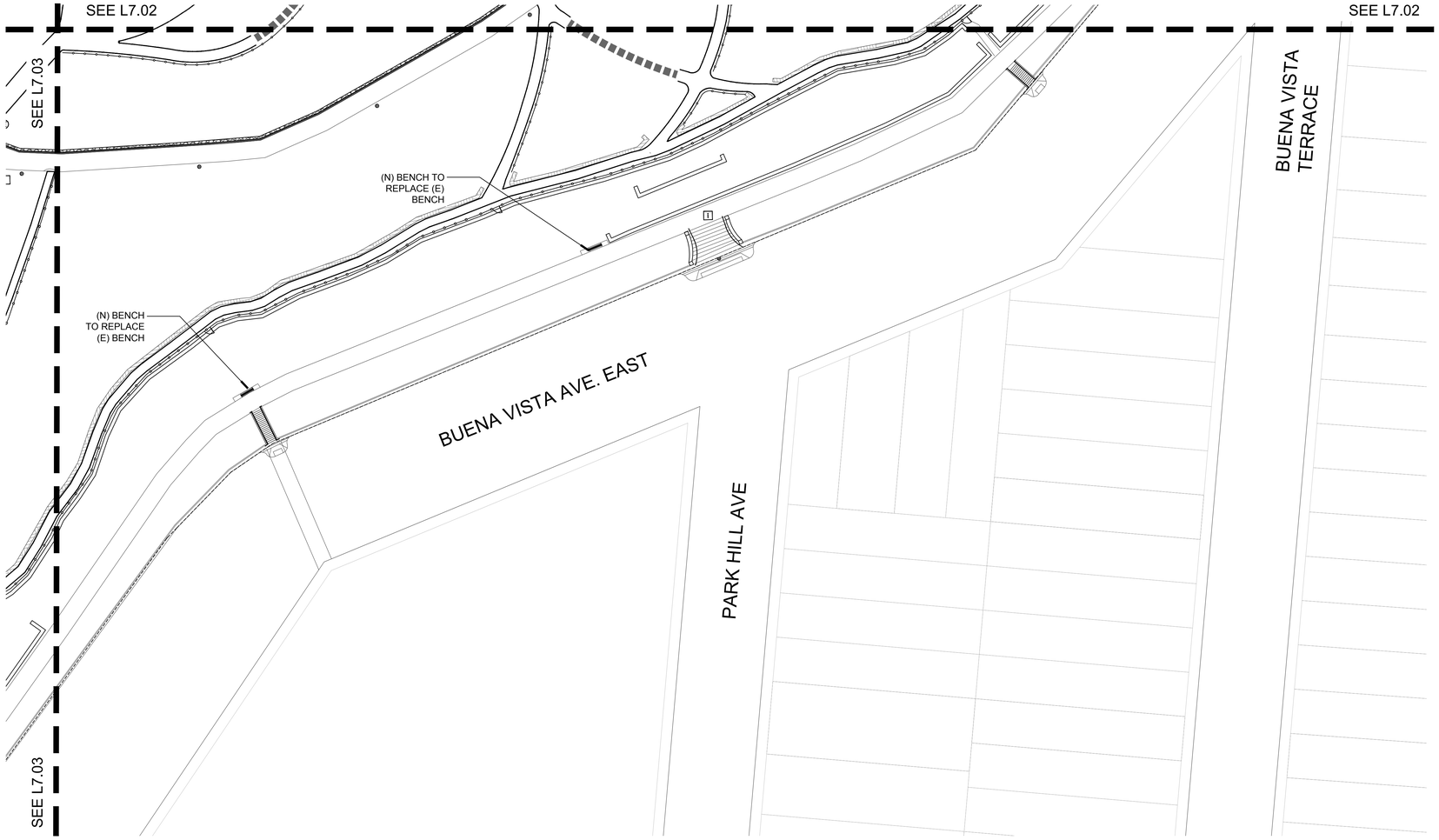
L7.03



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L7.04

LIGHTING LEGEND

SYMBOL	TYPE	NOTE
	NEW PEDESTRIAN LIGHTING	

N

SCALE: 1" = 100'

0' 100' 200' 300'

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	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

LIGHTING
SITE PLAN - ALT. #6

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L8.00

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BUENA VISTA PARK
NEEDS ASSESSMENT AND COST ANALYSIS
SAN FRANCISCO, CA

NOT FOR CONSTRUCTION
CONCEPTUAL DRAWINGS
FOR COST ESTIMATE
PURPOSE ONLY

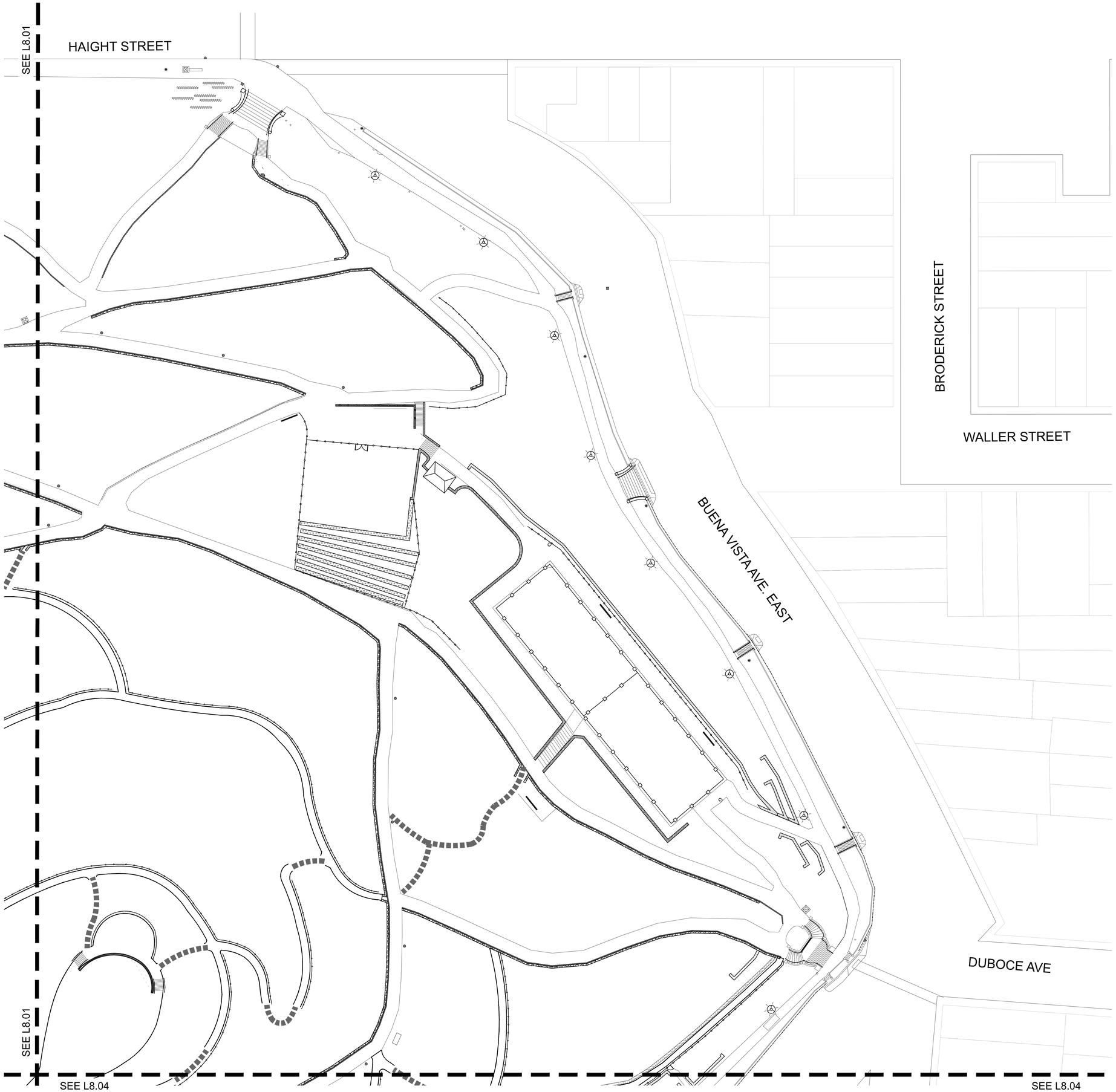
REV	DATE	DESCRIPTION
	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:
LIGHTING NORTHWEST QUADRANT - ALT. #6

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L8.01

SCALE: 1" = 30'
0' 30' 60' 90'



N

SCALE: 1" = 30'

0' 30' 60' 90'

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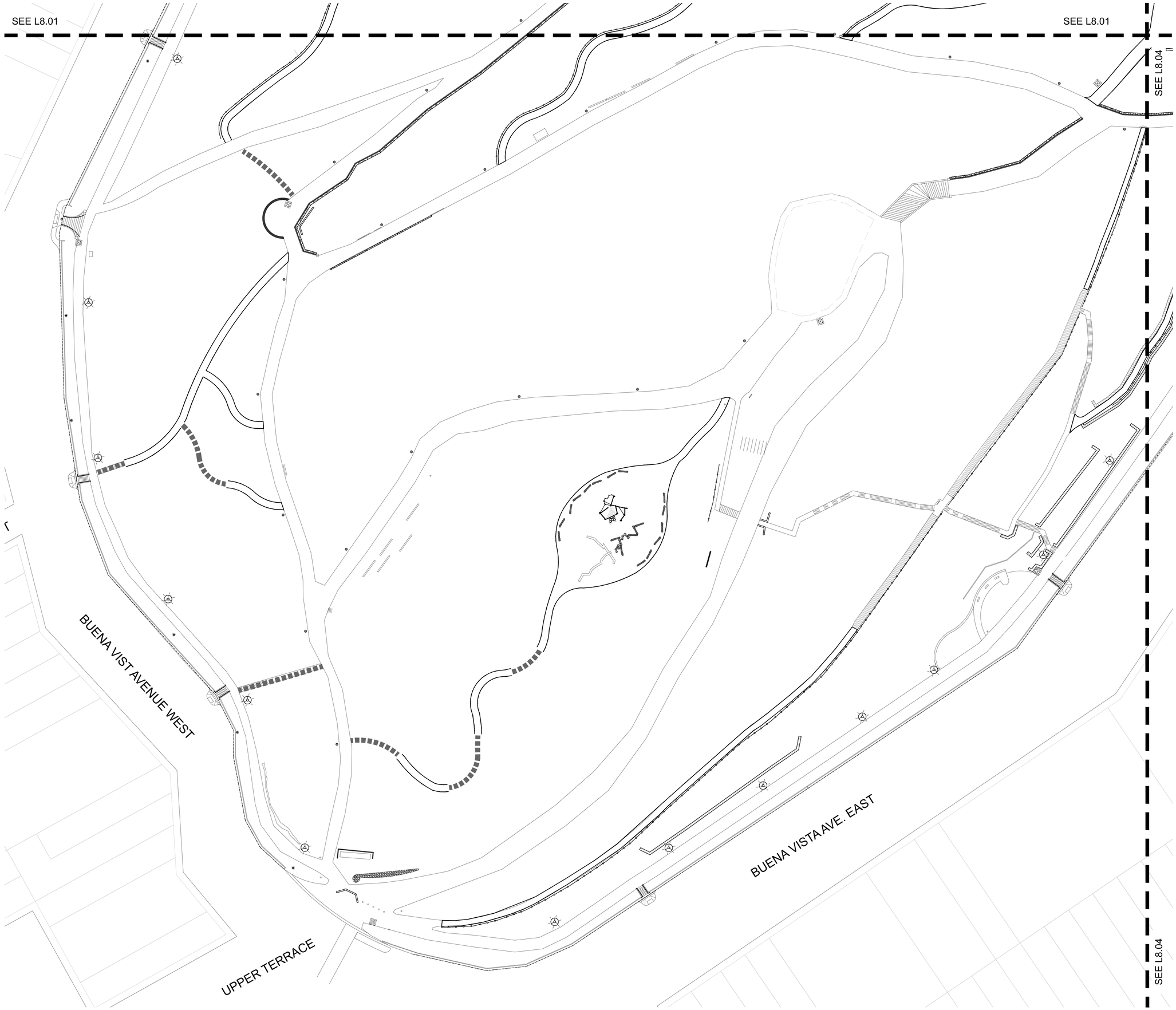
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

LIGHTING NORTHEAST QUADRANT - ALT #6

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L8.02



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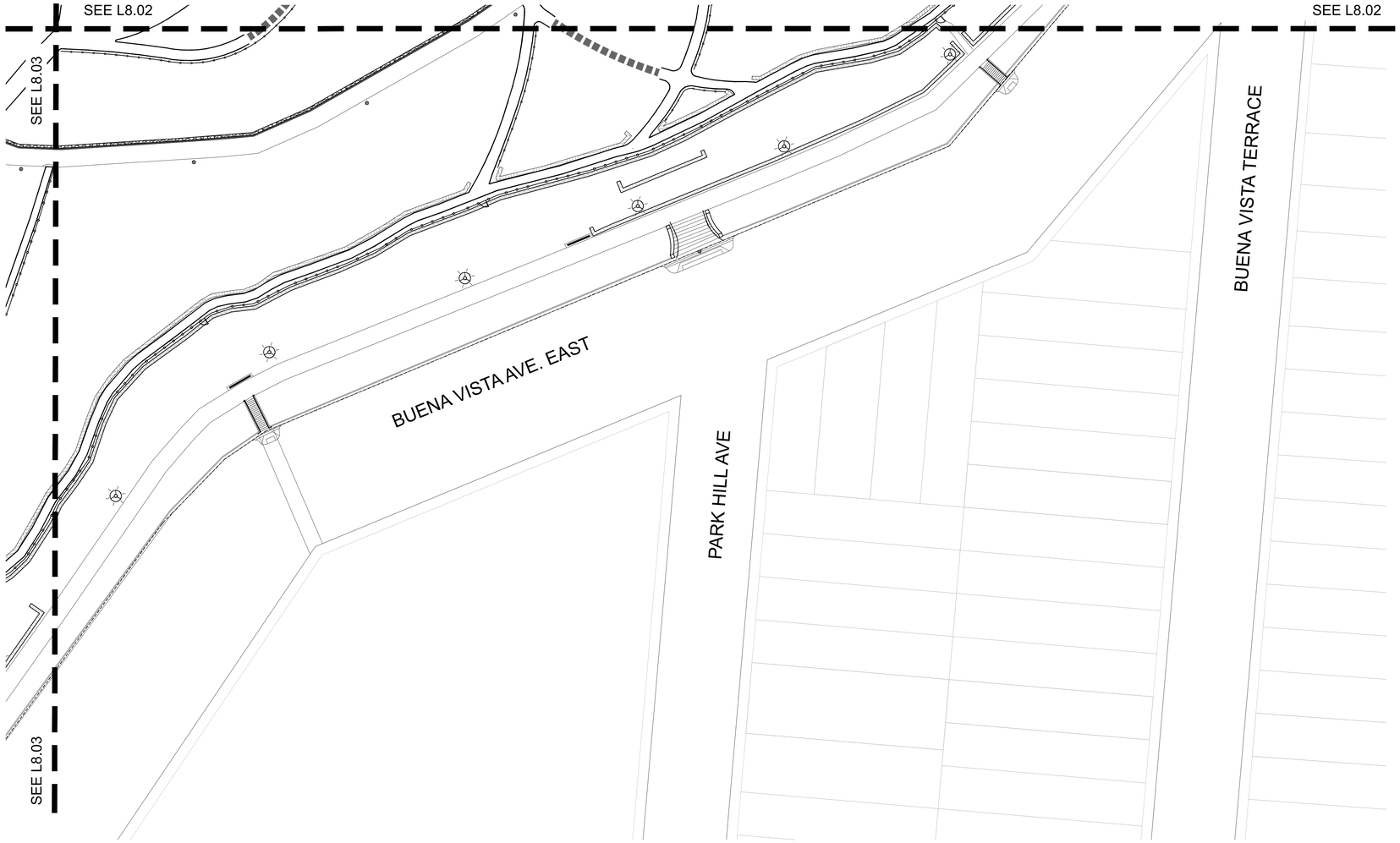
	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

LIGHTING SOUTHWEST QUADRANT - ALT #6

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L8.03



N

SCALE: 1" = 30'

0' 30' 60' 90'

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	11/15/19	PROGRESS SET
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

LIGHTING SOUTHEAST QUADRANT - ALT #6

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L8.04

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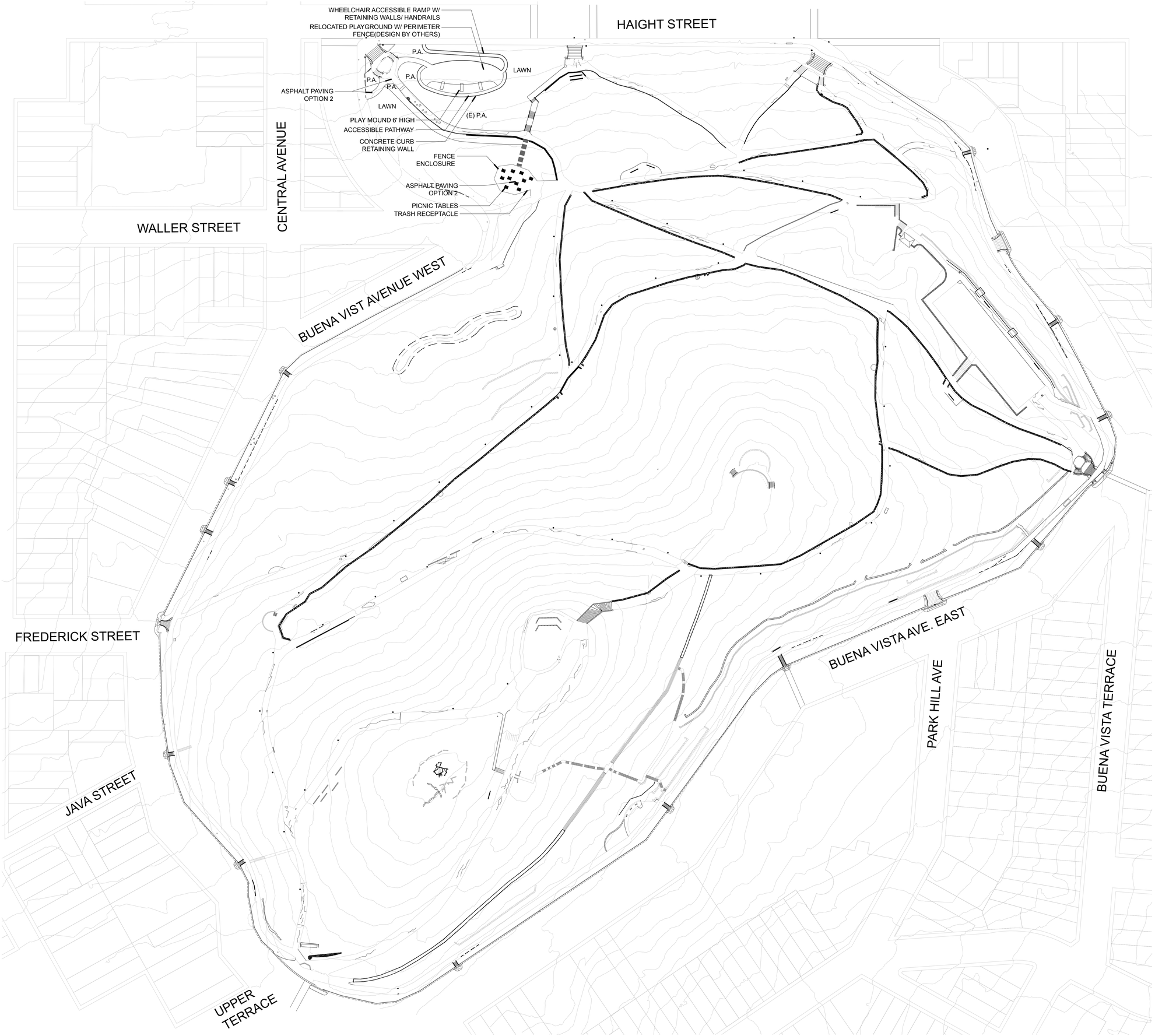
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTION DIAGRAM #1

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L9.00



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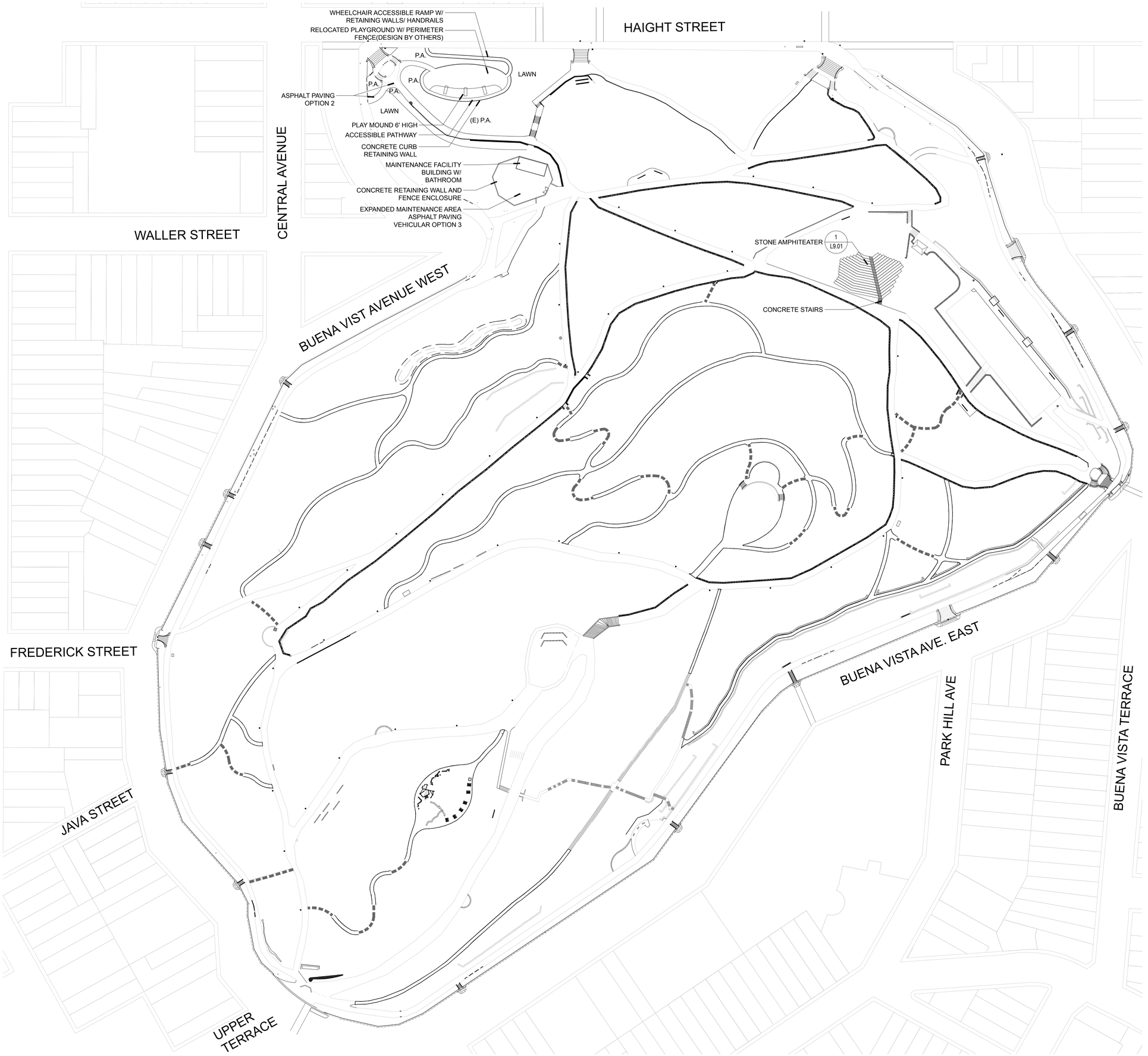
	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTIONS DIAGRAM #2

