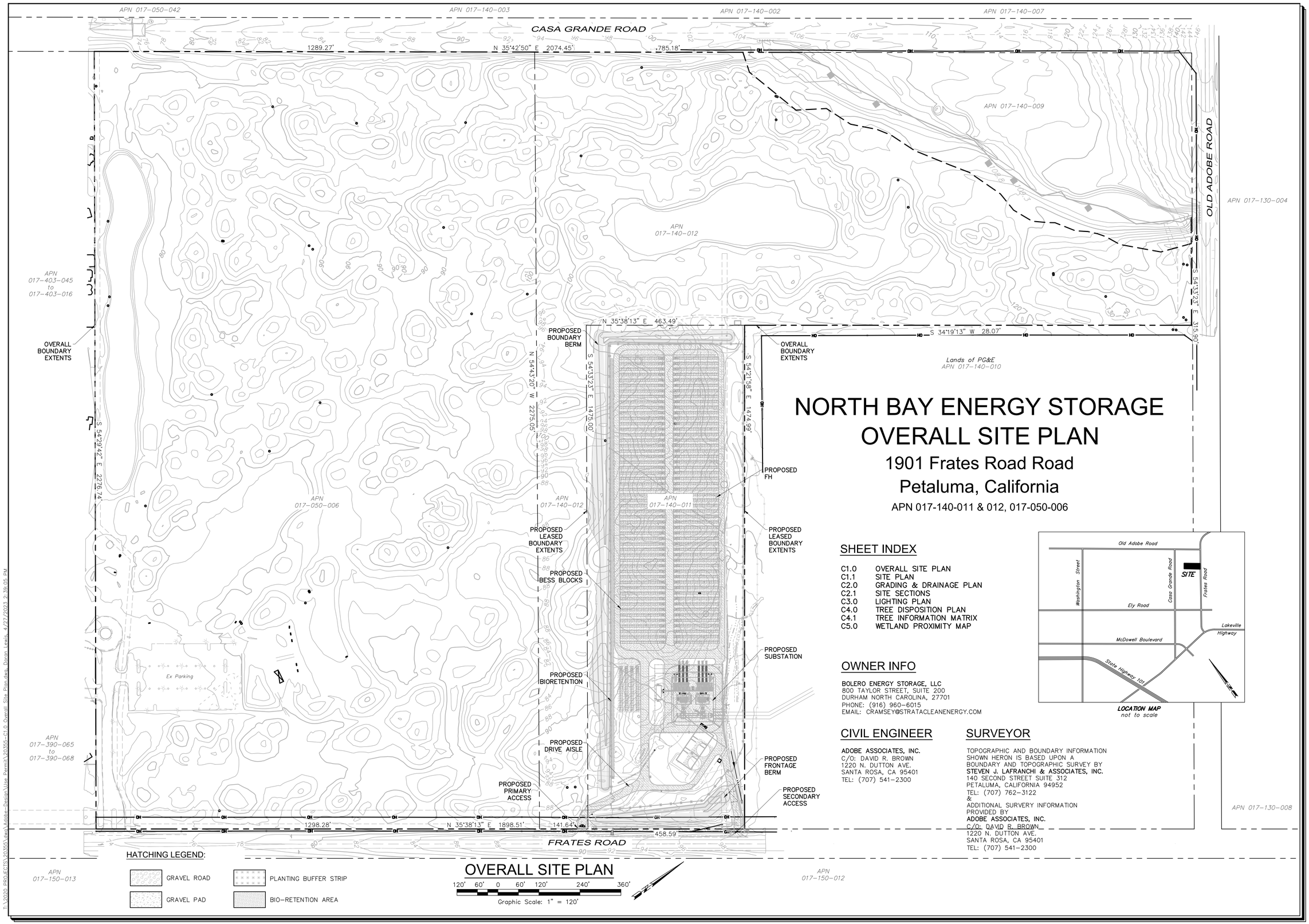

NORTH BAY ENERGY STORAGE
OVERALL SITE PLAN

1901 Frates Road Road
Petaluma, California

APN 017-140-011 & 012, 017-050-006

SHEET INDEX

LOCATION MAP
not to scale

OWNER INFO

BOLERO ENERGY STORAGE, LLC
800 TAYLOR STREET, SUITE 200
DURHAM NORTH CAROLINA, 27701
PHONE: (916) 960-6015
EMAIL: CRAMSEY@STRATACLEANENERGY.COM

CIVIL ENGINEER

ADOBE ASSOCIATES, INC.
C/O: DAVID R. BROWN
1220 N. DUTTON AVE.
SANTA ROSA, CA 95401
TEL: (707) 541-2300

SURVEYOR

TOPOGRAPHIC AND BOUNDARY INFORMATION SHOWN HERON IS BASED UPON A BOUNDARY AND TOPOGRAPHIC SURVEY BY
STEVEN J. LAFRANCHI & ASSOCIATES, INC.
140 SECOND STREET SUITE 312
PETALUMA, CALIFORNIA 94952
TEL: (707) 762-3122
&
ADDITIONAL SURVERY INFORMATION PROVIDED BY
ADOBE ASSOCIATES, INC.
C/O: DAVID R. BROWN
1220 N. DUTTON AVE.
SANTA ROSA, CA 95401
TEL: (707) 541-2300

HATCHING LEGEND:

GRAVEL ROAD
GRAVEL PAD
PLANTING BUFFER STRIP
BIO-RETENTION AREA

OVERALL SITE PLAN
120' 60' 0 60' 120' 240' 360'
Graphic Scale: 1" = 120'

Revisions			
No.	Date	Description	Approved

adobe associates, inc.
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1220 N. Dutton Ave., Santa Rosa, CA 95401
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Preliminary

David R. Brown, RCE 41833
My license expires 3/31/2024

REGISTERED PROFESSIONAL ENGINEER DAVID R. BROWN No. 41833 Exp.3/31/2024 CIVIL STATE OF CALIFORNIA

NORTH BAY ENERGY STORAGE
OVERALL SITE PLAN
1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

SCALE: AS SHOWN
Date: April 27th, 2023
Design by: DL, ZR
Drawn by: DL
Checked by: DRB

Sheet
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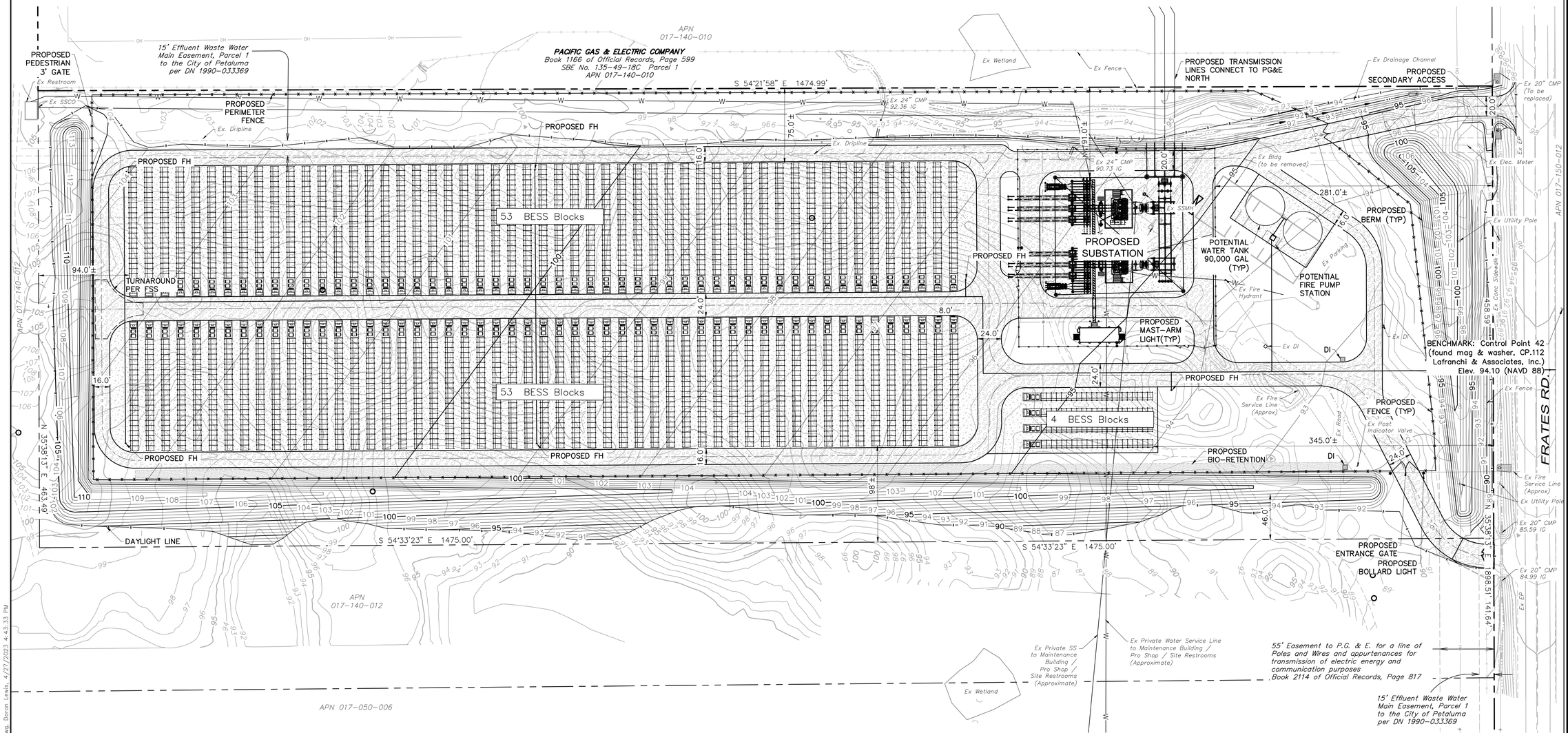
1 of 8 Sheets
Job 20355



SITE PLAN

50' 25' 0 25' 50' 100' 150'

Graphic Scale: 1" = 50'

HATCHING LEGEND:

- GRAVEL ROAD
- GRAVEL PAD
- PLANTING BUFFER STRIP
- BIO-RETENTION AREA

BATTERY ENERGY STORAGE SYSTEM:

TOTAL BESS Blocks:	110
TOTAL PCS UNITS:	110
TOTAL BATTERY SEGMENTS:	2,420

NOTE:

UTILITIES SHOWN HEREON WERE LOCATED BY: DUDEK AUGUST, 2022

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		Revisions	

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NORTH BAY ENERGY STORAGE

SITE PLAN

1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

SCALE: AS SHOWN
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Sheet
C1.1

2 of 8 Sheets
Job 20355

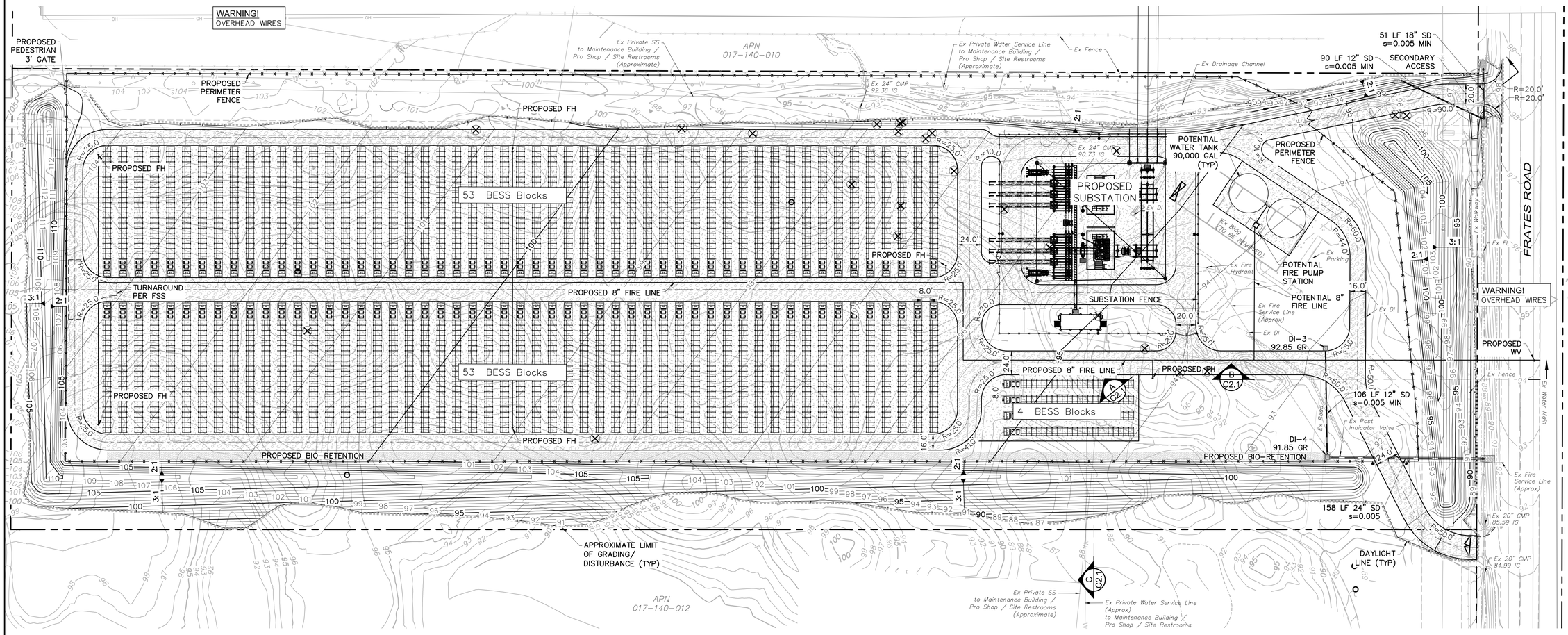
GRADING QUANTITIES:

Site Grading is based upon subgrade to existing grade. No account has been taken for strippings, expansion or contraction. Volumes should be verified and determined independently by the contractor.

CUT	FILL	TOTAL	BASE ROCK
41,858 CY	40,500 CY	1,358 CY (CUT)	8,000 CY (FILL)

Note:
Excess material to be off-hauled to an approved location or placed onsite under the direction of the project Solis Engineer. Earth materials placed onsite not shown on these plans may require revisions(s) to the grading permit.

Area of Disturbance = 13.52 Acres



GRADING, DRAINAGE & UTILITY PLAN

50' 25' 0 25' 50' 100' 150'

Graphic Scale: 1" = 50'

HATCHING LEGEND:

- GRAVEL ROAD
- GRAVEL PAD
- PLANTING BUFFER STRIP
- BIO-RETENTION AREA

DEMOLITION LEGEND:

- 12" LO — EX TREE TO BE REMOVED

STORM DRAIN SCHEDULE

DI-1 THRU DI-2	OLDCASTLE MODEL DI-4848
FOUNDATION DRAINS PER GEOTECH'S RECOMMENDATION	
STORM DRAIN PIPE SHALL BE PVC, OR HDPE. (MEETING CALTRANS SEC. 64 SPECIFICATIONS).	

