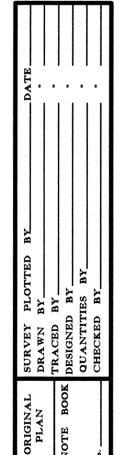
FISCAL SHEET TOTAL YEAR NO. SHEETS FED. ROAD DIST. NO. PROJ. NO. STATE 2016 HAW. HWY-O-04-16 32 HAWAII

PLANT NOTES:

- 1. Contractor shall field verify all plant quantities and dimensions prior to installation. Contractor shall determine quantities of plant materials to be provided. In all cases, Contractor shall install plant material on all areas affected by construction.
- 2. Contractor shall be responsible for locating and protecting existing utilities.
- 3. Prior to excavating for tree, shrub, or ground cover planting pits, all tree and shrub planting locations shall be staked out by Contractor for acceptance by Engineer. Do not plant until ground has been prepared and site is neat, orderly, and the Engineer accepts site for planting.
- 4. Notify Engineer of any discrepancies in plant locations.
- 5. Notify Engineer 30 days prior to planting operations for acceptance of all plant material at place of growth. All plant material not accepted by the Engineer will be subject to rejection.
- 6. The Engineer will inspect plants at the place of growth and after delivery to the project.
- 7. Plants shall meet size indicated. Plants shall be straight and uniformly shaped, unless unique or special characteristics are specified, and shall be undamaged, sound, healthy, vigorous and free of disease and insect infestation. Plants not conforming to these requirements on delivery to the project and at the end of the plant establishment period will be rejected.
- 8. Contractor shall be solely responsible for the complete removal and damages resulting from planting any plant species listed on the Hawaii Department of Agriculture 'Noxious Weed Rules' as defined in the statute, Hawaii Administrative Rules 4:68:1 or the 'Federal Noxious Weed List' as defined in Title 7 of the Code of Federal Regulations (CFR), parts 360 and 361.
- 9. All tree work must adhere to American National Standard Institute (or ANSI) a300 Tree Care Standards and ANSI-z133 safety standards for tree work. Work shall be contracted to arborists that has been certified in good standings as an ISA certified arborist for at least 10 continuous years to assure that tree work is performed properly and trees are not damaged by practices such as topping, flush cuts, over-thinning, or climbing with spikes. Contractor shall submit a copy of the ISA arborist certification of good standing of 10 years to the Engineer minimum 7 days prior to tree pruning. The cost for arborist services shall be considered incidental to Specification Section 619 - Planting.
- 10. For the duration of construction within the drip line of trees to remain there must be: no changes, alterations or disturbance to the grade by adding fill, excavating or scraping except as noted on plans; no storage of construction material or equipment; no stockpiling of any construction material or any excavated material no disposal of any liquids (E.G. Concrete slurry, gas, oil, paint); no vehicular traffic, equipment or excessive pedestrian traffic, no attachment of any wires, ropes, lights, or any other such attachment other than those of protective nature to any tree to be preserved; and no cleaning of equipment or material under the canopy of any tree or group of trees to remain. For slopes flatter than 3H:1V, till top six-inches of soil to evenly incorporate fertilizer and amendments. For slopes steeper than 3H:1V, no tilling is required.
- 11. Representative samples of soil from project site shall be submitted to Crop Nutrient Solutions Inc., the University of Hawaii Agricultural Extension Service or laboratory acceptable to the Engineer for analysis of required soil amendments. Test results and fertilization schedule shall be presented to the Engineer for review and acceptance before placing planting soil or amending existing soil. Uniformly distribute fertilizer and amendments over planting areas as recommended by the soil analysis report. Contractor shall prepare separate soil samples and analysis results for each site. Refer to Specification Section 618 - Soil Preparation.
- 12. Guy wires, flagging, stakes, windbreakers, etc. shall be maintained and replaced if necessary by the Contractor until the shrub is able to stand by itself. The Contractor shall remove and dispose of these items at the end of plant establishment period.

- 13. Any planting that obstructs sight distance, signs or traffic lights shall be relocated or removed as determined by the Engineer.
- 14. Provide water for all plant material for the duration of the project, including plant establishment period. Water trees, shrubs, ground cover and all grassed areas. Water for planting shall not cause erosion damage to the slopes. The Contractor shall be responsible for repairing any damage cause by the watering of plants. The Contractor shall gradually decrease the amount of water being provided to the plant material 8 weeks prior to final acceptance of plantings.
- 15. Temporary irrigation shall be provided and installed by the Contractor for the duration of the project. Refer to Specification Sections 619.03(N), 641.03(E) and 641.03(F). Temporary irrigation system shall be considered incidental to Specification Sections 619 - Planting and 641 - Hydro-Mulch Seeding.
- 16. Contractor shall be responsible for weeding throughout the 9-month plant establishment period. Refer to Specifications Section 619 - Planting.
- 17. Upon request, Hawaii Department of Transportation will furnish the seeds at no cost to the Contractor for the following plants:
 - Kawelu Grass (Eragrostis variabilis) Limit of 5 seeds per pot.
- 18. Tree roots greater than 2 inches in diameter shall not be disturbed. Cutting of tree roots larger than 2 inches in diameter must be approved by an ISA Certified Arborist with a minimum of 10 years of continuous licensure and experience. Contractor shall submit arborist's qualifications and a tree root assessment report to the Engineer for approval prior to cutting tree roots. Root pruning shall be done in conformance with ANSI a300 (Part 8) latest edition. Root pruning shall take place under the supervision of the approved arborist at all times.



