

# Design Considerations

- Gravity supply dependent on canal top of bank; +/- 24.0' EI
- Gravity drain dependent on Pond C Bennett North and Pond TBD in Nestor
- Gravity Drain also dependent on bottom Elevation of canal at the east end of the site

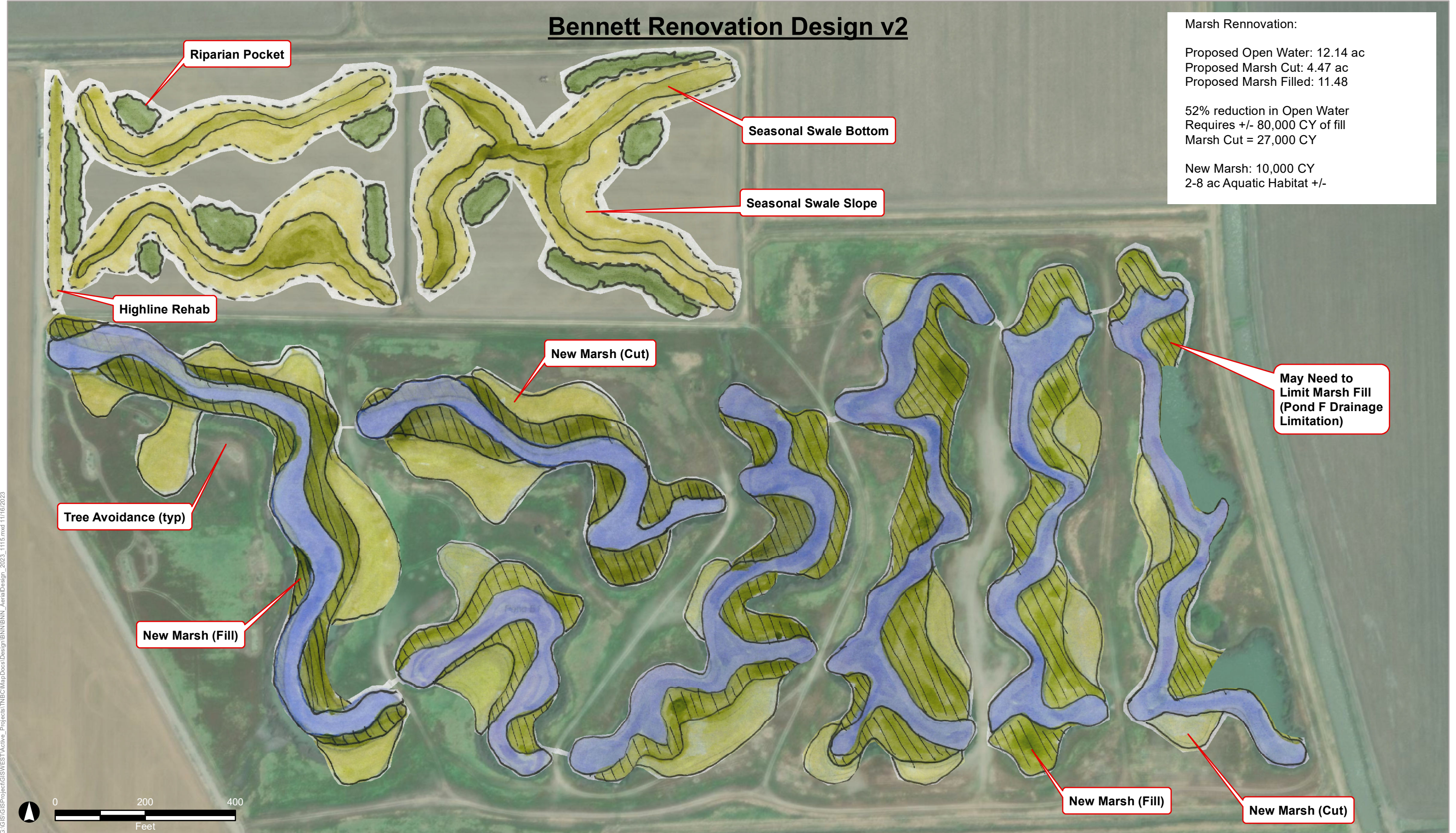


# Bennett Renovation Design v2

Marsh Renovation:  
Proposed Open Water: 12.14 ac  
Proposed Marsh Cut: 4.47 ac  
Proposed Marsh Filled: 11.48