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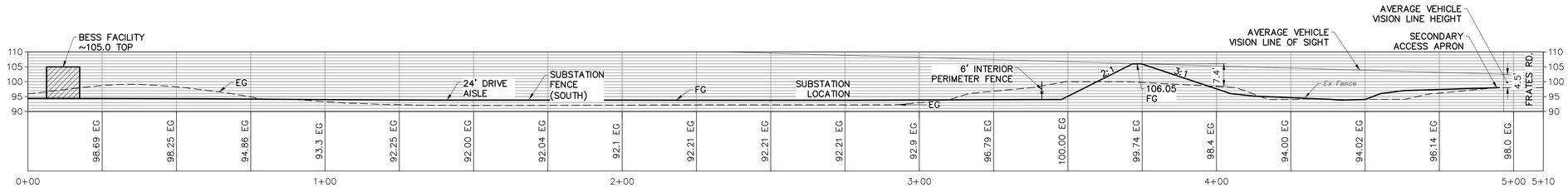
NORTH BAY ENERGY STORAGE
GRADING, DRAINAGE & UTILITY PLAN

1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

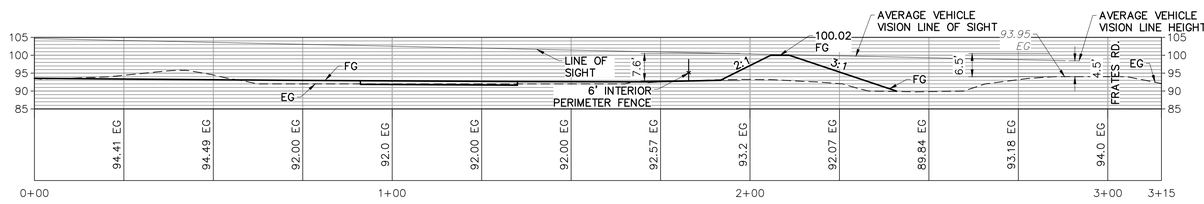
SCALE: AS SHOWN
Date: April 27th, 2023
Design by: DL, ZR
Drawn by: DL
Checked by: DRB

Sheet
C2.0
3 of 8 Sheets
Job 20355

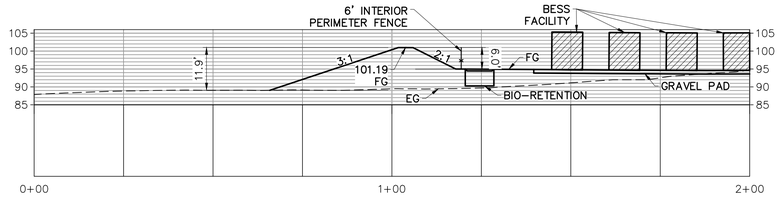
T:\2020 PROJECTS\20355\dwg\Adobe-Design\Use Permit\20355-C2.0 Grading & Utility Plan.dwg, Doran Lewis, 4/27/2023 4:27:11 PM



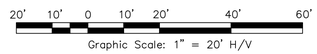
FRATES ROAD LINE OF SIGHT NORTHEAST (A)



FRATES ROAD LINE OF SIGHT EAST (B)



FRATES ROAD LINE OF SIGHT SOUTH (C)



LEGEND:

——— FINISHED GRADE

---------- EXISITNG GRADE

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NORTH BAY ENERGY STORAGE

SITE SECTIONS

1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

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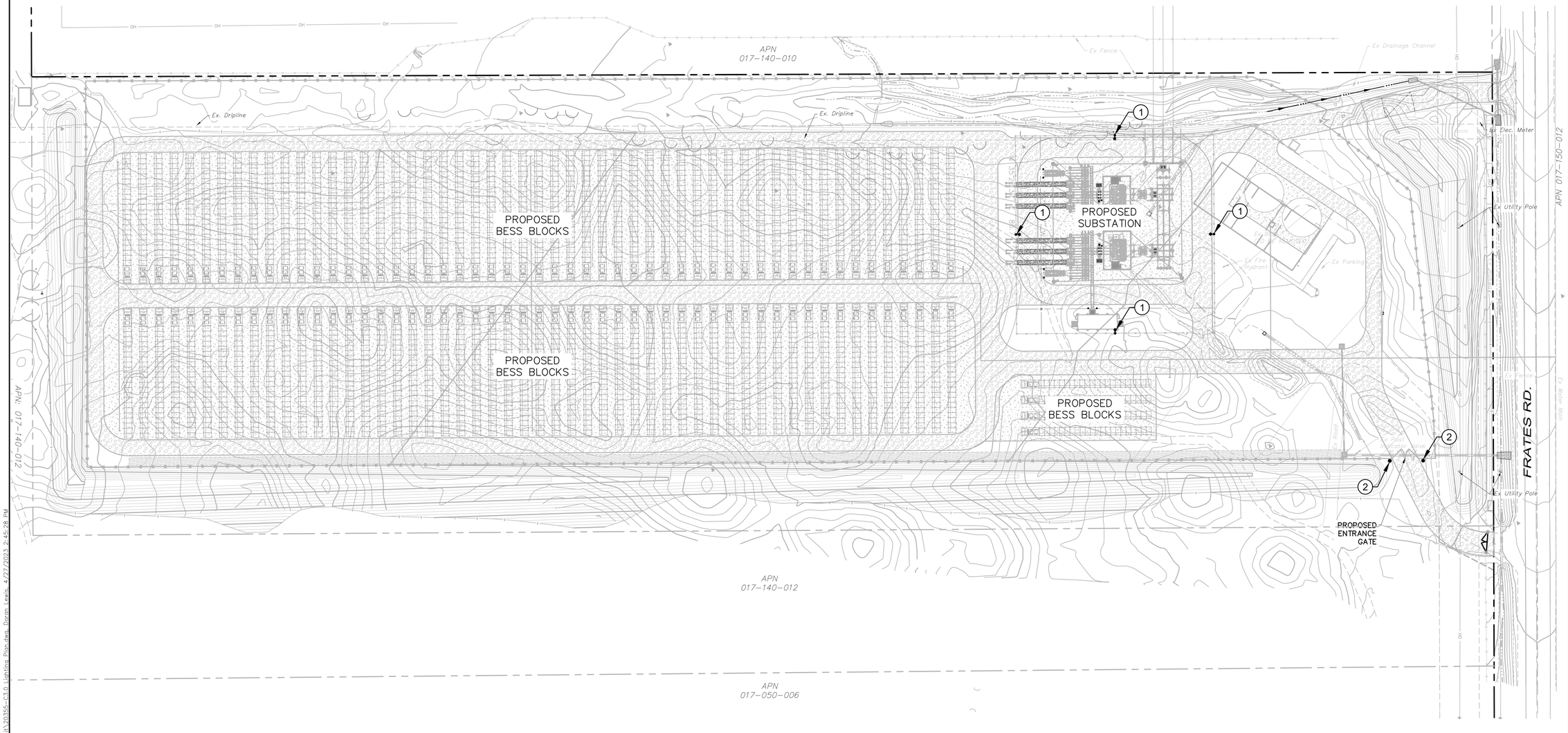
4 of 8 Sheets
Job 20355



HATCHING LEGEND:

- GRAVEL ROAD
- GRAVEL PAD
- PLANTING BUFFER STRIP
- BIO-RETENTION AREA

LIGHTING SCHEDULE:	
1	4- MAST ARM MOUNT LIGHT- DSX1 LED 60C 1000 40K T3M MVOLT MA DDBXD (LITHONIA LIGHTING)
2	2- BOLLARD LIGHT- KBR8 LED 16C 700 40K SYM MVOLT DDBXB (LITHONIA LIGHTING)

LIGHTING PLAN

50' 25' 0 25' 50' 100' 150'

Graphic Scale: 1" = 50'

Revisions			
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NORTH BAY ENERGY STORAGE

LIGHTING PLAN

1901 Frates Road
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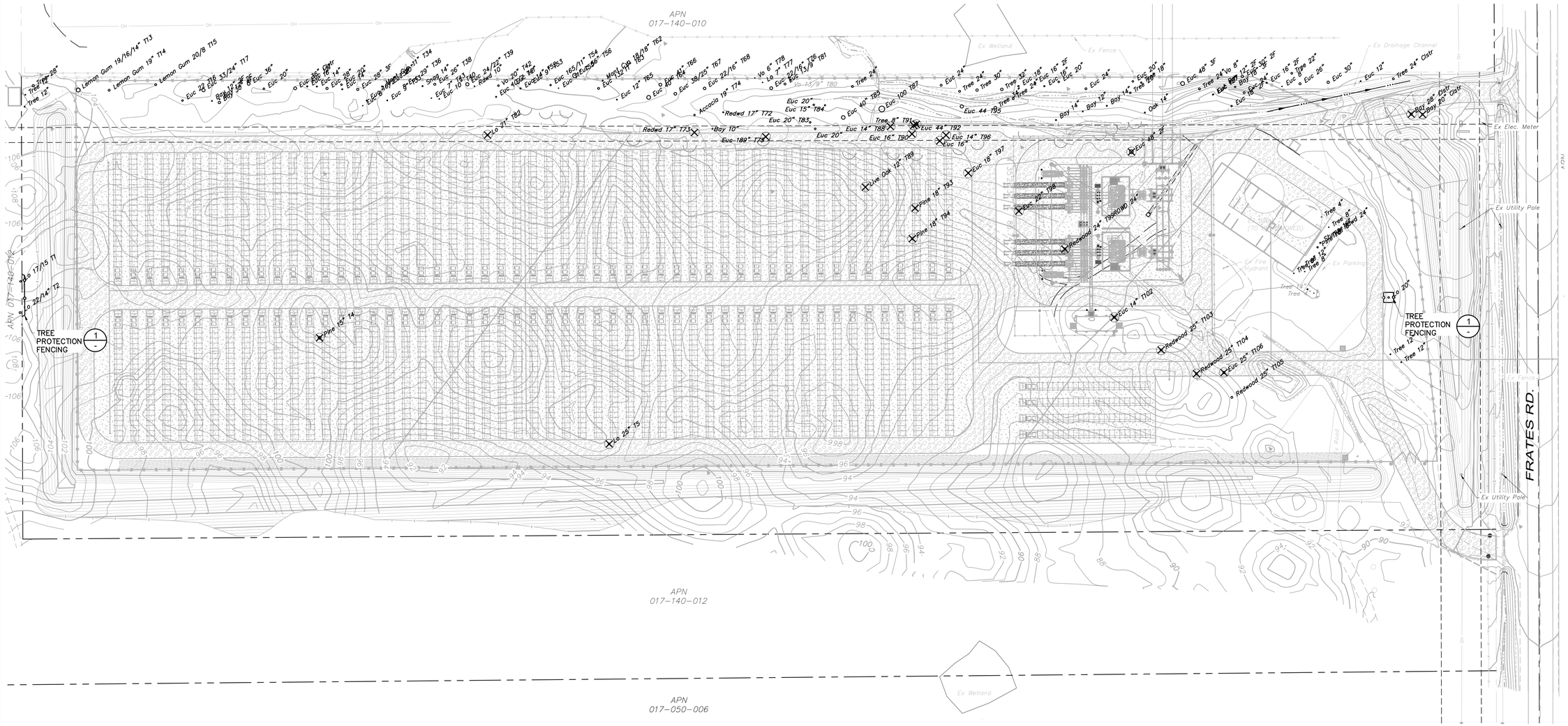
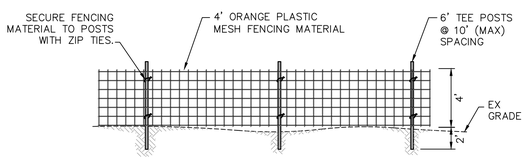
Sheet
C3.0
5 of 8 Sheets
Job 20355





1 TREE PROTECTION FENCING

NTS

TREE DISPOSITION PLAN

50' 25' 0 25' 50' 100' 150'

Graphic Scale: 1" = 50'

LEGEND:

12" LO — EX TREE TO BE REMOVED

TREE PROTECTION FENCING

Revisions			
No.	Date	Description	Approved

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David R. Brown, RCE 41833
My license expires 3/31/2024

NORTH BAY ENERGY STORAGE

TREE DISPOSITION PLAN

1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

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Drawn by: DL
Checked by: DRB

Sheet
C4.0
6 of 8 Sheets
Job 20355

ATTACHMENT B
TREE INFORMATION MATRIX

	Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
	1	*Quercus agrifolia*	Coast Live Oak	17 / 15	40	45	Fair	Good (80%)	Co dom w/inc bark	
	2	*Quercus agrifolia*	Coast Live Oak	22 / 14	50	50	Fair	Fair (60%)	Co dom w/inc bark becoming multi stem at 4 & 7 ft, crown thinning, branch tip dieback	
	3	*Pinus radiata*	Monterey Pine	18	30	20	Poor	Poor (40%)	Tree topped, bark battle activity with numerous pitch tubes	0
X	4	*Pinus radiata*	Monterey Pine	15	30	20	Fair	Fair (60%)		
X	5	*Quercus agrifolia*	Coast Live Oak	25	50	40	Good	Good (80%)	Mechanical damage, graffiti on lower stem	
	6	*Prunus sp*	Prunus	6 / 5 / 5	20	25	Fair	Good (80%)	Co dom w/inc bark	
	7	*Prunus sp*	Prunus	6 / 5 / 4 / 4	15	20	Fair	Good (80%)	Co dom w/inc bark	
	8	*Populus nigra var. italica*	Lombardy poplar	6	5	35	Fair	Critical (20%)	Tree in decline, very thin crown	
	9	*Populus nigra var. italica*	Lombardy poplar	6	5	35	Fair	Critical (20%)	Crown very thin, tree in decline	
	10	*Populus nigra var. italica*	Lombardy poplar	12 / 7 / 5	0	45	Dead	Dead (0%)	Dead	
	11	*Populus nigra var. italica*	Lombardy poplar	12 / 7 / 5	15	55	Fair	Poor (40%)	Crown thin, tree in decline, suspect drought stress	
	12	*Populus nigra var. italica*	Lombardy poplar	20	20	55	Fair	Poor (40%)	Crown thin, tree in decline, suspect drought stress	
	13	*Corymbia citriodora*	Lemon scented gum	19 / 16 / 14	50	70	Fair	Fair (60%)	Previous large limb failure, sapsucker activity	
	14	*Corymbia citriodora*	Lemon scented gum	19	55	60	Fair	Fair (60%)	Previous limb failure, crown somewhat thin	
	15	*Corymbia citriodora*	Lemon scented gum	20 / 8	50	60	Fair	Fair (60%)	Previous limb failure, lower stem mechanical damage w decay	

ATTACHMENT B
TREE INFORMATION MATRIX

Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
16	*Eucalyptus sp.*	Eucalyptus	22	50	60	Fair	Fair (60%)	Previous limb failures	
17	*Eucalyptus sp.*	Eucalyptus	33 / 24	70	65	Fair	Good (80%)	Previous large limb failures	
18	*Eucalyptus sp.*	Eucalyptus	8 / 6	25	45	Good	Good (80%)		
19	*Eucalyptus sp.*	Eucalyptus	10 / 9 / 9 / 8	35	45	Good	Good (80%)	Lean and balance to south	
20	*Eucalyptus sp.*	Eucalyptus	8 / 7	40	50	Good	Good (80%)		
21	*Eucalyptus sp.*	Eucalyptus	22 / 20 / 17	60	65	Fair	Good (80%)	Previous limb failures	
22	*Eucalyptus sp.*	Eucalyptus	11 / 10	40	60	Fair	Poor (40%)	Bark cracking at base, cambium dead	
23	*Eucalyptus sp.*	Eucalyptus	11 / 9	40	65	Fair	Good (80%)	5 inch dead stem at base	
24	*Eucalyptus sp.*	Eucalyptus	13 / 10 / 9	30	40	Fair	Good (80%)		
25	*Eucalyptus sp.*	Eucalyptus	12	25	40	Good	Good (80%)		
26	*Eucalyptus sp.*	Eucalyptus	16	55	60	Good	Good (80%)	Balance of crown to south	
27	*Eucalyptus sp.*	Eucalyptus	12	50	55	Good	Good (80%)	Minor sapsucker activity	
28	*Eucalyptus sp.*	Eucalyptus	29	65	75	Good	Good (80%)		
29	*Eucalyptus sp.*	Eucalyptus	16 / 16	45	75	Fair	Good (80%)	Previous large limb failures	
30	*Eucalyptus sp.*	Eucalyptus	16	45	50	Fair	Fair (60%)	Tree suppressed under T29, canopy reaching to south	
31	*Eucalyptus sp.*	Eucalyptus	13 / 9 / 7	40	60	Fair	Fair (60%)	Deadwood, crown somewhat thin	
32	*Eucalyptus sp.*	Eucalyptus	16 / 12	50	60	Fair	Good (80%)	Deadwood	
33	*Eucalyptus sp.*	Eucalyptus	9	20	50	Good	Good (80%)		
34	*Hesperocyparis macrocarpa*	Monterey Cypress	11	35	50	Good	Good (80%)	Some minor branch flagging	
35	*Eucalyptus sp.*	Eucalyptus	20	60	70	Fair	Good (80%)	Lean and balance to north	
36	*Eucalyptus sp.*	Eucalyptus	29	55	70	Fair	Good (80%)	Previous large branch failures	
37	*Hesperocyparis macrocarpa*	Monterey Cypress	30 / 21	45	55	Fair	Good (80%)	Some minor branch flagging	0
38	*Eucalyptus sp.*	Eucalyptus	26	55	75	Fair	Good (80%)	Previous large branch failures	
39	*Eucalyptus sp.*	Eucalyptus	24 / 22	55	65	Fair	Fair (60%)	Previous large branch failures	0
40	*Eucalyptus sp.*	Eucalyptus	10	20	50	Good	Very good (90%)		