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L9.01



SCALE: 1" = 60'

0' 60' 120' 180'

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BUENA VISTA PARK
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	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTIONS DIAGRAM #3

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L9.02

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

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BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BASE: CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT
MATERIAL ALTERNATE: BRICK EDGING AND ACCENTS AT CONCRETE WALKWAY WITH ACID WASH FINISH AND INNER CONCRETE CURB REPLACEMENT

BUENA VISTA PARK
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	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTIONS DIAGRAM #4

Date: 03/13/20
Scale:
Drawn: MN
Checked: JM
Job: 1911
Sheet:

L9.03

N

SCALE: 1" = 60'

0' 60' 120' 180'

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	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTIONS DIAGRAM #5

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L9.05

1 AMPHITHEATER - RENDERING

2 SMALL OVERLOOK - RENDERING

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	12/09/19	COST ESTIMATE (C.E.) SET
	01/31/20	REVISED C.E. SET
	03/13/20	REVISED C.E. SET

Sheet Title:

DESIGN OPTIONS IMAGES AND DETAILS

Date:	03/13/20
Scale:	
Drawn:	MN
Checked:	JM
Job:	1911
Sheet:	

L9.06

9.3 - cost estimate

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
BUENA VISTA & HAIGHT ST
SAN FRANCISCO, CA 94117

FINAL CONCEPTUAL ESTIMATE
BASED ON
NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE

SITE MAP

NOT TO SCALE N

Owner:
San Francisco Recreation and Parks Department (SFRPD)
City and County of San Francisco

Date: 6/4/2020

1405 Buena Vista Park Estimate 20200604

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
BUENA VISTA & HAIGHT ST
SAN FRANCISCO, CA 94117

FINAL CONCEPTUAL ESTIMATE
BASED ON
NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE

Table of Contents:

Date: 6/4/2020

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
BUENA VISTA & HAIGHT ST
SAN FRANCISCO, CA 94117

FINAL CONCEPTUAL ESTIMATE
BASED ON
NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE

Project Contact Information

Owner:
San Francisco Recreation and Parks Department (SFRPD)
Attn: Monica L. Scott, PLA, Project Manager
Email: monica.scott@sfgov.org
Ph: (415) 581-2546

Prepared for
Miller Company Landscape Architects
1585 Folsom Street
San Francisco, CA 94103
Attn: Maya Nagasaka
Email: nagasaka@millercomp.com
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Prepared by
M Lee Corporation
Construction Management & Consulting
601 Montgomery Street, Suite 2040
San Francisco, CA 94111
Attn: Franklin Lee, PE, LEED AP BD+C, CEP
Certified Estimating Professional
Email: flee@mleecorp.com
Ph: (415) 693-0236

Date: 6/4/2020

1.0 Purpose & Content of the Estimate

1.1 The cost estimate has been prepared for the purpose of establishing a preliminary estimate of probable construction cost based on conceptual design information for grant funding request.

1.2 The preliminary conceptual construction cost estimate, which represents our opinion of probable construction costs, is comprised of the following integral parts:
A) Basis of Estimate
B) Estimate Summaries
C) Estimate Details

2.0 Basis of Estimate:

2.1 The estimate has been prepared based on the following:
1) Buena Vista Park - Needs Assessment and Cost Analysis Revised Set drawings, a total of 55 sheets, dated 3/13/2020
2) Buena Vista - Existing Condition Site Assessment Quadrants, a total of 55 sheets, dated 11/12/2019
3) 31 13 00 - Selective Tree / Shrub Removal and Herbicide Application specifications, a total of 4 sheets, dated 6/21/2019
4) Buena Vista Pavement Restoration Narrative, a total of 2 sheets, dated 10/30/2019
5) Buena Vista Park Property Executive Summary Report, a total of 2 sheets, dated 10/7/2019
6) Buena Vista Park Facility Overview Report, a total of 34 sheets, dated 10/7/2019
7) Buena Vista Park Comments on Revised Conceptual Estimate Draft dated 2/20/2020, a total of 5 pages, dated 3/13/2020
8) Queries and Responses
9) Incorporation of comments on draft estimate

3.0 Scope

3.1 The general scope of work in this estimate, per the information listed above, is for improvement of the existing Buena Vista Park in the block between Buena Vista and Haight St which includes:
1) Circulation
2) Forest management and Habitat Opportunities
3) Water Management and Erosion Control
4) Miscellaneous Improvements

3.2 Items specifically excluded from the estimate:
Abatement of hazardous material or contaminated soil, if any
Permit and plan check fees
Administration costs such as bidding, advertising and contract award

Professional fees for architect, engineers, consultants, construction management and other soft costs
Construction change orders
Project reserve and project contingency
Cost escalation beyond the assumed construction schedule

It is assumed that the above items, if needed, are included elsewhere in the owner's overall project budget.

4.0 Construction Schedule

4.1 Based on a total duration of 48 months from February 2023 to February 2027. The midpoint of construction is February 2025.

5.0 Basis of Quantities

5.1 Wherever possible, this estimate has been based upon the actual measurement of different items of work. For the remaining items, parametric measurements were used in conjunction with references from other projects of a similar nature.

6.0 Basis of Pricing

6.1 The estimate is based on estimated prices current as of April 2020, with a minimum of four responsible and responsive bids under a competitive bidding environment for a fixed price lump sum contract (a fair market condition).

Note: Experience indicates that fewer bidders may result in higher bids, and conversely more bidders may result in more competitive bids. Therefore it is important to obtain as many bids as possible.

6.2 The estimate is based on all work to be performed during regular working hours. No allowance is included for overtime work.

6.3 The unit prices used in the direct cost section are composite unit prices which include costs for material including tax, labor, equipment and installing subcontractor's and supplier's mark-ups.

6.4 Based on State of California prevailing wages for City and County of San Francisco for labor pricing.

6.5 Appropriate allowances are included in the Estimate Hard Cost Summary for the following markups:
Design / Estimate Contingency
General Contractor's General Conditions and Requirements

Bonds and Insurance
General Contractor's Overhead and Profit
Construction Contingency

6.6 A cost escalation at 6.0% per year to the assumed mid-point of construction is included as a markup at the summary level of the estimate.

6.7 Items potentially affecting the cost estimate include, but are not limited to, the following:

Modifications to the scope of work included in this estimate.
Unforeseen sub-surface conditions.
Special phasing requirements.
Restrictive technical specifications or excessive contract conditions.
Any specified item of equipment, material, or product that cannot be obtained from at least three different sources.
Any other non-competitive bid situations.

7.0 Limitation

7.1 Client acknowledges that our service is consistent with and limited to the standard of care applicable to such services, which is that we provide our services consistent with the professional skill and care ordinarily provided by consultants practicing in the same or similar locality under the same or similar circumstances. The estimate is intended to be a determination of fair market value for the project construction. Since we have no control over market conditions and other factors which may affect the bid prices, we cannot and do not warrant or guarantee that bids or ultimate construction costs will not vary from the cost estimate. We make no other warranties, either expressed or implied, and are not responsible for the interpretation by others of the contents herein the cost estimate.

7.2 It should be noted that the cost estimate is a "snapshot in time" and that the reliability of this opinion of probable construction cost will inherently degrade over time.

7.3 Please note that the estimate has been prepared based on preliminary information and design assumptions which are subject to verifications and changes as the design progresses. An updated estimate should be prepared when more specific and detailed design information is available.

8.0 Abbreviations used in the estimate:

CY = cubic yard
EA = each
GSF = gross square foot
LF = linear foot
LOC = location
LS = lump sum
MTH = month
SF = square foot
SY = square yard

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
1.1 ESCALATION CALCULATION **Date: 6/4/2020**

Date of Estimate Pricing	4/10/2020	
Start construction	2/15/2023	
End construction	2/15/2027	
Duration	1461	days
Duration	48	months
Date of Estimate Pricing to start	1041	days
1/2 of construction period	731	days
Date of Estimate Pricing to mid-point	1772	days
	59	months
mid-point	2/14/2025	
Escalation per year for escalation	6.0%	
Total escalation factor	**33.20%**	

Note: Escalation factor carried forward to Estimate Summary

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
2.0 ESTIMATE GRAND SUMMARY

Date: 6/4/2020

Item	Item Description	Total Estimated Hard Cost (Escalated) $	Soft Cost (30%)	Total Estimated Project Cost $ (Hard Cost + Soft Cost)
BASE SCOPE:				
1	CIRCULATION	18,292,000	5,488,000	23,780,000
2	FOREST MANAGEMENT AND HABITATION	8,311,000	2,493,000	10,804,000
3	WATER MANAGEMENT AND EROSION CONTROL	10,040,000	3,012,000	13,052,000
4	MISCELLANEOUS IMPROVEMENTS	1,885,000	566,000	2,451,000
	TOTAL PROJECT COST - BASE SCOPE	38,528,000	11,559,000	**50,087,000**
ALTERNATES: Add To Base Scope Cost If Exercised				
1	ALTERNATE #1 - Frederick St Entry Replacement			86,000
2	ALTERNATE #2 - Adult Fitness Equipment			110,000
3	ALTERNATE #3 - Street Bulb-Out			342,000
4	ALTERNATE #4 - Cobblestone Retaining Wall			1,082,000
5	ALTERNATE #5 - Timber Retaining Wall			(387,000)
6.1	ALTERNATE #6.1 - Perimeter Walkway Replacement (Concrete with Exposed Aggregate Finish and New Concrete Curb)			2,700,000
6.2	ALTERNATE #6.2 - Perimeter Walkway Replacement (Concrete with Brick Edge and Accents and New Concrete Curb)			4,747,000
7	ALTERNATE #7 - New Small Overlooks			209,000
8	ALTERNATE #8 - Lighting			1,510,000
DESIGN OPTIONS: Add To Base Scope Cost If Exercised				
1	DESIGN OPTION #1 - New Maintenance Facility Building at Current Location			900,000
2	DESIGN OPTION #2 - New Relocated Playground and Picnic Area at Current Playground			1,307,000
3	DESIGN OPTION #3 - New Relocated Playground, New Stone Ampitheater and Relocated Maintenance Yard			7,406,000

Please see attached "Basis of Estimate" and "Estimate Details" for assumptions, exclusions, qualifications and scope of work.

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE **Date: 6/4/2020**
2.1 ESTIMATE HARD COST SUMMARY

Item	Description	A Direct Cost per Details	B=A*30% Design & Estimate Contingency 30.00%	C=(A+B) *15% General Conditions & Reqmts 15.00%	D=(A+B+C) *2% Bonds & Insurance 2.00%	E=(A+B+C+D) *8% Overhead & Profit 8.00%	F=(A+B+C+D +E)*10% Construction Contingency 10.00%	G=A+B+C+D+ E+F Total Estimated $ (Unescalated)	H=G*33.2% Escalation to mid-point of construction (assumed midpoint 2/14/2025) 33.20%	I=G+H Total Estimated Hard Cost $ (Escalated)
1	CIRCULATION	7,580,689	2,274,207	1,478,234	226,663	924,783	1,248,458	13,733,034	4,559,367	18,292,402
2	FOREST MANAGEMENT AND HABITATION	3,444,076	1,033,223	671,595	102,978	420,150	567,202	6,239,224	2,071,422	8,310,646
3	WATER MANAGEMENT AND EROSION CONTROL	4,160,820	1,248,246	811,360	124,409	507,587	685,242	7,537,664	2,502,505	10,040,169
4	MISCELLANEOUS IMPROVEMENTS	781,360	234,408	152,365	23,363	95,320	128,682	1,415,498	469,945	1,885,443
TOTAL ESTIMATED PRICE		15,966,945	4,790,084	3,113,554	477,413	1,947,840	2,629,584	28,925,420	9,603,240	38,528,660

Please see attached "Basis of Estimate" and "Estimate Details" for assumptions, exclusions, qualifications and scope of work.

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
3.0 CORE FEATURES SUMMARY

Date: 6/4/2020

Item	Item Description	Total Estimated Direct Cost $	Total Markup $	Total Estimated Hard Cost (Unescalated) $	Escalation to mid-point of construction	Total Estimated Hard Cost (Escalated) $	Soft Cost $	Total Estimated Project Cost $ (Hard Cost + Soft Cost)
			81.2%		33.2%	Rounded-off	30.0%	
1	Historic Entrance Restoration	833,200	676,209	1,509,409	501,124	2,011,000	603,000	2,614,000
2	Fully Renovated Entrances: Waller Street West	13,435	10,904	24,339	8,081	32,000	10,000	42,000
3	Asphalt Path	1,004,532	815,259	1,819,791	604,171	2,424,000	727,000	3,151,000
4	West Side Oak Woodlands Trails and Landscape	2,380,524	1,931,989	4,312,513	1,431,754	5,744,000	1,723,000	7,467,000
5	Central Forest Trails and Landscape	2,796,744	2,269,785	5,066,529	1,682,088	6,749,000	2,025,000	8,774,000
6	Southeast Slope Trails and Landscape	2,138,928	1,735,914	3,874,842	1,286,448	5,161,000	1,548,000	6,709,000
7	Glade Area Trails and Landscape	1,122,984	911,393	2,034,377	675,413	2,710,000	813,000	3,523,000
8	Historic Stone Wall Restoration	50,385	40,892	91,277	30,304	122,000	37,000	159,000
9	Perimeter Walkway Restoration	480,250	389,762	870,012	288,844	1,159,000	348,000	1,507,000
10	Perimeter Retaining Wall and Curb Extension	428,902	348,089	776,991	257,961	1,035,000	311,000	1,346,000
11	Perimeter Stairs Enhancement	223,920	181,729	405,649	134,675	540,000	162,000	702,000
12	Perimeter Planting	431,354	350,079	781,433	259,436	1,041,000	312,000	1,353,000
13	Central Terraced Overlook	443,272	359,751	803,023	266,604	1,070,000	321,000	1,391,000
14	The Window	48,378	39,263	87,641	29,097	117,000	35,000	152,000
15	The Summit	125,762	102,066	227,828	75,639	303,000	91,000	394,000
16	Small Overlooks	See Design Option #7						
17	Playground Renovation	649,844	527,401	1,177,245	390,845	1,568,000	470,000	2,038,000
18	Irrigation System	233,668	189,641	423,309	140,539	564,000	169,000	733,000
19	Maintenance Area	316,228	256,645	572,873	190,194	763,000	229,000	992,000
20	Park Frontage Trails and Landscape	308,696	250,532	559,228	185,664	745,000	224,000	969,000
21	Northeast Area Trails and Landscape	621,957	504,769	1,126,726	374,073	1,501,000	450,000	1,951,000
22	Southwest Slope Trails and Landscape	1,198,389	972,590	2,170,979	720,765	2,892,000	868,000	3,760,000
23	Wayfinding and Furnishing	115,600	93,819	209,419	69,527	279,000	84,000	363,000
	Total Estimated Cost	15,966,952	12,958,481	28,925,433	9,603,246	38,530,000	11,560,000	**50,090,000**

Please see attached "Basis of Estimate" and "Estimate Details" for assumptions, exclusions, qualifications and scope of work.

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
1	**1**	**Historic Entrance Restoration**				
2		Existing Conditions and Demolition:				
3		Remove wood log curb	18	LF	5.00	90
4		Remove entry concrete stairs, curved, 11' W	308	SF	30.00	9,240
5		Remove entry concrete stairs, 30' W	2,670	SF	30.00	80,100
6		Hardscape:				
7		Concrete entry stairs, 11' W	33	LF	990.00	32,670
8		Concrete entry stairs, 11' W curved	58	LF	1,100.00	63,800
9		Concrete entry stairs, 30' W	86	LF	2,700.00	232,200
10		Galvanized steel handrail at entry stairs	404	LF	300.00	121,200
11		Historic entry wall restoration	4	LOC	50,000.00	200,000
12		Repair chipped column edge at top	1	EA	200.00	200
13		Frederick Entrance:				
14		Structural retrofit for concrete entry stairs at Frederick St	1	LOC	20,000.00	20,000
15		Aesthetic repairs for concrete entry stairs at Frederick St	1	LOC	10,000.00	10,000
16		Historic entry wall restoration	1	LOC	50,000.00	50,000
17		Galvanized steel handrail at entry stairs	39	LF	300.00	11,700
18		Erosion control coir rolls at stairs and path	20	LF	100.00	2,000
19						
20	**1**	**SUBTOTAL - Historic Entrance Restoration**				**833,200**
21						
22	**2**	**Fully Renovated Entrances: Waller Street West**				
23		Waller Street West Entrance				
24		Existing Conditions and Demolition:				
25		Remove wood log curb	143	LF	5.00	715
26		Hardscape:				
27		Concrete entry stairs columns, ~25" H	2	EA	600.00	1,200
28		Removable bollards	3	EA	1,500.00	4,500
29		Concrete retaining wall, 18" H	117	LF	60.00	7,020
30						
31	**2**	**SUBTOTAL - Fully Renovated Entrances: Waller Street West**				**13,435**
32						
33	**3**	**Asphalt Path**				
34		Existing Conditions and Demolition:				
35		Remove asphalt path	117,468	SF	1.75	205,569
36		Hardscape:				
37		Asphalt Concrete, 4.5" thick	6,125	SY	42.00	257,250
38		Asphalt Concrete, 5" thick	7,327	SY	48.00	351,696
39		Recycled AC, 2" thick, compact in place	13,452	SY	10.00	134,520
40		Prime coat asphalt base	121,068	SF	0.15	18,160
41		Rock well:				
42		Excavation	42	CY	150.00	6,300
43		Rock fill	42	CY	200.00	8,400
44		Perforated pipe, 36" dia x 4' H	40	EA	500.00	20,000
45		Filter fabric	1,507	SF	1.75	2,637
46						
47	**3**	**SUBTOTAL - Asphalt Path**				**1,004,532**
48						
49	**4**	**West Side Oak Woodlands Trails and Landscape**				
50		Existing Conditions and Demolition:				
51		Remove rustic stairs, about 4' W	215	LF	12.00	2,580
52		Remove earth path	126	SF	1.00	126
53		Remove dog run entry sign	1	EA	200.00	200
54		Remove fallen log	1	EA	100.00	100
55		Hardscape:				
56		Park tread paving, 6' W	10,465	SF	25.00	261,625
57		Rustic stairs, 6' W	18	LF	550.00	9,900
58		Fencing				
59		Rustic fence, 3'-6" H	987	LF	105.00	103,635
60		Permeable base	5	CY	100.00	500

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
61		Concrete footing for fence, 8' o.c	19	CY	700.00	13,300
62		Earthwork for footing	24	CY	100.00	2,375
63		Sutter wall, 3' H	272	LF	310.00	84,320
64		Concrete foundation for sutter wall, including excavation	64	CY	800.00	51,200
65		Timber wall, 6x6, 1'-2 1/2" H	987	LF	30.00	29,610
66		Erosion Control:				
67		Erosion control blanket	7,804	SY	15.30	119,402
68		Erosion control coir rolls at stairs and path	2,861	LF	100.00	286,100
69		Erosion control coir rolls, 5' oc	100,333	SF	5.00	501,665
70		Erosion control swattles	55	SY	50.00	2,750
71		Bioswale	4,455	SF	30.00	133,650
72		Urban Forestry Removal:				
73		Remove/clear and grub shrubs and ivy	42,711	SF	1.50	64,067
74		Specimen removal (trees), incl. stump grinding	20	EA	4,000.00	80,000
75		Reforestation and Planting:				
76		Temporary protection fencing for new planting areas	117,299	GSF	0.25	29,325
77		Soil Amendment	117,299	SF	1.00	117,299
78		Low shrubs, 5 gal	4,233	EA	65.00	275,145
79		Groundcover, 5 gal	4,233	EA	50.00	211,650
80						
81	**4**	**SUBTOTAL - West Side Oak Woodlands Trails and Landscape**				**2,380,524**
82						
83	**5**	**Central Forest Trails and Landscape**				
84		Existing Conditions and Demolition:				
85		Remove rustic stairs, about 4' W	1,803	LF	12.00	21,636
86		Remove wood retaining wall	15	LF	15.00	225
87		Hardscape:				
88		Park tread paving, 6' W	16,321	SF	25.00	408,025
89		Rustic stairs, 6' W	468	LF	550.00	257,400
90		Fencing:				
91		Rustic fence, 3'-6" H	2,611	LF	105.00	274,155
92		Permeable base	14	CY	100.00	1,400
93		Concrete footing for fence, 8' o.c	51	CY	700.00	35,700
94		Earthwork for footing	64	CY	100.00	6,375
95		Repair stone stairs, 5' W	5	LF	50.00	250
96		Timber wall, 6x6, 1'-2 1/2" H	2,611	LF	30.00	78,330
97		Erosion Control:				
98		Erosion control blanket	13,403	SY	15.30	205,066
99		Erosion control coir rolls at stairs and path	6,687	LF	100.00	668,700
100		Erosion control coir rolls, 5' oc	11,261	SF	5.00	56,305
101		Bioswale	4,342	SF	30.00	130,260
102		Cascading berm	387	SF	20.00	7,740
103		Urban Forestry Removal:				
104		Specimen removal (trees), incl. stump grinding	17	EA	4,000.00	68,000
105		Remove/clear and grub shrubs and ivy	7,825	SF	1.50	11,738
106		Remove small trees	32,448	SF	2.00	64,896
107		Prune trees	6,978	SF	0.50	3,489
108		Reforestation and Planting:				
109		Temporary protection fencing for new planting areas	217,795	GSF	0.25	54,449
110		Soil Amendment	217,795	SF	1.00	217,795
111		Trees, 15 gal	15	EA	300.00	4,500
112		Low Shrubs, 5 gal	264	EA	65.00	17,160
113		Groundcover, 5 gal	4,063	EA	50.00	203,150
114						
115	**5**	**SUBTOTAL - Central Forest Trails and Landscape**				**2,796,744**
116						