52% reduction in Open Water  
Requires +/- 80,000 CY of fill  
Marsh Cut = 27,000 CY

New Marsh: 10,000 CY  
2-8 ac Aquatic Habitat +/-

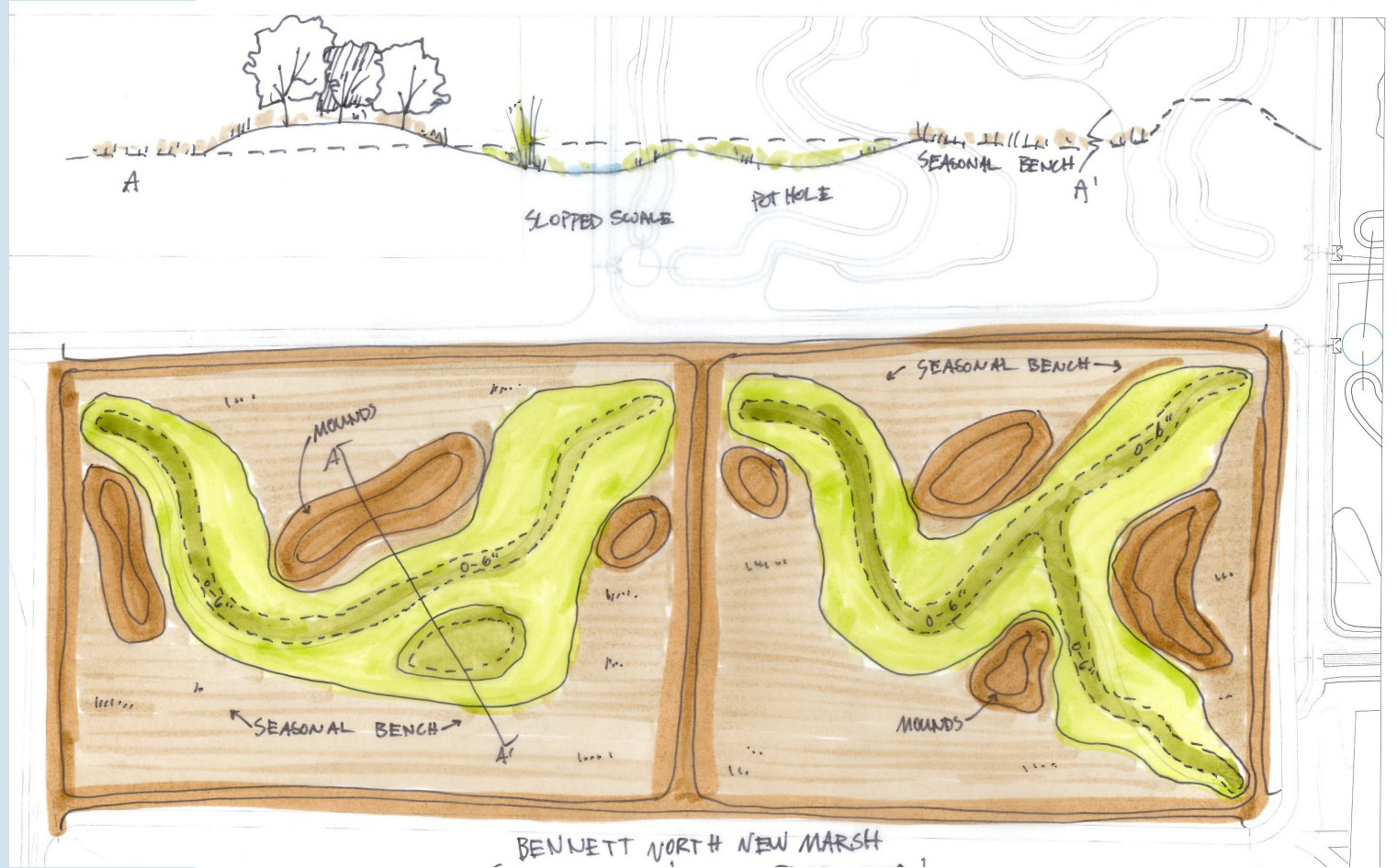


May Need to Limit Marsh Fill (Pond F Drainage Limitation)