ATTACHMENT B
TREE INFORMATION MATRIX

Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
41	*Eucalyptus sp.*	Eucalyptus	10 / 7	30	35	Good	Good (80%)		
42	*Quercus lobata*	Valley oak	20	70	60	Good	Good (80%)	Crown restricted by neighboring trees	
43	*Eucalyptus sp.*	Eucalyptus	7	20	50	Good	Very good (90%)		
44	*Acacia melanoxylon*	Acacia	20	40	60	Fair	Good (80%)	Crown balance to west	0
45	*Acacia melanoxylon*	Acacia	20 / 15	55	65	Fair	Fair (60%)	Three becomes multiple stems at DBH, all stems are codom w/ inc bark, crown somewhat thin	0
46	*Acacia melanoxylon*	Acacia	9 / 9 / 7 / 6	45	60	Fair	Good (80%)		0
47	*Acacia melanoxylon*	Acacia	7 / 6 / 6 /4	45	60	Fair	Good (80%)		0
48	*Acacia melanoxylon*	Acacia	13	35	60	Good	Good (80%)		0
49	*Quercus lobata*	Valley oak	20	60	55	Good	Good (80%)	Crown restricted by neighboring trees	0
50	*Hesperocyparis macrocarpa*	Monterey Cypress	10 / 10 / 8 / 8 / 6 / 4	45	30	Fair	Fair (60%)	Multiple stems at grade, broken branches	0
51	*Hesperocyparis macrocarpa*	Monterey Cypress	10 / 10 / 8 / 6 / 6 / 4	45	30	Poor	Fair (60%)	Multiple stems at grade, large Broken branches, dieback at top	0
52	*Eucalyptus sp.*	Eucalyptus	14	50	55	Fair	Fair (60%)	Previous branch failures, some branch tip dieback	
53	*Eucalyptus sp.*	Eucalyptus	9	10	45	Poor	Poor (40%)	Previous branch failures, dead top, tree in decline	
54	*Eucalyptus sp.*	Eucalyptus	15 / 11	50	65	Fair	Good (80%)	Co dom w/inc bark	
55	*Eucalyptus sp.*	Eucalyptus	11	30	50	Fair	Good (80%)		
56	*Eucalyptus sp.*	Eucalyptus	48	80	75	Fair	Good (80%)	Previous large branch failures	

ATTACHMENT B
TREE INFORMATION MATRIX

	Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
	57	*Hesperocyparis macrocarpa*	Monterey Cypress	18 / 8 / 8	35	30	Poor	Fair (60%)		0
	58	*Eucalyptus sp.*	Eucalyptus	18 / 14	45	55	Poor	Fair (60%)	Balance to the crown to the north, deadwood, crowned thin	0
	59	*Eucalyptus sp.*	Eucalyptus	9 / 8	45	55	Fair	Good (80%)		0
	60	*Quercus lobata*	Valley oak	18	55	50	Fair	Good (80%)	Crown has been pruned and lifted for clearance by fence for substation, lean and balance of crown is to the east	0
	61	*Quercus lobata*	Valley oak	13	40	50	Fair	Fair (60%)	Tree canopy restricted by neighboring trees, three suppressed below canopy of surrounding trees	0
	62	*Hesperocyparis macrocarpa*	Monterey Cypress	18 / 18	55	60	Fair	Good (80%)		
	63	*Eucalyptus sp.*	Eucalyptus	13 / 11	50	55	Fair	Good (80%)		
	64	*Eucalyptus sp.*	Eucalyptus	40	70	80	Fair	Good (80%)	Previous large branch failures	
	65	*Eucalyptus sp.*	Eucalyptus	12	30	55	Good	Good (80%)		
	66	*Eucalyptus sp.*	Eucalyptus	41	65	75	Fair	Good (80%)	Previous large branch failures	
	67	*Eucalyptus sp.*	Eucalyptus	38 / 25	65	75	Fair	Good (80%)	Crown restricted by neighboring trees	
	68	*Eucalyptus sp.*	Eucalyptus	22 / 16	65	75	Fair	Good (80%)	Crown restricted by neighboring trees	
	69	*Hesperocyparis macrocarpa*	Monterey Cypress	16	35	35	Fair	Fair (60%)	Tree suppressed under canopy of neighboring trees, some branch flagging	0
	70	*Eucalyptus sp.*	Eucalyptus	36	60	70	Good	Good (80%)		0
	71	*Eucalyptus sp.*	Eucalyptus	13	35	60	Good	Good (80%)		0
	72	*Sequoia sempervirens*	Coast Redwood	17	30	55	Fair	Poor (40%)	Tree has a dead top 40% of the live crown is dead, broken top, drought stress	

ATTACHMENT B
TREE INFORMATION MATRIX

	Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
X	73	*Sequoia sempervirens*	Coast Redwood	17	30	55	Poor	Critical (20%)	Tree is in serious decline, 90% of the live crown is dead, drought stress	
	74	*Acacia melanoxylon*	Acacia	19	50	45	Good	Good (80%)	Crown restricted by neighboring trees, lower branches dying back crown lifting for light	
X	75	*Eucalyptus sp.*	Eucalyptus	18	0	0	Good	Good (80%)		
	76	*Eucalyptus sp.*	Eucalyptus	22 / 16	50	70	Poor	Fair (60%)	Several large limb failures, crown unbalanced	
	77	*Quercus agrifolia*	Coast Live Oak	7	15	20	Good	Very good (90%)		
	78	*Quercus lobata*	Valley oak	6	20	25	Good	Good (80%)		
	79	*Quercus lobata*	Valley oak	18 / 6 / 6	55	60	Good	Good (80%)	Multiple nests in tree, crown balance to north	0
	80	*Quercus lobata*	Valley oak	13 / 9	45	50	Good	Good (80%)	Canopy restricted by neighboring trees	
	81	*Eucalyptus sp.*	Eucalyptus	13 / 9	50	65	Fair	Fair (60%)	Crown restricted by neighboring trees canopy lifted	
X	82	*Quercus agrifolia*	Coast Live Oak	21	60	40	Good	Good (80%)		
	83	*Eucalyptus sp.*	Eucalyptus	20	45	65	Good	Good (80%)		
	84	*Eucalyptus sp.*	Eucalyptus	15	50	60	Fair	Good (80%)	Canopy restricted by neighboring trees; balance of the crown is to the north	
	85	*Eucalyptus sp.*	Eucalyptus	40	0	75	Dead	Dead (0%)	Standing dead	
	86	*Acacia melanoxylon*	Acacia	14 / 11 / 10 / 6 / 6 / 4	50	60	Fair	Good (80%)		0
	87	*Eucalyptus sp.*	Eucalyptus	50 / 50 /30	100	85	Fair	Good (80%)		

ATTACHMENT B
TREE INFORMATION MATRIX

	Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
X	88	*Eucalyptus sp.*	Eucalyptus	13	50	55	Fair	Good (80%)	Balance the canopy to the south	0
X	89	*Quercus agrifolia*	Coast Live Oak	12	20	15	Good	Good (80%)	Pruned heavily throughout crown to reduce height	
X	90	*Eucalyptus sp.*	Eucalyptus	14	40	60	Fair	Fair (60%)	Previous large branch failures, crown unbalanced	
X	91	*Acacia melanoxylon*	Acacia	9	30	50	Poor	Poor (40%)	Three declining, crowned thin, deadwood, tree suppressed	0
X	92	*Eucalyptus sp.*	Eucalyptus	44	65	75	Fair	Good (80%)	Previous large branch failures	
X	93	*Pinus radiata*	Monterey Pine	18	40	20	Poor	Fair (60%)	Tree prostrate	
X	94	*Pinus radiata*	Monterey Pine	18	40	25	Fair	Good (80%)	Lean and balance to the east, heavy cone crop	
	95	*Eucalyptus sp.*	Eucalyptus	44	65	75	Fair	Fair (60%)	Previous large branch failures, dead top	
X	96	*Eucalyptus sp.*	Eucalyptus	14	40	60	Fair	Fair (60%)	Crown somewhat thin	0
X	97	*Eucalyptus sp.*	Eucalyptus	14 / 12	25	45	Fair	Fair (60%)		0
X	98	*Eucalyptus sp.*	Eucalyptus	24 / 16 / 10	55	60	Fair	Good (80%)		0
X	99	*Sequoia sempervirens*	Coast Redwood	23	35	55	Good	Fair (60%)	Crown reddening, drought stress, heavy cone crop	0
	100	*Eucalyptus sp.*	Eucalyptus	14 / 12	50	60	Fair	Good (80%)		0
	101	*Hesperocyparis macrocarpa*	Monterey Cypress	18	45	50	Fair	Good (80%)	Broken top, suppressed under other tree canopies	0
X	102	*Eucalyptus sp.*	Eucalyptus	14	45	55	Good	Good (80%)		
X	103	*Sequoia sempervirens*	Coast Redwood	25	25	55	Good	Poor (40%)	Tree canopy reddening, drought stress	
X	104	*Sequoia sempervirens*	Coast Redwood	25	25	55	Good	Poor (40%)	Tree canopy reddening, drought stress	
	105	*Sequoia sempervirens*	Coast Redwood	25	25	55	Good	Poor (40%)	Tree canopy reddening, drought stress	

ATTACHMENT B
TREE INFORMATION MATRIX

	Tree ID	Botanical Name	Common Name	DBH	Canopy Width	Height	Stuctural Condition	Health Condition	Tree Condition Notes	
X	106	*Eucalyptus sp.*	Eucalyptus	25	50	55	Good	Good (80%)	Small deadwood	0
	107	*Pinus radiata*	Monterey Pine	22 / 12	25	20	Fair	Good (80%)	Lean and balance to the south east	0
	108	*Pinus radiata*	Monterey Pine	26	25	20	Fair	Good (80%)	Lean and balance to the south east	0
	109	*Pinus radiata*	Monterey Pine	18	15	20	Poor	Fair (60%)	Lean and balance to the south east	0
	110	*Pinus radiata*	Monterey Pine	20 / 17	15	20	Fair	Good (80%)	Lean and balance to the south east	0
	111	*Pinus radiata*	Monterey Pine	14	20	35	Fair	Good (80%)	Crown restricted and lifted due to competition from neighboring trees	0
	112	*Pinus radiata*	Monterey Pine	20 / 10	20	35	Fair	Good (80%)		0
	113	*Pinus radiata*	Monterey Pine	19	25	30	Fair	Good (80%)	Lean and balance to the south east	0
	114	*Pinus radiata*	Monterey Pine	22	25	30	Fair	Good (80%)	Lean and balance to the south east, large co dom stem failure	0

No.	Date	Revisions	Description	Approved

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1220 N. Dutton Ave., Santa Rosa, CA 95401
P. (707) 541-2300 F. (707) 541-2301
Website: www.adobeinc.com
"A Service You Can Count On!"

Preliminary

David R. Brown, RCE 41833
My license expires 3/31/2024

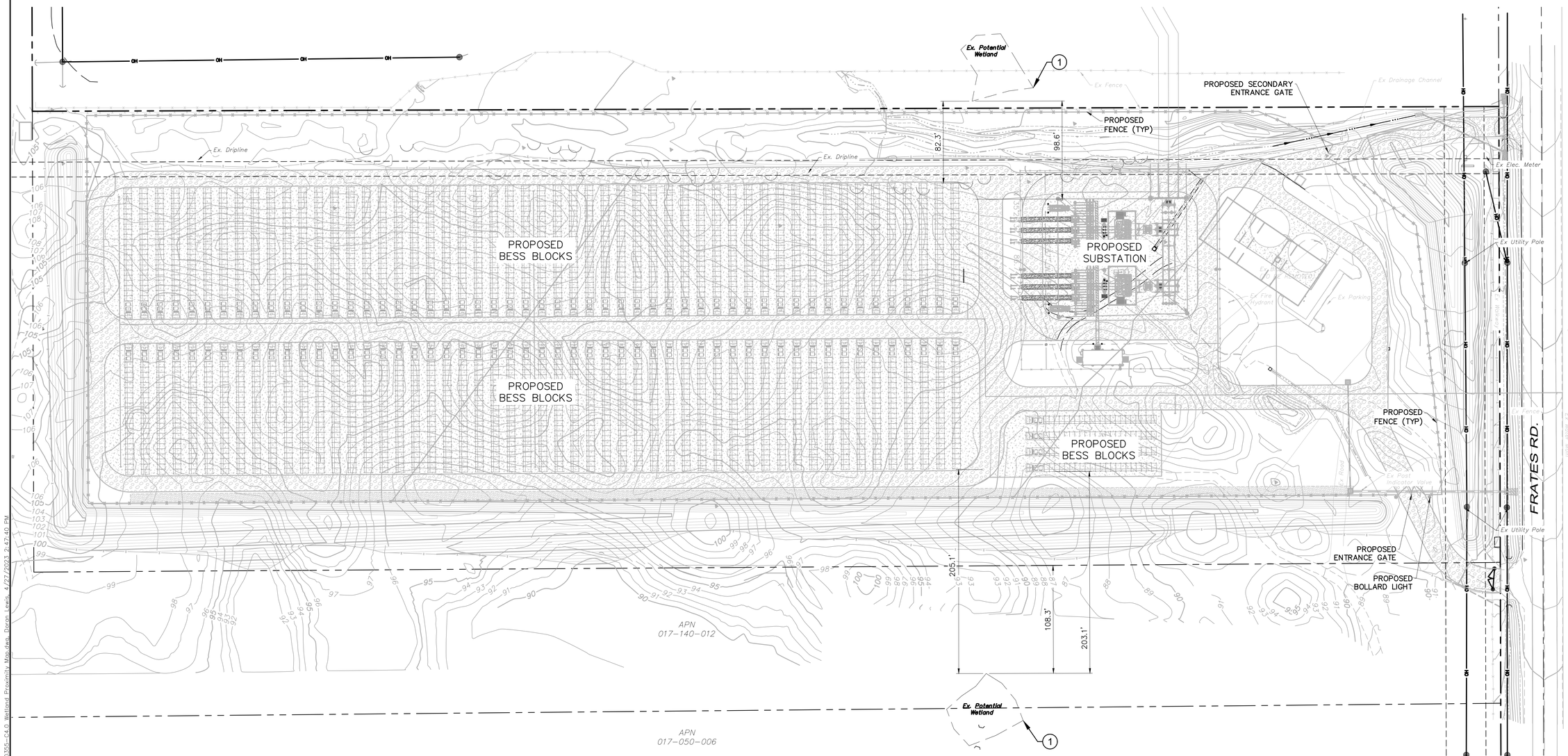
PROFESSIONAL ENGINEER * REGISTERED * DAVID R. BROWN * No. 41833 Exp. 3/31/2024 * CIVIL * STATE OF CALIFORNIA