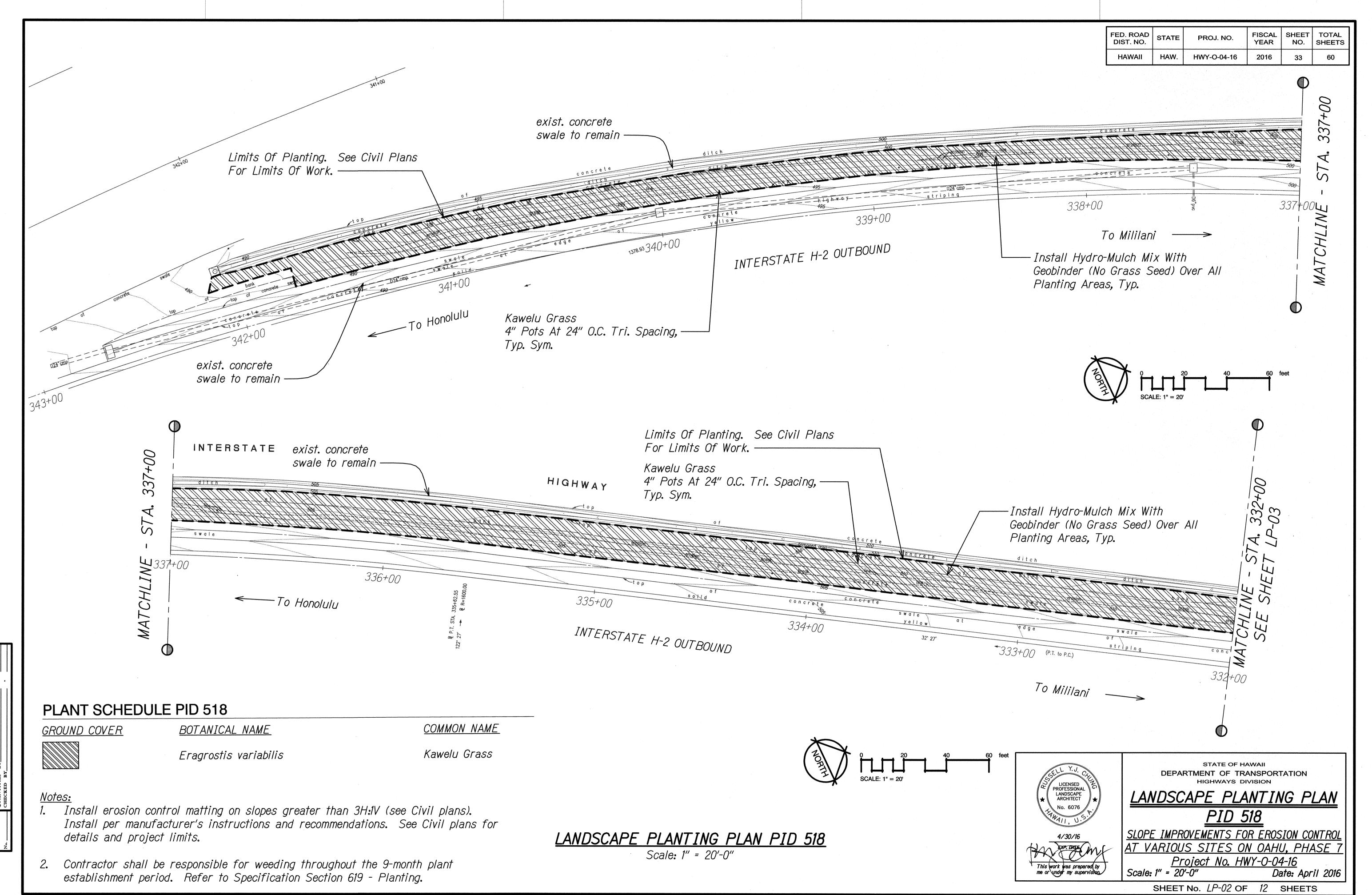


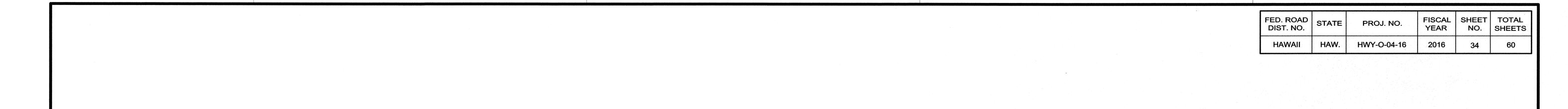
DEPARTMENT OF TRANSPORTATION

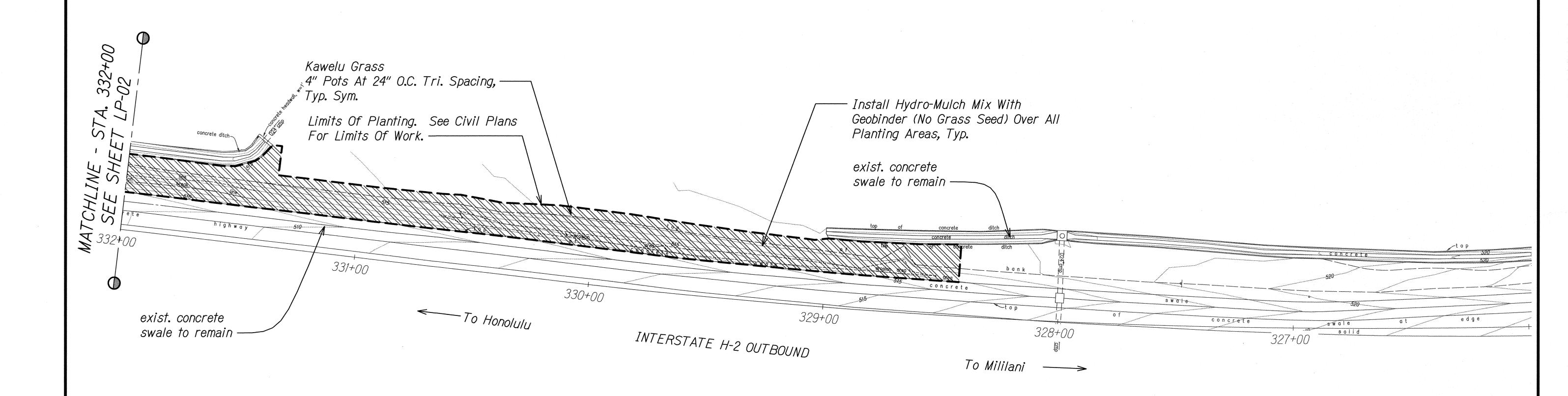
<u>LANDSCAPE</u> NOTES

SLOPE IMPROVEMENTS FOR EROSION CONTROL <u>AT VARIOUS SITES ON OAHU, PHASE 7</u> Project No. HWY-0-04-16 Scale: None Date: April 2016

SHEET No. LP-01 OF 12 SHEETS







PLANT SCHEDULE PID 518

GROUND COVER

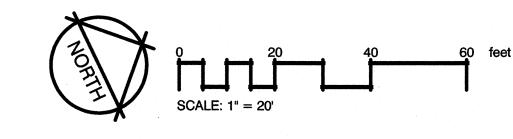
BOTANICAL NAME

COMMON NAME

Eragrostis variabilis

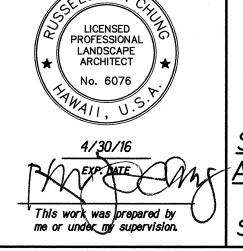
Kawelu Grass

- Install erosion control matting on slopes greater than 3H:1V (see Civil plans). Install per manufacturer's instructions and recommendations. See Civil plans for details and project limits.
- 2. Contractor shall be responsible for weeding throughout the 9-month plant establishment period. Refer to Specification Section 619 - Planting.