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# Wide & Shallow Swale

- 0.0-1.0' swale depth
- Allows full access to wetlands for management
- Allows for variable perennial water regime: wet periods or dry periods



Low water operation (Summer)



600 N. Market Blvd, Ste 3  
 Yuba City, TX 75904  
 Phone: (916) 946-3844  
 Fax: (916) 946-3875  
 www.westervelt.com

**WESTERVELT**  
 ECOLOGICAL SERVICES

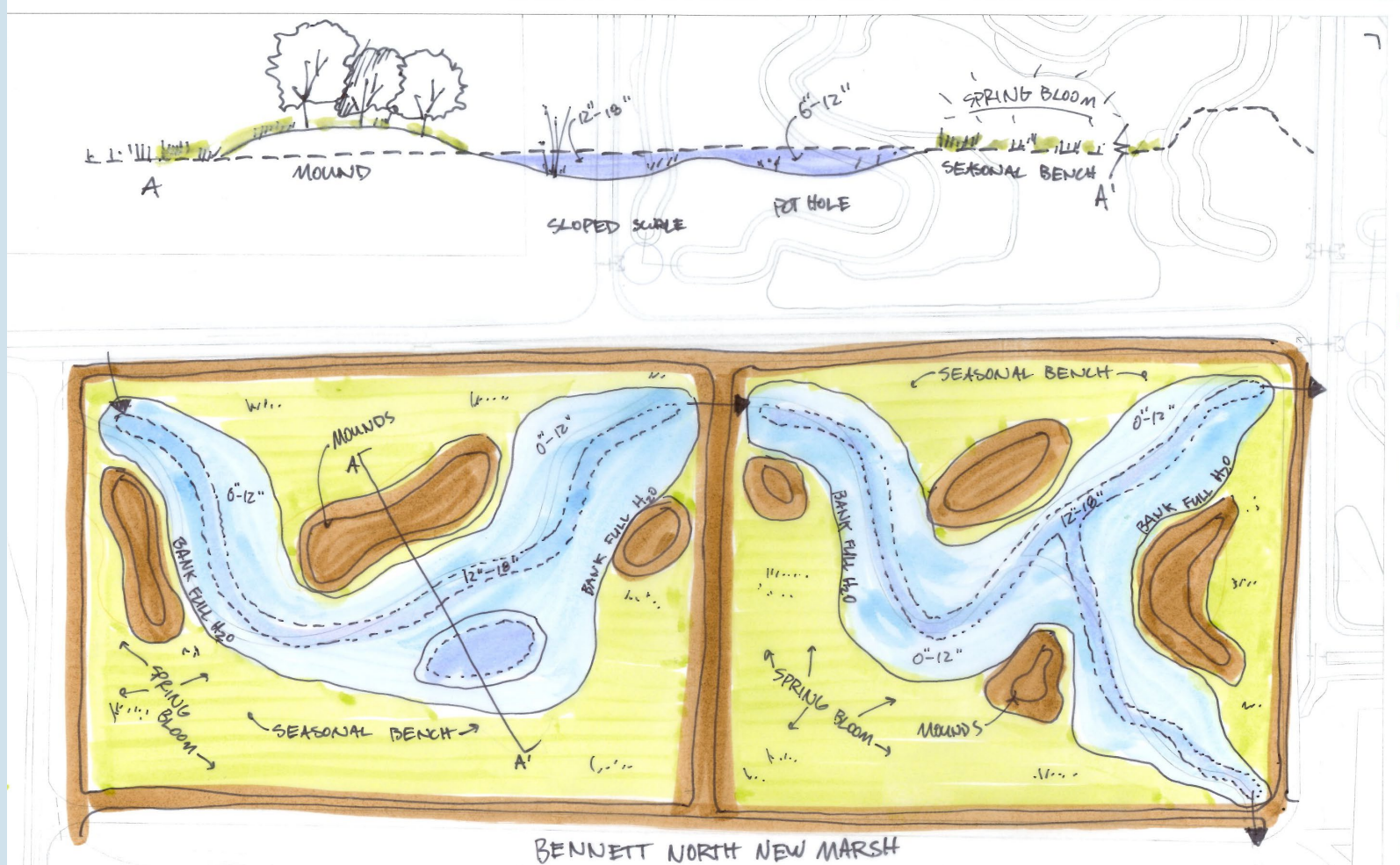
REGISTERED LANDSCAPE ARCHITECT  
 STATE OF CALIFORNIA  
**RAAF**  
 Construction Set