NORTH BAY ENERGY STORAGE
USE PERMIT (ARBORIST REPORT)

1901 Frates Road
Petaluma, California
APN 017-140-011 & 012, 017-050-006

SCALE: AS SHOWN
Date: April 27th, 2023
Design by: DL, ZR
Drawn by: DL
Checked by: DRB

Sheet
C4.1
7 of 8 Sheets
Job 20355



HATCHING LEGEND:

- GRAVEL ROAD
- GRAVEL PAD
- BIO-RETENTION AREA

KEY NOTES:

(1) POTENTIAL WETLANDS AS IDENTIFIED IN THE FIELD BY LUCY MACMILLAN (M.S.), ENVIRONMENTAL SCIENTIST. (SEE "*BIOLOGICAL RESOURCES ASSESSMENT*" REPORT DATED: AUGUST 2021)

WETLAND PROXIMITY MAP

50' 25' 0 25' 50' 100' 150'

Graphic Scale: 1" = 50'

Revisions			
No.	Date	Description	Approved

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NORTH BAY ENERGY STORAGE

WETLAND PROXIMITY MAP

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Sheet
C5.0
8 of 8 Sheets
Job 20355

I:\2020 PROJECTS\20355\dwg\Adobe-Design\Use Permit\20355-C4.0 Wetland Proximity Map.dwg, Daron Lewis, 4/27/2023 2:47:40 PM

U.S.A NOTE

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TYPICAL IRRIGATION LEGEND

SYMBOL	EQUIPMENT	MANUFACTURER	MODEL	REMARKS
	Root Zone Watering System	Hunter	RZWS-18-25-CV	One per tree, typical
	Stream Bubbler: 6" Pop-up	HUNTER	PROS-06-CV-R-PRS30-MSBN-25Q	One per tree, typical
	Landscape Dripline	Rain Bird	XFS-06-12	
	Eco-Mat	Hunter		
SEE DETAIL	Automatic Line Flush Valve	Hunter	AFV-T	INSTALL IN 6" VALVE BOX @ END OF CIRCUIT
SEE DETAIL	Air Relief Valve	Hunter	AVR-075	INSTALL IN 6" VALVE BOX @ HIGH POINT OF CIRCUIT
SEE DETAIL	Continuous Acting Air Vent	Netafim	65ARI51	INSTALL UPSTREAM FROM SUBMETER
	Control Valve	Hunter Industries(R)	ICV-101G-AS-ADJ	
	Drip Zone Control Valve	Hunter Industries(R)	ICZ-101-25	
	Isolation Valve - Ball Valve	KBI	CPVC CTS	
M	Master Valve	Hunter Industries(R)	ICV-101G	
	1" Reduced Pressure Backflow Preventer	Watts	LF009M2-PC-QT 1	Required
FS	Flow Sensor	CST	ELF-T10-N01	
C	Irrigation Controller - 6 Station	Hunter Industries(R)	IC-600-M	
	6 Station Plug-in Expansion Module	Hunter	ICM-600	(4 TOTAL)
	Main Line		PVC Schedule 40	
	Lateral		PVC Schedule 40	

MAWA AND ETWU CALCULATIONS

1) Maximum Applie'"

MAWA = (ETo) (0.62) [(0.55 X LA) + (0.45 X SLA)]

Where:
ETo = Annual Net Reference Evapotranspiration (inches)
0.45 = ET Adjustment Factor (Commercial)
0.55 = ET Adjustment Factor (Residential,
LA = Landscaped Area (square feet)
0.62 = Conversion factor (to gallons per square foot)
SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
0.45 = the additional ET adjustment factor for Special Landscape Area (1.0 - 0.55 = 0.45) (Commercial)
0.55 = the additional ET adjustment factor for Special Landscape Area (1.0 - 0.45 = 0.55) (Residential)

Commercial (C) or Residential (R) C

A) Net Evapotranspiration Calculation

Local Reference ETo 39.60

29.00"/yr (Annual Rainfall) X .25 = 7.45 (Effective Rainfall)

Net Evapotranspiration Calculation = Annual ETo - Effective Rainfall = 32.15

B) Adjusted Landscape Area Calculation

39,561 sf (Landscape Area) X 0.45 Adjustment Factor = 17,805.00 sf

0.00 sf (Special Landscape Area) X 0.55 Adjustment Factor = 0.00 sf

Sum of Adjusted Landscape Area = 17,805.00 sf

MAWA= 32.15 X .62 X 17,805 sf = 354,907 gal/yr

2) Estimated Total Water Use (ETWU)

A) Net Evapotranspiration Calculation = 32.15 sf

Net Evapotranspiration Calculation = Annual ETo - Effective Rainfall

B) Adjusted Landscape Area Calculation

0.00 sf Very Low Water Use X.1 = 0.00 sf

39,566 sf Low Water Use X .3 = 11,869.90 sf

0 sf Moderate Water Use X .6 = 0.00 sf

0.00 sf High Water Use X .9 = 0.00 sf

Sum of Adjusted Landscape Area = 11,869.90 sf

ETWU = 32.15 X .62 X 11,870 sf / 0.81 = 245,759 gal/yr

Irrigation Efficiency Factor

Square Footage of Landscape on Drip	39,566.67 sf
Square Footage of Landscape on Spray	0.00 sf
Total Square Footage of Landscape	39,566.67 sf
Adjusted Irrigation Efficiency Factor	0.81

THESE DRAWINGS COMPLY WITH THE CRITERIA OF THE ORDINANCE. ORDINANCE REQUIREMENTS HAVE BEEN APPLIED FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN AND THE LANDSCAPE DESIGN PLAN."

CONCEPT HYDROZONE DETAIL TABLE

Name	Method	Water Use	Water Use Value	Hydrozone Area in SF	% of Landscape
1B	Root Watering System	Low	0.3	2,835.75 sf	6.8%
2E	Sub-Surface Dripline	Low	0.3	12,123.31 sf	30.6%
3D	Sub-Surface Dripline	Low	0.3	23,909.06 sf	60.4%
4B	Root Watering System	Low	0.3	848.14 sf	2.1%
				39,566 sf	100%

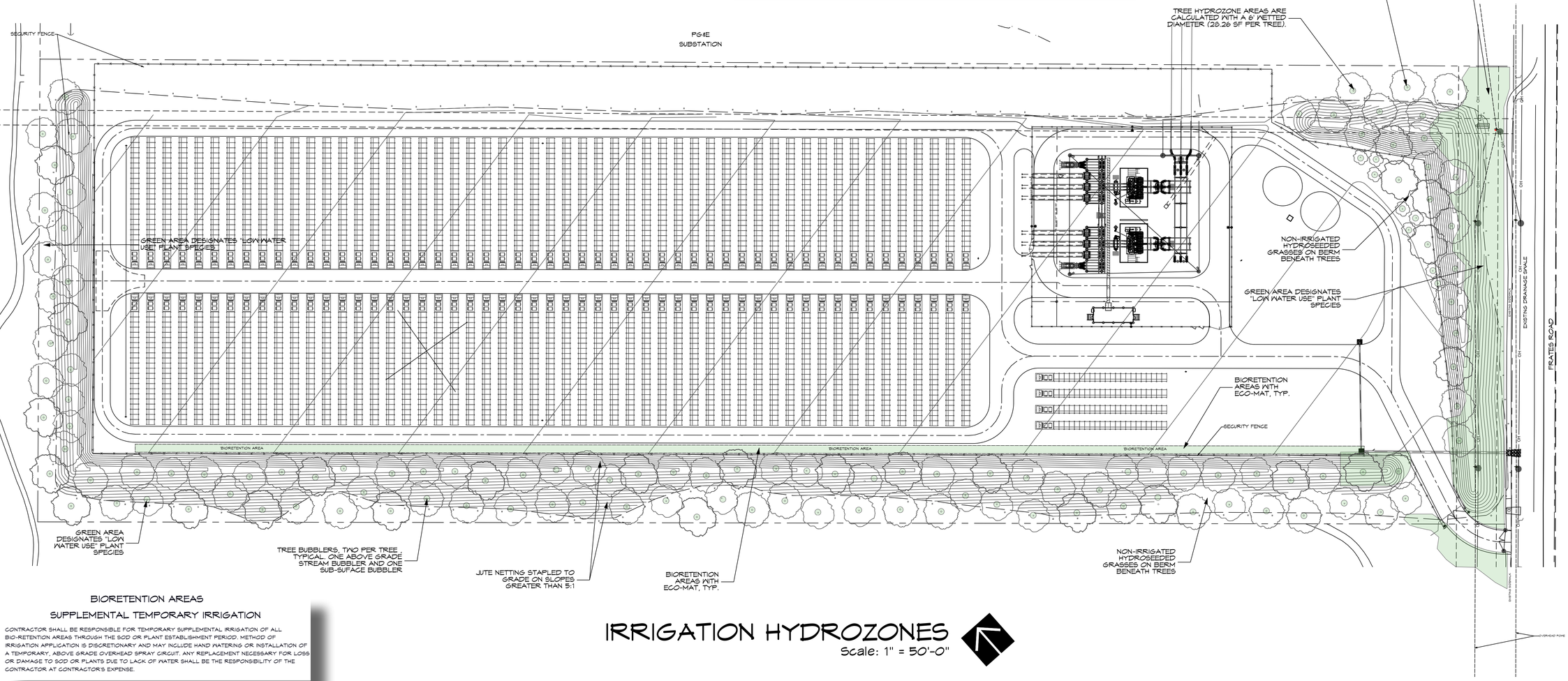
CONCEPT SUMMARY HYDROZONE TABLE

PLANT TYPE	AREA	% OF LANDSCAPE
Very Low	0.00	0%
Low	39,566.35	100%
Moderate	0.00	0%
High	0.00	0%
Total	39,566.35	100%

BIORETENTION AREAS

SUPPLEMENTAL TEMPORARY IRRIGATION

CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY SUPPLEMENTAL IRRIGATION OF ALL BIO-RETENTION AREAS THROUGH THE SOD OR PLANT ESTABLISHMENT PERIOD. METHOD OF IRRIGATION APPLICATION IS DISCRETIONARY AND MAY INCLUDE HAND WATERING OR INSTALLATION OF A TEMPORARY, ABOVE GRADE OVERHEAD SPRAY CIRCUIT. ANY REPLACEMENT NECESSARY FOR LOSS OR DAMAGE TO SOD OR PLANTS DUE TO LACK OF WATER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT CONTRACTOR'S EXPENSE.



IRRIGATION HYDROZONES

Scale: 1" = 50'-0"

BIORETENTION AREAS

SUPPLEMENTAL TEMPORARY IRRIGATION

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IRRIGATION HYDROZONES

NORTH BAY ENERGY STORAGE

1901 FRATES ROAD
PETALUMA, CA
APN #017-140-011 & 012, 017-050-006

DATE: 2/22/23
MLA JOB #: 2021-21
SCALE: 1" = 20'
DRAWN: DM

L1.1

SHEET L1.1 OF 6

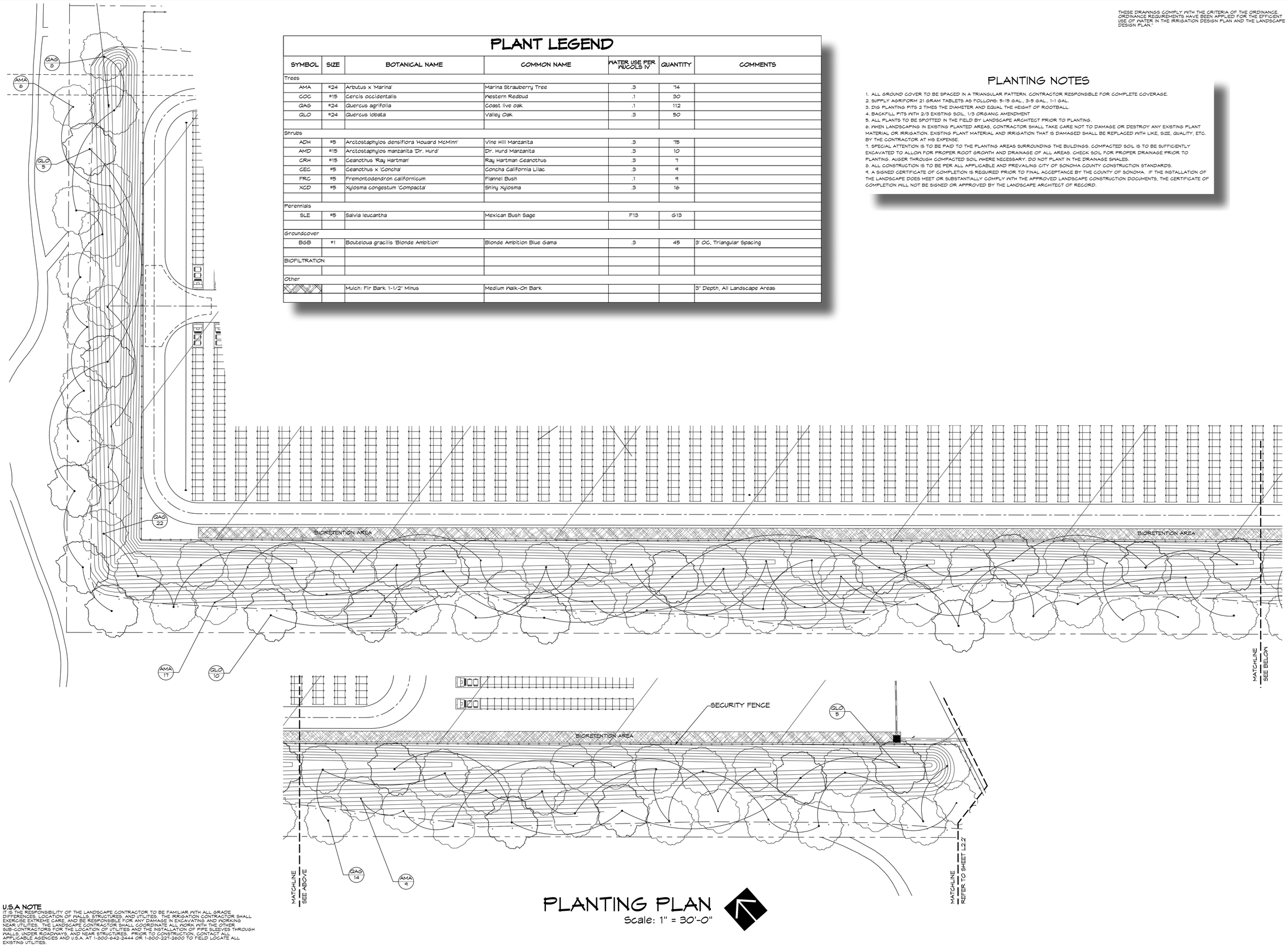
THESE DRAWINGS COMPLY WITH THE CRITERIA OF THE ORDINANCE. ORDINANCE REQUIREMENTS HAVE BEEN APPLIED FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN AND THE LANDSCAPE DESIGN PLAN."