LANDSCAPE PLANTING PLAN PID 518

Scale: 1" = 20'-0"

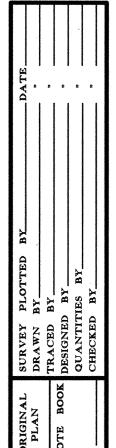


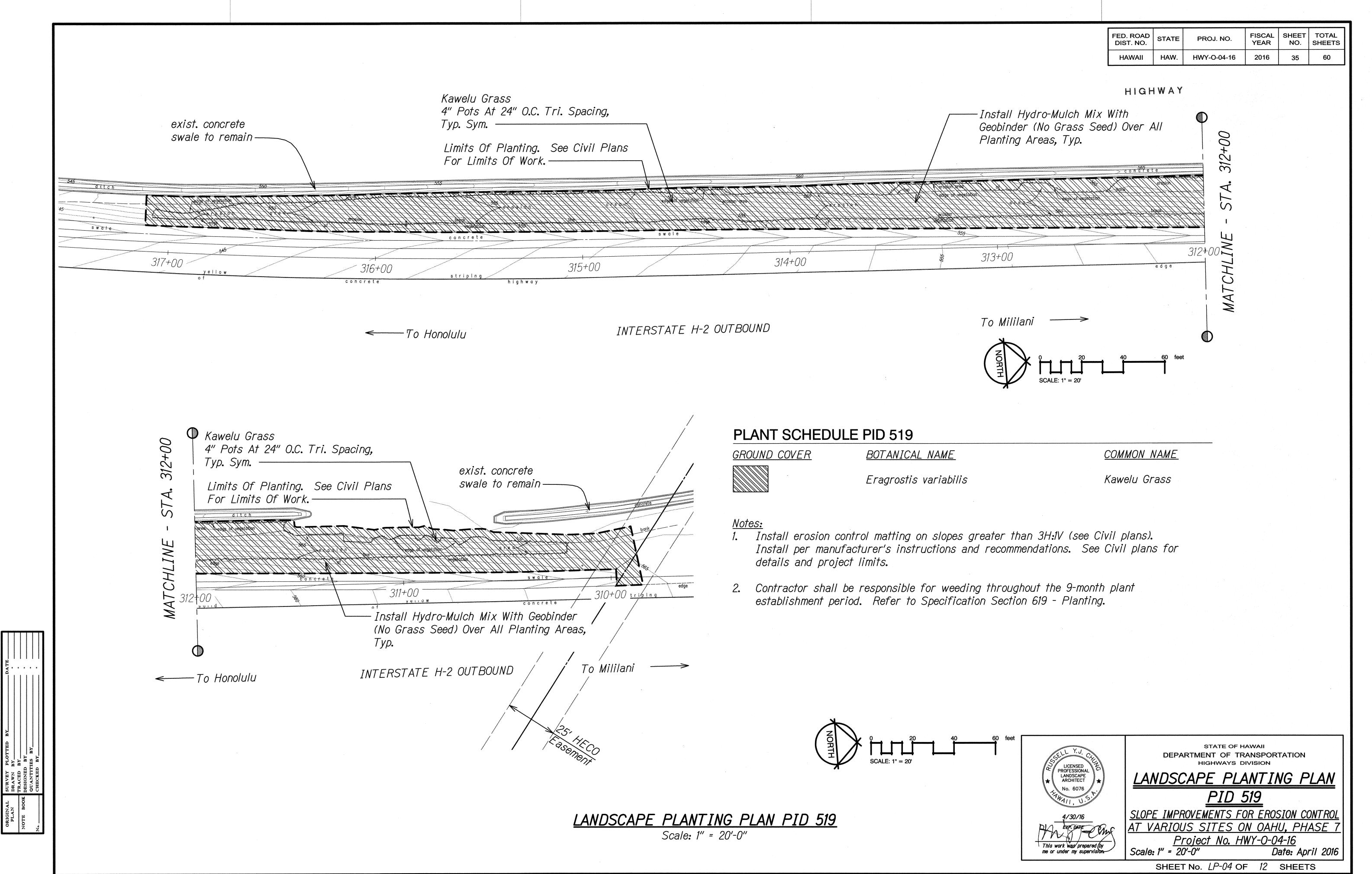
DEPARTMENT OF TRANSPORTATION

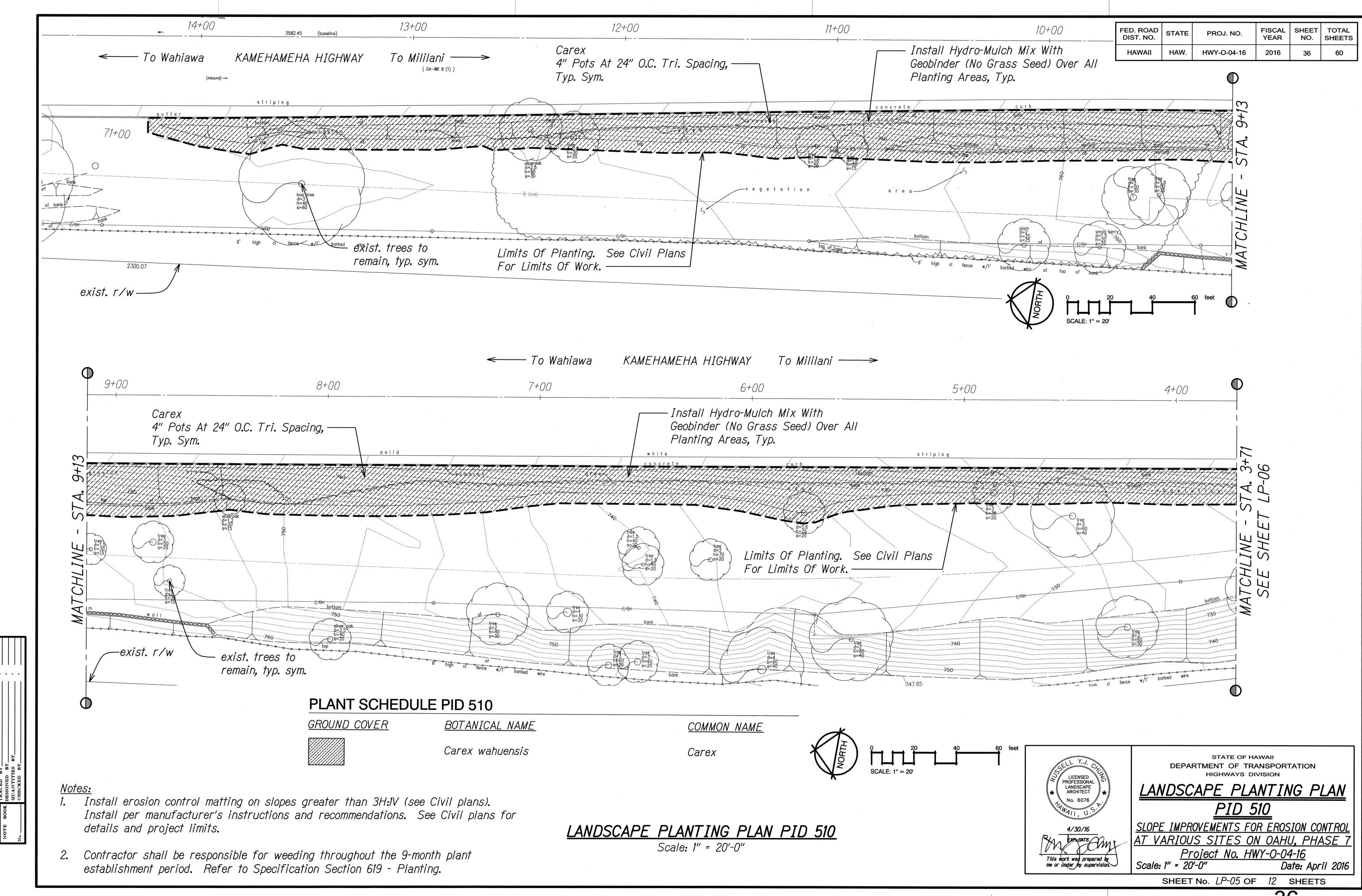
LANDSCAPE PLANTING PLAN <u>PID 518</u>

SLOPE IMPROVEMENTS FOR EROSION CONTROL AT VARIOUS SITES ON OAHU, PHASE 7 Project No. HWY-0-04-16
Scale: 1" = 20'-0" Date: A Date: April 2016