Bennet North and Nestor Habitat Restoration  
 The Nestor Rehabilitation Company, Sacramento  
 County, California

Drawn By: \_\_\_\_\_  
 Checked By: \_\_\_\_\_  
 Date: 12-06-2022  
 REVISIONS

# Wide & Shallow Swale

- 0.0-1.5' swale depth
- Seasonal bench growing



BENNETT NORTH NEW MARSH  
Mid water operation (Spring)

600 N. Market Blvd., Ste 3  
 Westervelt Ecological Services  
 Phone: (916) 646-2944  
 Fax: (916) 646-2875  
 www.westervelt.com

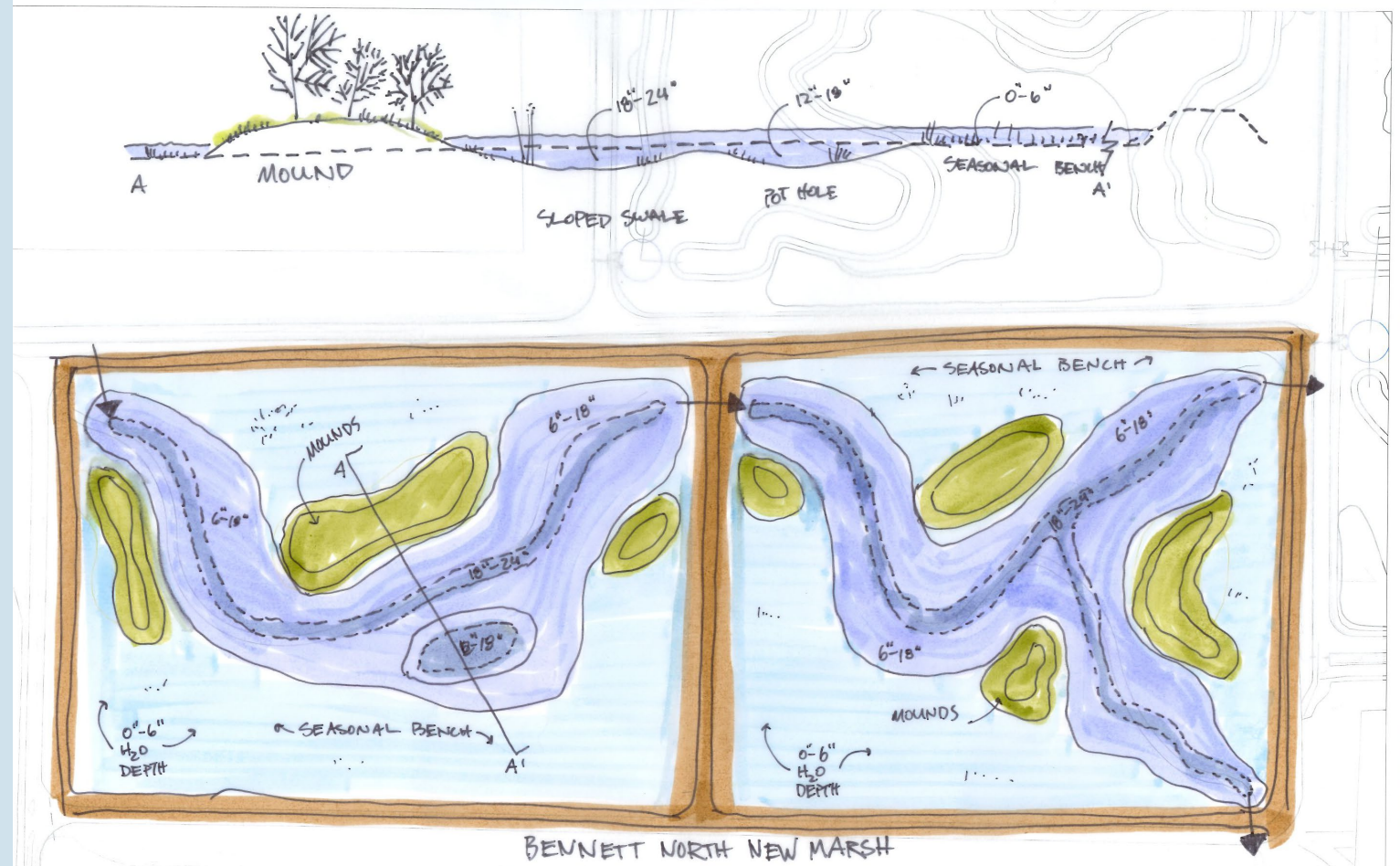
THE CALIFORNIA LANDSCAPE ARCHITECTS BOARD  
**CRAP**  
 STATE OF CALIFORNIA  
 Construction Set