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
117	**6**	**Southeast Slope Trails and Landscape**				
118		Existing Conditions and Demolition:				
119		Remove sand path	3,082	SF	1.00	3,082
120		Remove wood retaining wall	1,052	LF	15.00	15,780
121		Remove wood fence w/ welded wire mesh panel	935	LF	10.00	9,350
122		Remove cyclone fence	650	LF	7.00	4,550
123		Remove resin paving at ADA paveway	2,852	SF	2.00	5,704
124		Remove wood bench	2	EA	400.00	800
125		Remove fallen log	1	EA	100.00	100
126		Remove wood steps, 4' W	108	SF	10.00	1,080
127		Remove wood retaining logs	6	EA	100.00	600
128		Hardscape:				
129		Gabion wall	1,380	SF	20.00	27,600
130		Concrete foundation for gabion wall, including excavation	51	CY	800.00	40,800
131		Park tread paving, 6' W	9,095	SF	25.00	227,375
132		Rustic stairs, 6' W	69	LF	550.00	37,950
133		Fencing:				
134		Rustic fence, 3'-6" H	255	LF	105.00	26,775
135		Metal fence, 3'-6" H	934	LF	120.00	112,080
136		Metal fence, 6'-0" H	785	LF	150.00	117,750
137		Permeable base	10	CY	100.00	1,000
138		Concrete footing for fence, 8' o.c	39	CY	700.00	27,300
139		Earthwork for footing	49	CY	100.00	4,875
140		Access gates at 6'-0" H metal fence	3	EA	1,000.00	3,000
141		Wood stairs w/ metal railing, 4' W	27	LF	720.00	19,440
142		Sutter wall, 3' H	785	LF	310.00	243,350
143		Concrete foundation for sutter wall, including excavation	185	CY	800.00	148,000
144		Stone wall	3,030	SF	70.00	212,100
145		Erosion Control:				
146		Erosion control blanket	4,323	SY	15.30	66,142
147		Erosion control coir rolls at stairs and path	870	LF	100.00	87,000
148		Erosion control coir rolls, 3' oc	38,814	SF	8.00	310,512
149		Erosion control coir rolls, 5' oc	16,762	SF	5.00	83,810
150		Inline Swale	124	SF	20.00	2,480
151		Urban Forestry Removal:				
152		Specimen removal (trees), incl. stump grinding	7	EA	4,000.00	28,000
153		Remove/clear and grub shrubs and ivy	24,511	SF	1.50	36,767
154		Remove small trees	24,604	SF	2.00	49,208
155		Prune trees	16,584	SF	0.50	8,292
156		Reforestation and Planting:				
157		Temporary protection fencing for new planting areas	57,025	GSF	0.25	14,256
158		Soil Amendment	57,025	SF	1.00	57,025
159		Low Shrubs, 5 gal	913	EA	65.00	59,345
160		Groundcover, 5 gal	913	EA	50.00	45,650
161						
162	**6**	**SUBTOTAL - Southeast Slope Trails and Landscape**				**2,138,928**
163						
164	**7**	**Glade Area Trails and Landscape**				
165		Existing Conditions and Demolition:				
166		Remove rustic stairs, about 4' W	500	LF	12.00	6,000
167		Remove earth path	480	SF	1.00	480
168		Remove wood stairs, 10' W	270	SF	10.00	2,700
169		Remove wood bench	1	EA	400.00	400
170		Hardscape:				
171		Park tread paving, 6' W	9,717	SF	25.00	242,925
172		Rustic stairs, 6' W	131	LF	550.00	72,050
173		Fencing:				
174		Rustic fence, 3'-6" H	50	LF	105.00	5,250
175		Permeable base	0.5	CY	100.00	50

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
176		Concrete footing for fence, 8' o.c	1	CY	700.00	700
177		Earthwork for footing	1	CY	100.00	125
178		Wood stairs w/ metal railing, 6' W	18	LF	780.00	14,040
179		Erosion Control:				
180		Erosion control blanket	4,399	SY	15.30	67,305
181		Erosion control coir rolls at stairs and path	1,247	LF	100.00	124,700
182		Erosion control coir rolls, 5' oc	56,577	SF	5.00	282,885
183		Inline swale	695	SF	20.00	13,900
184		Erosion control swattles	52	SY	50.00	2,583
185		Urban Forestry Removal:				
186		Specimen removal (trees), incl. stump grinding	4	EA	4,000.00	16,000
187		Remove/clear and grub shrubs and ivy	11,974	SF	1.50	17,961
188		Prune trees	4,181	SF	0.50	2,091
189		Reforestation and Planting:				
190		Temporary protection fencing for new planting areas	66,915	GSF	0.25	16,729
191		Soil Amendment	66,915	SF	1.00	66,915
192		Trees, 15 gal	146	EA	300.00	43,800
193		Low Shrubs, 5 gal	1,073	EA	65.00	69,745
194		Groundcover, 5 gal	1,073	EA	50.00	53,650
195						
196	**7**	**SUBTOTAL - Glade Area Trails and Landscape**				**1,122,984**
197						
198	**8**	**Historic Stone Wall Restoration**				
199		Existing Conditions and Demolition:				
200		Remove stone retaining wall	183	LF	20.00	3,660
201		Hardscape:				
202		Replace historic stone wall	181	LF	225.00	40,725
203		Repair historic stone wall from damage	6	LOC	1,000.00	6,000
204						
205	**8**	**SUBTOTAL - Historic Stone Wall Restoration**				**50,385**
206						
207	**9**	**Perimeter Walkway Restoration**				
208		Replace concrete paving and mortar brick accent in place	9,605	SF	50.00	480,250
209						
210	**9**	**SUBTOTAL - Perimeter Walkway Restoration**				**480,250**
211						
212	**10**	**Perimeter Retaining Wall and Curb Extension**				
213		Existing Conditions and Demolition:				
214		Remove all timber curb at perimeter curb	2,879	LF	8.00	23,032
215		Hardscape:				
216		Concrete path	6,538	SF	15.00	98,070
217		Concrete retaining wall, 30" H, 1' T	3,078	LF	100.00	307,800
218						
219	**10**	**SUBTOTAL - Perimeter Retaining Wall and Curb Extension**				**428,902**
220						
221	**11**	**Perimeter Stairs Enhancement**				
222		Existing Conditions and Demolition:				
223		Remove stone stairs, 3' W	39	SF	20.00	780
224		Remove stone stairs, 5' W	65	SF	20.00	1,300
225		Remove wood stairs, 4' W	200	SF	10.00	2,000
226		Remove wood stairs, 12' W	312	SF	10.00	3,120
227		Remove concrete stairs, 3' W	66	SF	30.00	1,980
228		Remove concrete and wood stairs, 3' W	135	SF	20.00	2,700
229		Remove concrete and wood stairs, 12' W	192	SF	20.00	3,840
230		Hardscape:				
231		Concrete entry stairs, 5' W	154	LF	450.00	69,300
232		Concrete entry stairs curb wall, 6" W	308	LF	75.00	23,100
233		Galvanized steel handrail at entry stairs	386	LF	300.00	115,800
234						
235	**11**	**SUBTOTAL - Perimeter Stairs Enhancement**				**223,920**

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
236						
237	**12**	**Perimeter Planting**				
238		Urban Forestry Removal:				
239		Specimen removal (trees), incl. stump grinding	6	EA	4,000.00	24,000
240		Remove/clear and grub shrubs and ivy	2,693	SF	1.50	4,040
241		At perimeter, clear and grub low growing vegetation, remove small and invasive species and protect existing oaks	45,188	SF	5.00	225,940
242		Reforestation and Planting:				
243		Temporary protection fencing for new planting areas	41,527	GSF	0.25	10,382
244		Soil Amendment	41,527	SF	1.00	41,527
245		Low Shrubs, 5 gal	1,091	EA	65.00	70,915
246		Groundcover, 5 gal	1,091	EA	50.00	54,550
247						
248	**12**	**SUBTOTAL - Perimeter Planting**				**431,354**
249						
250	**13**	**Central Terraced Overlook**				
251		Existing Conditions and Demolition:				
252		Remove wood wall, 2' H	191	LF	10.00	1,910
253		Remove wood bench	1	EA	400.00	400
254		Hardscape:				
255		Backfill	1,674	SF	3.00	5,022
256		Drainage work	1,674	SF	50.00	83,700
257		Stone wall, 18" H	98	LF	105.00	10,290
258		Stone wall, 5' H	81	LF	350.00	28,350
259		Stone cap, 3" T	269	SF	50.00	13,425
260		Concrete footing for wall	21	CY	700.00	14,700
261		Earthwork for concrete footing	21	CY	100.00	2,100
262		Concrete stairs, 8' W curved	18	LF	800.00	14,400
263		Metal picket fence, curved, 42" H	81	LF	200.00	16,200
264		Galvanized steel handrail for stairs	47	LF	300.00	14,100
265		Park tread paving, 6' W	9,547	SF	25.00	238,675
266						
267	**13**	**SUBTOTAL - Central Terraced Overlook**				**443,272**
268						
269	**14**	**The Window**				
270		Existing Conditions and Demolition:				
271		Remove wood retaining wall	53	LF	15.00	795
272		Hardscape:				
273		Stone wall, 6' H	61	LF	363.00	22,143
274		Stone columns, 18" sq x 4' H	8	EA	800.00	6,400
275		Metal Railing	48	LF	280.00	13,440
276		Concrete footing for wall	7	CY	700.00	4,900
277		Earthwork for concrete footing	7	CY	100.00	700
278						
279	**14**	**SUBTOTAL - The Window**				**48,378**
280						
281	**15**	**The Summit**				
282		Urban Forestry Removal:				
283		Remove/clear and grub shrubs and ivy	8,739	SF	1.50	13,109
284		Reforestation and Planting:				
285		Temporary protection fencing for new planting areas	14,264	GSF	0.25	3,566
286		Soil Amendment	14,264	SF	1.00	14,264
287		Low Shrubs, 5 gal	515	EA	65.00	33,475
288		Groundcover, 5 gal	515	EA	50.00	25,750
289		Replace lawn at summit	5,933	SF	6.00	35,598
290						
291	**15**	**SUBTOTAL - The Summit**				**125,762**
292						
293	**16**	**Small Overlooks**				

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
294		See Design Option #7				
295						
296	**17**	**Playground Renovation**				
297		Existing Conditions and Demolition:				
298		Remove playground, including sand in playground area	2,594	SF	10.00	25,940
299		Remove cyclone fence	192	LF	7.00	1,344
300		Playground renovation	2,594	SF	240.00	622,560
301						
302	**17**	**SUBTOTAL - Playground Renovation**				**649,844**
303						
304	**18**	**Irrigation System**				
305		Irrigation:				
306		Main Line, assume 2" PVC	8,363	LF	7.50	62,723
307		Trenching and backfill	8,363	LF	15.00	125,445
308		Quick Coupler	130	EA	300.00	39,000
309		Connect to (E)	13	EA	500.00	6,500
310						
311	**18**	**SUBTOTAL - Irrigation System**				**233,668**
312						
313	**19**	**Maintenance Area**				
314		Existing Conditions and Demolition:				
315		Remove stone retaining wall	220	LF	20.00	4,400
316		Remove cyclone fence	303	LF	7.00	2,121
317		Remove shipping containers	5	EA	500.00	2,500
318		Hardscape:				
319		Fencing:				
320		Metal fence, 3'-6" H	83	LF	120.00	9,960
321		Metal fence, 10'-0" H	461	LF	200.00	92,200
322		Permeable base	3	CY	100.00	300
323		Concrete footing for fence, 8' o.c	11	CY	700.00	7,700
324		Earthwork for footing	14	CY	100.00	1,375
325		Double gate at 10'-0" H metal fence, 10' W	1	EA	1,800.00	1,800
326		Terraced gravity block wall w/ planting pockets, 5' H	3,410	SF	30.00	102,300
327		Repair stone cap	1	EA	250.00	250
328		Shipping containers, 8' x 20' x 8'-6" H	4	EA	2,500.00	10,000
329		Shipping containers, 8' x 20' x 10' H	1	EA	3,000.00	3,000
330		Urban forestry removal:				
331		Remove/clear and grub shrubs and ivy	5,065	SF	1.50	7,598
332		Reforestation:				
333		Temporary protection fencing for new planting areas	5,091	GSF	0.25	1,273
334		Soil Amendment	5,091	SF	1.00	5,091
335		Low Shrubs, 5 gal	184	EA	65.00	11,960
336		Groundcover, 5 gal	184	EA	50.00	9,200
337		Electrical Line to (E) transformer	216	SF	200.00	43,200
338						
339	**19**	**SUBTOTAL - Maintenance Area**				**316,228**
340						
341	**20**	**Park Frontage Trails and Landscape**				
342		Existing Conditions and Demolition:				
343		Remove wood steps, 10' W x 11' L	2	EA	500.00	1,000
344		Remove wood wall, 2' H	16	LF	10.00	160
345		Remove earth path	2,009	SF	1.00	2,009
346		Remove wood bench	2	EA	400.00	800
347		Remove wood stairs, 10' W	460	SF	10.00	4,600
348		Hardscape:				
349		Concrete stairs with curb walls, 10' W	25	LF	600.00	15,000
350		Rustic stairs, 6' W	47	LF	550.00	25,850
351		Fencing:				
352		Rustic fence, 3'-6" H	86	LF	105.00	9,030
353		Permeable base	0.5	CY	100.00	50

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
354		Concrete footing for fence, 8' o.c	1	CY	700.00	700
355		Earthwork for footing	1	CY	100.00	125
356		Stone wall	158	SF	70.00	11,060
357		Erosion Control:				
358		Erosion control blanket	4,114	SY	15.30	62,945
359		Erosion control coir rolls at stairs and path	135	LF	100.00	13,500
360		Rainwater garden	1,042	SF	40.00	41,680
361		Urban Forestry Removal:				
362		Specimen removal (trees), incl. stump grinding	7	EA	4,000.00	28,000
363		Remove/clear and grub shrubs and ivy	4,665	SF	1.50	6,998
364		Reforestation and Planting:				
365		Temporary protection fencing for new planting areas	10,095	GSF	0.25	2,524
366		Soil Amendment	10,095	SF	1.00	10,095
367		Trees, 24" box	15	EA	750.00	11,250
368		Trees, 15 gal	1	EA	300.00	300
369		Low Shrubs, 5 gal	508	EA	65.00	33,020
370		Groundcover, 5 gal	560	EA	50.00	28,000
371						
372	**20**	**SUBTOTAL - Park Frontage Trails and Landscape**				**308,696**
373						
374	**21**	**Northeast Area Trails and Landscape**				
375		Existing Conditions and Demolition:				
376		Remove cyclone fence	244	LF	7.00	1,708
377		Remove rustic stairs, about 4' W	184	LF	12.00	2,208
378		Remove wood bench	4	EA	400.00	1,600
379		Remove fallen log	3	EA	100.00	300
380		Remove gutter	150	LF	5.00	750
381		Remove wood retaining logs	4	EA	100.00	400
382		Hardscape:				
383		Gabion wall	1,686	SF	20.00	33,720
384		Concrete foundation for gabion wall, including excavation	42	CY	800.00	33,600
385		Rustic stairs, 6' W	201	LF	550.00	110,550
386		Fencing:				
387		Rustic fence, 3'-6" H	444	LF	105.00	46,620
388		Permeable base	2	CY	100.00	200
389		Concrete footing for fence, 8' o.c	9	CY	700.00	6,300
390		Earthwork for footing	11	CY	100.00	1,125
391		Repair gutter	37	LF	20.00	740
392		Gutter	200	LF	40.00	8,000
393		Erosion Control:				
394		Erosion control blanket	270	SY	15.30	4,131
395		Erosion control coir rolls at stairs and path	585	LF	100.00	58,500
396		Erosion control coir rolls, 5' oc	1,471	SF	5.00	7,355
397		Inline swale	427	SF	20.00	8,540
398		Level spreader	188	SF	15.00	2,820
399		Rock check dam on steep slopes/channels	893	SF	18.00	16,074
400		Urban Forestry Removal:				
401		Specimen removal (trees), incl. stump grinding	12	EA	4,000.00	48,000
402		Remove/clear and grub shrubs and ivy	25,562	SF	1.50	38,343
403		Remove small trees	3,601	SF	2.00	7,202
404		Reforestation and Planting:				
405		Temporary protection fencing for new planting areas	29,797	GSF	0.25	7,449
406		Soil Amendment	29,797	SF	1.00	29,797
407		Trees, 15 gal	10	EA	300.00	3,000
408		Low Shrubs, 5 gal	1,095	EA	65.00	71,175
409		Groundcover, 5 gal	1,435	EA	50.00	71,750
410						
411	**21**	**SUBTOTAL - Northeast Area Trails and Landscape**				**621,957**
412						

Line	Item	Item Description	Quantity	Unit	Unit Cost $	Total Estimated Cost
413	**22**	**Southwest Slope Trails and Landscape**				
414		Existing Conditions and Demolition:				
415		Remove earth path	1,077	SF	1.00	1,077
416		Remove rustic stairs, about 4' W	245	LF	12.00	2,940
417		Remove wood stairs, 4' W	200	SF	10.00	2,000
418		Remove damaged trash can	1	EA	100.00	100
419		Hardscape:				
420		Park tread paving, 6' W	2,125	SF	25.00	53,125
421		Rustic stairs, 6' W	227	LF	550.00	124,850
422		Timber wall, 6x6, 1'-2 1/2" H	360	LF	30.00	10,800
423		Erosion Control:				
424		Erosion control blanket	4,258	SY	15.30	65,148
425		Erosion control coir rolls at stairs and path	1,335	LF	100.00	133,500
426		Erosion control coir rolls, 5' oc	54,745	SF	5.00	273,725
427		Rainwater garden	1,976	SF	40.00	79,040
428		Inline swale	262	SF	20.00	5,240
429		Urban Forestry Removal:				
430		Specimen removal (trees), incl. stump grinding	15	EA	4,000.00	60,000
431		Remove/clear and grub shrubs and ivy	23,057	SF	1.50	34,586
432		Remove small trees	21,529	SF	2.00	43,058
433		Prune trees	23,773	SF	0.50	11,887
434		Reforestation and Planting:				
435		Temporary protection fencing for new planting areas	59,934	GSF	0.25	14,984
436		Soil Amendment	59,934	SF	1.00	59,934
437		Trees, 15 gal	146	EA	300.00	43,800
438		Low Shrubs, 5 gal	1,553	EA	65.00	100,945
439		Groundcover, 5 gal	1,553	EA	50.00	77,650
440						
441	**20**	**SUBTOTAL - Southwest Slope Trails and Landscape**				**1,198,389**
442						
443	**23**	**Wayfinding and Furnishing**				
444		Bearsaver Trash receptacle	5	EA	2,000.00	10,000
445		Wood Bench	8	EA	4,000.00	32,000
446		Picnic table	5	EA	8,000.00	40,000
447		Signage, 12"x18"x32"	20	EA	175.00	3,500
448		Signage, 24"x18"x32"	10	EA	375.00	3,750
449		Signage, 30"x18"x32"	1	EA	500.00	500
450		Signage, refurbished, historical tree planting	1	EA	250.00	250
451		Post and footing for signage	32	EA	800.00	25,600
452						
453	**23**	**SUBTOTAL - Wayfinding and Furnishing**				**115,600**

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4.0 ESTIMATE DETAILS - BASE SCOPE