PLANT LEGEND

SYMBOL	SIZE	BOTANICAL NAME	COMMON NAME	WATER USE PER WUCOLS IV	QUANTITY	COMMENTS
Trees						
AMA	#24	Arbutus x 'Marina'	Marina Strawberry Tree	.3	74	
COC	#15	Cercis occidentalis	Western Redbud	.1	30	
QAG	#24	Quercus agrifolia	Coast live oak	.1	112	
QLO	#24	Quercus lobata	Valley Oak	.3	50	
Shrubs						
ADH	#5	Arctostaphylos densiflora 'Howard McMinn'	Vine Hill Manzanita	.3	75	
AMD	#15	Arctostaphylos manzanita 'Dr. Hurd'	Dr. Hurd Manzanita	.3	10	
CRH	#15	Ceanothus 'Ray Hartman'	Ray Hartman Ceanothus	.3	7	
CEC	#5	Ceanothus x 'Concha'	Concha California Lilac	.3	9	
FRC	#5	Fremontodendron californicum	Flannel Bush	.1	9	
XCD	#5	Xylosma congestum 'Compacta'	Shiny Xylosma	.3	16	
Perennials						
SLE	#5	Salvia leucantha	Mexican Bush Sage	F13	G13	
Groundcover						
BGB	#1	Boutelcua gracilis 'Blonde Ambition'	Blonde Ambition Blue Gama	.3	45	3' OC, Triangular Spacing
BIOFILTRATION						
Other						
		Mulch: Fir Bark 1-1/2" Minus	Medium Walk-On Bark			3" Depth, All Landscape Areas

PLANTING NOTES

1. ALL GROUND COVER TO BE SPACED IN A TRIANGULAR PATTERN. CONTRACTOR RESPONSIBLE FOR COMPLETE COVERAGE.
2. SUPPLY AGRIFORM 21 GRAM TABLETS AS FOLLOWS: 5-15 GAL., 3-5 GAL., 1-1 GAL.
3. DIG PLANTING PITS 2 TIMES THE DIAMETER AND EQUAL THE HEIGHT OF ROOTBALL.
4. BACKFILL PITS WITH 2/3 EXISTING SOIL, 1/3 ORGANIC AMENDMENT
5. ALL PLANTS TO BE SPOTTED IN THE FIELD BY LANDSCAPE ARCHITECT PRIOR TO PLANTING.
6. WHEN LANDSCAPING IN EXISTING PLANTED AREAS, CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE OR DESTROY ANY EXISTING PLANT MATERIAL OR IRRIGATION. EXISTING PLANT MATERIAL AND IRRIGATION THAT IS DAMAGED SHALL BE REPLACED WITH LIKE, SIZE, QUALITY, ETC. BY THE CONTRACTOR AT HIS EXPENSE.
7. SPECIAL ATTENTION IS TO BE PAID TO THE PLANTING AREAS SURROUNDING THE BUILDINGS. COMPACTED SOIL IS TO BE SUFFICIENTLY EXCAVATED TO ALLOW FOR PROPER ROOT GROWTH AND DRAINAGE OF ALL AREAS. CHECK SOIL FOR PROPER DRAINAGE PRIOR TO PLANTING. AUGER THROUGH COMPACTED SOIL WHERE NECESSARY. DO NOT PLANT IN THE DRAINAGE SWALES.
8. ALL CONSTRUCTION IS TO BE PER ALL APPLICABLE AND PREVAILING CITY OF SONOMA COUNTY CONSTRUCTION STANDARDS.
9. A SIGNED CERTIFICATE OF COMPLETION IS REQUIRED PRIOR TO FINAL ACCEPTANCE BY THE COUNTY OF SONOMA. IF THE INSTALLATION OF THE LANDSCAPE DOES MEET OR SUBSTANTIALLY COMPLY WITH THE APPROVED LANDSCAPE CONSTRUCTION DOCUMENTS, THE CERTIFICATE OF COMPLETION WILL NOT BE SIGNED OR APPROVED BY THE LANDSCAPE ARCHITECT OF REGORD.



PLANTING PLAN
Scale: 1" = 30'-0"

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PLANTING PLAN

NORTH BAY ENERGY STORAGE

1901 FRATES ROAD
PETALUMA, CA
APN #017-140-011 & 012, 017-050-006

DATE: 2/22/23
MLA JOB #: 2021-21
SCALE: 1" = 20'
DRAWN: DM

L2.1

SHEET L2.1 OF 6

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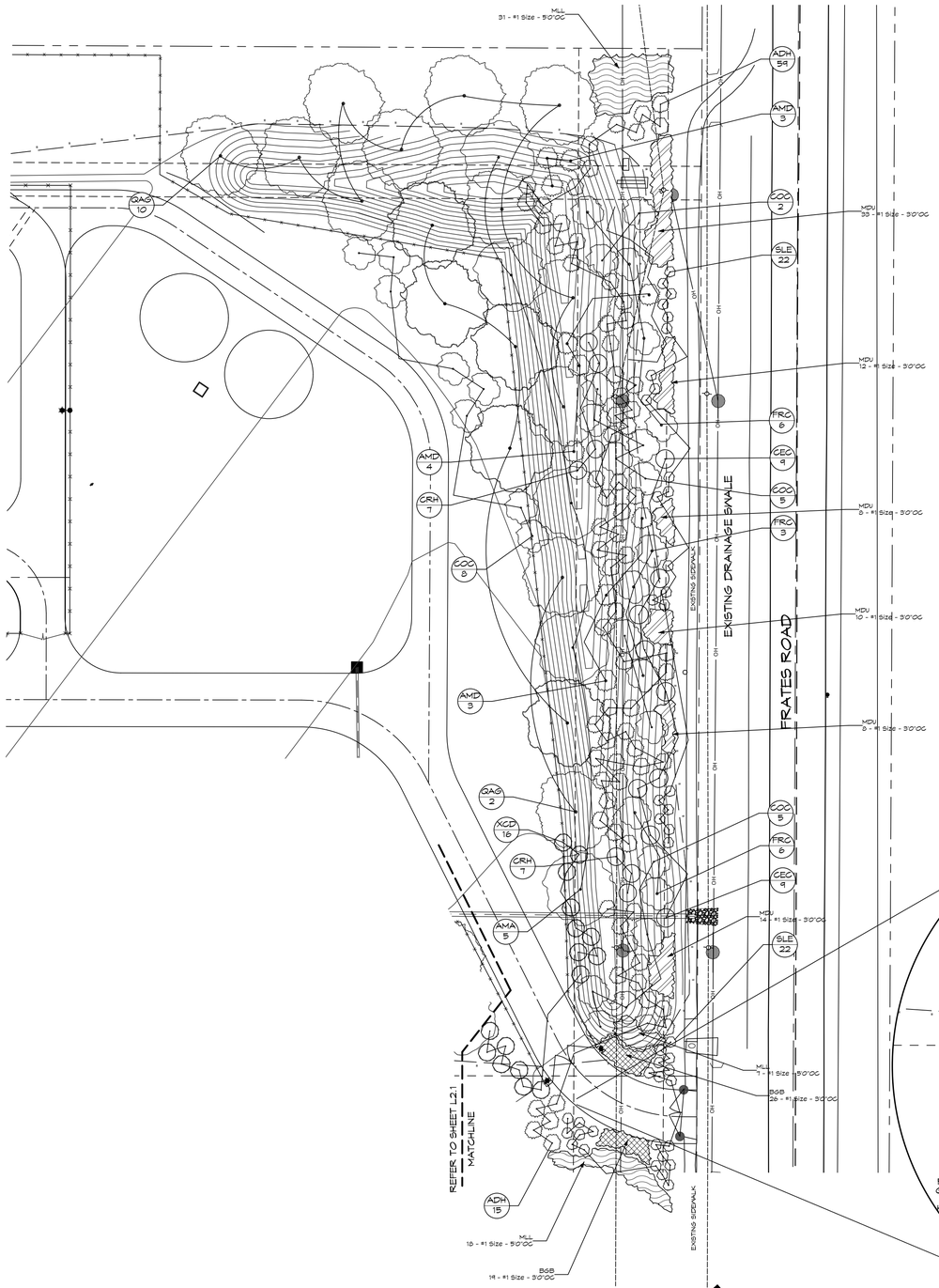
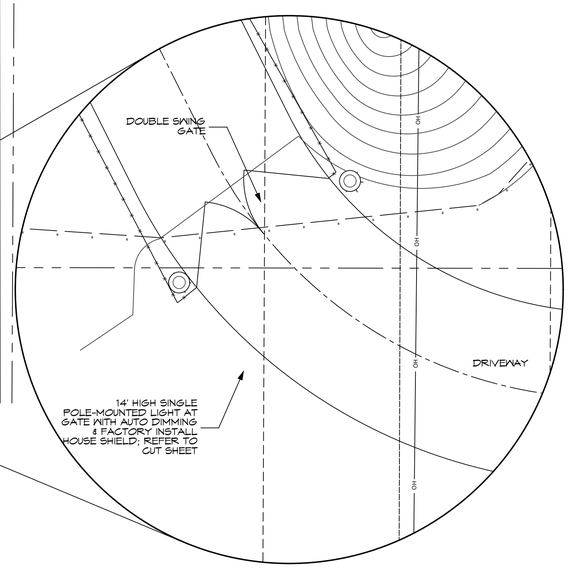


PLANTING PLAN
Scale: 1" = 30'-0"



LIGHT POLE LOCATION
SCALE: 1" = 10'

PLANT LEGEND

SYMBOL	SIZE	BOTANICAL NAME	COMMON NAME	WATER USE PER WUCOLS IV	QUANTITY	COMMENTS
Trees						
AMA	#24	Arbutus x 'Marina'	Marina Strawberry Tree	.3	74	
COC	#15	Cercis occidentalis	Western Redbud	.1	30	
QAG	#24	Quercus agrifolia	Coast live oak	.1	112	
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CEC	#5	Ceanothus x 'Concha'	Concha California Lilac	.3	9	
FRC	#5	Fremontodendron californicum	Flannel Bush	.1	9	
XCD	#5	Xylosma congestum 'Compacta'	Shiny Xylosma	.3	16	
Perennials						
SLE	#5	Salvia leucantha	Mexican Bush Sage	F13	613	
Groundcover						
BGB	#1	Bouteloua gracilis 'Blonde Ambition'	Blonde Ambition Blue Gama	.3	45	3' OC, Triangular Spacing
BIOFILTRATION						
Other						
		Mulch: Fir Bark 1-1/2" Minus	Medium Walk-On Bark			3" Depth, All Landscape Areas

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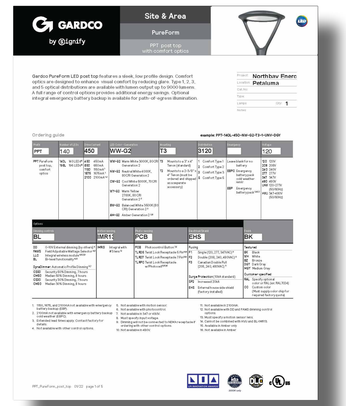

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PLANTING PLAN

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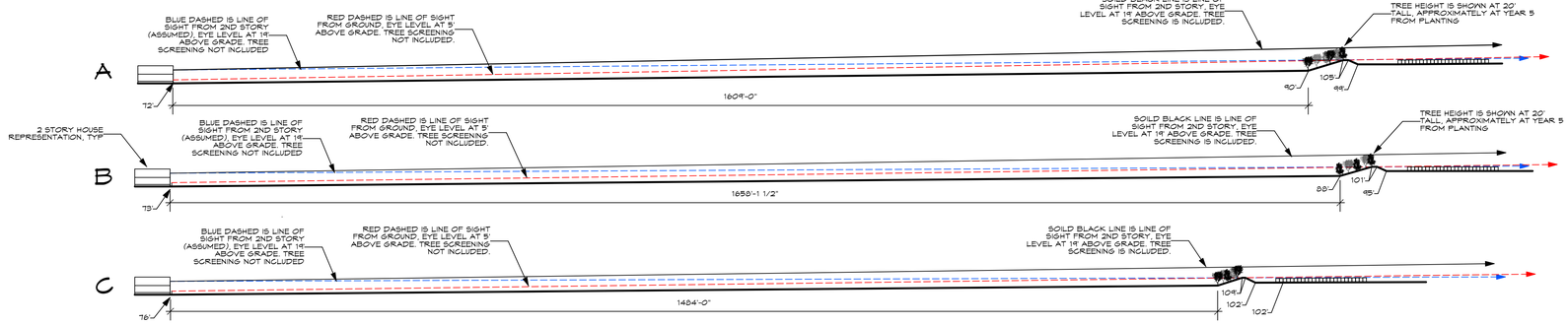
DRAWN: DM

L2.2

SHEET L2.2 OF 6



VISUAL ANALYSIS
Scale: 1" = 100'-0"

0 100 200 FT

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NO. 2800
EXP. 8/31/23
STATE OF CALIFORNIA

MACNAIR
LANDSCAPE ARCHITECTURE
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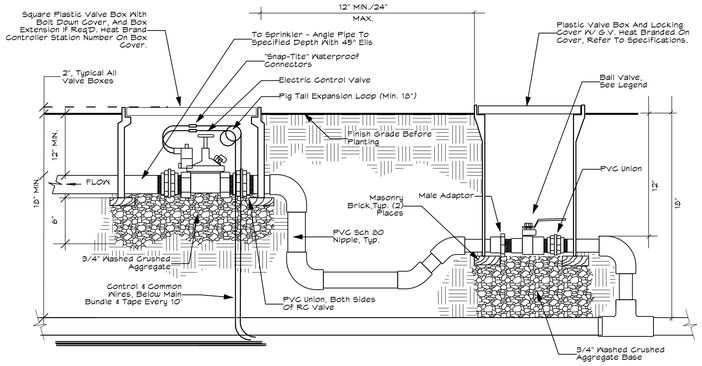
VISUAL ANALYSIS

NORTH BAY ENERGY STORAGE

1901 FRATES ROAD
PETALUMA, CA
APN #017-140-011 & 012, 017-050-006

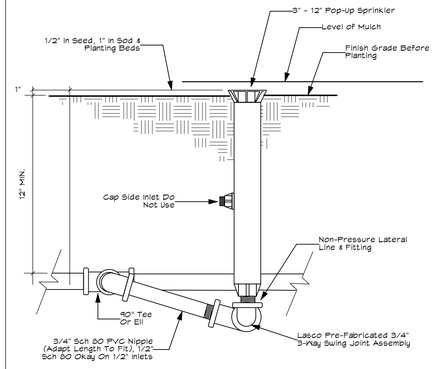
DATE: 2/22/23
MLA JOB #: 2021-21
SCALE: 1" = 20'
DRAWN: DM

L2.3



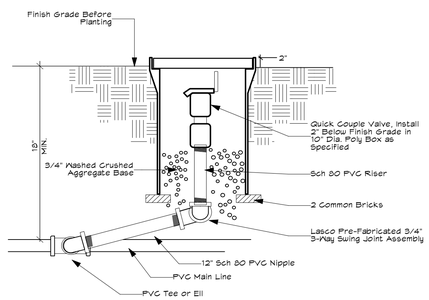
NOTES:
1) INSTALL CONTROL VALVES A MINIMUM OF 18" FROM STRUCTURES OR HARDSCAPING.
2) INSTALL VALVES IN PLANT BEDS WHEREVER POSSIBLE.
3) PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4) INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5) PLACE AGGREGATE PRIOR TO INSTALLATION OF VALVE BOX.
6) INSTALL VALVE BOXES SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPE.
7) INSTALL ONE BALL VALVE IN BOX IMMEDIATELY UPSTREAM FROM EACH REMOTE CONTROL VALVE.

A / L3 ELECTRIC CONTROL VALVE WITH SHUT OFF
NTS

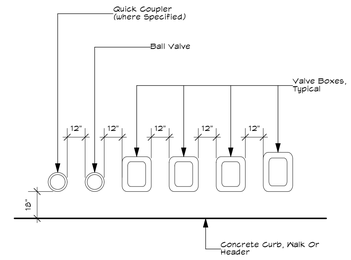


NOTES
1) LOCATE HEAD 6" FROM ALL EDGES IN LAWN AREAS. LOCATE HEAD 12" FROM ALL EDGES IN SHRUB AREAS.
2) LOCATE STREAM SPRAY AND BUBBLERS HEADS 6" FROM ALL EDGES.
3) USE TEFLON PASTE ON ALL MALE THREADS.