Bennett North and Nestor Habitat Restoration  
 The National Basin Conservancy, Sacramento County, California

Design Number:	
Checked By:	
Drawn By:	
Date:	12-06-2022
REVISIONS	

# Wide & Shallow Swale

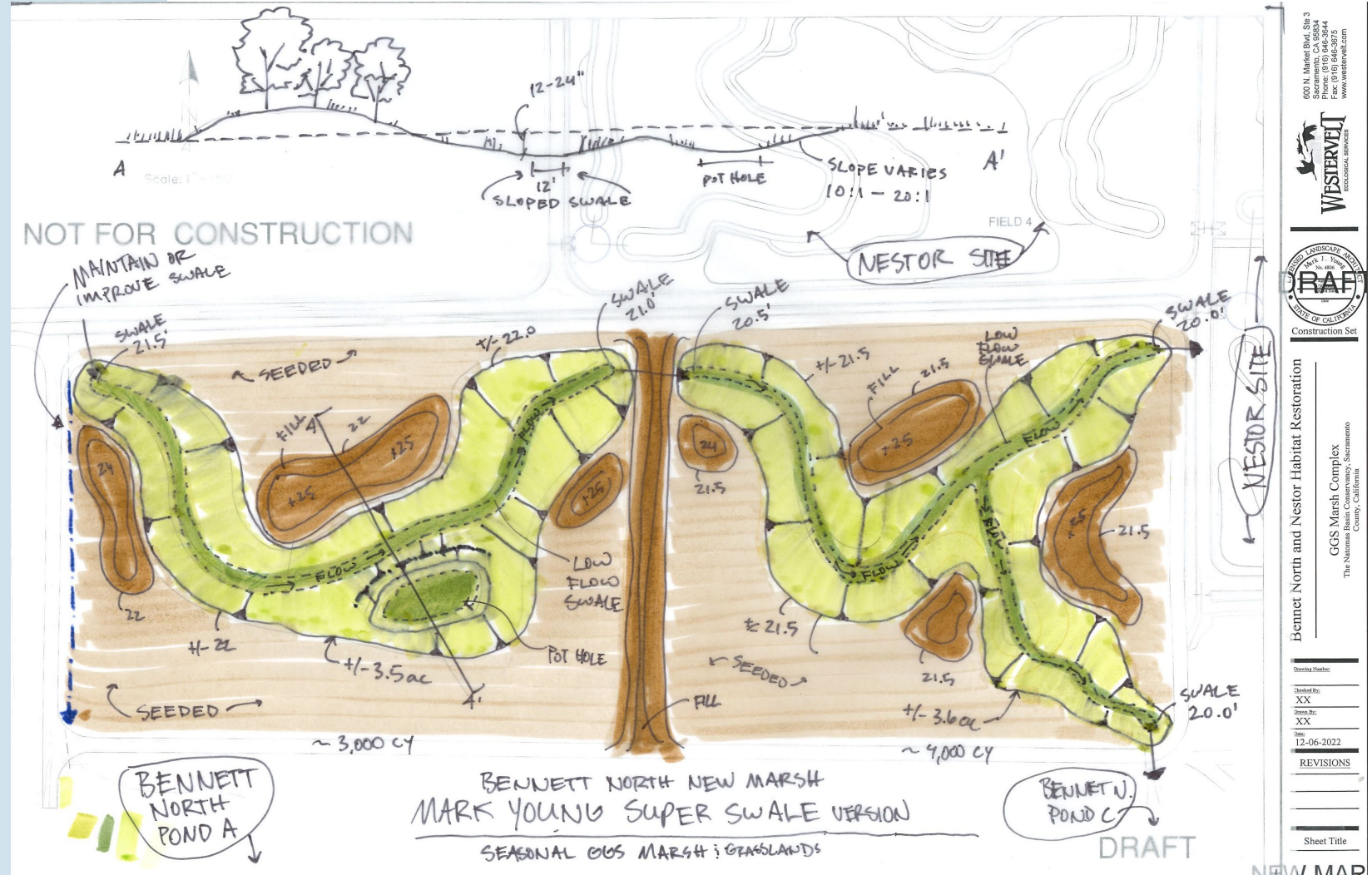
- 1.5'-2.0' swale depth
- 0.0'-0.5' Seasonal depth