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	510,259 GSF Quadrant 1 (NW) Quantity	421,284 GSF Quadrant 2 (NE) Quantity	582,394 GSF Quadrant 3 (SW) Quantity	95,930 GSF Quadrant 4 (SE) Quantity	1,609,867 GSF Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
1	**1**	**CIRCULATION**												
2		Existing Conditions and Demolition:												
3		Remove asphalt path	SF	1.75	26,293	38,299	50,332	2,544	117,468	46,013	67,023	88,081	4,452	205,569
4		Remove wood steps, 10' W x 11' L	EA	500.00	2	-	-	-	2	1,000	-	-	-	1,000
5		Remove wood wall, 2' H	LF	10.00	16	191	-	-	207	160	1,910	-	-	2,070
6		Remove wood retaining wall	LF	15.00	-	137	362	621	1,120	-	2,055	5,430	9,315	16,800
7		Remove stone retaining wall	LF	20.00	183	220	-	-	403	3,660	4,400	-	-	8,060
8		Remove wood fence w/ welded wire mesh panel	LF	10.00	-	-	935	-	935	-	-	9,350	-	9,350
9		Remove playground, including sand in playground area	SF	10.00	2,594	-	-	-	2,594	25,940	-	-	-	25,940
10		Remove cyclone fence	LF	7.00	192	547	47	603	1,389	1,344	3,829	329	4,221	9,723
11		Remove wood log curb	LF	5.00	143	18	-	-	161	715	90	-	-	805
12		Remove dog run entry sign	EA	200.00	1	-	-	-	1	200	-	-	-	200
13		Remove rustic stairs, about 4' W	LF	12.00	1,111	1,028	808	-	2,947	13,332	12,336	9,696	-	35,364
14		Remove sand path	SF	1.00	-	524	213	2,345	3,082	-	524	213	2,345	3,082
15		Remove earth path	SF	1.00	1,643	366	1,683	-	3,692	1,643	366	1,683	-	3,692
16		Remove resin paving at ADA paveway	SF	2.00	-	-	2,852	-	2,852	-	-	5,704	-	5,704
17		Remove wood bench	EA	400.00	2	5	1	2	10	800	2,000	400	800	4,000
18		Remove fallen log	EA	100.00	1	3	1	-	5	100	300	100	-	500
19		Remove shipping containers	EA	500.00	-	5	-	-	5	-	2,500	-	-	2,500
20		Remove gutter	LF	5.00	-	150	-	-	150	-	750	-	-	750
21		Remove entry concrete stairs, curved, 11' W	SF	30.00	-	308	-	-	308	-	9,240	-	-	9,240
22		Remove entry concrete stairs, 30' W	SF	30.00	1,080	990	-	600	2,670	32,400	29,700	-	18,000	80,100
23		Remove concrete stairs, 3' W	SF	30.00	-	-	-	66	66	-	-	-	1,980	1,980
24		Remove concrete and wood stairs, 3' W	SF	20.00	-	48	39	48	135	-	960	780	960	2,700
25		Remove concrete and wood stairs, 12' W	SF	20.00	-	192	-	-	192	-	3,840	-	-	3,840
26		Remove stone stairs, 3' W	SF	20.00	39	-	-	-	39	780	-	-	-	780
27		Remove stone stairs, 5' W	SF	20.00	-	65	-	-	65	-	1,300	-	-	1,300
28		Remove wood steps, 4' W	SF	10.00	-	-	-	108	108	-	-	-	1,080	1,080
29		Remove wood stairs, 4' W	SF	10.00	52	-	348	-	400	520	-	3,480	-	4,000
30		Remove wood stairs, 10' W	SF	10.00	460	-	270	-	730	4,600	-	2,700	-	7,300
31		Remove wood stairs, 12' W	SF	10.00	-	192	120	-	312	-	1,920	1,200	-	3,120
32		Remove wood retaining logs	EA	100.00	-	10	-	-	10	-	1,000	-	-	1,000
33		Remove all timber curb at perimeter curb	LF	8.00	87	518	1,575	699	2,879	696	4,144	12,600	5,592	23,032
34		Remove damaged trash can	EA	100.00	-	-	1	-	1	-	-	100	-	100
35														
36		Hardscape:												
37		Asphalt concrete, 4.5" thick	SY	42.00	1,222	2,599	2,304	-	6,125	51,324	109,158	96,768	-	257,250
38		Asphalt concrete, 5" thick	SY	48.00	1,718	2,306	3,020	283	7,327	82,464	110,688	144,960	13,584	351,696
39		Recycled AC, 2" thick, compact in place	SY	10.00	2,940	4,905	5,324	283	13,452	29,400	49,050	53,240	2,830	134,520
40		Prime coat asphalt base	SF	0.15	26,460	44,145	47,916	2,547	121,068	3,969	6,622	7,187	382	18,160
41		Park tread paving, 6' W	SF	25.00	16,557	16,102	19,389	5,222	57,270	413,925	402,550	484,725	130,550	1,431,750
42		Concrete path	SF	15.00	980	2,101	2,434	1,023	6,538	14,700	31,515	36,510	15,345	98,070
43		Fencing:												
44		Rustic fence, 3'-6" H	LF	105.00	2,339	1,485	326	283	4,433	245,595	155,925	34,230	29,715	465,465
45		Metal fence, 3'-6" H	LF	120.00	-	83	934	-	1,017	-	9,960	112,080	-	122,040
46		Metal fence, 6'-0" H	LF	150.00	-	138	51	596	785	-	20,700	7,650	89,400	117,750
47		Metal fence, 10'-0" H	LF	200.00	-	461	-	-	461	-	92,200	-	-	92,200
48		Permeable base	CY	100.00	12	11	7	5	35	1,200	1,100	700	500	3,500
49		Concrete footing for fence, 8' o.c	CY	700.00	46	42	26	17	131	32,200	29,400	18,200	11,900	91,700
50		Earthwork for footing	CY	100.00	58	53	33	21	164	5,750	5,250	3,250	2,125	16,375

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51		Access gates at 6'-0" H metal fence	EA	1,000.00	-	1	-	2	3	-	1,000	-	2,000	3,000
52		Double gate at 10'-0" H metal fence, 10' W	EA	1,800.00	-	1	-	-	1	-	1,800	-	-	1,800
53		Rustic stairs, 6' W	LF	550.00	327	407	358	69	1,161	179,850	223,850	196,900	37,950	638,550
54		Concrete stairs with curb walls, 10' W	LF	600.00	25	-	-	-	25	15,000	-	-	-	15,000
55		Concrete entry stairs, 5' W	LF	450.00	23	43	52	36	154	10,350	19,350	23,400	16,200	69,300
56		Concrete entry stairs, 11' W	LF	990.00	-	33	-	-	33	-	32,670	-	-	32,670
57		Concrete entry stairs, 11' W curved	LF	1,100.00	30	28	-	-	58	33,000	30,800	-	-	63,800
58		Concrete entry stairs, 30' W	LF	2,700.00	35	33	-	18	86	94,500	89,100	-	48,600	232,200
59		Structural retrofit for concrete entry stairs at Frederick St	LS	20,000.00	-	-	1	-	1	-	-	20,000	-	20,000
60		Aesthetic repairs for concrete entry stairs at Frederick St	LS	10,000.00	-	-	1	-	1	-	-	10,000	-	10,000
61		Concrete entry stairs curb wall, 6" W	LF	75.00	44	88	104	72	308	3,300	6,600	7,800	5,400	23,100
62		Concrete entry stairs columns, ~25" H	EA	600.00	2	-	-	-	2	1,200	-	-	-	1,200
63		Historic entry wall restoration	LOC	50,000.00	2	2	1	-	5	100,000	100,000	50,000	-	250,000
64		Galvanized steel handrail at entry stairs	LF	300.00	210	317	174	128	829	63,000	95,100	52,200	38,400	248,700
65		Wood stairs w/ metal railing, 4' W	LF	720.00	-	-	-	27	27	-	-	-	19,440	19,440
66		Wood stairs w/ metal railing, 6' W	LF	780.00	-	-	18	.	18	-	-	14,040	-	14,040
67		Concrete retaining wall, 30" H, 1' T	LF	100.00	643	866	1,569	-	3,078	64,300	86,600	156,900	-	307,800
68		Concrete retaining wall, 18" H	LF	60.00	117	-	-	-	117	7,020	-	-	-	7,020
69		Gabion Wall	SF	20.00	-	1,686	162	1,218	3,066	-	33,720	3,240	24,360	61,320
70		Concrete foundation for gabion wall, including excavation	CY	800.00	-	42	6	45	93	-	33,600	4,800	36,000	74,400
71		Terraced gravity block wall w/ planting pockets, 5' H	SF	30.00	-	3,410	-	-	3,410	-	102,300	-	-	102,300
72		Sutter wall, 3' H	LF	310.00	272	144	78	563	1,057	84,320	44,640	24,180	174,530	327,670
73		Concrete foundation for sutter wall, including excavation	CY	800.00	64	34	18	133	249	51,200	27,200	14,400	106,400	199,200
74		Stone wall, height varies	SF	70.00	158	186	1,807	1,037	3,188	11,060	13,020	126,490	72,590	223,160
75		Central Terraced Overlook:												
76		Backfill	SF	3.00	-	1,674	-	-	1,674	-	5,022	-	-	5,022
77		Drainage work	SF	50.00	-	1,674	-	-	1,674	-	83,700	-	-	83,700
78		Stone wall, 18" H	LF	105.00	-	98	-	-	98	-	10,290	-	-	10,290
79		Stone wall, 5' H	LF	350.00	-	81	-	-	81	-	28,350	-	-	28,350
80		Stone cap, 3" T	SF	50.00	-	269	-	-	269	-	13,425	-	-	13,425
81		Concrete footing for wall	CY	700.00	-	21	-	-	21	-	14,700	-	-	14,700
82		Earthwork for concrete footing	CY	100.00	-	21	-	-	21	-	2,100	-	-	2,100
83		Concrete stairs, 8' W curved	LF	800.00	-	18	-	-	18	-	14,400	-	-	14,400
84		Metal guardrail, curved, 42" H	LF	200.00	-	81	-	-	81	-	16,200	-	-	16,200
85		Galvanized steel handrail for stairs	LF	300.00	-	47	-	-	47	-	14,100	-	-	14,100
86		Window overlook:												
87		Stone wall, 6' H	LF	363.00	-	-	61	-	61	-	-	22,143	-	22,143
88		Stone columns, 18" sq x 4' H	EA	800.00	-	-	8	-	8	-	-	6,400	-	6,400
89		Metal Railing	LF	280.00	-	-	48	-	48	-	-	13,440	-	13,440
90		Concrete footing for wall	CY	700.00	-	-	7	-	7	-	-	4,900	-	4,900
91		Earthwork for concrete footing	CY	100.00	-	-	7	-	7	-	-	700	-	700
92		Repair stone stairs, 5' W	LF	50.00	5	-	-	-	5	250	-	-	-	250
93		Rock well:												
94		Excavation	CY	150.00	13	9	18	2	42	1,950	1,350	2,700	300	6,300
95		Rock fill	CY	200.00	13	9	18	2	42	2,600	1,800	3,600	400	8,400
96		Perforated pipe, 36" dia x 4' H	EA	500.00	12	7	19	2	40	6,000	3,500	9,500	1,000	20,000
97		Filter fabric	SF	1.75	452	264	716	75	1,507	791	462	1,253	131	2,637
98		Timber wall, 6x6, 1'-2 1/2" H	LF	30.00	2,254	941	635	128	3,958	67,620	28,230	19,050	3,840	118,740
99		Replace historic stone wall	LF	225.00	181	-	-	-	181	40,725	-	-	-	40,725
100		Replace concrete paving and mortar brick accent in place	SF	50.00	4,763	2,850	815	1,177	9,605	238,150	142,500	40,750	58,850	480,250

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101		Repair historic stone wall from damage	LOC	1,000.00	4	2	-	-	6	4,000	2,000	-	-	6,000
102		Repair gutter	LF	20.00	-	37	-	-	37	-	740	-	-	740
103		Repair stone cap	EA	250.00	-	1	-	-	1	-	250	-	-	250
104		Removable bollards	EA	1,500.00	3	-	-	-	3	4,500	-	-	-	4,500
105		Repair chipped column edge at top	EA	200.00	-	1	-	-	1	-	200	-	-	200
106		Gutter	LF	40.00	-	200	-	-	200	-	8,000	-	-	8,000
107		Shipping containers, 8' x 20' x 8'-6" H	EA	2,500.00	-	4	-	-	4	-	10,000	-	-	10,000
108		Shipping containers, 8' x 20' x 10' H	EA	3,000.00	-	1	-	-	1	-	3,000	-	-	3,000
109														
110	**1**	**SUBTOTAL - CIRCULATION**								2,099,116	2,519,974	1,970,132	991,467	7,580,689
111														
112	**2**	**FOREST MANAGEMENT AND HABITATION**												
113		Urban Forestry Removal:												
114		Tagged specimen removal (trees), incl. stump grinding for 25% of removed trees	EA	4,000.00	9	1	18	3	31	36,000	4,000	72,000	12,000	124,000
115		Untagged specimen removal (trees), incl. stump grinding for 25% of removed trees	EA	4,000.00	19	16	19	3	57	76,000	64,000	76,000	12,000	228,000
116		Remove/clear and grub shrubs and ivy	SF	1.50	61,800	31,003	47,767	16,232	156,802	92,700	46,505	71,651	24,348	235,203
117		At perimeter, clear and grub low growing vegetation, remove small and invasive species and protect existing oaks	SF	5.00	7,272	9,311	17,893	10,712	45,188	36,360	46,555	89,465	53,560	225,940
118		Remove small trees	SF	2.00	19,085	11,078	32,938	19,081	82,182	38,170	22,156	65,876	38,162	164,364
119		Prune trees	SF	0.50	3,599	1,276	34,053	12,588	51,516	1,800	638	17,027	6,294	25,758
120														
121		Reforestation and Planting:												
122		Temporary protection fencing for new planting areas	GSF	0.25	225,077	137,500	208,450	48,715	619,742	56,269	34,375	52,113	12,179	154,936
123		Soil amendment	SF	1.00	225,077	137,500	208,450	48,715	619,742	225,077	137,500	208,450	48,715	619,742
124		Trees, 24" box	EA	750.00	15				15	11,250	-	-	-	11,250
125		Trees, 15 gal	EA	300.00	12	11	294	1	318	3,600	3,300	88,200	300	95,400
126		Low Shrubs, 5 gal	EA	65.00	4,564	1,810	4,284	771	11,429	296,660	117,650	278,460	50,115	742,885
127		Groundcover, 5 gal	EA	50.00	6,388	3,602	4,716	914	15,620	319,400	180,100	235,800	45,700	781,000
128		Replace lawn at summit	SF	6.00	-	-	5,933	-	5,933	-	-	35,598	-	35,598
129														
130	**2**	**SUBTOTAL - FOREST MANAGEMENT AND HABITATION**								1,193,286	656,779	1,290,639	303,373	3,444,076
131														
132	**3**	**WATER MANAGEMENT AND EROSION CONTROL**												
133		Irrigation:												
134		Main Line, assume 2" PVC	LF	7.50	3,087	3,023	1,759	494	8,363	23,153	22,673	13,193	3,705	62,723
135		Trenching and backfill	LF	15.00	3,087	3,023	1,759	494	8,363	46,305	45,345	26,385	7,410	125,445
136		Quick Coupler	EA	300.00	44	49	30	7	130	13,200	14,700	9,000	2,100	39,000
137		Connect to (E)	EA	500.00	3	5	3	2	13	1,500	2,500	1,500	1,000	6,500
138														
139		Erosion Control:												
140		Erosion control blanket	SY	15.30	16,550	6,386	12,864	2,771	38,571	253,215	97,706	196,819	42,399	590,139
141		Erosion control coir rolls at stairs and path	LF	100.00	6,469	3,303	3,195	773	13,740	646,900	330,300	319,500	77,300	1,374,000
142		Erosion control coir rolls, 3' oc	SF	8.00	-	-	11,441	27,373	38,814	-	-	91,528	218,984	310,512
143		Erosion control coir rolls, 5' oc	SF	5.00	87,604	21,303	131,039	1,203	241,149	438,020	106,515	655,195	6,015	1,205,745
144		Erosion control swattles	SY	50.00	55	-	52	-	107	2,750	-	2,583	-	5,333
145		Rainwater garden	SF	40.00	1,042	-	1,976	-	3,018	41,680	-	79,040	-	120,720
146		Bioswale	SF	30.00	4,455	4,342	-	-	8,797	133,650	130,260	-	-	263,910
147		Inline swale	SF	20.00	-	551	957	-	1,508	-	11,020	19,140	-	30,160

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.0 ESTIMATE DETAILS - BASE SCOPE

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	510,259 GSF Quadrant 1 (NW) Quantity	421,284 GSF Quadrant 2 (NE) Quantity	582,394 GSF Quadrant 3 (SW) Quantity	95,930 GSF Quadrant 4 (SE) Quantity	1,609,867 GSF Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
148		Level spreader	SF	15.00	-	188	-	-	188	-	2,820	-	-	2,820
149		Rock check dam on steep slopes/channels	SF	18.00	-	893	-	-	893	-	16,074	-	-	16,074
150		Cascading berm	SF	20.00	-	184	-	203	387	-	3,680	-	4,060	7,740
151														
152	**3**	**SUBTOTAL - WATER MANAGEMENT AND EROSION CONTROL**								1,600,373	783,592	1,413,883	362,973	4,160,820
153														
154	**4**	**MISCELLANEOUS IMPROVEMENTS**												
155		Wayfinding and Furnishing:												
156		Playground renovation	SF	240.00	2,594	-	-	-	2,594	622,560	-	-	-	622,560
157		Bearsaver Trash receptacle	EA	2,000.00	-	2	3	-	5	-	4,000	6,000	-	10,000
158		Wood Bench	EA	4,000.00	1	5	-	2	8	4,000	20,000	-	8,000	32,000
159		Picnic table	EA	8,000.00	5	-	-	-	5	40,000	-	-	-	40,000
160		Signage, 12"x18"x32"	EA	175.00	5	6	8	1	20	875	1,050	1,400	175	3,500
161		Signage, 24"x18"x32"	EA	375.00	2	3	5	-	10	750	1,125	1,875	-	3,750
162		Signage, 30"x18"x32"	EA	500.00	1	-	-	-	1	500	-	-	-	500
163		Signage, refurbished, historical tree planting	EA	250.00	-	-	1	-	1	-	-	250	-	250
164		Post and footing for signage	EA	800.00	8	9	14	1	32	6,400	7,200	11,200	800	25,600
165														
166		Electrical Line to (E) transformer	LF	200.00	-	216	-	-	216	-	43,200	-	-	43,200
167														
168	**4**	**SUBTOTAL - MISCELLANEOUS IMPROVEMENTS**								8,525	52,575	14,725	975	781,360
169														

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.1 ALTERNATES

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	Quadrant 1 (NW) Quantity	Quadrant 2 (NE) Quantity	Quadrant 3 (SW) Quantity	Quadrant 4 (SE) Quantity	Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
1	**1**	**ALTERNATE #1 - Frederick St Entry Replacement**												
2		Deduct from base scope:												
3		Concrete entry stairs, 30' W tapered	LF	2,850.00	-	-	18	-	18	-	-	51,300	-	51,300
4		Concrete retaining wall, 30" T	LF	30.00	-	-	626	-	626	-	-	18,780	-	18,780
5		Structural retrofit for concrete entry stairs at Frederick St	LS	20,000.00	-	-	1	-	1	-	-	20,000	-	20,000
6		Aesthetic repairs for concrete entry stairs at Frederick St	LS	10,000.00	-	-	1	-	1	-	-	10,000	-	10,000
7		Historic entry wall restoration	LOC	50,000.00	-	-	1	-	1	-	-	50,000	-	50,000
8														
9		Deduct Subtotal												150,080
10														
11		Add:												
12		Remove entry concrete stairs, 30' W	SF	30.00	-	-	540	-	540	-	-	16,200	-	16,200
13		Remove entry stairs wall	LF	100.00	-	-	32	-	32	-	-	3,200	-	3,200
14		Remove entry stairs columns	EA	200.00	-	-	2	-	2	-	-	400	-	400
15		Earthwork	LS	5,000.00	-	-	1	-	1	-	-	5,000	-	5,000
16		Street bulb out	SF	50.00	-	-	277	-	277	-	-	13,850	-	13,850
17		Concrete entry stairs, 30' W tapered	LF	6,000.00	-	-	18	-	18	-	-	108,000	-	108,000
18		Concrete entry stairs curb wall	LF	500.00	-	-	34	-	34	-	-	17,000	-	17,000
19		Concrete entry stairs columns, ~25" H	EA	1,000.00	-	-	2	-	2	-	-	2,000	-	2,000
20		Galvanized steel handrail at entry stairs	LF	300.00	-	-	39	-	39	-	-	11,700	-	11,700
21														
22		Add Subtotal												177,350
23														
24		Net Direct Cost (Add - Deduct)												27,270
25		Add Markups, Cost Escalation and Soft Cost		214%										58,358
26														
27	**1**	**TOTAL - ALTERNATE #1 - Frederick St Entry Replacement**												85,628
28														
29														
30	**2**	**ALTERNATE #2 - Adult Fitness Equipment**												
31		Deduct from base scope:												
32														
33		Deduct Subtotal												-
34														
35		Add:												
36		Adult fitness equipment	LS	35,000.00	-	-	1	-	1	-	-	35,000	-	35,000
37														
38		Add Subtotal												35,000
39														
40		Net Direct Cost (Add - Deduct)												35,000
41		Add Markups, Cost Escalation and Soft Cost		214%										74,900
42														
43	**2**	**TOTAL - ALTERNATE #2 - Adult Fitness Equipment**												109,900
44														

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.1 ALTERNATES

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	Quadrant 1 (NW) Quantity	Quadrant 2 (NE) Quantity	Quadrant 3 (SW) Quantity	Quadrant 4 (SE) Quantity	Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
45														
46	**3**	**ALTERNATE #3 - Street Bulb-Out**												
47		Deduct from base scope:												
48														
49		Deduct Subtotal												-
50														
51		Add:												
52		Street bulb out	SF	50.00	260	832	626	458	2,176	13,000	41,600	31,300	22,900	108,800
53														
54		Add Subtotal												108,800
55														
56		Net Direct Cost (Add - Deduct)												108,800
57		Add Markups, Cost Escalation and Soft Cost		214%										232,832
58														
59	**3**	**TOTAL - ALTERNATE #3 - Street Bulb-Out**												341,632
60														
61														
62	**4**	**ALTERNATE #4 - Cobblestone Retaining Wall**												
63		Deduct from base scope:												
64		Concrete retaining wall, 30" H, 1' T	LF	100.00	643	866	1,569	-	3,078	64,300	86,600	156,900	-	307,800
65														
66		Deduct Subtotal												307,800
67														
68		Add:												
69		Cobblestone retaining wall, 30" H, 1' T	LF	212.00	643	866	1,569	-	3,078	136,316	183,592	332,628	-	652,536
70														
71		Add Subtotal												652,536
72														
73		Net Direct Cost (Add - Deduct)												344,736
74		Add Markups, Cost Escalation and Soft Cost		214%										737,735
75														
76	**4**	**TOTAL - ALTERNATE #4 - Cobblestone Retaining Wall**												1,082,471
77														
78														
79	**5**	**ALTERNATE #5 - Timber Retaining Wall**												
80		Deduct from base scope:												
81		Concrete retaining wall, 30" H, 1' T	LF	100.00	643	866	1,569	-	3,078	64,300	86,600	156,900	-	307,800
82														
83		Deduct Subtotal												307,800
84														
85		Add:												
86		Timber retaining wall, 6x6", 30" H	LF	60.00	643	866	1,569	-	3,078	38,580	51,960	94,140	-	184,680
87														
88		Add Subtotal												184,680
89														
90		Net Direct Cost (Add - Deduct)												(123,120)
91		Add Markups, Cost Escalation and Soft Cost		214%										(263,477)
92														
93	**5**	**TOTAL - ALTERNATE #5 - Timber Retaining Wall**												(386,597)
94														