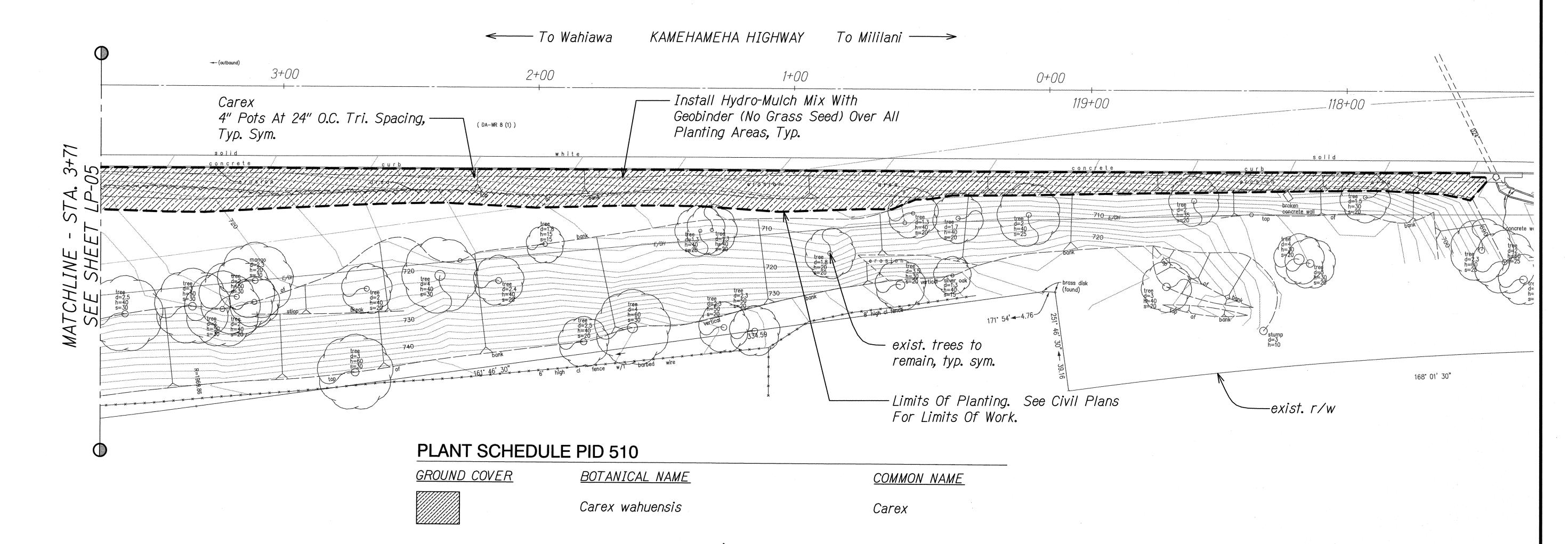
SHEET No. LP-03 OF 12 SHEETS



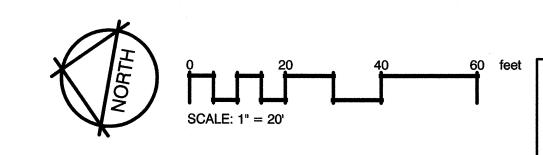




FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-16	2016	37	60

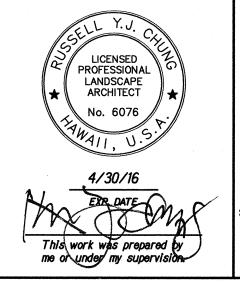


- 1. Install erosion control matting on slopes greater than 3H:1V (see Civil plans). Install per manufacturer's instructions and recommendations. See Civil plans for details and project limits.
- 2. Contractor shall be responsible for weeding throughout the 9-month plant establishment period. Refer to Specification Section 619 - Planting.



LANDSCAPE PLANTING PLAN PID 510

Scale: 1" = 20'-0"

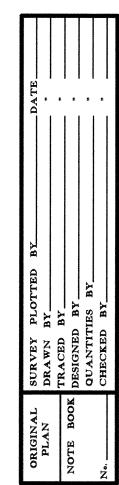


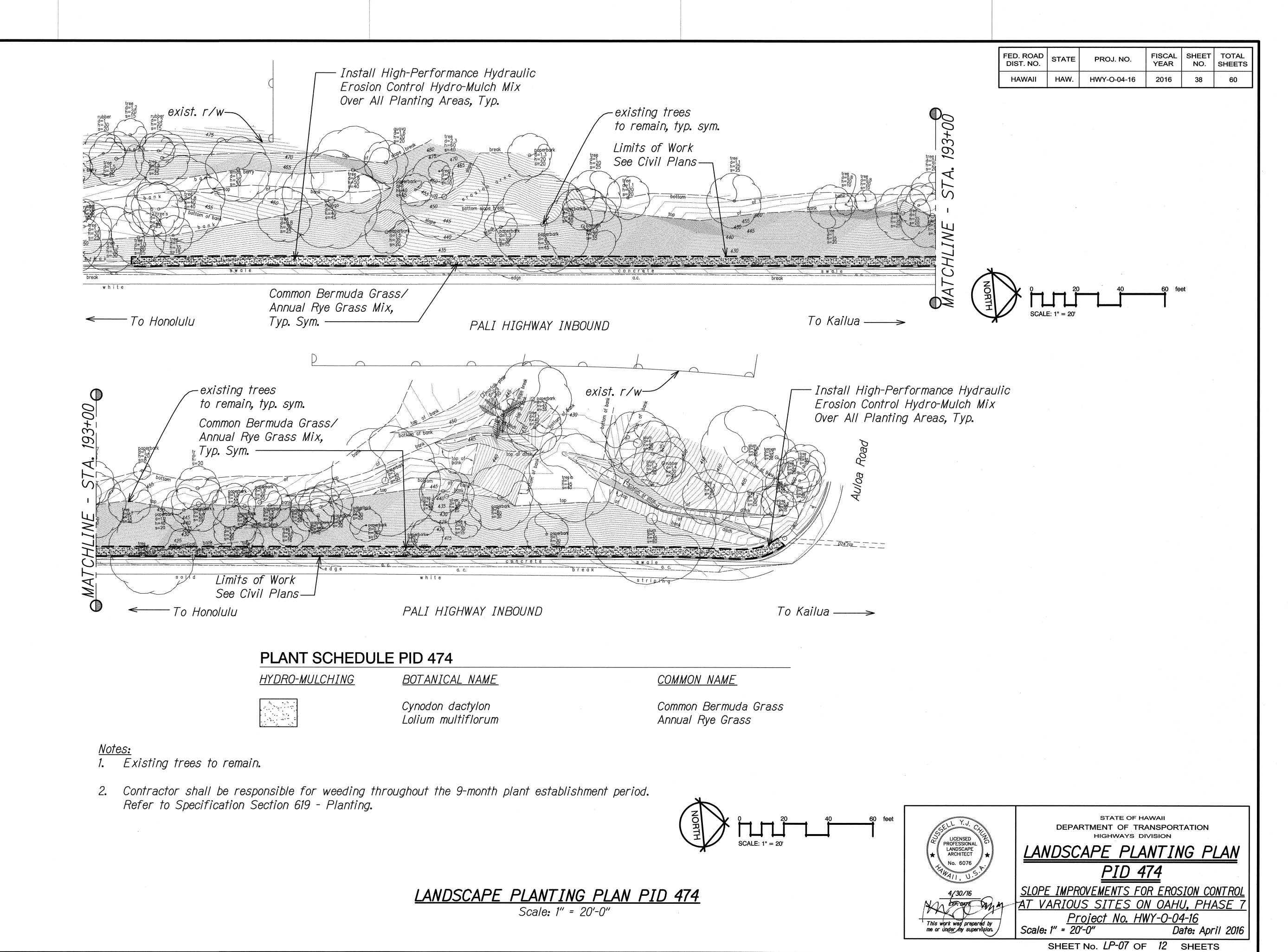
DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION

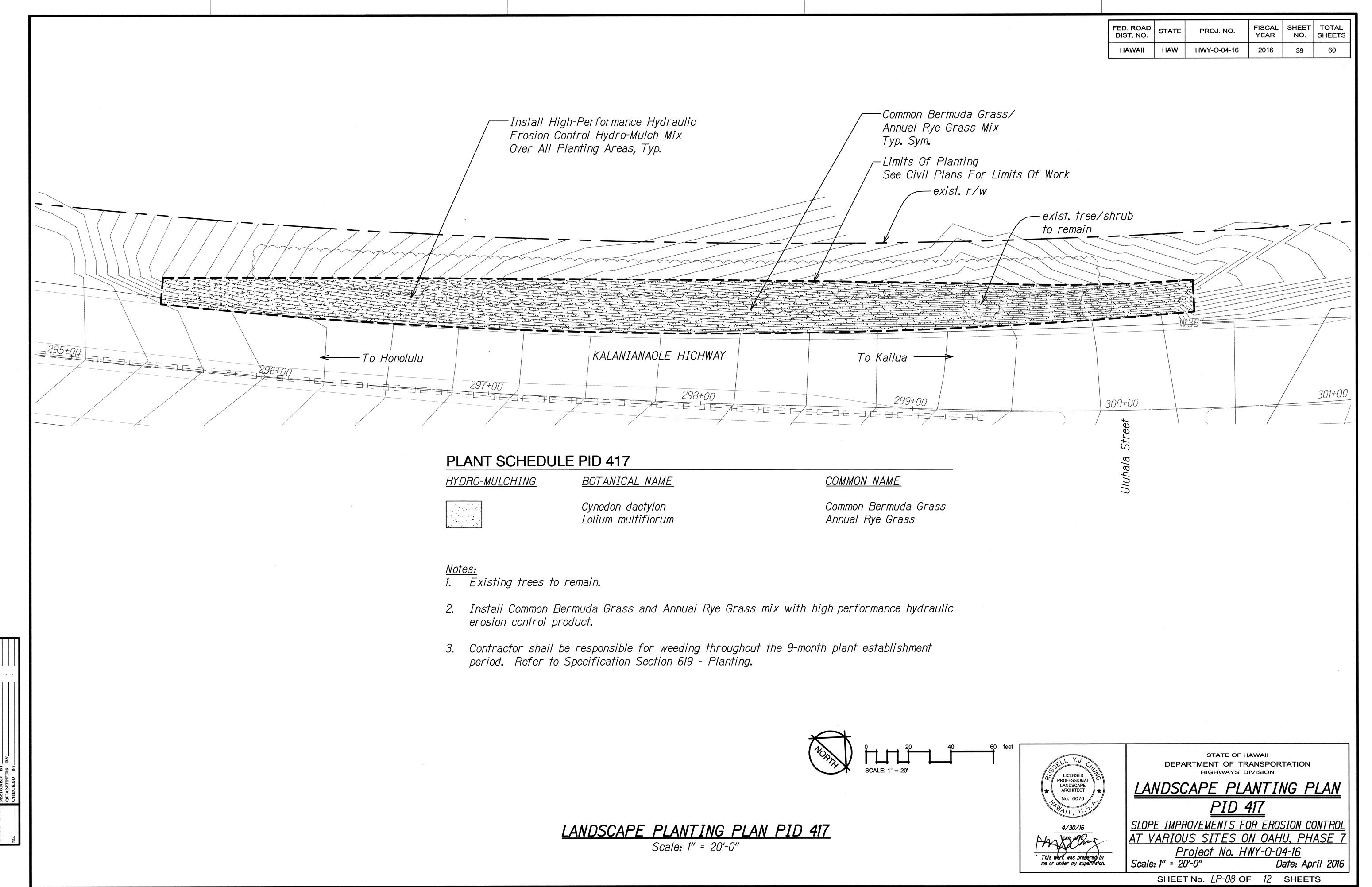
LANDSCAPE PLANTING PLAN PID 510

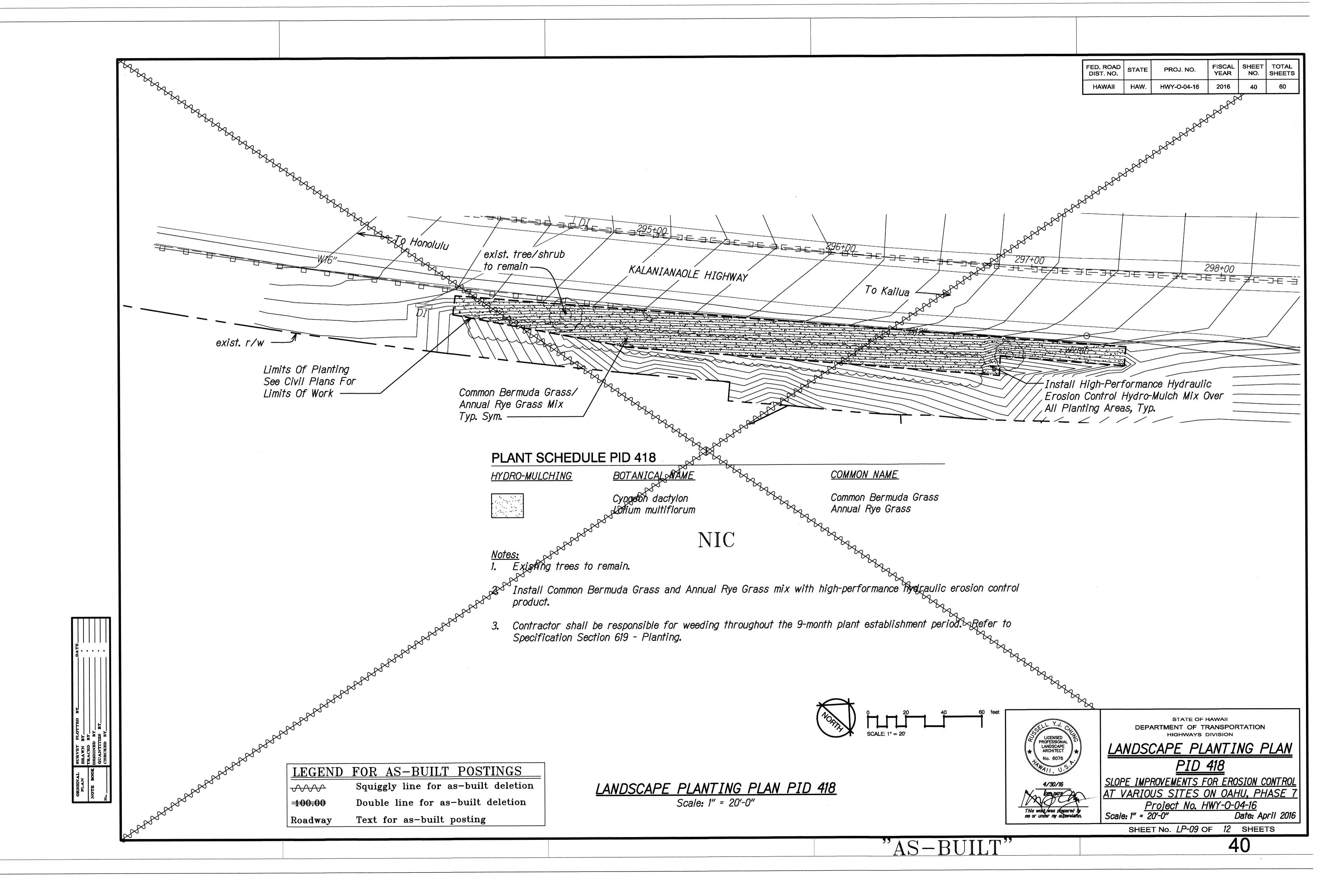
SLOPE IMPROVEMENTS FOR EROSION CONTROL AT VARIOUS SITES ON OAHU, PHASE 7 Scale: 1" = 20'-0" Date: A Date: April 2016

SHEET No. LP-06 OF 12 SHEETS









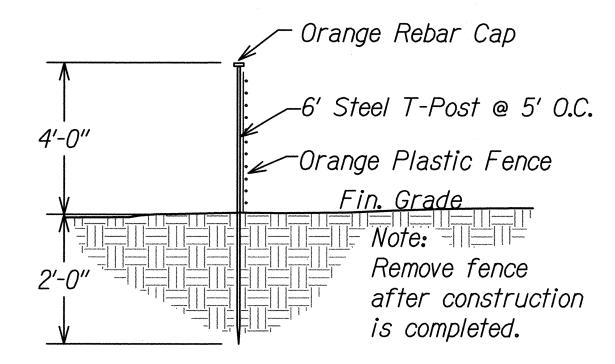
TREE PROTECTION ZONE:

- All trees identified on the plans to be protected unless noted otherwise. All trees 24" caliper or greater (as measured at 4½ feet height) shall be protected. If trees other than those designated for removal are damaged beyond survival condition as determined by the Engineer, the Contractor shall remove such trees and replace with a tree of the same species and size and maintain for the duration of the construction or 12 months whichever is greater at no cost to the State.
- The recommended tree protection zone should be located at the outer drip line of the canopy of the tree. However, the minimum protection zone around a tree should be at least 10 feet from the external surface of the tree's trunk. For all palms, the minimum protection zone should be at least 10 feet from the external surface of the palm's trunk. Fence location may be adjusted as directed by the Engineer.
- All underground utilities and irrigation lines should be routed outside of the tree protection zone. If utilities must traverse the tree protection zone, they shall be tunneled or bored at a depth of 4 feet or greater within the tree protection zone.
- 4. All protected trees shall be listed on the demolition, landscape, grading and utilities plans. If there is a discrepancy with all plans, Contractor shall contact Engineer immediately.