B / L3 POP-UP SPRINKLER DETAIL
INCLUDES 4", 6" AND 12" NTS



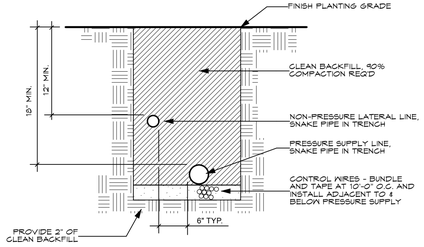
C / L3 QUICK COUPLER DETAIL
NTS



PLAN VIEW

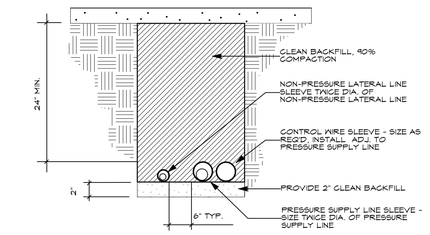
NOTES:
1) CENTER VALVE BOX OVER VALVE ASSEMBLY.
2) LOCATE VALVE BOXES IN GROUND COVER/SHRUB AREAS WHEN POSSIBLE.
3) SET VALVE BOXES PARALLEL TO EACH OTHER AND PERPENDICULAR TO EDGE.

D / L3 VALVE BOX LAYOUT
NTS



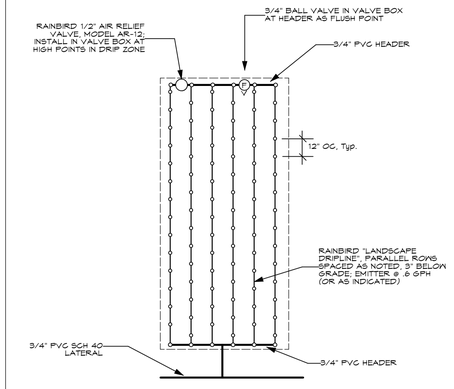
NOTE:
1) PIGTAIL AND LOOP CONTROL WIRE AT ALL CHANGES IN DIRECTION.
2) PROVIDE 18" EXPANSION LOOP AT ALL 90° ANGLES, AND EVERY 100' OF STRAIGHT CURVE RUN.

E / L3 PIPE INSTALLATION IN PLANTED AREA
NTS



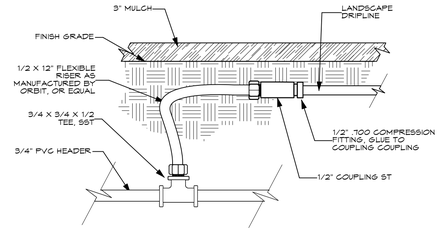
NOTES:
1) ALL SLEEVES TO BE SCH 40 PVC.
2) EXTEND ALL SLEEVES 12" BEYOND EDGE OF HARDSCAPING AT BOTH ENDS.

F / L3 PIPE INSTALLATION UNDER PAVING
NTS

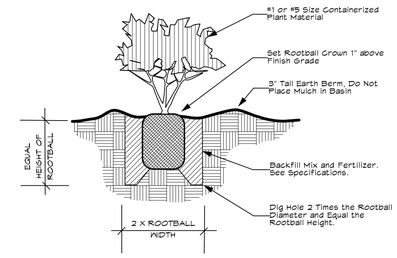


PLAN

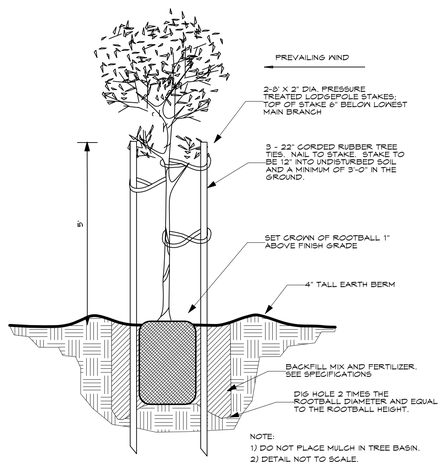
G / L3 DRIP CIRCUIT LAYOUT
NTS



H / L3 POLY TO PVC COMPRESSION FITTING DETAIL
NTS

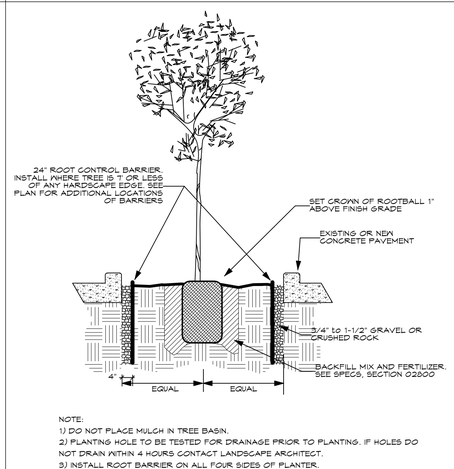


I / L3 SHRUB PLANTING DETAIL
NTS



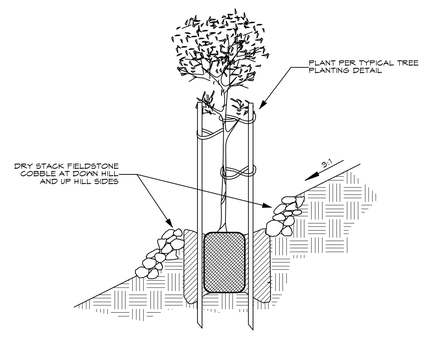
NOTE:
1) DO NOT PLACE MULCH IN TREE BASIN.
2) DETAIL NOT TO SCALE.

J / L3 TREE PLANTING DETAIL
NTS



NOTE:
1) DO NOT PLACE MULCH IN TREE BASIN.
2) PLANTING HOLE TO BE TESTED FOR DRAINAGE PRIOR TO PLANTING. IF HOLES DO NOT DRAIN WITHIN 4 HOURS CONTACT LANDSCAPE ARCHITECT.
3) INSTALL ROOT BARRIER ON ALL FOUR SIDES OF PLANTER.

K / L3 TREE WELL WITH ROOT BARRIER
NTS



NOTE:
1) DO NOT PLACE MULCH IN TREE BASIN.
2) INSTALL JUTE NETTING ALL ON SLOPES GREATER THAN 6:1.
3) DETAIL NOT TO SCALE.

L / L3 TREE PLANTING ON SLOPE DETAIL
NTS

REGISTERED LANDSCAPE ARCHITECT
DONALD G. MACNAIR
NO. 2800
EXP. 8/31/25
STATE OF CALIFORNIA

MACNAIR
LANDSCAPE ARCHITECTURE
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LANDSCAPE DETAILS

NORTH BAY ENERGY STORAGE
1901 FRATES ROAD
PETALUMA, CA
APN #017-140-011 & 012, 017-050-006

DATE: 2/22/23
MLA JOB #: 2021-21
SCALE: AS SHOWN
DRAWN: DM

L3

SHEET L3 OF 6

DIVISION 2 SITE WORK
SECTION 02750

UNDERGROUND IRRIGATION SYSTEM

PART 1 GENERAL

1.01 SCOPE

A. Work Included: perform all work necessary and required for the construction of the project as indicated. Such work includes but is not limited to the following:

1. Furnish and install complete irrigation system.
2. Trenching and backfilling.
3. Sleeves for irrigation piping and remote control valve wiring under pavements and walls as noted.

B. Related Work in Other Sections: The following items of associated work are included in other sections of these specifications:

1. Landscaping, Section 02800

C. By Others: The following items of work will be performed by others and are not included in the contract.

1. Electrical stub-out for irrigation controller.
2. Irrigation water meter.
3. Water stub-out(s) for irrigation system.

1.02 INSPECTION OF CONDITIONS: Examine related work and surfaces before starting work of this section. Report to the landscape architect, in writing, conditions which will prevent the proper provision of this work. Beginning the work of this section without reporting unsuitable conditions to the landscape architect constitutes acceptance of conditions by the contractor. Any required removal, repair, or replacement of this work caused by unsuitable conditions to be done at no additional cost to the owner.

1.03 CODES, RULES AND SAFETY ORDERS

A. All work and materials to be in full accordance with the latest rules and regulations of safety orders of Division of Industrial Safety; the Uniform Plumbing Code published by the Western Plumbing Officials' Association; and other applicable laws or regulations, including the presiding local plumbing code. Nothing in these drawings or specifications is to be construed to permit work not conforming to these codes. Should the construction documents, or instructions, be at variance with the aforementioned rules and regulations, notify the landscape architect and get instructions before proceeding with the work affected.

B. Furnish and maintain all warning signs, shoring, barricades, red lanterns, etc., as required by the Safety Orders of the Division of Industrial Safety and local ordinances.

C. Contact U.S.A. for location of underground utilities.

1.04 STANDARDS: American Society of Testing and Materials (ASTM).

1.05 PERMITS AND FEES: Obtain all permits and pay required fees to any governmental agency having jurisdiction over the work. Arrange inspections required by local agencies and ordinances during the course of construction as required.

1.06 APPROVAL: Wherever the terms "approve", "approval", or "approved" are used in the specifications, they mean approval of landscape architect in writing.

1.07 WORK SCHEDULE: Submit a proposed work schedule to landscape architect at least 5 days prior to start of work under this Section. After approval, no modification shall be made to this schedule with out written authorization by the landscape architect.

1.08 OBSERVATION SCHEDULE
Schedule a job start meeting with the landscape architect at least 5 days before beginning work under this Section. All requests for observation must be made 72 hours in advance.

A. Job start meeting

The purpose of this conference is to review questions the contractor may have regarding the work, administrative procedures during construction and project work schedule.

B. Irrigation installation and hydrostatic tests

Observation of installation and hydrostatic test results to be made by the landscape architect prior to backfilling of trenches.

C. Pre-maintenance

When all work has been completed a pre-maintenance walk-through will be conducted. If approved, the 90 calendar day maintenance period will begin.

D. Final Observation

Final Observation will be after the 90 calendar day maintenance period and all required work is completed. Please give 1 week notice for this observation meeting.

1.09 SUBSTITUTIONS

A. Specific reference to manufacturer's names and products specified in this Section are used as standards, but this implies no right to substitute other material or methods without written approval of the landscape architect.

B. Installation of any approved substitution is contractor's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the landscape architect and without additional cost to the owner.

1.10 PROTECTION OF EXISTING CONDITIONS

A. Contractor shall acquaint themself with all site conditions. Should utilities or other work not shown on the plans be found during excavations, contractor shall promptly notify landscape architect for instructions as to further action. Failure to do so will make contractor liable for any and all damage thereto arising from their operations subsequent to discovery of such utilities not shown on plans.

1.11 COORDINATION: Coordinate and cooperate with other contractors to enable the work to proceed as rapidly and efficiently as possible.

1.12 PRODUCT HANDLING: Protect work and materials under this Section from damage during construction and storage. Protect polyvinyl chloride (PVC) pipe and fittings from direct sunlight. Beds on which PVC is stored must be full length of pipe. Do not use any pipe or fitting that has been damaged or dented.

1.13 SAMPLES: Landscape architect reserves the right to take and analyze samples of materials for conformity to specifications at any time. Contractor shall furnish samples upon request by the landscape architect. Rejected material shall be removed from the site immediately and replaced at the contractors expense. Cost of testing materials not meeting specifications shall be paid by contractor.

1.14 HYDROSTATIC TESTS
A. Make hydrostatic tests when welded PVC joints have cured at least 24 hours. Apply continuous static water pressure of 100 psi as follows:

1. All piping on the pressure side of control valves shall be tested for two hours.
2. At completion of hydrostatic test, mainline shall be opened at farthest most point from the location of the pump to verify continuity of the mainline.

B. Leaks resulting from tests shall be repaired and tests repeated until system passes tests.

1.15 "AS-BUILT" IRRIGATION DRAWINGS: Contractor shall furnish Record Drawings of the complete irrigation system. Procure from the landscape architect full sized sepias of Contract Drawings. Construction drawings shall be on the construction site at all times while the irrigation system is being installed. Actual location of valves and all irrigation and drainage piping shall be shown on the prints by dimensions from easily identified permanent features, such as buildings, curbs, fences, walks or property lines. Drawings shall show approved substitutions, if any, of material including manufacturer's name and catalog number. The drawings shall be at scale and all indications shall be neat. All information noted on the print shall be transferred to the prints by contractor and all indications shall be recorded in a neat, orderly way. The record drawings shall be turned over to the landscape architect at or before the Final Acceptance of the project.

1.16 CONTROLLER CHARTS

1. As-built drawings shall be approved by the landscape architect before charts are prepared.
2. Provide one controller chart for each controller supplied.
3. The chart shall show the area controlled by automatic controller and shall be the maximum size controller door will allow.
4. The chart is to be reduced drawing of the actual as-built system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced.
5. Chart shall be black line print and a different color shall be used to show area of coverage for each station.
6. The chart shall be mounted using Velcro, or an approved equal.
7.When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 20 mils. thick.
8. These charts shall be completed and approved prior to final inspection of the irrigation system.

1.17 MATERIALS TO BE FURNISHED

A. Prior to final inspection the contractor shall furnish the following materials to the owner:

1. Two wrenches for disassembling and adjusting each type of sprinkler head supplied.
2. Two keys for each automatic controller.
3. Four keys for loose key hose bibs and/or hose bibs.
4. Twelve 12 inch pop-up sprinkler bodies.

1.18 CLEAN-UP: Keep all areas of work clean, neat and orderly at all times. Keep paved areas clean during installation. Clean up and remove all debris from the entire work area prior to Final Acceptance to satisfaction of landscape architect.

1.19 FINAL ACCEPTANCE: Work under this Section will be accepted by landscape architect upon satisfactory completion of all work. Upon Final Acceptance, owner will assume responsibility for maintenance of the work. Said assumption does not relieve contractor of obligations under Warranty.

1.20 WARRANTY: In addition to manufacturer's guarantees or warranties, all work shall be warranted for one year from the date of Final Acceptance against defects in material, equipment and workmanship by contractor. Warranty shall also cover repair of damage to any part of the premises resulting from leaks or other defects in materials, equipment and workmanship to the satisfaction of the owner.

PART 2 MATERIALS

2.01 GENERAL: Materials throughout the system shall be new and in perfect condition. At least 14 days prior to beginning work, submit for approval 2 copies of manufacturer's catalog cuts, specifications, and operating instructions of the complete list of materials and assemblies to be installed. Quantities of materials and equipment need not be included. No deviations from the specifications shall be allowed. The decision of the landscape architect shall be final in the determination of the quality of materials and equipment.

2.02 WATER METERS: Shall be provided by others.

2.03 PIPE

A. Mainline piping on pressure side of irrigation control valves:

1. 2" size and greater to be Polyvinyl Chloride (P.V.C.) 1120-1220, Class 315 and shall conform to ASTM D 2241-73 and D 2672-73.
2. Up to and including 1-1/2" size to be Polyvinyl Chloride (P.V.C.) 1120-1220, Schedule 40 and shall conform to ASTM D 1785-73.
3. Galvanized Steel: Standard wall, Schedule 40, capable of working pressure up to 600 psi shall run from the point of connection to back flow prevention device.
4. Piping from the point of connection to the back flow prevention device shall be as approved by local code.

B. Lateral line piping on non-pressure side of irrigation control valves:

1. 2" size and greater to be Polyvinyl Chloride (P.V.C.) 1120-1220, Class 315 and shall conform to ASTM D 2241-73 and D 2672-73.
2. Up to and including 1-1/2" size to be Polyvinyl Chloride (P.V.C.) 1120-1220, Schedule 40 and shall conform to ASTM D 1785-73.

2.04 FITTINGS

A. PVC Fittings: Schedule 40, Polyvinyl Chloride, high impact weight, as manufactured by Sloane, Lasco, medium or approved equal.