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.1 ALTERNATES

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	Quadrant 1 (NW) Quantity	Quadrant 2 (NE) Quantity	Quadrant 3 (SW) Quantity	Quadrant 4 (SE) Quantity	Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
95														
96	**6.1**	**ALTERNATE #6.1 - Perimeter Walkway Replacement (Concrete with Exposed Aggregate Finish and New Concrete Curb)**												
97		Deduct from base scope:												
98		Replace concrete paving and mortar brick accent in place	SF	50.00	4,763	2,850	815	1,177	9,605	238,150	142,500	40,750	58,850	480,250
99														
100		Deduct Subtotal												480,250
101														
102		Add:												
103		Demo (E) perimeter concrete walkway	SF	5.00					46,574					232,870
104		Base course, 4", compacted	SF	1.00					46,574					46,574
105		Concrete paving with acid wash finish, 4" thick	SF	18.00					46,574					838,332
106		Concrete curb, 18" H x 8" W	LF	40.00					4,040					161,600
107		Dowels, 60" OC	EA	75.00					808					60,600
108														
109		Add Subtotal												1,339,976
110														
111		Net Direct Cost (Add - Deduct)												859,726
112		Add Markups, Cost Escalation and Soft Cost		214%										1,839,814
113														
114	**6.1**	**TOTAL - ALTERNATE #6.1 - Perimeter Walkway Replacement (Concrete with Exposed Aggregate Finish and New Concrete Curb)**												2,699,540
115														
116	**6.2**	**ALTERNATE #6.2 - Perimeter Walkway Replacement (Concrete with Brick Edge and Accents and New Concrete Curb)**												
117		Deduct from base scope:												
118		Replace concrete paving and mortar brick accent in place	SF	50.00	4,763	2,850	815	1,177	9,605	238,150	142,500	40,750	58,850	480,250
119														
120		Deduct Subtotal												480,250
121														
122		Add:												
123		Demo (E) perimeter concrete walkway	SF	5.00					46,574					232,870
124		Base course, 4", compacted	SF	1.00					46,574					46,574
125		Concrete paving with brick edging and accents, 4" thick	SF	32.00					46,574					1,490,368
126		Concrete curb, 18" H x 8" W	LF	40.00					4,040					161,600
127		Dowels, 60" OC	EA	75.00					808					60,600
128														
129		Add Subtotal												1,992,012
130														
131		Net Direct Cost (Add - Deduct)												1,511,762
132		Add Markups, Cost Escalation and Soft Cost		214%										3,235,171
133														
134	**6.2**	**TOTAL - ALTERNATE #6.2 - Perimeter Walkway Replacement (Concrete with Brick Edge and Accents and New Concrete Curb)**												4,746,933
135														
136	**7**	**ALTERNATE #7 - New Small Overlooks**												
137		Deduct from base scope:												
138														
139		Deduct Subtotal												-
140														
141		Add:												
142		Asphalt Concrete, 4.5"	SY	50.00					61					3,050
143		Recycled AC	SY	10.00					61					610
144		Prime coat asphalt base	SF	0.15					548					82

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.1 ALTERNATES

Date: 6/4/2020

Line	Item	Description	Unit	Unit Cost $	Quadrant 1 (NW) Quantity	Quadrant 2 (NE) Quantity	Quadrant 3 (SW) Quantity	Quadrant 4 (SE) Quantity	Total Quantity	Quadrant 1 (NW) Estimated Cost	Quadrant 2 (NE) Estimated Cost	Quadrant 3 (SW) Estimated Cost	Quadrant 4 (SE) Estimated Cost	Total Estimated Cost $
145		Stone wall, 6' H	LF	363.00					118					42,834
146		Stone cap, 3" T	SF	50.00					177					8,850
147		Concrete footing for wall	CY	700.00					14					9,800
148		Earthwork for concrete footing	CY	100.00					14					1,400
149														
150		Add Subtotal												66,626
151														
152		Net Direct Cost (Add - Deduct)												66,626
153		Add Markups, Cost Escalation and Soft Cost		214%										142,580
154														
155	**7**	**TOTAL - ALTERNATE #7 - New Small Overlooks**												209,206
156														
157	**8**	**ALTERNATE #8 - Lighting**												
158		Deduct from base scope:												
159														
160		Deduct Subtotal												-
161														
162		Add:												
163		Street lights	EA	12,000.00	10	8	13	6	37	120,000	96,000	156,000	72,000	444,000
164		Connect to (E) electrical line	EA	1,000.00	10	8	13	6	37	10,000	8,000	13,000	6,000	37,000
165														
166		Add Subtotal												481,000
167														
168		Net Direct Cost (Add - Deduct)												481,000
169		Add Markups, Cost Escalation and Soft Cost		214%										1,029,340
170														
171	**8**	**TOTAL - ALTERNATE #8 - Lighting**												1,510,340
172														

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.2 DESIGN OPTIONS **Date: 6/4/2020**

Line	Alt	Component Description	Quantity	Unit	Unit Cost $	Estimated Total $
1	1	**DESIGN OPTION #1 - New Maintenance Facility Building at Current Location**				
2		Deduct From Base Scope				
3		Shipping containers, 8' x 20' x 8'-6" H	4	EA	2,500.00	10,000
4		Shipping containers, 8' x 20' x 10' H	1	EA	3,000.00	3,000
5		Terraced gravity block wall w/ planting pockets, 5' H	600	SF	30.00	18,000
6						
7		Deduct Subtotal				31,000
8						
9		Add				
10		Asphalt concrete, 5" thick	295	SY	48.00	14,160
11		Recycled AC, 2" thick, compact in place	295	SY	8.00	2,360
12		Maintenance facility building	753	SF	400.00	301,200
13						
14		Add Subtotal				317,720
15						
16		Net Direct Cost				286,720
17		Add Markups, Cost Escalation and Soft Cost			214%	613,581
18						
19	1	**TOTAL - DESIGN OPTION #1 - New Maintenance Facility Building at Current Location**				**900,301**
20						
21	2	**DESIGN OPTION #2 - New Relocated Playground and Picnic Area at Current Playground**				
22		Deduct From Base Scope				
23		Asphalt concrete, 4.5" thick	80	SY	42.00	3,360
24		Recycled AC, 2" thick, compact in place	80	SY	8.00	640
25		Rustic fence, 3'-6" h	86	LF	105.00	9,030
26		Playground renovation	2,594	SF	240.00	622,560
27						
28		Deduct Subtotal				635,590
29						
30		Add				
31		Clear and Grub	9,195	SF	1.00	9,195
32		Grading	9,195	SF	3.00	27,585
33		Asphalt concrete, 4.5" thick	487	SY	42.00	20,454
34		Recycled AC, 2" thick, compact in place	487	SY	10.00	4,870
35		Concrete curb retaining wall	211	LF	50.00	10,550
36		Accessible ramp and pathway	2,001	SF	40.00	80,040
37		Relocated playground	6,175	SF	120.00	741,000
38		Fence	508	LF	150.00	76,200
39		Bearsaver Trash receptacle	1	EA	2,000.00	2,000
40		Picnic table	10	EA	8,000.00	80,000
41						
42		B) Add Subtotal				1,051,894
43						
44		Net Direct Cost				416,304
45		Add Markups, Cost Escalation and Soft Cost			214%	890,891
46						
47	2	**TOTAL - DESIGN OPTION #2 - New Relocated Playground and Picnic Area at Current Playgroun**				**1,307,195**
48						

BUENA VISTA PARK - NEEDS ASSESSMENT AND COST ANALYSIS
FINAL CONCEPTUAL ESTIMATE OF PROBABLE CONSTRUCTION COST
BASED ON NEEDS ASSESSMENT AND COST ANALYSIS DESIGN PACKAGE
4.2 DESIGN OPTIONS **Date: 6/4/2020**

Line	Alt	Component Description	Quantity	Unit	Unit Cost $	Estimated Total $
49	**3**	**DESIGN OPTION #3 - New Relocated Playground, New Stone Ampitheater and Relocated Maintenance Yard**				
50		Deduct From Base Scope				
51		Asphalt concrete, 4.5" thick	80	SY	42.00	3,360
52		Asphalt concrete, 5" thick	521	SY	48.00	25,008
53		Recycled AC, 2" thick, compact in place	601	SY	10.00	6,010
54		Rustic stairs, 6' W	47	LF	550.00	25,850
55		Rustic fence, 3'-6" h	86	LF	800.00	68,800
56		Playground renovation	2,594	SF	240.00	622,560
57		Shipping containers, 8' x 20' x 8'-6" H	4	EA	2,500.00	10,000
58		Shipping containers, 8' x 20' x 10' H	1	EA	3,000.00	3,000
59		Terraced gravity block wall w/ planting pockets, 5' H	3,410	SF	30.00	102,300
60						
61		Deduct Subtotal				866,888
62						
63		Add				
64		Clear and Grub	14,779	SF	1.00	14,779
65		Grading	14,779	SF	3.00	44,337
66		Asphalt concrete, 3" thick	614	SY	42.00	25,788
67		Asphalt concrete, 4.5" thick	199	SY	48.00	9,552
68		Recycled AC, 2" thick, compact in place	813	SY	10.00	8,130
69		Concrete curb retaining wall	497	LF	50.00	24,850
70		Accessible ramp and pathway	2,001	SF	40.00	80,040
71		Relocated playground	6,175	SF	120.00	741,000
72		Maintenance facility building w/ bathroom	964	SF	400.00	385,600
73		Fence	610	LF	150.00	91,500
74		Bearsaver Trash receptacle	1	EA	2,000.00	2,000
75		Picnic table	10	EA	8,000.00	80,000
76		Concrete stairs, 6' w	79	LF	540.00	42,660
77		Stone amphitheater	5,584	SF	300.00	1,675,200
78						
79		B) Add Subtotal				3,225,436
80						
81		Net Direct Cost				2,358,548
82		Add Markups, Cost Escalation and Soft Cost			214%	5,047,293
83						
84	**3**	**TOTAL - DESIGN OPTION #3 - New Relocated Playground, New Stone Ampitheater and Relocat**				**7,405,841**

M Lee Corporation

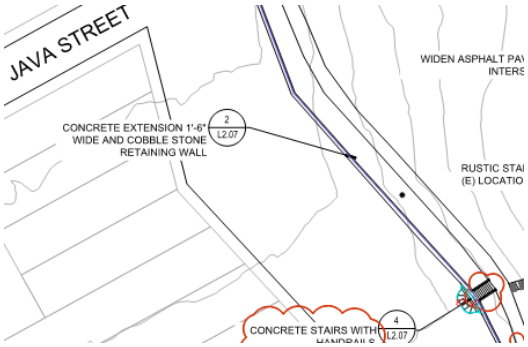
Project Query Sheet

TO: **Maya Nagasaka of Miller Company Landscape Architects**

FROM: **M Lee Corporation**

MLC Job No. ***1405***

Job Name: ***Buena Vista Park*** *Date: 3/26/2020*

Item	Reference	Queries	Answers
1	L2.03	In L2.03, the call out specifies that concrete extension 1'-6" wide and cobble stone retaining wall will be used, while on other locations the base scope is concrete retaining wall instead of cobblestone retaining wall which is moved to Alternate #4. Please clarify. 	This was an overisght on our part - the base cost is supposed to be for a concrete retaining wall while cobblestone is moved to alt #4 as specified in other locations.
2	L1.03 and L2.03	Frederick St Entry: in the landscape drawing (L2.03), the base scope states that (N) concrete stairs are to be installed, while on the existing and demolition drawing (L1.03), the base scope states that the stairs are to remain, while the stairs removal is included in Alternate #1. Please clarify.	For the Base scope, the Frederick Street Staircase is to remain, however similiar to the other historic stairs, new concrete stairs are to be installed and walls to be repaired (strucutral repair and resurfacing). L1.03 was stated incorrectly and the stairs are to be removed and the walls to remain. For Alternate #1, both the stairs and the walls are to be completely replaced as shown in DET #5/L2.07. This change came up due to historic review by the planning may potentially require an EIR if we are to replace the stair entirely.
3			

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Key Professionals

Martin Lee

Founding principal and chief estimator of M Lee Corporation, Martin is a professional civil engineer (PE), chartered quantity surveyor (CQS), and certified professional estimator (CPE) by ASPE with over 35 years of practical experience in construction cost management and consulting services in the San Francisco Bay Area. Prior to establishing M Lee Corporation, Martin gained extensive experience working with a renowned general contractor/construction management firm and an international cost consulting firm. Working on over 1,300 projects with an estimated construction value of over $35 billion, Martin is knowledgeable of local construction practice and pricing. He enjoys and excels in construction cost and schedule management.

Franklin Lee

Principal and project manager/senior cost estimator of M Lee Corporation, Franklin is a professional civil engineer (PE), LEED accredited professional and certified estimating professional (CEP) by AACE. Franklin Lee holds a B.S. in Civil and Environmental Engineering from University of California, Berkeley and a M.S. in Construction Engineering and Management from Stanford University. Prior to joining M Lee Corporation Franklin worked for a nationally renowned general contractor/construction management firm. Franklin has provided cost estimating, scheduling and project management services on over 500 projects in the San Francisco Bay Area over the past 12 years.

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9.4 - urban forestry report

Client: Miller Company Landscape Architects
Project Location: Buena Vista Park, San Francisco, CA
Inspection Date: 9/2019-3/2020
Arborist: Ben Anderson

URBAN FORESTRY ASSOCIATES, INC.

Assignment

I was hired by Miller Company Landscape Architects (MCLA) to produce a Forest Management Plan for Buena Vista Park as part of the Needs Assessment and Cost Analysis. In addition to production of this plan, I attended several meetings at the MCLA office and at the park itself. This plan is specifically for forest management. Erosion control and park upgrades are addressed elsewhere in the Needs Assessment. The report is guided by the desires and opinions of the Buena Vista Park Neighborhood Association and the San Francisco Recreation and Parks Department.

Summary

Despite the age of the park, there are few urgent management needs related to tree health. Several trees should be removed immediately for safety. The dominant species in the park is Monterey cypress (*Hesperocyparis macrocarpa*) and these are generally healthy. The coast live oak (*Quercus agrifolia*) trees are also in good health. There are three pine species scattered throughout the park, none of which is recommended, and all should be targeted for a passive removal campaign. The primary management goal is to increase the health of the forest while reducing the presence of invasive species and to maintain a safe and enjoyable park experience for users. Four targeted tree removals near the top of the park will provide view access to the Golden Gate Bridge and downtown.

The park will be divided into management units by forest type. These will include oak woodland, cypress, mixed conifer, mixed hardwood and low perimeter planting. New plantings in these units will be limited to specific species appropriate to each forest type. There will be no abrupt change in the feel of the park. There is no recommendation for mass removal of large trees. The composition of the forest will gradually shift over decades as old trees are removed when they die or fail, and the new plantings mature.

Vision

Buena Vista Park will immerse visitors in a healthy, diverse, resilient, and sustainable forest ecosystem and provide high quality habitat for wildlife in the heart of San Francisco.

Adaptive Management

Adaptive Management is an iterative process of evaluating outcomes of management decisions and adjusting accordingly to continually improve and learn about the system being managed. The park is a living system subject to continually changing environmental conditions and choices made today may not be appropriate in the future. Certain species are known to perform well in the park. Not all these species are desirable. The only way to know what will perform well in the park is to use existing knowledge as a guide and to experiment with planting a variety of new species throughout the park, then to monitor the successes and failures. Using adaptive management, a recommendation to plant blue oak (*Quercus douglasii*) today, does not lock the park into planting this tree if it fails to perform well in the park. Similarly, the absence of a species in the report does not mean it can or will never be planted. Management of the park will be fluid, but always guided by the vision statement and the needs and wants of the community.

Existing Conditions

Buena Vista Park is approximately 37 acres of steep terrain covered with scattered mature vegetation, giving it a wild feel similar to Golden Gate Park. The site is typified by steep slopes and sandy soils. Lidar elevation data for the park dated 2009-2011 shows slopes in the range of up to 50 degrees (Figure 1). The park is an

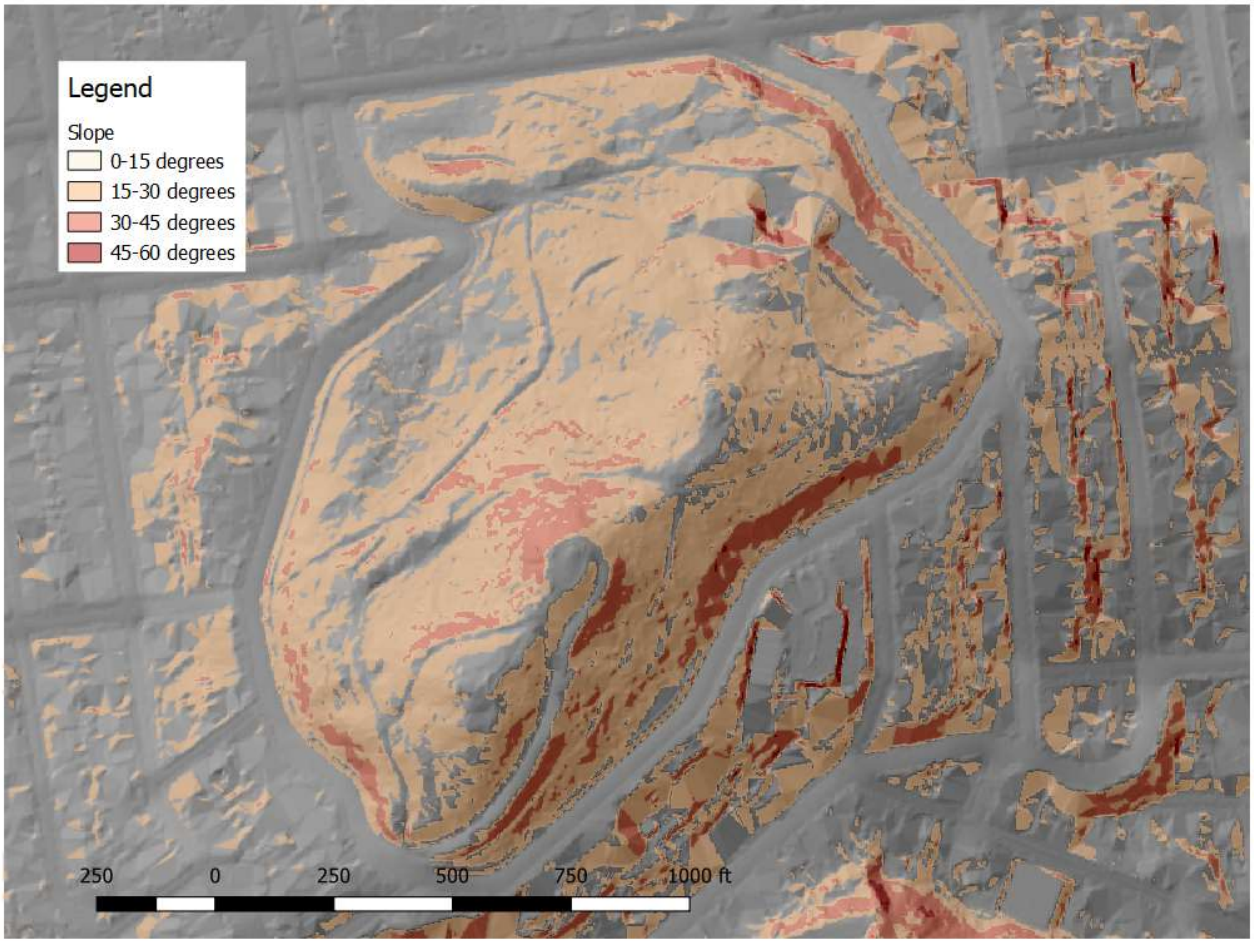

Figure 1. Map showing slope in the park.

oblong knoll, the long axis of which is oriented northeast/southwest. This results in all aspects represented on the knoll, but the largest areas are northwest aspect and southeast aspect.

The dominant tree species on the site include eucalyptus (*Eucalyptus spp.*), Catalina ironwood (*Lyonothamnus floribundus* subsp. *aspleniifolius*), coast live oak[1], coast redwood (*Sequoia sempervirens*), Torrey pine (*Pinus torreyana*), European olive (*Olea europaea*), Green wattle acacia (*Acacia decurrens*), mayten (*Maytenus boaria*), Monterey cypress, Monterey pine (*Pinus radiata*), tree of heaven (*Ailanthus altissima*), and several California buckeyes (*Aesculus californica*). The understory plants include Algerian ivy (*Hedera algeriensis*), Australian tea tree (*Leptospermum laevigatum*), California blackberry (*Rubus ursinus*), Cape ivy (*Delairea odorata*), ceanothus (*Ceanothus sp.*), cotoneaster (*Cotoneaster sp.*), elderberry (*Sambucus spp.*), Himalayan blackberry (*Rubus armeniacus*), manzanita (*Arctostaphylos spp.*), what appears to be pineapple guava (*Feijoa sellowiana*), thimbleberry (*Rubus parviflorus*), and toyon (*Heteromeles arbutifolia*). This is not a full list of species present in the park, only a list of what I see as the dominant species.

A review of historic photography of the park suggests the mature cypress, pine and eucalyptus trees date back to the original planting of the park. An aerial from 1909 shows the knoll covered with what appears to be relatively short vegetation similar to what appears in the panhandle and east end of Golden Gate Park in the photo (Figure 2). There is also an aerial image of the park from 1938 in which many of the existing trees are distinguishable and appear smaller than they are today.

[1] In the initial assessment of the park, I referenced scrub oak. I was informed scrub oak has never been documented in the park and upon closer inspection of the trees I see that they are coast live oaks with scrubby form and stiff twigs, superficially similar to *Quercus durata*.

Figure 2. Aerial photo of the park from 1909 showing young vegetation.

According to the Golden Gate Park website, the park was once a barren hill with sandy dune-like features. Since the establishment of the park in 1867, there has been an ongoing but inconsistent effort to plant trees in the park. This, along with invasive[2] species volunteering in the park, lead to the diverse list of plants above. There are a few areas in the park where a single species dominates, but many areas contain a diverse mix. Most of the California native tree species are performing well. These include but are not limited to the Monterey cypress, coast live oak, and California buckeye. Most of the coast redwoods are not extremely large or healthy, but they are surviving and provide a nice aesthetic. The shed needles protect and insulate the root system, build soil, and limit undergrowth (see Figure 5).

The Monterey cypress trees are the defining trees of the park. They are generally very large and healthy. It is the nature of forest grown conifers to lose their lower limbs, and this is the case for these trees as well. This results in a beautiful, open understory but this offers little protection from falling branches to park users. Cypress regeneration in the park is sporadic. Some areas contain many young trees while others have almost none. This is particularly an issue in the grove north of the summit.

The Torrey pines still look healthy, but they are getting monstrously large and do not belong in the setting. The Canary Island pines appear stressed and two have advanced red turpentine beetle (*Dendroctonus valens*) activity in their base. The blue gum eucalyptus is not performing particularly well, and most trees display

[2] For the purposes of this report, “invasive species” shall be defined as those species with undesirable traits capable of natural regeneration and shall include but are not limited to blue gum eucalyptus, all acacia species, tree-of-heaven, Himalayan blackberry, Algerian ivy, and Cape ivy.

significant deadwood in their canopies. Mayten trees are doing well and have formed a nice grove on the northeast end of the park. Olive is performing well and has formed a nice grove near the mayten grove.

Natural Area

A section at the north end of the park is under the *Significant Natural Resource Areas Management Plan* from the San Francisco Recreation and Park Department. This area is depicted with blue shading in Figure 7 at the end of this report. This area is subject to the recommendations of that document, though they do not differ markedly than those of this report.