- 5. Protective fences shall be erected around trees identified on plan to remain and/or trees with a trunk diameter greater than 24 inches (as measured at a height of 4 ½ feet.) Protective fence shall be 4 feet high orange plastic mesh or approved equivalent supported on steel T-post a minimum of 6 feet long. Protective fence shall surround tree at a minimum of 10 feet from tree trunk with steel T-post at a minimum of 5 feet on center. Fence shall be installed prior to any demolition work and shall remain in place until site work is completed. Signs shall be posted on all four sides to read "TREE PROTECTION ZONE [TPZ] NO GRADE CHANGE, STORAGE OR EQUIPMENT PERMITTED WITHIN TPZ."
- 6. For the duration of construction within the drip line of the trees to remain there must be:
 - No changes, alteration or disturbance to the grade by adding fill, excavating or scraping except as noted on plans;
 - No storage on construction materials or equipment;
 - No stockpiling of any construction materials or excavated materials;
 - No disposal of any liquids (e.g. concrete slurry, gas, oil, paint);
 - No vehicular traffic, equipment er excessive pedestrian traffic;
 - No attachment of any wires, ropes, lights or any other such attachment other than those of a protective nature to any tree to be preserved; and
 - No cleaning of equipment or material under the canopy of any tree or group of trees to be preserved
- 7. Auger tunneling, not trenching, shall be used where possible for utility placement within the drip line of the tree. If trenching is necessary it shall be hand dug within the drip line of the tree.

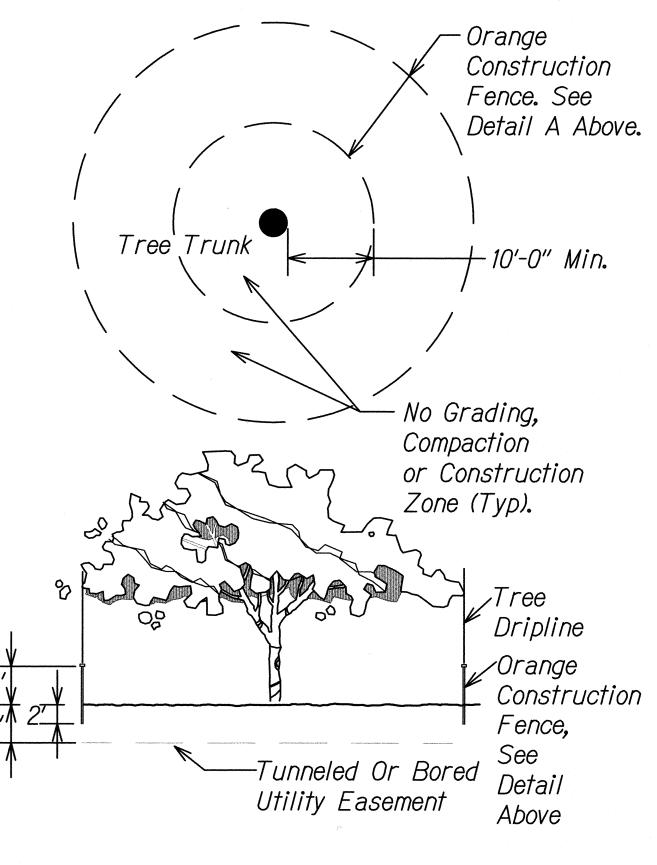
TREE PROTECTION

Scale: Not to Scale





<u>DETAIL A - ORANGE CONSTRUCTION FENCE</u> NOT TO SCALE



Note:

- 1. S = Spacing, (refer to plant list for spacing)
 2. Use spacing layout for shrubs, groundcovers, a
- 2. Use spacing layout for shrubs, groundcovers, and annuals

FED. ROAD DIST. NO.