B. Fittings for Galvanized Steel Pipe: Schedule 40, standard weight as manufactured by Grinnell, or approved equal.

C. Connections between main and valves shall be PVC Schedule 80 nipples and fittings.

2.05 SLEEVE MATERIALS

A. For Control Wires: PVC 1120-1220, Class 200 pipe or heavy wall galvanized steel conduit.

B. For Water Lines: PVC 1120-1220, Class 200 pipe or heavy wall galvanized steel conduit.

2.06 IRRIGATION CONTROLLERS

A. Controller to be as shown on plans and is to be installed as per detail and manufacturer's specifications.

2.07 IRRIGATION CONTROL VALVES

A. Remote Control Valves: Valves to be as shown on plans and installed per details and manufacturer's specifications.

2.08 CONTROL WIRE

A. Wire: Solid copper wire, U.L. approved for direct burial in ground. Minimum gauge: #14. Common ground wire shall be white.

B. Splicing Materials: Wire connectors shall be Pentite or snap connectors.

C. All wires shall be labeled with the valve number at the controller and valve.

D. 120 wiring shall be as required by local code and installed by an electrician. It shall not be on a switched circuit.

E. Common wire shall be white. Control wires shall be other than white. Use a different color control wire for each controller.

2.09 VALVE BOXES

A. Remote Control Valves: To be Brooks, Green or approved equal, one per valve.

B. Gate Valves and Control Wire Stub-out Locations: To be Brooks, Green or approved equal, one per valve or stub-out location.

2.10 QUICK-COUPLING VALVES

A. Quick coupling valves to be as per plans and details.

B. Furnish 2 valve keys fitted with hose valve assembly.

C. All valve boxes shall be purple in color or clearly labeled by the manufacturer to designate reclaimed water.

2.11 LANDSCAPE DRIP-LINE: Tubing as shown in legend and drawings.

A. Install in parallel and consistent rows at spacing indicated in all specified areas.

B. Install 3" below grade.

2.12 SPRINKLER HEADS

A. Heads as shown in legend and drawings.

2.13 BACK-FLOW PREVENTION ASSEMBLIES

A. Back-flow prevention device as shown in legend and drawings.

PART 3 EXECUTION

3.01 LAYOUT

A. Layout work as accurately as possible to drawings. Drawings are diagrammatic to the extent that swing joints, offsets and all fittings are not shown.

B. Full and complete coverage is required. Contractor shall make any necessary minor adjustments to layout required to achieve full coverage of irrigated areas at no additional cost to owner.

C. Dig trenches wide enough to allow a minimum of 6 in. between parallel pipe lines. Trenches shall be of sufficient depth to provide minimum cover from finish grade as follows:

1. Over PVC pipe on pressure side of irrigation control valve, control wires and quick coupling valves: 18 inches.
2. Over pipe on non-pressure side of irrigation control valve: 12 inches.

3.03 BACK FLOW PREVENTION DEVICE INSTALLATION

A. Install according to local code and manufacturer's instructions.

B. Install with union on discharge side for servicing, or with flanges, as required.

3.04 SLEEVING

A. Where pipes or wires must be installed under paving place them in sleeves with a 24" minimum depth and sufficient size to accommodate irrigation lines and/or wires.

B. Lack of pipe chase coordination does not relieve the contractor from installing the pipes and control wire shown on the drawing. In the event pipe chases were not installed prior to paving the contractor shall bore under the paving to accommodate pipes and wires.

C. All control wire shall be in Schedule 40 conduit from trench to controller. When valves are grouped together allow 12" between valve boxes, each valve in a separate box, (not to be placed in drainage swales, but kept in ground cover areas.)

3.05 PIPE LINE ASSEMBLY

A. Install pipe in accordance with manufacturer's instructions.

B. Solvent weld all PVC pipe and fittings using solvents (including primer) and methods as recommended by the manufacturer, except where screw connections are required. Clean pipe and fittings of dirt and moisture before assembly. PVC pipe may be assembled on ground surface beside trench. Snake pipe from side to side of trench bottom to allow for expansion and contraction. Make all connections between PVC pipe and metal valves or pipe with threaded fittings using PVC male adapters.

C. Use Teflon tape on all threaded fittings.

D. Thrust blocks shall be installed where the irrigation main changes direction as at ells and tees and where the irrigation main terminates. Pressure tests shall not be made for a period of 36-48 hours following the completion of pouring of the thrust blocks. Concrete thrust blocks for supply mains shall be sized and placed in strict accordance with the pipe manufacturer's specifications and shall be of an adequate size and so placed as to take all thrust created by the maximum internal water pressure.

3.06 IRRIGATION CONTROL VALVES:

A. Install control valves in valve boxes where shown and group together where practical. Place no closer than 18 in. to walk edges, buildings and walls and other valves. Valve boxes shall be placed in relation to finish grade as follows:

1. 1" above grade when no mulch is used
2. 1/2" with seeded lawn
3. 1 1/2" with sod lawn
4. 2" with plant beds

B. The contractor shall paint on the cover of each valve box in 2" white stenciled letters with the value number as designated on the plan.

C. Clearance between the highest part of the valve and the bottom of the valve box lid shall be 2" minimum and 4" maximum. (Lid must not rest on any part of valve and valves must not be buried too deep for convenient access.)

D. Clearance between the top of the piping and the bottom of the valve box and/or the valve box knock outs, shall be a minimum of 2". (The box must not rest on the piping.)

E. Clearance between the valve and the sides of the valve box shall be a minimum of 3".

3.07 SPRINKLER HEADS

A. Install heads as per details.

B. Nozzles may be changed to control precipitation rate and G.P.M. with approval from the landscape architect.

3.08 QUICK COUPLING VALVES: Quick coupling valves to be installed as per detail.

3.09 AUTOMATIC CONTROLLER

A. Install per local code and manufacturer's instructions.

B. Grounding of Irrigation controller shall be as per manufacturer's recommendations and as per local code.

3.10 CONTROL WIRING

A. Install control wires with sprinkler mains and laterals in common trenches wherever possible. Lay to the side of pipe line. Provide looped slack at valves of 18" and snake wires in trench to allow for contraction of wires. Tie wires in bundles at 10 ft. intervals. Provide expansion loop at all 90 degree angles, and every 100' of straight wire run.

B. Control wire splices at remote control valves to be crimped and sealed with specified splicing materials. Line splices will be allowed only on runs of more than 500 ft. All line splices to be in separate valve box.

C. Install one continuous ground wire and one extra wire to all valves.

3.11 CLOSING OF PIPE AND FLUSHING OF LINES

A. Thoroughly flush out all water lines before installing heads, valves and other hydrants.

B. Test as specified.

3.12 PRESSURE TESTS

A. The contractor shall partially backfill, leaving all fittings exposed before testing.

B. Cap all valve openings and test the mainline pipe at full line working pressure and visually check all fittings.

3.13 BACKFILL AND COMPACTING

A. After system is operating and required tests and inspections have been made, backfill excavations and trenches with clean soil, free of rubbish. All pipe shall have a bedding of 2" under and 4" over of select, rock free backfill.

B. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 95% density under pavements, 85% under planted areas.

C. Compact trenches in areas to be planted by thoroughly flooding the backfill. Jetting process may be used in those areas.

D. Dress off all areas to finish grades.

E. Any settling more than 1" which may occur during the guarantee period shall be brought to finish grade by the contractor at his expense.

END OF SECTION 02750

SECTION 02800
LANDSCAPING

PART 1 GENERAL

1.01 SCOPE

A. Work Included: Perform all work necessary and required for the construction of the project as indicated. Such work includes but is not limited to the following:

1. Site preparation including weed and rubble removal.
2. Laboratory soil analysis.
3. Furnishing and spreading topsoil.
4. Finish grading of planted areas.
5. Soil amendment.
6. Planting.

B. Related Work: The following items of associated work are included in other sections of these specifications.

1. Section 02750: Underground Irrigation System.

C. Use Teflon tape on all threaded fittings.

D. Thrust blocks shall be installed where the irrigation main changes direction as at ells and tees and where the irrigation main terminates. Pressure tests shall not be made for a period of 36-48 hours following the completion of pouring of the thrust blocks. Concrete thrust blocks for supply mains shall be sized and placed in strict accordance with the pipe manufacturer's specifications and shall be of an adequate size and so placed as to take all thrust created by the maximum internal B. Related Work: The following items of associated work are included in other sections of these specifications.

1. Section 02750: Underground Irrigation System.

C. By Others: The following items of work will be performed by others and are not included in the contract.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Perform work in accordance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for all inspections and permits required by federal, state, and local authorities in furnishing, transporting and installing materials.

B. Certificates of inspection required by law for transportation shall accompany the invoice for each shipment of plants. File copies of certificates with landscape architect after acceptance of material. Inspections of federal and state governments at place of growth does not preclude rejection of plants at project site.

1.03 SELECTION, TAGGING AND ORDERING OF PLANT MATERIAL

A. Submit documentation to landscape architect at least 7 days prior to start of work under this section that all plant material has been ordered. Arrange procedure for observation with landscape architect at time of submission.

B. Plants shall be subject to observation and approval by landscape architect at place of growth or upon delivery for conformity to specifications. Such approval shall not impair the right of observation and rejection during progress of the work. Submit written request for observation of plant material at place of growth to landscape architect. Written request shall state the place of growth and the quantity and variety of plants to be observed. Landscape architect reserves the right to refuse observation at this time if, in his judgment, a sufficient number of plants are not available for observation or not in the landscape architect's contract.

C. Substitution of plant material will not be permitted unless authorized in writing by landscape architect. If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of contract price.

1.04 COORDINATION: Contractor shall coordinate and cooperate with other contractors to enable the work to proceed as rapidly and efficiently as possible.

1.05 INSPECTION OF SITE: Contractor shall visit site and inspect conditions as they exist prior to submitting bid. Site dimensions, water pressure and general conditions shall be verified prior to beginning of any work.

1.06 INTENT OF DRAWINGS AND SPECIFICATIONS: It is the intent of the drawings and specifications to provide planting with plants in vigorous growth, ready for owner's use. Any items not specifically shown in the drawings or called for in the specifications, but normally required to conform with such intent, are to be considered as part of the work. Written dimensions take precedence over scale dimensions.

1.07 APPROVAL: Wherever the terms "approve", "approval" or "approved" are used herein, they mean approval of landscape architect in writing.

1.08 PRODUCT HANDLING

A. Furnish standard products in manufacturer's standard containers bearing original labels showing quantity, analysis and name of manufacturer.

B. Store products with protection from weather or other conditions which would damage or impair the effectiveness of the product.

1.09 PROTECTION OF EXISTING PLANTS TO REMAIN

A. Do not store materials or equipment, permit burning, or operate or park equipment within designated plant protection zones as specified on the plans.

B. Notify landscape architect in any case where contractor feels grading or other construction called for by Contract Documents may damage existing plants to remain. Do not proceed with such work until directed by landscape architect.

C. If existing plants are damaged during construction, contractor shall replace such plants of the same species and size as those damaged at no cost to owner. Determination of extent of damage and value of damaged plant shall rest solely with landscape architect.

1.10 GRADING

A. Prior to planting grading will be brought to within .10 + foot of finish grade with soil suitable for planting by the landscape contractor. It is the responsibility of the landscape contractor to verify that no conflict exists with the grading plan. Fine finish grading will be done by the landscape contractor.

B. Finish grade in ground cover areas shall be 2 inches below surrounding concrete or asphalt. In lawn areas, sodded areas shall be 2 inches and seeded areas shall be 1 inch below sidewalks, header boards, or mow strips and examined by the landscape architect, owner, or his representative.

1.11 CLEAN-UP: Keep all areas of work clean, neat and orderly at all times. Keep all paved areas clean during planting and maintenance operations. Clean up and remove all deleterious materials and debris from the entire work area prior to Final Acceptance to the satisfaction of landscape architect. The landscape contractor shall bear final responsibility for proper surface drainage of planted areas. Any prior work done by another party or obstructions on the site which the contractor feels precludes establishing proper drainage shall be brought to the attention of the landscape architect, owner or his representative for correction or the relief of responsibility.

1.12 SAMPLES, TESTS AND SUBMITTALS: Landscape architect reserves the right to take and analyze samples of materials for conformity to specifications at any time. Contractor shall furnish samples and/or manufacturer's specification sheets for any construction material or item upon request by the landscape architect. Rejected materials shall be immediately removed from the site at contractor's expense. The cost of testing materials not meeting specifications shall be paid by the contractor.

1.13 PROJECT SCHEDULE: Contractor shall submit for approval a complete work schedule indicating tentative dates for inspections. This schedule is to be submitted prior to the job start meeting.

1.14 OBSERVATION SCHEDULE: Schedule a job start meeting with the landscape architect at least 5 days before beginning work under this Section. All requests for observation must be made 72 hours in advance.

A. Job Start Meeting
The purpose of this conference is to review questions the contractor may have regarding the work, administrative procedures during construction and project work schedule.
B. Planting - Fine Grading and Soil Preparation
The fine grading and soil preparation of all planting areas must be observed prior to installation of plant material.
C. Plant Material
Landscape architect shall observe plant material for quality prior to planting. Plants shall be subject to observation and approval at place of growth or upon delivery for quality, size and variety; such approval shall not impair the right of inspection and condition of ball and roots, latent defects or injuries. Rejected plants shall be removed immediately from site.
D. Plant Layout
Layout plants (in containers) in locations shown on drawings. Landscape architect will check location of plants in the field and adjust to exact position before planting begins. Landscape architect reserves the right to refuse inspection if, in his opinion, an insufficient quantity of plants is available for layout check.
E. Pre-maintenance
When all work has been completed a pre-maintenance walk-through will be conducted. If approved, the 90 calendar day maintenance period will begin.
F. Final Observation
Final Observation will be after the 90 calendar day maintenance period and all required work is completed. Please give 1 week notice for this observation meeting.

1.15 MAINTENANCE

A. All landscape areas shall be substantially weed free at beginning of maintenance period and at final acceptance.

B. Begin maintenance after each plant and each portion of lawn or ground cover is installed and continue until Final Acceptance.

C. Maintenance Period shall begin upon inspection and approval by landscape architect and shall be for 90 calendar days.

D. Maintenance of new planting shall consist of watering, cultivating, weeding, fertilizing, mulching, re-staking, tightening and repairing of guys, resetting plants to proper grades or upright position, restoration of the plant saucer, and furnishing and applying such sprays and fertilizers as are necessary to keep the plants free of insects and disease and in thriving condition.

E. Protect planting areas and plants at all times against damage of all kinds for duration of maintenance period. Maintenance includes temporary protection fences, barriers and signs as required for protection. If any plants become damaged or injured, treat or replace as directed by landscape architect at no additional cost to owner.

1.16 FINAL ACCEPTANCE: Work under this Section will be accepted by landscape architect upon satisfactory completion of all work, including maintenance, but exclusive of replacement of plant materials under the Warranty Period. Upon Final Acceptance, the owner will assume responsibility for maintenance of the work.

1.17 WARRANTY PERIOD AND REPLACEMENTS

A. Contractor shall warrant that all plant material except annual color planted under this contract will be healthy and in flourishing condition of active growth one year from date of Final Acceptance.

B. Any delay in completion of planting operations which extends the planting period shall extend the Maintenance and Warranty Periods correspondingly.

C. Replace, without cost to owner, and as soon as weather conditions permit, all dead plants and all plants not in vigorous, thriving condition, as determined by landscape architect during and at the end of Warranty Period. Plants shall be free of dead or dying branches and branch tips, and shall bear foliage of a normal density, size and color. Replacements shall closely match adjacent specimens of the same species and shall be subject to all requirements of this specification.

D. Contractor shall not be held responsible for failures due to neglect by owner, vandalism, or acts of god, etc., during Warranty Period. Report such conditions to landscape architect in writing.