Discussion

BVP is a beautiful old park with many mature trees. Monterey cypress is one the most common landscape trees in California. It is typically recommended as a specimen tree due to its dense, dark green foliage, its spreading, craggy, contorted form and its rapid growth up to maturity but it can be maintained as a clipped hedge or windbreak. Under ideal conditions it may live 200 years or more but in many urban settings its useful and safe life may be 40 years or less. It is native to a small area of the coastal fog zone around Monterey and so becomes heavily stressed on inland sites. Due to this, it is not well-suited to adapt to the changing climate without supplemental irrigation in the future.

The tree has not been planted outside its native range for more than the past 150 years, so it is difficult to estimate the top end of its life expectancy in such a location. It is described as shade intolerant. This means young trees do not tolerate growing in the shade and prefer newly disturbed or open areas (early successional species). The cones are also moderately serotinous, meaning it normally depends on low intensity fire for the majority of its regeneration. This would explain the lack of age diversity in much of the park. It rarely gets hot enough for the cones to release seeds and young trees may just may not be able to survive in the shade of the overstory. Even aged stands of Monterey cypress are natural, but fire exclusion is not. This led to a stand of over-mature[3] cypress with insufficient regeneration.

Monterey cypress is susceptible to several pests, including cypress bark beetle (*Phloeosinus spp*.), cypress canker (*Cytospora cardinale*), and Cytospora canker (*Cytospora cenisia*). It is especially bad at closing pruning wounds and these are prone to heavy termite activity. It tends to form many crossing limbs and poor branch attachments, leading to a high incident of limb failure. These trees do not recover well from poor pruning, as they do not (or rarely) sprout from the middle of branches or the stem, but only from buds on branch tips. Due to these characteristics and the sheer number of trees in the park, there is little to be done to mitigate the risk posed to visitors by branch failure while still allowing access to the park. Informational signs could be installed to enlist the visitors in the effort to monitor the park for dangers (Figure 4).

There is already a healthy population of native vegetation in the park. Because of this, even with the removal of all invasive species, there would still be a healthy stock of overstory and understory plants. Pines make up part of the existing overstory. These pines are not particularly long-lived or adapted to climate change. As a result, most are severely stressed, and several are dead or actively dying. A large Monterey pine failed from the roots during a storm over the course of this project.

Monterey pine is a native of the Monterey coastal region. The native range is one of the most limited of the common tree species, only within and surrounding Monterey county. It is best adapted to cool, moist climates with light, well-drained soils. It is short lived in highly developed settings (60 years). It is commonly said to be one of the most hazard prone species in Northern California. In maturity and over-maturity, it has the tendency to grow beyond the structural capacity of the wood to support branch extension or whole tree stability. It is very shallow rooted and tall, full sail specimens are subject to whole or partial tree failure. It is listed as an “undesirable tree”, by many local municipalities. It is currently subject to two epidemic disease and pest problems: pine pitch canker (*Fusarium circinatum*), and Western pine gall rust (*Endocronartium harknessii*).

[3] Relative to what would likely have been found in natural stands during the evolution of the species.

Red turpentine beetles threaten all the pine trees in the park. They attack pine trees by burrowing in through the bark to deposit their larva, which feed on the growth layer beneath, called the cambium. This layer also serves to transport water and nutrients between the roots and the canopy. When enough beetles are feeding on a single tree, they can destroy enough of this layer to kill the tree. As a general rule of thumb, if there is a pitch tube (red, lava-like exudate from a small hole in the trunk) every 6" around the circumference of the tree, it will not survive. The only recognized prophylactic chemical treatment for the beetles is to coat the bark with a neurotoxin several times a year. If the beetle lands on a spot that was not treated, it will still enter the tree. Larva already in the tree are also not affected. Beetles are attracted to stressed trees, such as those infected with pine pitch canker.

Age class diversity in a forest can be a difficult thing to visualize. It is best thought of as a relationship between three factors: the expected life expectancy of the average tree, the number of trees per acre for ideal stocking, and the number of new trees planted annually. If we assume the large trees were planted 100 years ago and will last for, on average, another 20 years, that means we could conservatively estimate a 100-year lifespan for trees in the park. If there were only 100 trees in the park, we could plant a single tree each year and always have trees to represent every age class. Alternatively, we could plant ten trees every ten years to have a group of 10 age classes.

Generally speaking, a healthy forest has around 50 trees per acre which is approximately a 30-foot average spacing between trees. Buena Vista Park is approximately 37 acres. Factoring in a few acres of open area, the whole park should have somewhere in the neighborhood of 1,500 trees for ideal forest stocking. If each tree lasts an average of 100 years, the park needs 15 new successful trees each year (with zero planting mortality). By that same logic, an average of 15 trees should die or be removed each year. The park reportedly lost approximately 40 trees in the last year, serving as evidence the forest is in decline. These 15 annual replacement trees include natural regeneration and are not necessarily trees introduced through planting events. The recommended inventory will show how close the park currently is to the desired stocking. I suspect it is slightly overstocked in terms of biomass due to the amount of large, old trees and the dense clumps of undesirable exotic species, but will quickly become understocked as the mature trees are removed through failures and deaths. To compensate for the high reported mortality rate of the existing trees and because we will be experimenting with new species, the annual replacement tree count should be at least doubled for the first three to five years. It is more than likely that some of the new species will fail to thrive and result in a higher than normal mortality rate.

There is currently no evidence of the presence of sudden oak death (*Phytophthora ramorum*) in the park that I am aware of and I saw no symptoms during my field work. The SODMap app from UC Berkeley shows there have been 12 tests performed on samples in the park and all have been negative for SOD. Sudden oak death is caused by the introduced pathogen *Phytophthora ramorum*, a water mold that lives on the foliage and in the stems of many of the native and ornamental plants in California. In trees, foliar hosts like California bay (*Umbellularia californica*) are rarely significantly affected but the health of vascular hosts (like coast live oak) is weakened by cankers that form on the trunk and disrupt the flow of nutrients between the roots and canopy. It is typically the secondary pathogens that kill or destabilize the trees after they are weakened by *P. ramorum*. SOD is not known to decrease the stability of oak trees on its own.

The most common scenario is for the disease to live in the canopy of a bay and rain spores down onto the trunks of adjacent oaks. With enough spores, the disease can take hold and infect the oak (valley and blue oaks are not affected). Cankers will arise from flat areas of the bark and are not typically associated with cracks. The lack of bay trees in the park is excellent in terms of SOD risk for the oaks but the pathogen can live on many species. It does not spread from oak to oak. If it were to become established in the park, it could have a significant impact on the oak woodlands which are populated entirely with coast live oak. For this reason, the oak species composition should be diversified to include native oaks that are not susceptible to SOD including those in the white oak subgenus (*Leucobalanus*).

RECOMMENDATIONS

This is a forest management plan, not a tree protection plan. It is not my intent to produce a plan that values and protects each tree in the park but to produce a plan that treats the park as a whole. In this plan, as with all forest management plans, healthy plants are recommended for removal in order to achieve management goals of species composition and increasing park utility. None of these recommendations is mandatory but all are based on my best professional judgement.

The park should be divided into distinct management sections of either oak woodland (includes the Natural Area), cypress, mixed conifer, mixed hardwood, or low perimeter planting. These units are delineated mostly by existing trails and a map can be found in Figure 7. Only the species listed for each forest type or appropriate understory plants should be planted in these units. When we begin to obtain results on the success of the new plantings, additional species can be experimented with as long as they are consistent with the forest type. If new plantings are formally limited to the approved species for that zone, as older trees die and are removed, larger, more clearly defined zones will become established. All invasive understory shrubs and young trees (as loosely defined above) should be removed in the short term (ideally three to five years). All undesirable tree species in the overstory can remain and can be removed as they decline and die, leaving the existing desirable species to remain with gaps to be filled with desirable replacement trees. Using this approach, the composition of the park will gradually shift over time to the map shown in Figure 7.

When choosing from the listed species to plant inside the management units, soil type, aspect, and sun exposure should be weighed against published tolerances of the species, but not necessarily strictly adhered to. Listed tolerance to these conditions often vary among authors and are typically anecdotal. The best way to determine what will perform well in a given site is though informed experimentation and documentation.

Oak Woodland

The dominant species in the oak woodland should certainly be coast live oak, as it is the best adapted to growing in sandy soil, but other California oak species should also be planted to see what will thrive. There are at least nine species of oak trees native to California as well as several scrub oak species and many hybrids. I recommend experimenting with blue oak, Santa Cruz Island oak (*Q. tomentella*), canyon live oak (*Q. chrysolepis*), scrub oak (*Q. berberidifolia*), leather oak (*Q. durata,* another type of scrub oak). Blue oak is highly adapted to drought and can grow in very poor soils with very low water holding capacity. I believe it is an excellent candidate.

Typically, it is best to source from local trees to maintain local genetics, but there is also an argument to source trees from Southern California as those may be better adapted to drought and therefore more able to thrive in the upcoming change in climate. This would be a form of “assisted migration” which is a somewhat controversial practice. I am not advocating for or specifically recommending this but wish to acknowledge it is an option for areas outside the Natural Area, especially if we continue to experience longer, dryer summers. All plant material in the Natural Area shall be sourced locally. Species commonly associated with oak should also be planted. These include but are not limited to California buckeye, toyon, coast silk tassel, coffee berry and any natives found in the freely available publication *Compatible Plants Under and Around Oaks* (http://californiaoaks.org/wp-content/uploads/2016/04/CompatiblePlantsUnderAroundOaks.pdf).

Mixed Hardwood

These areas will be very similar to the existing oak woodland, but with less reliance on coast live oak and greater species diversity. Recommended species for new plantings in these areas include but are not limited to coast live oak, blue oak, Santa Cruz Island oak, canyon live oak, scrub oak, leather oak, big leaf maple, California buckeye, Catalina ironwood, Pacific madrone, toyon, coast silk tassel, coffee berry and any natives found in the freely available publication *Compatible Plants Under and Around Oaks* (http://californiaoaks.org/wp-content/uploads/2016/04/CompatiblePlantsUnderAroundOaks.pdf). In preparation for climate change, southern California species like *Q. engelmannii* could also be planted. What is labeled

"Costa Rican oak" on the informational sign in the park appears to have produced an offspring in the park[4] and is another potential species to explore (presumably *Q. costaricensis*).

These areas will include the perimeter of the park, where there will be height restrictions on all new plantings to mitigate risk to the adjacent roads and sidewalks.

Mixed Conifer

It is my understanding there is a desire to maintain a conifer component in the park to maintain areas of high canopy and support diversification. This goal is at odds with being well adapted to climate change, assuming climate change results in less moisture for the Bay Area. Conifer forests (other than pine) are usually restricted to northern latitudes. The existing redwood grove is relatively small but, in my opinion, it is one of the nicest areas in the park. The trees are self-mulching and do an excellent job of suppressing weeds in the understory (Figure 5). Redwood is a shade tolerant species, meaning it can grow in shade until overstory trees are remove or die, then grow up into the overstory. Redwood is often described as needing regular water, but I commonly see it all over the Bay Area thriving with little to no irrigation once established. The Aptos blue cultivar has a thick cuticle (waxy layer that covers the needles) that gives the plant its blue hue. This further protects the tree from water stress.

Douglas fir (*Pseudotsuga menziesii*) is a California native and a close associate species of redwood. It can grow very well on dry, inland sites. It is also shade tolerant and long-lived, and generally disease resistant (though not as resistant as redwood). Incense cedar (*Calocedrus decurrens*) is another shade tolerant, native species that is also a close associate of redwood. These three species can be interplanted in the delineated grove found in Figure 7. Planting trees now will serve to slowly transition the existing vegetation to a mixed conifer forest over time. Only close associate species should be planted in the understory. These include but are not limited to sword fern (*Polystichum munitum*), huckleberry (*Vaccinium ovatum*), rhododendron (*Rhododendron macrophyllum*) and big-leaf maple (*Acer macrophyllum*).

Cypress Groves

Monterey cypress has a very limited native range and very few natural stands left in the native range. In these stands, there is very little growing in the understory and very few trees share the overstory. This is somewhat like what exists in the park. This open understory should be maintained and only planted sparsely with huckleberry and other drought hardy native shrubs. Limit tree planting in the cypress groves to the smaller cultivars including 'Aurea' and 'Saligna Aurea'. Both grow up to a maximum height of approximately 40 feet.

Low Perimeter Planting

Future planting within 60-feet of the perimeter sidewalk will be limited to plants with a mature height of 40-feet or less. This will mitigate the risk of falling trees and branches onto the road. Again, this does not mean that all trees greater than 40 feet in height will be removed, only that as these tall trees age out, they are not replaced by new tall trees. The plant palette will be similar to the understory planting in the oak woodland units.

Natural Area

This area is governed by the *Significant Natural Resource Areas Management Plan.* Planting will be identical to the Oak Woodland forest type and limited to California natives.

Action Plan

Immediate Goals

Strategy: Mitigate risk of dead and declining trees.
Actions:

- Remove all Canary Island pines near south entrance.
- Remove two standing dead Monterey pines in southwest quadrant.
- Remove decaying cypress over path (Tree shown in Figure 6, approximate location shown in Figure 3).

[4] While self-pollination in oaks is uncommon, it is not impossible.

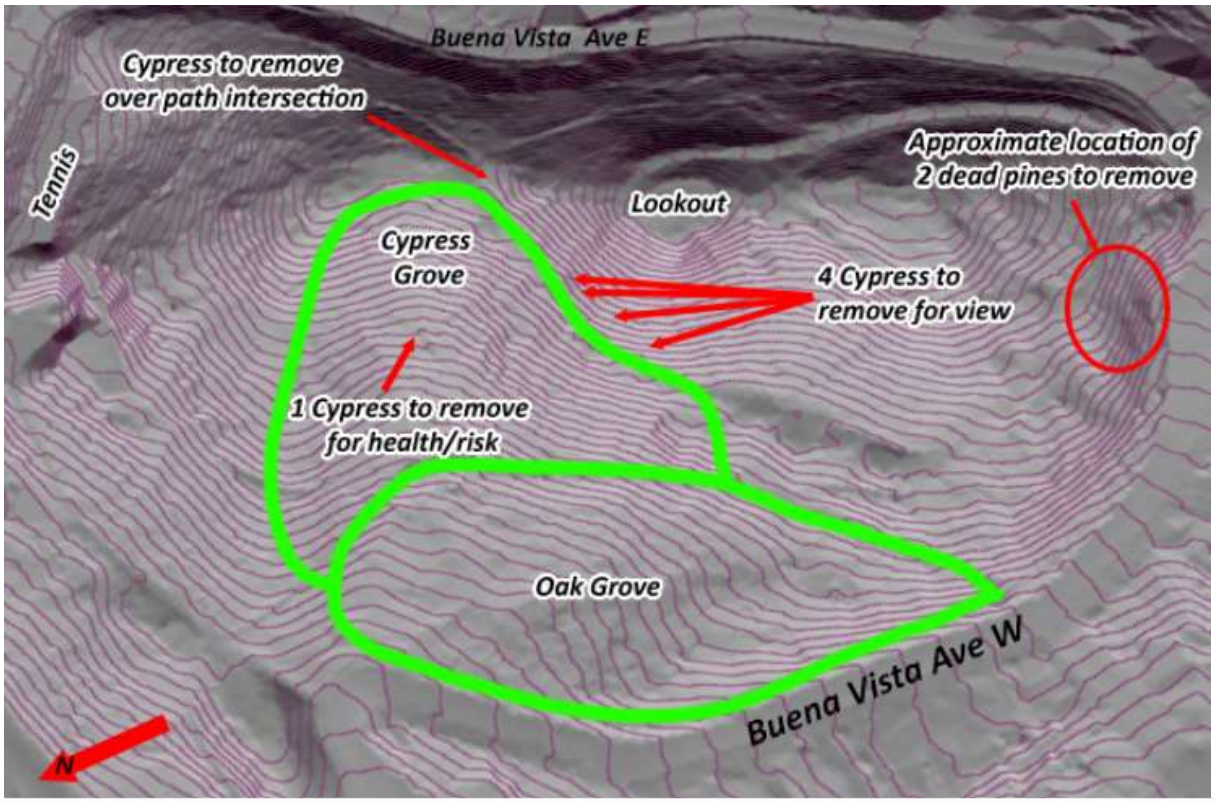

Figure 3. 3D map of park viewed from the northwest looking southeast. Approximate location of five cypress removals indicated with red arrows.

- Remove nearly dead cypress northeast of vista (also recommended for removal below for view clearance).
- Chip as much brush as possible on site and broadcast chips over the landscape to promote more favorable root conditions (discussed below).
- Partially embed logs perpendicular to the slope to retain soil moisture, slow erosion and add habitat.

Strategy: Mitigate risk of trees along Buena Vista Ave (East and West).
Actions:

- Perform all work recommended in the HortScience report dated 2017 (separate from this report).
- If all work was previously performed, contract with HortScience or a similar company to update the risk assessment and provide updated recommendations.

Strategy: Limit future undesirable tree species establishment in the park.
Actions:

- A ground/landscape crew shall remove all pine, acacia (green wattle and blackwood), eucalyptus, and tree of heaven that can safely be removed without having to climb the tree. This will involve an initial investment to remove trees up to approximately 30 feet high.
- Remove all acacia and tree of heaven of any size in the park. These species spread aggressively and will continue to be a problem if they are not entirely removed.
- Acacia, eucalyptus, and tree of heaven will all sprout from the stump. Removals should be performed in early summer when root reserves are lowest. Stumps will need to be quickly painted with herbicide (within five minutes of cutting). If the use of herbicide is restricted/undesirable, sprouts will need to be cut back monthly until energy reserves are depleted. Given the scale of the proposed work, it is hard to imagine anything other than herbicide being efficient/effective.
- Perform an annual sweep of the park in early summer to remove any new seedlings or sprouts.

Strategy: Enhance native understory.

Actions:

- Remove all cotoneaster from the park. This will also sprout from the stump and so will also need to be cut in early summer and either treated with herbicide or the sprouts will need to be cut periodically until energy reserves are depleted.
- Remove all pineapple guava from the park.
- Remove all Australian tea tree from the park.
- See and implement recommendations by Josiah Clark, consulting ecologist. These contain many planting recommendations based on microsite characteristics.

Figure 4. Example of sign to notify visitors of dangers of falling branches.

Strategy: Improve view from top vista.
Actions:

- Remove four mature cypress trees, one of which is in advanced decline (mentioned above under risk mitigation). These trees are indicated in Figure 3, Figure 8, and Figure 9. *RECOMMENDED BUT NOT NECESSARY*
- Any planting within 30 feet of the lawn area should have a mature height low enough to ensure it will not obstruct sunlight or views from the hilltop. This is a great location for scrub oak species like *Q. durata* or *berberidifolia.*

Strategy: Increase soil and tree health through mulching (outside of Natural Area).
Actions:

- All chipping from tree removals should be kept on site and spread under the canopies of the trees[5]. Mulch treatments are beneficial to trees in many ways. Mulch insulates the soil and root zone, reducing moisture loss and soil temperature, which in turn, increasing root productivity. In addition, mulch mitigates establishment of weeds, reduces soil compaction, soil erosion and water runoff. Ideally, mulch should be maintained at an approximate depth of two to four inches. Mulch should not be piled against the bases of the trees, as it can trap moisture against the trunk, creating an environment conducive to root disease and decay organisms.
- No mulch should be applied where it would hinder understory plants from Mr. Clark's recommendations. In time, these plants may eliminate the need for mulch entirely.

Strategy: Mitigate risk of injury from branch failure.
Actions:

- Install signage at park entrances explaining the danger of falling branches (example in Figure 4). Signs should have an email or phone number to report broken branches over paths to they can be promptly removed by park staff or hired contractors.

Long-Term Goals

Strategy: Produce then maintain an inventory of the trees in the park.
Actions:

- Following all work described above, produce an inventory of the trees in the park greater than six

[5] Chips from invasive species should be disposed offsite if they are in seed at the time of removal.

inches diameter as well as any newly planted trees. The inventory should include at a minimum a digital map of tree locations with data points showing species, trunk diameter, health and structure ratings, and a photo of each tree.
- As part of the inventory, all trees shall be marked with metal tree tags similar or identical to the ones used in the HortScience inventory.
- Update the inventory every five years.
- The park manager shall review the inventory to identify areas in need of planting, thinning, or health treatments as well as to evaluate the success of the species being planted.

Strategy: Promote establishment of management units shown in Figure 7.
Actions:
- Limit planting in the management units to species found in those ecosystem types (See discussion above).
- New plantings shall be a maximum of 15-gallon (preferably smaller to speed establishment) and shall be planted in accordance with current Best Management Practices. Specifically, remove nursery stakes and only use planting stakes if necessary[6].
- Number of plantings shall be established through an evaluation of the inventory recommended above. Initial three to five annual plantings should be heavy, with up to 30 new trees each. Timeframe for heavy plantings will be dependent on survival rate of plantings. I estimate that future plantings should not exceed 15 new trees each year *including* natural regeneration.
- Plantings shall be located in open, sunny areas; areas of recent tree removal/failure; and among stands with only mature trees that lack natural regeneration.
- Planted trees shall be irrigated with gator bags or equivalent once each month during the dry season for ***at least*** the first two years after planting. Drought conditions may necessitate irrigation for up to five years. If at the end of five years the trees cannot survive without irrigation, they should be abandoned.

Strategy: Promote age diversity in cypress forest while maintaining characteristic feel of a pure cypress grove.
Actions:
- Remove declining cypress in the center of the grove indicated in Figure 3.
- Interplant groves with some of the smaller cultivars discussed above. Space at least 15 feet away from established trees. Plant anywhere this spacing requirement can be met up to 10 trees in each of the two groves.

Strategy: Reduce size of trees around perimeter of park that target the road.
Actions:
- Limit all future planting within 60 feet of the road to shrubs or tree species with a maximum height of 40 feet. Potential species include scrub oak, strawberry tree (*Arbutus marina*), coast silk tassel (*Garrya elliptica*), coffee berry (*Rhamnus californica*), California buckeye, elderberry, and hollyleaf cherry (*Prunus ilicifolia*).
- No trees shall be planted in the perimeter apron planting area between the sidewalk and the street.

Strategy: Favor removal of pines.
Actions:
- The default action anytime the management of a pine is under consideration should be removal. The pines are problematic and were ill-advised for planting in the park.

[6] Studies have shown that trees establish more quickly and develop stronger trunk and root systems if they are not staked at the time of planting. Staking may be required, however, when planting bare root stock or planting on windy sites. Stakes may also offer protection against lawn mower damage and vandalism. One or two stakes used in conjunction with a wide, flexible tie material on the lower half of the tree will hold the tree upright and minimize injury to the trunk (see diagram), yet still allow movement. Remove support staking and ties after the first year of growth (https://www.treesaregood.org/portals/0/docs/treecare/New_TreePlanting.pdf).