STATE

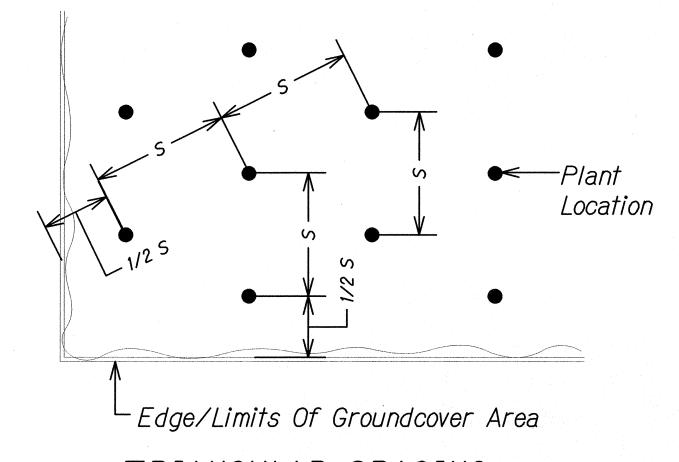
HAW.

PROJ. NO.

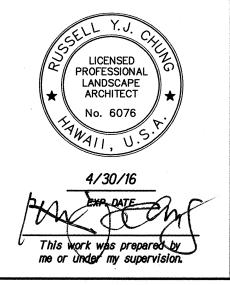
HWY-O-04-16

FISCAL SHEET TOTAL YEAR NO. SHEETS

2016



TRIANGULAR SPACING
Scale: Not to Scale



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

LANDSCAPE DETAILS

SLOPE IMPROVEMENTS FOR EROSION CONTROL

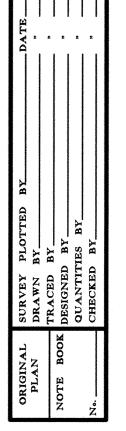
AT VARIOUS SITES ON OAHU, PHASE 7

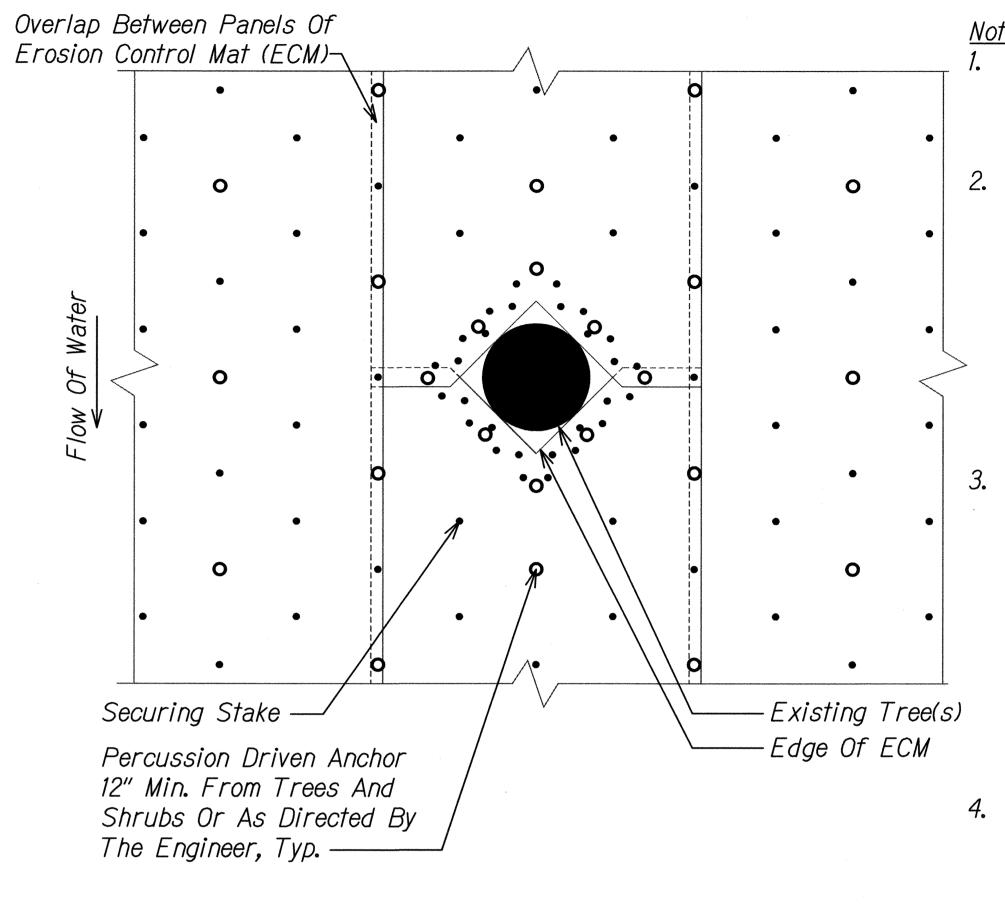
Project No. HWY-0-04-16

Scale: As Shown Date: April 2016

SHEET No. LP-10 OF 12 SHEETS

No. LP-10 OF 12 SI





Contractor Shall Join Overlapping Sections Of Erosion Control Mat (ECM) In Accordance With The Contract Documents.

Contractor Shall Create An Opening Around The Circumference Of Each Existing Tree To Ensure ECM Maintains Direct Contact With The Ground Surface. For Densely Growing Trees, ECM Openings May Be Created To Encompass Multiple Trees. Contractor Shall Create Opening In ECM Using Methods Approved Or Recommended By The Manufacturer.

Contractor Shall Secure ECM With Combination Of Stakes And Percussion Anchors. Stake Placement May Require Modification In The Field Due To Root Location, Trunk Structure, Or Other Obstacles. Contractor Shall Install Additional Stakes And/Or Anchors To Ensure ECM Maintains Direct Contact With Ground Surface. Refer To Erosion Control Plans For Stake And Anchor Placement.