High water operation (Winter)

# Wide & Shallow Swale

- Mechanical or livestock vegetation management
- Requires +/- 8,000 CY of cut
- Easier to fill and drain via gravity
- Does not eliminate future construction options





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A yellow excavator is shown in a field of dry, golden-brown grass. The excavator's arm is extended, and its bucket is digging into the ground, creating a deep soil pit. A person wearing a blue shirt and a hat is visible in the operator's cab. The background shows a flat, open field under a clear blue sky.

# Nestor and Bennett North Soil Pits

11/9/2023 for Marsh Restoration Design

INBC SOIL PITS

(15)

PIT 1

0-7" CLAY LOAM TILL PAN

7-19" DARK GRAY CLAY

18-34" BROWN CLAY

34-44" CLAY SAND MODELING  
DARK BROWN  
& RED

44-55" COARS SAND

PIT 2

0-6 TILL PAN

6-36 DARK BROWN HEAVY  
CLAY

36-54" LIGHT GRAY CLAY  
LOAM

DECREASES IN  
CLAY WITH DEPTH

PIT 3

(16)

0-8 TILL PAN

8-32 HEAVY CLAY

32-36 LIGHT TAN  
MODEL CLAY LOAM

36-42" LIGHT TAN LOAM  
DEGRADED DURAPAN

PIT 4 CLEAR LAKES OB

0-8 TILL PAN

8-60 VERY DARK CLAY  
HEAVY CLAY

60" LIGHT GRAY

PIT 5 CLEAR LAKE SOIL

0-6 TILL PAN

6-26 DARK GRAY  
HEAVY CLAY

26-48 LIGHT GRAY  
HEAVY CLAY

48-60 TAN OLIVE CLAY

60+ LIGHT TAN OLIVE  
CLAY

PIT 6

0-6 TILL PAN

6-51 DARK GRAY HEAVY  
CLAY

51-55 LIGHT GRAY CLAY

55+ FRACTURED DURAPAN  
WITH WATER

PIT 7 GALT SERIES

1-8 TILL PAN

8-50 DARK GRAY  
HEAVY CLAY

50-58 LIGHT GRAY  
CLAY LUMP  
Friable

HARD INTACT

58+ SILICA

PIT 8

0-8 TILL PAN

8-45 DARK GRAY  
HEAVY CLAY

45-55 LIGHT BROWN CLAY

55-60 LIGHT BROWN  
TBD = SILTY CLAY  
WITH WATER AT BOTTOM

# Picture of Soil Pit 6



Clear Lake: Olive Silty Clay  
under Dark Gray Clay

# Picture of Soil Pit 7



**Typical Dark Gray Clay found in top 36" of both Clear Lake and Galt pits**



**Galt: Silica Pan under  
Dark Gray Clay**

Picture of  
Soil Pit 8



PIT 9

- 0-8 TILL PAN
- 8-49 DARK GRAY HEAVY CLAY
- 49-58 LIGHT BROWN SILTY CLAY FRIABLE
- 58-64 LIGHT BROWN SILTY CLAY

PIT 10

- 0-6 TILL PAN
- 6-16 DARK GRAY HEAVY CLAY
- 16-24 DARK BROWN RED SANDY CLAY

24-36 BROWN HEAVY CLAY

36-50 SILT CLAY

50-56 TAN LOAM OR FRACTURED DURAPAN BREAKS INTO CLEAN FACES

PIT 11

0-6 DARK GRAY CLAY

6-10 LIGHT TAN FRACTURED DURAPAN

PIT 12 GALT SERIES

0-8 TILL PAN

8-36 DARK GRAY HEAVY CLAY

36-56 LIGHT BROWN SILTY CLAY

(2)

SI-56<sup>+</sup> LIGHT BROWN  
CLAY WITH MODE<sub>2</sub>  
COULD BE FRACTURED  $\frac{1}{6}$   
SILICA PAN



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NESTOR CONCEPT