SCOPE OF WORK AND LIMITATIONS

Urban Forestry Associates has no personal or monetary interest in the outcome of this investigation. All observations regarding trees in this report were made by UFA, independently, based on our education and experience. All determinations of health condition, structural condition, or hazard potential of a tree or trees at issue are based on our best professional judgment. The health and hazard assessments in this report are limited by the visual nature of the assessment. Defects may be obscured by soil, brush, vines, aerial foliage, branches, multiple trunks, other trees, etc. Even structurally sound, healthy trees can fail during severe storms. Consequently, even a low risk rating is not a guarantee of no risk, hazard, or sound health.

Benjamin Anderson, Urban Forester
ISA Board Certified Master Arborist & TRAQ
RCA #686, WE #10160B
(415) 454-4212

Figure 5. Stand of coast redwood. Great for weed suppression. Nice filtered shade.

Figure 6. Photo of cypress over path intersection that should be removed to mitigate risk due to decay in the attachment of the branch over the path.

Planting Unit / Future Conditions Map

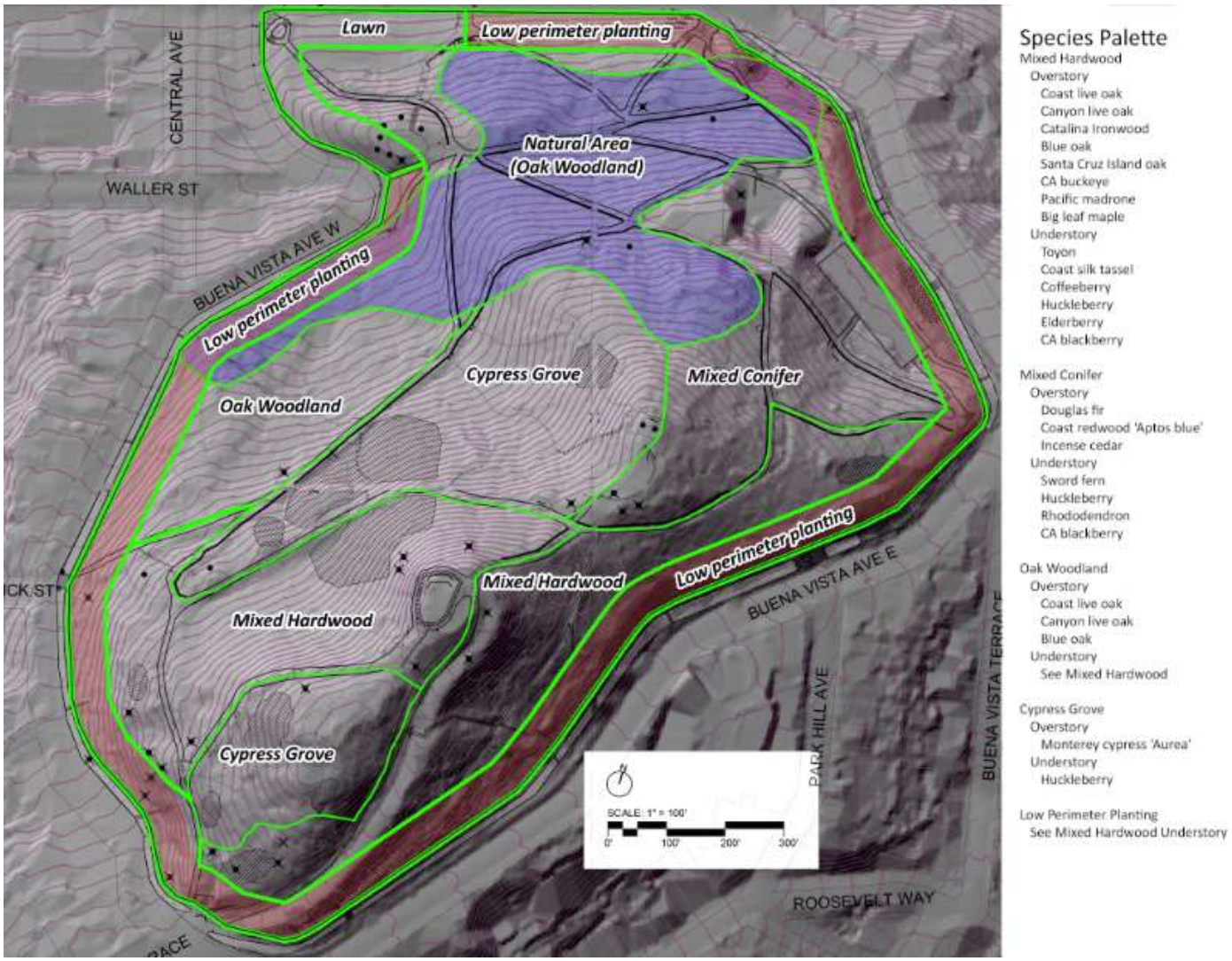

Figure 7. Recommended management units. This should be viewed as a map of how the park will look in 30-50 years as the existing trees age out and are replaced by future plantings. The only immediate change to the park will be the removal of invasive species and several pine trees.

Figure 8. Image from summit showing four cypress trees to remove and one to prune to greatly enhance the view.

Figure 9. Four cypress trees recommended to improve views from the summit indicated with red arrows.

9.5 - civil engineer supplemental report for asphalt concrete paving + Stormwater management concepts

SHERWOOD
DESIGN ENGINEERS

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Memorandum

December 4, 2019

To: **Maya Nagasaka, Miller Company**
nagasaka@millercomp.com
(415) 252-7288-104

cc: Jeffrey Miller, Miller Company
Ramy Azar, SDE

From: **Elizabeth Lo, Sherwood Design Engineers**
elo@sherwoodengineers.com
(415) 677-7300 x 218

Project: **19-070 Buena Vista Park**
Subject: Pavement Restoration Options and Methodologies

Ms. Nagasaka,

For the Buena Vista Park Project located at Buena Vista Avenue & Haight Street, we propose the following pavement restoration options and methodologies:

Installation Method 1: Milling of 1/4”-1/2” of the existing pavement surface and overlay with 4 to 7” of lift, see table 1 below for specific thickness.

Methodology: Use an asphalt milling machine to remove and grind asphalt pavement; haul grinded asphalt pavement to on-site storing location (Maintenance Yard) for future use. If asphalt milling machine use is limited due to road width or clearance, milling can be performed using a skid steer with milling attachment.

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling.
B. Mill to a depth of 1/4” - 1/2", removing existing asphalt pavement to grades and cross sections indicated.
C. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
D. Control rate of milling to prevent tearing of existing asphalt course.
E. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled asphalt pavement.
F. Transport milled asphalt pavement materials to onsite storing location (Maintenance Yard) for use pavement rehabilitation options.
G. Keep milled pavement surface free of loose material and dust.

After milling and mauling is completed, apply a tack coat to prepared surface. Apply tack coat uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gallon/square yard. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces. Place Hot-Mix Asphalt (HMA) on prepared surface, spread uniformly and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. Spread mix at minimum temperature of 250 deg F. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt paving mat.

Installation Method 2: Grind and compact existing asphalt pavement in place, use previously grinded asphalt pavement (from installation method 1 and 3) to achieve a minimum of 2” total recycled asphalt base and add 3 to 5’’ of asphalt pavement, see table 1 below for specific thickness.

Methodology: Use an asphalt milling machine, as applicable, to grind existing asphalt pavement. Grind and compact materials in place; compact materials to 95% relative compaction (RC). Add additional harvested, crushed asphalt (from installation method 1 and 3), as need, to achieve the required base thickness. Prior to pavement section installation:

A. Verify that subgrade is dry and in suitable condition to begin paving operations.
B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify & remediate soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
C. Proceed with pavement installation only after unsatisfactory conditions have been corrected.

After milling and mauling is completed, install 2'' of recycled in place asphalt and compact to 95% relative compaction (RC). Apply prime coat uniformly over the compacted unbound-aggregate base course at a rate of 0.15 to 0.5 gallon/square yard. Apply enough material to penetrate and seal, but not flood the surface. Allow prime coat to cure. Machine place Hot-Mix Asphalt (HMA) on prepared surface, spread uniformly and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. Spread mix at minimum temperature of 250 deg F. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt paving mat.

Installation Method 3: Removal of the existing asphalt pavement, grind (mill) and store material on site (to be used in installation method 2). Replace pavement section with 3 to 4'' of asphalt pavement over 2 to 5'' of class 2 aggregate base.

Methodology: Use an asphalt milling machine to remove and grind asphalt pavement; haul grinded asphalt pavement to on-site storing location (Maintenance Yard) for future use. If asphalt milling machine use is limited due to road width or clearance, milling can be performed using a skid steer with milling attachment. Prior to pavement section installation:

A. Verify that subgrade is dry and in suitable condition to begin paving operations.
B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify & remediate soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
C. Proceed with pavement installation only after unsatisfactory conditions have been corrected.

After milling and mauling is completed, install Class 2 aggregate base to a thickness equal to 2 to 5'' and compact to 95% relative compaction (RC). If aggregate base is found, the total depth of AB will include both the existing and proposed up to the required depth, per table 1 below. Apply prime coat uniformly over the compacted unbound-aggregate base course at a rate of 0.15 to 0.5 gallon/square yard. Apply enough material to penetrate and seal, but not flood the surface. Allow prime coat to cure. Machine place Hot-Mix Asphalt (HMA) on prepared surface, spread uniformly and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. Spread mix at minimum temperature of 250 deg F. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt paving mat.

	Installation Method 1		Installation Method 2		Installation Method 3	
T.I.	A AC (in)	B No Base (in)	A AC (in)	B Recycled AC Compact in Place (in)	A AC (in)	B AB (in)
4.5	4	0	3	2	3	2
5.5	5.5	0	4.5	2	3	5
6.0	7	0	5	2	4	4

Table 1: Pavement Thickness

Pavement sections used in this narrative are preliminary and will be adjusted once geotechnical information is provided. Pavement sections described in this narrative are based on the following assumptions:

R=40 for native soil
R=78 for Class 2 Aggregate Base
R=75 for Compacted recycle asphalt pavement (used for installation method 2 base)

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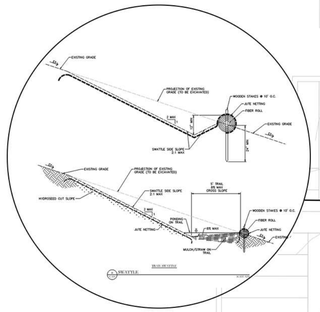
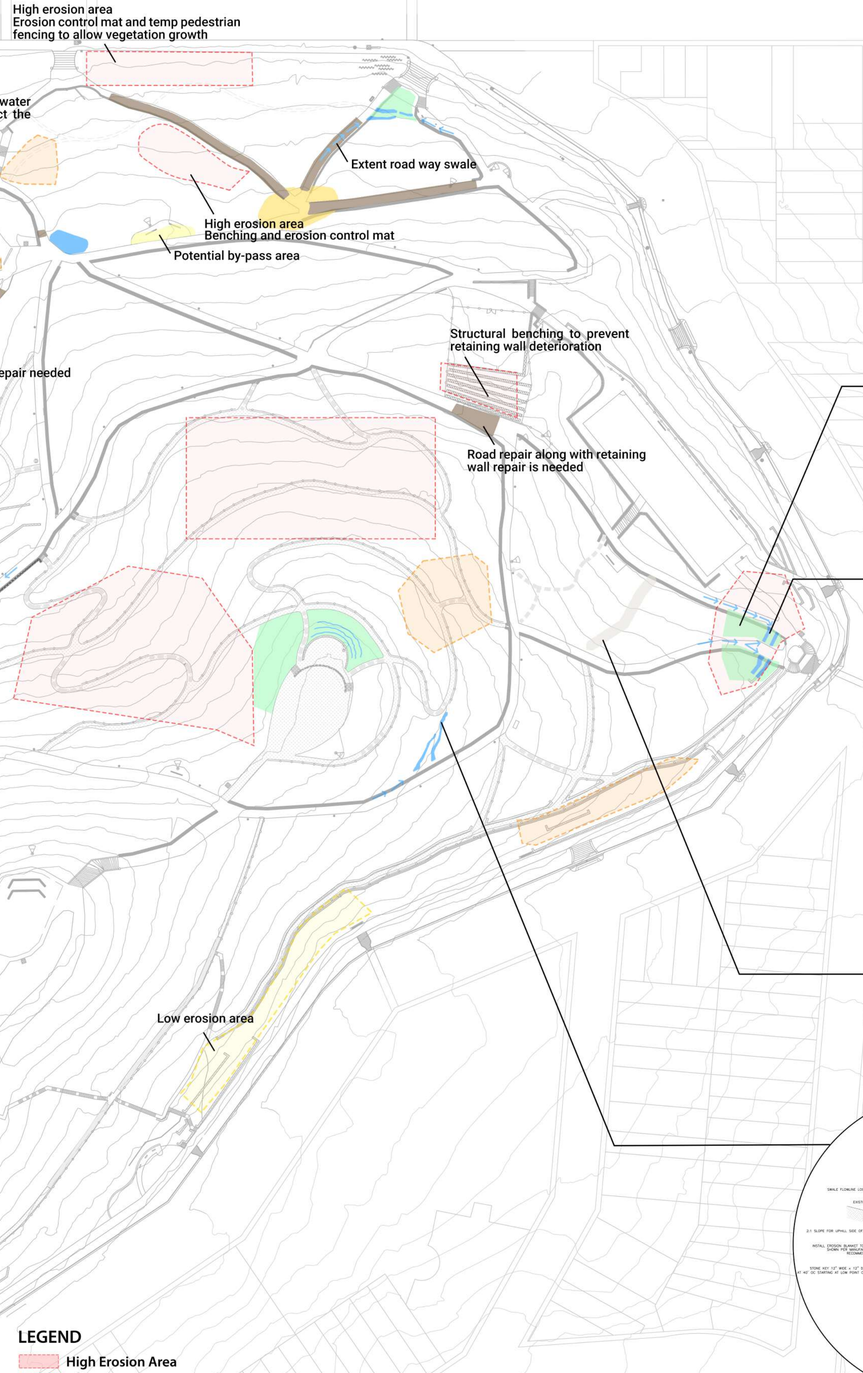


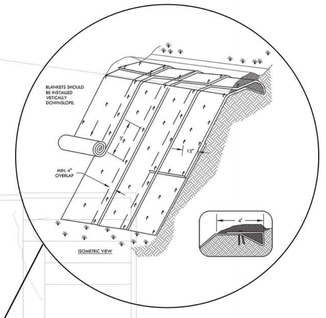
Swattles
Embed biodegradable wattle in swale to manage run-off and slow down stormwater flows.

Asphalt Pavement Repair
Asphalt pavement reseal with localized, grind and overlay.

Road Widen
Increase road area for emergency and maintenance vehicle turn around.

Rain Garden
Direct stormwater run-off from hardscape to vegetated area to slow down flows, improve water quality and encourage infiltration.

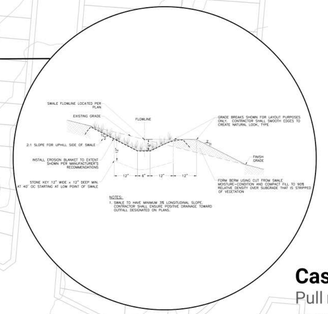




Erosion Control Blanket
Use biodegradable erosion control blanket in high erosion areas to stabilize hillside and establish vegetation.

Inline Swale
Use surface conveyance for stormwater flows.

Rock Check Dam on Steep Slopes/ Channels
Use intermediary rock check dams to reduce water flow velocity and mitigate erosion.



Cascading Berm
Pull runoff off the path intermittently and direct it into cascading berm micro-treatments that aesthetically blend in with the natural environmental and mimic natural storm water patterns.

LEGEND
- High Erosion Area
- Medium Erosion Area
- Low Erosion Area
- Erosion Control Blanket
- Potential Road Widen Area
- Asphalt Pavement Repair
- Rain Garden/ Inline Swale/ Cascading Berm
- Infiltration Basin

SHERWOOD DESIGN ENGINEERS

9.6 - habitat ecologist report

Habitat Potential Management Concepts for Buena Vista Park

Prepared by Josiah M.T. Clark, Consulting Ecologist, For Miller Company Landscape Architects, April 2019

Introduction: Buena Vista Park contains remnant native flora and fauna that predate the creation of this park, the oldest in all of San Francisco. Parts of the park contain Coast Live Oak woodlands and other native plant communities. These are recognized as significant by the San Francisco Natural Areas Division of SFRPD and receive special care and protection.

Birds, pollinators and other wildlife that are dependent on native plant communities are the fauna requiring the most attention and protection during renovations. These are the most significant and "important" native species with the fewest alternate habitats and thus have the most to lose. Everywhere possible, these specific native plant assemblages should be mimicked to maximize breeding habitats for native fauna.

Serving as a breeding area is the most important role any park can serve for wildlife. Many of the bird species in the park are widespread generalists or edge specialists, and utilize non-native trees and plants, much as they do in every other park around the city. In all at least 33 species of native birds are known to have nested at Buena Vista Park, with the mantra to preserve "the last of the least and best of the rest" defining the hierarchy of needs for birds and avian habitat. An additional 20 species use the park annually during winter and migration.

Habitat Opportunities: This park features an isolated peak flanked by green space, and has a wide range of exposures, soil types, hydrology and topographic variation. These abiotic factors create conditions that can support at least five overlapping native plant communities: Coast Live Oak Woodlands, Bluff scrub, Dune Scrub, Upland Dune and Riparian scrub. Using "Reference Sites" from other successful restoration efforts around the San Francisco and the Presidio will help to ensure success and maximize ecosystem function.

Sand is an especially noteworthy and underutilized resource at this location. Ideal conditions for establishing native dune associated plants can be achieved by exposing old, clean sand and burying more developed, weedy soils, through "sand inversion" practices. Using sand as at least a top dressing/mulch in planting areas will greatly reduce invasive weeds during the establishment of native plants.

Native pollinators favor these exposed sandy conditions, as found by Professor John Hafernik during San Francisco State's Bee Study in the Presidio, where 56 species were observed on native plants in sandy areas. Approximately 30% of all human food crops are dependent on insect pollinators.

Interpretive signage, volunteer programs, bird boxes to replace lost nesting cavities and nature trails are other relevant habitat opportunities. Historic gravestones placed here from cemetaries are a historic element that should also be interpreted and not overlooked.

Habitat Challenges:

Illegal encampments, drug use and violence have long plagued neighbors and visitors around this large, wooded area for decades. Specialized measure must be factored in to any future management of the park to protect habitat and human visitors alike. Utilizing nightly sprinklers, thorny vegetation, the steepest slopes and creating uneven terrain embedded with rocks are methods to discourage illegal encampments and loitering in problem areas.

"The hardest part of healing the Earth is getting permission". Neighbors, dog walkers and tree advocacy groups are likely the biggest challenges in realizing meaningful ecosystem function in this or any other park. Almost any physical challenge in the landscape is easier to overcome than human opposition.

Habitat simplification, destruction, fragmentation and intrusion by increased visitation are very real threats to existing wildlife during large-scale renovations of any urban park. Thoughtful preventative measures can mitigate these impacts, especially during the installation phase when these impacts will be most intense and apparent.

2) , Buena Vista Park Landscape and Habitat Conditions: Opportunities, Challenges and Recommendations November 2019 Observations and Recommendations by Josiah Clark, Consulting Ecologist Josiah.clark621@gmail.com (415)317-3978

Conditions types:

1) Dry Shade: Areas under significant tree canopy with hydrophobic sandy soils and sparse groundcover vegetation. Under the surface thick root networks from nearby trees occupy much of the available space in the soil profile in their quest for to absorb sparse resources. These areas are currently a monoculture of invasive *Erharta erecta* grDryLow ass or are bare soil. Thicker grass growth indicates better planting conditions that will require less soil preparation. While access is easy, these areas will be some of the more challenging planting and establishment conditions with a small palette of native species to choose from.

   Treatment: Any plantings in these areas will require preparation with soil amendments, soil aeration and supplemental water during establishment and subsequent dry seasons. "Spot amendments" for plantings could entail digging a deep narrow hole, clearing roots, backfilling with water retaining soil and using hardy, well rooted nursery stock. Creating planting "basins" built to last out of heavy soils or pathway fines will increase water catchment and absorption. Build-up of downed pine and cypress needles reduce the vigor of plantings and in time will kill plants, so should be removed periodically.

   The following treatments can be applied to all the following conditions except for sandy areas and lawns:
   Using a thick layer of wood chips or mulch at the surface around plantings will help retain moisture and shade the soil. Additions of large woody debris or half buried logs will help to retain soil moisture, provide refuge for small animals and add structure to an otherwise uniform condition. Logs and terraces of smaller woody debris will help slow erosion and provide hiding areas for sparrows and other songbirds.

   With shallow creeping roots, these plants survive on resources present in the thin layer of topsoil.

Creeping Wild Rye	California Blackberry
Woodland Strawberry	Miner's Lettuce

2) Moist Shade: Under significant tree canopy with more water retaining organic matter in the soil, fog drip and overhead irrigation in places. With more available water and nutrients there is significantly more flora and fauna diversity in the ground cover and the potential for understory trees and shrubs. Plants in this condition produce more blossoms, fruit and resources for wildlife than in drier areas of the park.
   Currently these areas are dominated by assemblages of Algerian Ivy (*Hedera helix*), Cape Ivy (*Delairea odorata*), Himalayan Blackberry (*Rubus armeniacus*), California Blackberry (*Rubus parviflorus*) (a native which should remain) and Mattress Wireweed (*Muelhenbeckia complexa*). Initial access and preparations for plantings where possible will take some time, but conditions for establishment should be good and the plant options are many.

   Treatment: Plantings here will require clearing invasive vegetation and roots by hand to make way for new young plants. Follow up weeding will be necessary and in steeper areas erosion control measures will need to be employed. Phased removal and sequenced installations of plantings is recommended over a few years, so as to maintain refuges and populations of resident fauna as improved habitat develops in planting areas. Weeding out invasive ivy and blackberry seedlings brought by birds will be an ongoing effort for it not to revert back to a monoculture.

   Mimicking the understory present in Mixed Coniferous woodland plant communities, these plants will fill in and produce a diversity of attractive blossoms and resources for local wildlife throughout the year.

California Blackberry	Douglas Iris
Snowberry	Woodland Strawberry
Oso berry	Yerba Buena
Ocean Spray	Creeping wild Rye
California Hazelnut	California Fescue
Red Elderberry	Nutka Reed Grass
Flowering Currant	Sword Fern
Toyon	Creeping Honeysuckle
Coffeeberry	Ceonothus spp.