PART 2 MATERIALS

2.01 PLANTS

A. Plant Quality: Plants shall be fresh, well established, vigorous, of normal habit of growth, free of disease, insects, insect eggs and larvae. Roots shall be healthy and extend to the bottom and sides of the container, and rooting shall be extensive enough to hold the rood ball together during planting, but not so dense as to discourage root establishment into surrounding soils. Roots shall not show any signs of restriction due to kinked, circular, or distorted growth. No trees will be accepted that will not stand on their own trunks after the nursery stakes have been removed. All plants will be inspected prior to planting and may be rejected if noted quality standards are not met.

B. Plant Quantity: Plant materials shall be furnished in size, quantities, species and at the spacing indicated or as noted on the plans. Ground cover material shall be provided in quantity adequate to fill the entire ground cover areas at the spacing shown.

C. Plant Spacing: No planting, except for ground covers, espaliers and vines shall be placed closer than two feet to pavement, structures or other landscape edges. Ground covers adjacent to pavement, structures or landscape edges shall be no closer to these than 75% of their spacing. No plants that would obstruct the sprinkler coverage shall be placed closer than 30% of the radius of the sprinkler throw as specified by the sprinkler manufacturer at the optimum operating pressure unless approved by the landscape architect.

2.02 LANDSCAPE AREA PLANTING SOILS

A. Soil to be tested by testing agency as per specifications.

B. All landscape area planting soils shall be equal or coarser in texture to the original on-site topsoil. All landscape area soils shall be free from stones larger than 1 in. in size, sub-soil, refuse, plants or roots, clods, weeds, sticks, or other extraneous material. All landscape area soils shall be tested by an approved soils laboratory for horticultural suitability and verified to be capable of sustaining healthy plant life. Landscape area planting soils may be obtained through stockpiling of existing topsoil or imported soil of equal texture and quality as determined by approved soil laboratory analysis.

C. Soil Chemistry: All planting soils shall meet the following soil chemistry parameters.

1. Reaction - pH of saturated paste = 5.5 to 7.5
2. Salinity (Electrical conductivity in mmho/cm) = <4.0
3. Sodium Adsorption Ratio (SAR) = <6.0
4. Sodium = <5.0 milliequivalents per liter
5. Chloride = <5.0 milliequivalents per liter
6. Boron (Parts Per Million in extract) = <1.0

D. Soil Fertility: Adequate amounts of nitrogen, potassium, phosphorus, calcium, and magnesium shall be available to support healthy plant growth. Soil shall be analyzed for fertility and any deficiencies shall be treated with inorganic fertilizer amendments prior to planting.

E. Lime Treated Soil: If lime is used for soil compaction in landscape areas, all lime treated soil shall be removed to a depth equal or more to the depth of the treated soil. Soil shall be replaced with import soil as described in the landscape specifications.

2.03 PREPARATION OF LANDSCAPE AREA PLANTING SOILS

A. Prior to any work in planting areas all construction debris shall be removed.

B. Structural fill and/or compacted engineered fill and/or any other soil deemed unsuitable for horticultural use as defined by Sections 2.2-A, 2.2-B and 2.2-C, shall be excavated and removed to a depth of 12 inches in landscape planting areas by the landscape contractor. Replacement planting soil shall be equal or coarser to the on-site soil in texture. This may be obtained through stockpiling of existing topsoil or imported soil of equal quality as determined by approved soil laboratory analysis. It shall be free from stones larger than 1 in. in size, sub-soil, refuse, plants or roots, clods, weeds, sticks, or other extraneous material. It shall be capable of sustaining healthy plant life.

C. All landscape area soils shall be ripped in two directions to a depth of 12 inches. In areas not accessible by large equipment, ripping shall be accomplished by small backhoe or manually to thoroughly cultivate the soil to a depth of 12 inches.

D. Landscape area planting soil, imported or otherwise, shall be spread evenly over the site. Minimum depth of friable soil shall be 12 inches deep in all landscape planting areas and finish surface shall be within one inch of finish grade. Import topsoil shall be supplied by the landscape contractor to meet this requirement and shall meet all specifications as defined Sections 2.2-A, 2.2-B and 2.2-C. Imported landscape area planting soils shall be compacted to 85%± relative compaction. Never apply the topsoil when the site or the topsoil is wet.

2.04 COMMERCIAL FERTILIZER

A. Pre-plant fertilizer for soil incorporation shall consist of the following percent by weight

6% Nitrogen
20% Phosphoric Acid
20% Potash

B. Post Planting/Surface Application Fertilizer:

16% Nitrogen
8% Phosphoric Acid
8% Potash

C. Fertilizer requirement is subject to change based on soil testing for horticultural suitability.

2.05 SOIL AMENDMENTS

A. Organic Amendment: Shall be nitrolized and derived from fir wood residuals.

B. Physical Properties: 1/2" minus fir bark, nitrolized fortified or entranced.

C. Chemical Amendments: As required by soil analysis with approval of landscape architect.

2.06 STAKING MATERIALS

A. Contractor shall use staking materials necessary to meet requirements of specifications, subject to approval of landscape architect.

B. Tree Stakes: 2" x 2" X 8' lodgepole pine pressure treated stakes. Construction heart grade. (Do not drive stakes through the rootball). Use 2 stakes per tree.

C. Tree Ties: Corded rubber tree ties, 18" without wire.

2.07 ROOT BARRIERS

A. "Root Solutions" control planter, or equal. Install according to local code and manufacturer's instructions. Use in all areas where tree is within 7 feet of any walkway, wall, building or other structural edge. Linear type barrier shall be used in all cases. Linear barriers shall be installed a minimum of 7 feet to either side of tree's relative position to sidewalk or structural edge.

B. All root barriers to be 24" deep, interlocking linear panels.

C. All root barriers shall be installed 4" from the back of curb or other hardscape edge with 4" of 3/4" gravel drain rock 24" deep on the root barrier side away from the tree.

2.08 WATER: Furnished by owner. Transport as required.

2.09 MULCH: Fir bark 1" to 2", free of sticks, dirt, dust and other debris, as approved, to a depth of 3" to be placed in all landscaped areas except where flats have been planted or annual beds and drainage swales. Fir bark, 1/2" minus, free of sticks, dirt, dust and other debris, as approved, to a depth of 1" to be placed in all landscaped areas where flats have been planted or in annual beds. Shredded bark mulch shall be used in conjunction with jute netting on all slopes greater than 6:1.

2.10 PRE-EMERGENT WEED CONTROL: All herbicides used to control weeds shall comply with all governmental regulations and shall be appropriate to weed species. Contact the local county agricultural agent or pest control advisor for proper herbicide recommendations. Follow manufacturers instructions carefully

PART 3 EXECUTION

3.01 HANDLING OF PLANT MATERIAL

A. Canned stock shall be removed carefully after cans have been cut on two sides. Do not use spade to cut cans. Do not lift or handle container plants by tops, stems, or trunks at any time.

3.02 PREPARATION OF SUB-GRADE AND/OR EXISTING SOILS

A. Prior to any work in planting areas by landscape contractor, the general contractor shall clear all construction debris from planting areas.

B. Soil shall be ripped in two directions to a depth of 12". In areas not accessible by large equipment, ripping shall be accomplished by small backhoe or manually.

3.03 SPREADING OF TOPSOIL

A. After sub-grade has been prepared, the landscape contractor shall be responsible for furnishing and installing topsoil to within (1) inches of finish grade.

B. Topsoil should be spread evenly over the site. Minimum depth of friable to be 12 inches within five feet of all structures and 24 inches deep in all other areas. If this condition does not exist on the site, the balance of topsoil shall be imported by the landscape contractor to meet this requirement. Import soil shall be compacted to 85% relative compaction. Never apply the topsoil when the site or the topsoil is wet.

3.04 AMENDMENT OF SOIL

A. Apply amendments to all planting and lawn areas at the following rates per 1,000 sq.ft. at zero to eight inches depth:

8 cubic yards organic amendment as specified.
20 pounds pre-plant fertilizer
Additional amendments as determined from soil test

B. Incorporate thoroughly with top 8 in. soil layer and remove stones over 1 in. in diameter, roots, clods, weeds, and other extraneous material. Bring amended soil to finish grades and elevations shown on Contract Documents. Do not work soils under frozen or muddy conditions.

3.05 SURFACE DRAINAGE OF PLANTED AREAS: Landscape Contractor shall bear final responsibility for proper surface drainage of planted areas. Any discrepancy in the drawings or specifications, obstructions on the site, or prior work done by another party, which contractor feels precludes establishing proper drainage shall be bought to the attention of landscape architect in writing for correction or relief of said responsibility.

3.06 EXCAVATION OF PLANTING AREAS

A. Excavate container grown tree, shrub, and vine pits to the following dimensions:

1. Two times as large in diameter as the original growing container (Rhododendron and azaleas 3 times the diameter)
2. The depth should be equal to the root ball height.

B. Scarify all sides of planting hole. Auger through structural fill, compacted soil or hardpan if encountered or as directed by landscape architect.

3.07 DRAINAGE, DETRIMENTAL SOIL AND OBSTRUCTIONS

A. Notify landscape architect in writing of all soil or drainage conditions contractor considers detrimental to growth of plant material. State condition and submit proposal and cost estimate for correcting condition.

3.08 PLANTING OPERATIONS

A. Protect plants at all times from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected, and shall be kept well watered.

B. Planting Soil (excluding trees):

2/3 Existing Soil
1/3 Organic Amendments

C. Prior to planting test hole for drainage by filling with water, if hole does not drain within four hours, do not plant. Contact landscape architect.

D. Use planting soil to backfill plant pits. Crown of root ball shall be 1" above finished grade. Set plant plumb and brace rigidly in position until planting soil has been tamped solidly around the ball and roots. When plant pits have been backfilled approximately 2/3 full, water thoroughly, saturating rootball, before installing remainder of the planting soil to top of pit, eliminating all air pockets.

E. Smooth planting areas to conform to specified grades after full settlement has occurred.

F. Form saucer with 4 in. high berm around tree and shrub pits 12 inches wider that the root ball diameter.

G. Water all plants immediately after planting.

3.09 STAKING

A. Staking shall be completed immediately after planting. Plants shall stand plumb after staking.

B. Locate stakes in position relative to the prevailing wind as shown on detail.

C. Attach tree straps as per details.

D. Need for auxiliary stake shall be determined in the field by the landscape architect and shall only be used when trees are exceptionally spindly. If necessary, place auxiliary stake adjacent to tree leader and tie with polyethylene nursery tape at 10 inch intervals. Auxiliary stake to be bamboo or equal.

3.10 PRUNING: Prune plants only at the time of planting and according to standard horticultural practices to preserve the natural character of the plant. Trees shall be pruned at the direction of the landscape architect in accordance with current I.S.A. Standards. Remove all dead wood, suckers and broken or badly bruised branches. Use only clean sharp tools. Do not prune to compensate for root loss. Landscape contractor is responsible for replacement of all improperly pruned plant material.

3.11 GROUND COVER PLANTING

A. Plant ground cover plant at optimum depth for proper growth. Do not bury deeper than the original soil level which was established in the nursery can. Avoid air pockets.

B. Apply post plant or surface application fertilizer at the rate of 5 lbs. per 1000 sq.ft. Water bed thoroughly after fertilizer application. Wash all fertilizer from leaves of plant materials.

3.11 BIOSWALE SOD

A. To be "Biofiltration Sod" as produced by Delta Bluegrass Company, or approved equal.

3.12 SOD BED PREPARATION

A. Roll amended soil with 200 lb. water ballast roller.

B. Sod immediately thereafter, provided the sod bed has remained in a friable condition.

3.13 SODDING OPERATIONS

A. Sod must be delivered to site within 24 hours of cutting. Lay sod so that adjacent strips butt tightly with no spaces between strips. Lay sod on slopes and mounds with strips parallel to contours. Stagger joints and do not overlap seams. Sodded areas shall be flush with adjoining seeded areas.

B. Tamp and roll sod thoroughly to make contact with sod bed.

C. Apply post planting fertilizer at a rate of 5 lbs. per 1000 s.f.

D. Water sod thoroughly.

E. No portion of the sod lawn will be allowed to dry out until the sod is well rooted.

F. Supplemental Temporary Irrigation: Contractor shall be responsible for temporary supplemental irrigation of all bio-retention areas through the sod establishment period. Method of irrigation application is discretionary and may include hand watering or installation of a temporary, above grade overhead spray circuit. Any replacement of sod necessary for loss or damage to sod due to lack of water shall be the responsibility of the contractor at contractor's expense.

PART 4 TREE PRESERVATION

4.01 CONSTRUCTION IMPACT: The impact of construction within the project area will be minimal when appropriate protection measures are implemented. The following specifications have been developed to minimize impact on the area.

A. The landscape architect shall be called to inspect and verify staked location of trenches within the project zone. No trenching, pruning or tree removal shall take place without the approval of the landscape architect.

B. The smallest possible equipment shall be used for all construction work to minimize damage to the existing trees.

C. If the installation of storm drains or irrigation lines is to occur within the drip line of any major tree, a professional arborist shall be called upon to inspect the tree and determine whether head pruning will be necessary to balance the projected loss of roots.

D. Following completion of grading, all soil shall be brought back to original grade. No additional soil shall be allowed to remain at the base of any shrub or tree, and grade shall not be changed to allow collection of surface drainage at the base of any shrub or tree.

E. Minimal disturbance to the natural setting is to occur during trenching and installation of pipe lines. The mainlines are to be set 18" below grade.

F. Trenches shall be the minimum width possible to accommodate the specified diameter of pipe.

G. Existing foliage shall be preserved wherever possible. When it becomes necessary to remove any limbs from remaining trees the following guidelines shall be followed:

1. No branches shall be damaged or broken.
2. Prior to installation of lines it shall be determined what foliage needs to be removed and pruning shall be done using a sharp saw.
3. Limbs shall be removed back to the nearest lateral branch or trunk, using a flush cut.
4. All cuts shall be painted with a commercial asphaltic compound designed specifically for covering pruning wounds.

H. No roots over 2" in diameter shall be torn or damaged. When it becomes necessary to remove any major roots over 2" in diameter, a sharp saw shall be used and the wound treated as described in G-4 above.

I. Following the installation of the pipelines all soil from the trenches shall be brought back to the original grade. No soil shall be allowed to remain at the base of any tree or shrub, and grade shall not be changed to allow collection of surface drainage at the base of any tree or shrub.

J. All pruning and plant debris associated with the installation shall be removed from the site and disposed in an appropriate manner.

4.02 IMPACT OF GRADING :Protection of all existing trees within the construction zone is to be given the highest priority. As described in the following section, the trees within the project area will be protected by a temporary construction fence during all construction phases, including rough and final grading. Grade changes will be prevented around the base of these trees by this fence, and the impact of grading will be negligible as it will occur outside the drip line of all trees.

4.03 MEASURES TO PROTECT VEGETATION FROM CONSTRUCTION ACTIVITIES: A minimum six foot cyclone fence shall be erected aRound the drip line of all trees located within the project area prior to the beginning of any construction activities, including grading. General Contractor shall direct all equipment, subcontractors and personnel to remain outside the fenced area. Warning signs shall be posted on the fence indicating a protected area. As shown on the irrigation plan the cyclone fence will be placed around all existing trees to be saved. The purpose of this fence is to discourage the parking of vehicles under the trees and prevent grading or storage of material too close to the tree trunks.

END OF SECTION 02800

REGISTERED LANDSCAPE ARCHITECT
DONALD G. MACNAIR
NO. 2800
EXP. 8/31/23
STATE OF CALIFORNIA

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LANDSCAPE SPECIFICATIONS

NORTH BAY ENERGY STORAGE
1901 FRATES ROAD
PETALUMA, CA
APN #017-140-011 & 012, 017-050-006

DATE: 2/22/23
MLA JOB #: 2021-21
SCALE: N/A
DRAWN: DM

L4

SHEET L4 OF 6