Condition Types continued

3) Steep, moist, heavily vegetated slopes: The most impenetrable parts of the park are on steep, often cliff-like slopes above paths and retaining walls. They appear to get significant moisture, often in the form of runoff from paved pathways above. Most have scattered trees but they are dominated by dense tangles of Himalayan Blackberry and Algerian Ivy, making them difficult to traverse and access. They are also very important foraging areas and refugia for birds, pollinators and other wildlife.
Initial preparation work will be difficult and require significant thought to minimize erosion and impacts to wildlife onsite. Subsequent plantings should experience good establishment conditions, though follow up weeding need to happen regularly until plantings mature and intermittently after that. Erosion control measures will also require regular monitoring and upkeep during the establishment period.

Treatment: The steep terrain and thick vegetation make access to these areas especially challenging. Removal of the surface vegetation can happen quickly with the use of a reciprocating hedger and hand tools. Leaving a thick strip of vegetation at the top and bottom edges of the site during initial stages will reduce erosion, public entry and visual impacts. Root networks from Algerian Ivy and root balls from Himalayan Blackberry will need to be dug out carefully to minimize soil disturbance.
Jute netting, straw waddles and bundles of twigs from elsewhere onsite can be secured laterally to the slopes to slow runoff and minimize erosion. Planting behind waddles and into basins will prevent roots from being undermined on the steep slopes. Arroyo willows have already sprung up in this condition here, and more should be planted for their outstanding habitat value and their ability to stabilize the base of slopes.

Plants from the Riparian Scrub plant community are adapted to these moist, steep conditions. They will function to resist erosion and their tumbling nature makes them aesthetically pleasing when grown from steep areas above.

California Blackberry	Arroyo Will
Thimbleberry	Creeping Wild Rye
Red Elderberry	California Bee Plant
Blue Elderberry	Mugwart
Twinberry	Ceonothus thrysiflorus
Flowering currant	Woodland Strawberry
Ocean Spray	Creeping Honeysuckle

4)

Open areas with exposed sand: Some of the most barren, plant poor areas in the park are on loose, exposed sand. These areas are very warm and dry on the surface, but surprisingly moisture is usually present just a foot or so down. Foot traffic accelerates the shifting nature of the sandy substrate making plant survival difficult. The nutrient poor, sterile qualities of the sand mean that invasive weeds are at a disadvantage, and there are generally fewer weeds in these areas. In contrast dune adapted native plants can thrive in this condition with thoughtful contouring, grading and trail routing. Mounds like this are among the richest havens for specialized pollinating insects, which burrow and bask in the warm sand and forage for nectar on the plants.

Treatment:
Gather and move loose sand from trails and low-lying areas where it gathers and pile it up on nearby open areas for planting. The sand will serve as a mulch, keeping down invasive weeds while enhancing specialized native processes. On a small to medium scale, this sand movement can be done efficiently with the use of hand tools and a wheelbarrow. Where accessible, this could also be done using a small excavator. Layering sand on top of more developed soils will yield faster growth and more robust plants. Low lying paths with pathway materials to encourage trail use. Stabilizing the edges of paths in sandy areas will minimize sand loss in the future.

The following native plants from the Dune Scrub plant community are adapted to full exposure and thrive in sand. These plants are also important nectar sources and some are larval food plants for native butterflies.

Pacific Dune Grass	Beach Sagewart
Dune Strawberry	Mock Heather
Seaside Daisy	Lizardtail
California Poppy	Coyote Brush (Prostrate)
Coast Buckwheat	Sticky monkey flower
Dune knotweed	Yellow Bush lupine

5) Oak Woodlands: The most significant natural resources in the park are the stands of Coast Live Oak Woodland and have been recognized as such by the Natural Resources Division of SFRPD. (Contrary to what was written elsewhere recently, there are no Scrub Oaks at this park nor anywhere in SF as confirmed recently by Natural Resources staff.) Most of the designated Natural Areas will not be touched during renovations at the park. There are many places however where invasive plants, especially Algerian Ivy have dominated the understory and begun to climb up the trees. In other areas erosion threatens to undermine roots.

Treatment: Removing Ivy that is climbing up oaks is the fastest, easiest way to improve conditions for them in the short term. Removing Ivy roots from the base of oak trees will stop ivy runners from getting into the canopy in the future. The best way to get rid of large mats of Ivy will be a crew of people working in line to remove surface vegetation with a rake-like tool called a debris hook and then cut loose with a reciprocating hedger. Root networks will also need to be chased down and pulled out, being careful not to disturb oak roots. In some areas laying down woodchips around the base of the trees can reduce the impact of compacted soil caused by foot traffic. Where appropriate oak associated native plantings can be used to diversify and enhance the understory, but will likely need to be enclosed with fencing so as not to get trampled.

The Oak Woodlands of Golden Gate Park serves as a good reference site as to the plants that do well in this condition.

California Blackberry	Woodland Strawberry
Coffeeberry	Mugwart
Creeping Honeysuckle	California Fescue
Snowberry	Yerba Buena
Douglas Iris	California Bee Plant

6) Summit: This most exposed condition receives full sun and wind from all sides. In places trees are obstructing the wind and light, making conditions less harsh. Soil types around the summit are a mix of imported top soil, worn mineral based soils and sand. Currently landscapes at the summit are comprised of lawn, side gardens and plantings at the forest edge. Like other hilltops in San the summit here is an important migration reorienting spot for migratory birds and butterflies. The lawn condition means there is a significant A leaking sprinkler head has inadvertently become an important water source to local wildlife, which readily come down to drink in this otherwise dry condition.

Treatment: Remove tallest growth around summit, as much as is allowed to restore the classic "hilltop park" condition present in many of the city's most iconic parks. This will not only improve views of the city and surrounding lands, but also views of local and migratory wildlife. The moist, irrigated condition in the lawn would allow for the presence of a ring of White Alders (*Alnus alba*) or some other riparian tree, which are magnets for migratory birds.
Enhance side planting areas with species that provide specific resources for wildlife including pollinator plants, larval food for butterflies and berries for birds during the various seasons. Additions of various substrates including small mounds sand, patches of pathway fines and clusters of boulders will create micro-habitats used by burrowing and pollinating insects.
Diversifying the forest edge with native food shrubs will provide habitat and forage for wildlife. Even a small water source here would be an outstanding offering for the many migrant species that use the summit each migration. This could be achieved by focusing runoff from the lawn into concave hardscaped features or diverting water from an existing quick coupler head.

Shrubs, subshrubs and wildflowers from Coastal Scrub and grassland plant communities will do well here in planting areas with supplemental water.

Coast Buckwheat	Coffeeberry
California Aster	Ceonothus spp.
Seaside Daisy	Blue Elderberry
California Phacelia	California Sagebrush
Yarrow	Coyote brush
California Poppy	Sticky monkey flower
Lupine sp. (yellow, bicolored, Formosa)	Toyon
Deerweed	California Blackberry

7) Low spots with runoff: Areas that receive excess run off are present below pathways, roads and hardscaped surfaces in various areas around the park. Water can be directed to concentrate in "rain garden" type features that will allow water to absorb into the land naturally, contributing to the local hydrology while taking pressure off of city rain gutters and plumbing infrastructure. These areas will be seasonally wet and will receive massive amounts of water during big downpours. Plants will need to be hardy and can function to actually strain debris out of the water, much like baleen in a whale's mouth. During the summer these areas will get very dry, so plants here have to be specialized to deal with a wide range of conditions throughout the year.

   Treatment: Low spots appropriate for rain gardens should be identified as the planting condition does not exist here yet and needs to be developed. Hardscapes that focus water into French drain style basins could be armored with attractive boulders and gravel and then funneled into buried perforated pipes in the landscapes. Ideally these would function to direct more water underground where it can seep in, benefit the vegetation and recharge the local aquafer.

   Plants in this group are from seasonally flooded wetlands so are tough and deeply rooted, good for erosion control and overwintering habitat for pollinators

Blue Rush (*Juncus pattens*)	Marsh Cinquefoil
Basket sedge	California Hemp
Twinberry	Cow Parsnips

8) Planting beds and enclosures: Recommendations for planting beds are present in the summit section.

9.7 - recommended planting list

Dry Shade plants

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
Creeping Wild Rye	Leymus triticoides	x	x	x	Beneficial insect plant, soil-retaiing rhizome network. Excellent for erosion control.
California blackberry	Rubus ursinus	x	x	x	Good for dry shade.
Woodland Strawberry	Fragaria vesca	x	x	x	Good for sandy soils, bird and butterfly garden.
Evergreen currant	Ribes viburnifolium	x	x	x	Attracts insects and butterflies, including monarchs.
Beach Knotweed	Polygonum paronychia	x		x	Attracts bees.
Coffeeberry (lower growing)	Frangula californica 'Mound San Bruno'	x	x	x	Very low water needs.
Evergreen huckleberry	Vaccinium ovatum	x	x	x	Songbirds and mammals eat berries.

Moist Shade Plants

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
California Blackberry	Rubus ursinus	x	x	x	Widely used as a food source for wildlife, prickly branches.
Snowberry	Symphoricarpos albus	x		x	Tolerance of poor soil, low light, and neglect, Flowers attracts hummingbirds
Oso Berry	Oemleria cerasiformis	x		x	Flowers attract birds
Ocean Spray	Holodiscus discolor	x	x	x	Great for butterflies and birds.
California Hazelnut	Corylus cornuta californica	x	x	x	good for slopes
Red elderberry	Sambucus racemosa	x	x	x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Blue elderberry	Sambucus nigra ssp. caerulea	x	x	x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Toyon	Heteromeles arbutifolia	x	x	x	Flowers attract birds and insects.
Coffeeberry	Frangula californica	x	x	x	Flowers attract many benficial insects and butterflies. Birds and mammals relish the berries
Douglas Iris	Iris douglasiana	x		x	Does great in rainwater runoffs.
Woodland Strawberry	Fragaria vesca	x	x	x	good for sandy soils.
Yerba Buena	Clinopodium douglasii			x	good understory plants associated with Oak.
Creeping wild rye	Leymus triticoides	x	x	x	Beneficial insect plant, soil-retaiing rhizome network
California fescue	Festuca caliofornica	x	x	x	good under oaks. Seeds are large and plentiful and food for numerous creatures.
Nutka Reed Grass	Calamagrostis nutkaensis		x	x	A coastal bunch grass that can grow in sand dunes, wetlands, and woodlands.
Western Sword Fern	Polystichum munitum		x	x	Good for hillside slopes and as understory plants.
California honeysuckle	Lonicera hispidula	x	x	x	Use as bank filler or groundcover. Attractive to bees and hummingbirds.
Ceanothus	Ceanothus spp.	x	x	x	grows well on slopes, attracts pollinators and birds
Evergreen huckleberry	Vaccinium ovatum	x	x	x	Handsome evergreen shrub native to moist forests. Fruits atrract wildlife.
Rhododendron occidentale	Western Azalea	x		x	Deciduous with beautiful flowers. Attracts butterflies, hummingbirds and birds.
Flowering currant	Ribes sanguineum, Ribes spp.	x		x	Insects including bees, and hummingbirds attracted to flowers. Berries attract birds.
Salal	Gautheria shallon	x	x	x	Grows under redwoods and great in shade. Tolerates sand. Attracts butterflies, and birds.

Steep, Moist, Heavily Vegetated slopes

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
California blackberry	Rubus ursinus	x	x	x	Widely used as a food source for wildlife, lower growing than Himalayan blackberry.
Thimbleberry	Rubus parviflorus	x	x	x	Berries attract birds.
Red elderberry	Sambucus racemosa	x	x	x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Blue elderberry	Sambucus nigra ssp. caerulea	x		x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Twinberry	Lonicera involucrata	x		x	Good for wet meadows and raingardens. Berries attracts birds.

Flowering currant	Ribes sanguineum	x		x	Attracts birds and butterflies.
Ocean Spray	Holodiscus discolor	x	x	x	Noticeable scent is very sweet and agreeable.
Arroyo willow	Salix lasiolepis	x	x	x	Flowers catkins are important for many insects and birds. Grows in marshes and wet areas.
Creeping Wild Rye	Leymus triticoides	x		x	Beneficial insect plant, soil-retaiing rhizome network. Excellent for erosion control.
California Bee Plant	Schropularia californica	x	x	x	Flowers attract CA native bees and hummingbirds, leaves host buckeye and checkerspot butterflies.
Sticky monkey flower	Mimulus auriantacus	x		x	hosts several insects species, attracts bees, butterflies, hummingbirds, birds
Low blue blossom	Ceanothus thyrsiflorus	x	x	x	Good for bank stabilization. Bird, butterfly and bee garden.
Dune strawberry	Fragaria chiloensis	x	x	x	Bird and butterfly garden. Ideal sand binding groundcover.
Woodland strawberry	Fragaria vesca	x	x	x	Bird and butterfly garden.
California honeysuckle	Lonicera hispidula	x	x	x	Use as bank filler or groundcover. Attractive to bees and hummingbirds.
Toyon	Heteromeles arbutifolia	x	x	x	Flowers attract birds and insects. Berries attract birds and coyotes.
Garrya elliptica	Coast silktassel	x		x	Attracts birds, butteflies, bees and beneficial insects.
Evergreen huckleberry	Vaccinium ovatum	x	x	x	Handsome evergreen shrub native to moist forests. Fruits atrract wildlife.
Flowering currant	Ribes sanguineum, Ribes spp.	x		x	Insects including bees, and hummingbirds attracted to flowers. Berries attract birds.

Open Areas with Exposed Sand

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
Pacific Dune Grass	Leymus mollis	x	x	x	Grows in dunes. It can be important part of dune ecology. Attracts butterflies and moths.
Dune strawberry	Fragaria chiloensis	x	x	x	Bird and butterfly garden. Ideal sand binding groundcover.
Seaside Daisy	Erigeron glaucus	x	x	x	Attracts butterflies, bees, insects
Coast buckwheat	Eriogonum latifolium	x	x	x	Attracts butterflies, bees, insects, provides habitat for birds.
California poppy	Eschscholzia californica	x		x	Attracts butterflies, bees, insects, thrives on slopes.
Beach knotweed	Polygonum paronychia	x	x	x	Low mat forming plant related to Buckwheats. Makes dense groundcover.
Beach sagewort	Artemisia pycnocephala	x	x	x	Various insects attracted to the plant. Nesting bees utilize the plant.
Mock heather	Ericameria ericoides	x	x	x	Great for sandy seaside conditions.
Lizard's tail	Eriophyllum staechadifolium	x		x	Attracts butterflies, bees, insects.
Coyote brush - prostate form	Baccharis pilularis	x	x	x	Attracts various insects and native skippers.
Sticky monkey flower	Mimulus auriantacus	x		x	hosts several insects species, attracts bees, butterflies, hummingbirds, birds.
Yellow bush Lupine	Lupinus arboreus	x		x	attracts butterflies, bees, hummingbirds.
Silver Dune Lupine	Lupinus chamissonis	x		x	attracts butterflies, bees, hummingbirds, great in dunes/sand.
Dune Goldenrod	Solidago spathulata	x		x	Attracts native bees, honey bees, beneficial insects and butterflies, including monarchs.
Flannel bush	Fremontodendron californicum	x		x	Tolerates serpentine soil.
California sage bush	Artemesia californica ('Canyon Gray')	x	x	x	Great for bank stabilization. Good for Bee garden.

Summit and Perimeter Apron

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
Coast buckwheat	Eriogonum latifolium	x	x	x	attracts butterflies, bees, insects, provides habitat for birds
Coast buckwheat	Eriogonum spp. (CA native)	x	x	x	Important food sources for pollinators.
John Dourley Manzanita	Arctostaphlos 'John Dourley'	x	x	x	fast growing and performe well in other SF parks
California aster	Symphyritrucum chilense	x		x	host plant for several butterflies, attracts several insects species
Seaside Daisy	Erigeron glaucus	x	x	x	attracts butterflies, bees, insects
California phacelia	Phacelia californica	x		x	attracts beneficial insects

Yarrow	Achillea millefolium	x		x	attracts butterflies
California poppy	Eschscholzia californica	x		x	attracts butterflies, bees, insects, thrives on slopes
Lupine species	Lupinus spp	x		x	attracts butterflies, hummingbirds
Goldenrod	Solidago spp.	x		x	Attracts native bees, honey bees, beneficial insects and butterflies, including monarchs.
Deerweed	Acmispon glaber	x		x	good on slopes, provides intake for larvae butterflies bees and deer
Ceanothus spp.	Ceanothus spp.	x	x	x	Flowers are good food sources for pollinators.
California sagebrush	Artemisia californica	x	x	x	Attracts quails, birds, other animals
Coyote brush	Baccharis pilularis 'twin peaks'/'pigeon point'	x	x	x	Attracts various insects and native skippers.
Sticky monkey flower	Mimulus aurantiacus	x		x	hosts several insects species, attracts bees, butterflies, hummingbirds, birds
Toyon	Heteromeles arbutifolia	x	x	x	Flowers attract birds and insects. Berries attract birds and coyotes.
Milkweed	Asclepias fascicularis	x		x	hosts larval species of butteflies, attracts pollinators,
Indian Mallow	Abutilon palmeri	x			Supports Butterflies and other pollinators.
Cleveland Sage	Salvia clevelandii	x		x	Hummingbirds are very attracted to this plant.
Hummingbird Sage	Salvia spathecea	x		x	Attracts butterflies, bees, and hummingbirds. Does well in shade and under oaks.
Black Sage	Salvia millifera	x		x	The plant flowers are important food sources for butterflies and humming birds. Can grow in various soils.
Sonoma Sage	Salvia sonomensis	x	x	x	Groundcover and great for a bird garden.
Blueblossom	Ceanothus thryrsiflorus	x		x	Good for bank stabilization. Bird, butterfly and bee garden.
California Buckeye	Aesculus calfiornica	x		x	Not for perimeter apron
Catalina Ironwood	Lyonothamnus floribundus ssp. Aslpenifolius	x		x	Not for perimeter apron
Western Redubud	Cercis occidentalis	x		x	Not for perimeter apron
Big Leaf Maple	Acer macrophyllum	x		x	Not for perimeter apron
Hollyleaf Cherry	Prunus ilicifolia	x		x	Not for perimeter apron
Black Elderberry	Sambucus nigra	x			Not for perimeter apron

Oak Woodlands

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
California blackberry	Rubus ursinus	x	x	x	Good for dry shade.
Coffeeberry	Frangula californica	x	x	x	Flowers attract many benficial insects and butterflies. Birds and mammals relish the berries
Toyon	Heteromeles arbutifolia	x	x	x	Flowers attract birds and insects. Berries attract birds and coyotes.
Ocean Spray	Holodiscus discolor	x	x	x	Great for butterflies and birds.
California honeysuckle	Lonicera hispidula	x	x	x	Grows in oak woodlands. Attractive to bees and hummingbirds.
Snowberry	Symphoricarpos albus	x		x	tolerance of poor soil, low light, and neglect
Western Sword Fern	Polystichum munitum		x	x	Good for hillside slopes and as understory plants.
Douglas Iris	Iris douglasiana	x		x	Does great in rainwater runoffs.
Dune Strawberry	Fragaria chiloensis	x	x	x	Bird and butterfly garden. Ideal sand binding groundcover.
California sage bush	Artemesia californica ('Canyon Gray')	x	x	x	Great for bank stabilization. Good for Bee garden.
California fescue	Festuca caliofornica	x	x	x	Good under oaks. Seeds are large and plentiful and food for numerous creatures.
Yerba Buena	Clinopodium douglasii	x		x	Leaves and flowers have lovely fragrance and are both edible. Supports butterflies and mot
California Bee Plant	Schropularia californica	x	x	x	Flowers attract CA native bees and hummingbirds, leaves host buckeye and checkerspot butterflies.
Manzanita	Arctostaphylos 'Pacific Mist'	x	x	x	Broadly spreading shrub, eventually forming a good dense groundcover.
Coastal woodfern	Dryopteris arguta	x		x	Coastal wood fern. Grows in oak woodlands. Supports butterflies and moths.

Snowball	Ceanothus rigidus 'Snowball"	x	x	x	thorny leaves, mounding shrub 3' tall
Island Alum Root	Heuchera maxima	x		x	Performs best in coastal gardens. Hummingbirds love the flowers.
hummingbird Sage	Salvia spathecea	x		x	Attracts butterflies, bees, and hummingbirds. Does well in shade and under oaks.
Red elderberry	Sambucus racemosa	x	x	x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Blue elderberry	Sambucus nigra ssp. cerulea	x		x	great for hummingbirds, butterflies, fruits attract birds
Ribes speciosum	Ribes speciosum	x		x	Good companion for coast live oaks, scrub oaks. Suports, bird, small mammals and humming birds.

Low spots with runoff

Common name	Latin name	Pollinator/ Habitat	Erosion	CA Native	
California Gray Rush	Juncus patens	x		x	Yellow collared Scape Moth and other moths and marble
Basket sedge	Carex barbarae	x	x	x	CA native sedge. Supports moths and butterflies.
Twinberry honeysuckle	Lonicera involucrata	x		x	Attracts hummingbirds and birds feed on the fruit
Marsh Cinquefoil	Comarum palustre	x		x	Grows in marshy riveresides and stream margins. Prefers peat soil, but can grow in moist sandy soil.
Cow parsnips	Heracleum lanatum	x		x	A Pacific coast native with large bold leaves and white flat topped flowers which are good nectars for lots of beneficial insects.
Western Columbine	Aquilegia formosa	x		x	Flower attracts hummingbirds. Seeds are relished by small birds such as Juncos and Sparro
Blue WildRye	Elymus glaucus	x		x	Attracts various insects especially bees and butterflies.
Clustered Field Sedge	Carex praegracilis	x		x	Grows in wet and seasonally wet environments. Supports butterflies and moths.
Douglas Iris	Iris douglasiana	x		x	Does great in rainwater runoffs.
Sticky monkey flower	Mimulus aurantiacus	x		x	Hosts several insects species, attracts bees, butterflies, hummingbirds, birds
Wild Ginger	Asarum caudatum				An excellent groundcover along coast in part shade or redwood garden.
Western Sword Fern	Polystichum munitum		x	x	Good for hillside slopes and as understory plants.
California blackberry	Rubus ursinus	x	x	x	Good for dry shade.
Arroyo willow	Salix lasiolepis	x	x	x	Flowers catkins are important for many insects and birds. Grows in marshes and wet areas.
Blue elderberry	Sambucus nigra ssp. caerulea	x	x	x	Great for hummingbirds, butterflies, bees. Fruits attract birds
Hummingbird Sage	Salvia spathecea	x		x	Attracts butterflies, bees, and hummingbirds. Does well in shade and under oaks.