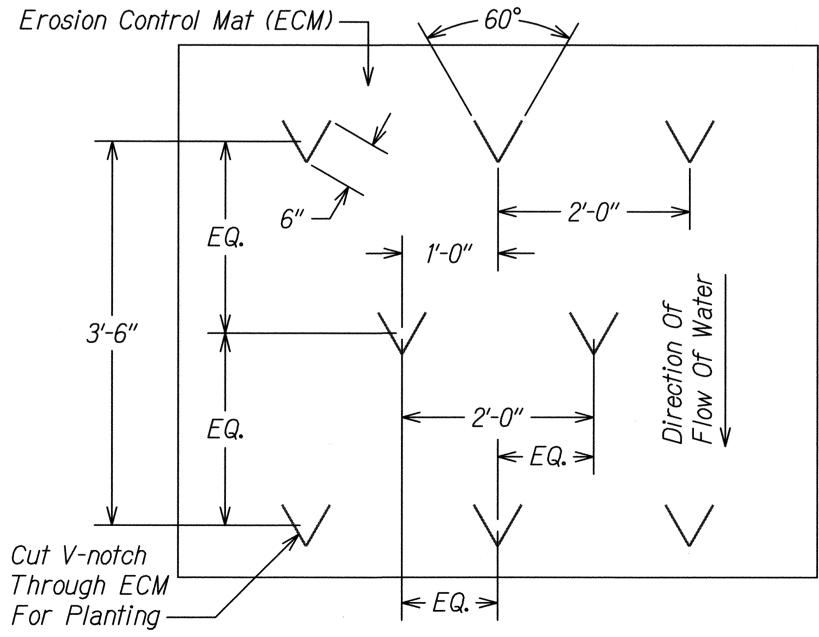
When Placing Matting Between Clusters Of Existing Trees, Contractor May

Install ECM Around Cluster If Spacing Between Trees Is 12 Inches Or Less With Engineer's Approval. Contractor

Shall Plant Ground Cover Where Space Permits Between Trees Or As Directed

By The Engineer.

TYPICAL ECM INSTALLATION AROUND EXISTING TREES LP-11 LP-11 Scale: Not to Scale



SURVEY
DRAWN H
TRACED
DESIGNED

Install Erosion Control Mat (ECM) In Accordance With The Contract Documents Or Per Manufacturer's Standard Guidelines for Trenching, Overlaps, And Stapling. Consult The ECM Manufacturer's Installation Guidelines For Full Installation Details.

- Install The Live Plant Material Using A V-notch Design Approved Or Recommended By The ECM Manufacturer.
- Contractor Shall Remove Soil Material From V-Shaped Opening For Planting Pit.
- After Placing Tree, Shrub, Or Ground Cover In Planting Pit, Backfill Pit And Compact Soil. Secure ECM Flaps Back Down To The Soil With Securing Stakes Per ECM Manufacturer's Recommendations.

TYPICAL PLANTING THROUGH ECM 2 Scale: Not to Scale

FED. ROAD DIST. NO. FISCAL SHEET TOTAL YEAR NO. SHEETS STATE PROJ. NO. HAW. HAWAII HWY-O-04-16 2016

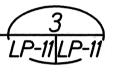
Hydro-Mulch Mix: Shall Be Specifically Processed Fiber Containing No Growth Or Germination Inhibiting Factors. It Shall Be Such That After Addition And Agitation In The Hydraulic Equipment With Seed, Fertilizer, Water, Geobinders, And Other Additives Not Detrimental To Plant Growth The Fibers Will Form A Homogeneous Slurry When Hydraulically Sprayed On The Soil. The Fibers Shall Form A Blotter-like Ground Cover Which Readily Absorbs Water And Allows Infiltration. Complete Coverage Of The Surface Shall Be Attained.



Erosion Control Mat (Where Indicated On Plans) Prepared Soil Existing Soil

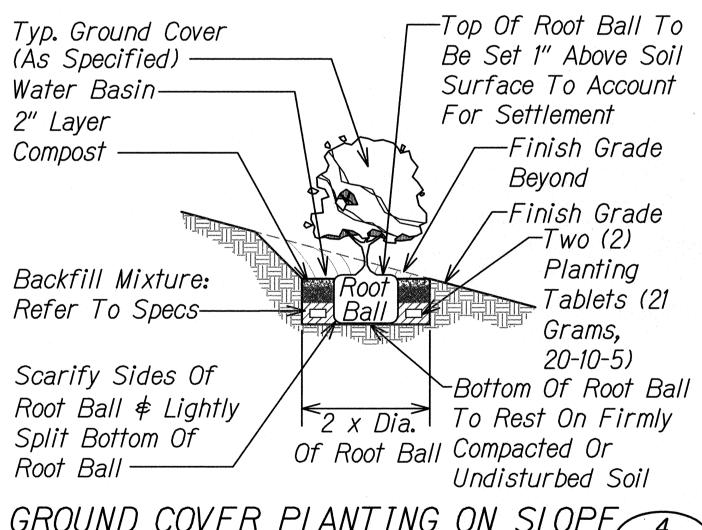
HYDRO-MULCH DETAIL

Scale: Not to Scale



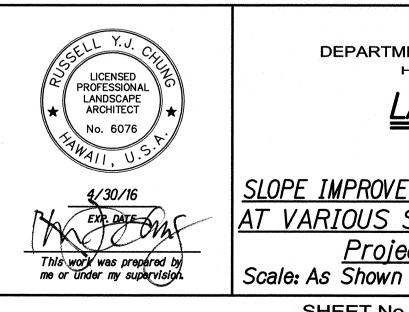
Single stem ground cover shall be plumb. If shrub is leaning at the end of the plant establishment period, it shall be replaced at the contractor's expense.

Immediately after planting, water heavily to ensure soil settles around roots.



GROUND COVER PLANTING ON SLOPE 4

Scale: Not to Scale



STATE OF HAWAII DEPARTMENT OF TRANSPORTATION

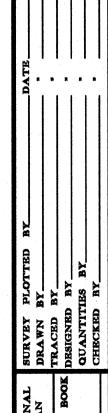
> **LANDSCAPE DETAILS**

SLOPE IMPROVEMENTS FOR EROSION CONTROL AT VARIOUS SITES ON OAHU, PHASE 7 Project No. HWY-0-04-16 Date: April 2016

SHEET No. LP-11 OF 12 SHEETS

ED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-04-16	2016	43	60

PLANT SCHEDU	LE PID 518				
GROUND COVER	<u>QTY</u>	BOTANICAL NAME	COMMON NAME	CONT	REMARKS
	6,120 Each	Eragrostis variabilis	Kawelu Grass	4" Pot	24" O.C. Triangular Spacing Ensure No Conflict With ECM Stakes And Anchors. Install Hydro-Mulch Mix With Geobinder (No Grass Seed) Over All Planting Areas
PLANT SCHEDU	LE PID 519				
GROUND COVER	<u>QTY</u>	BOTANICAL NAME	COMMON NAME	<u>CONT</u>	REMARKS
	4,565 Each	Eragrostis variabilis	Kawelu Grass	4" Pot	24" O.C. Triangular Spacing Ensure No Conflict With ECM Stakes And Anchors. Install Hydro-Mulch Mix With Geobinder (No Grass Seed) Over All Planting Areas
PLANT SCHEDU	LE PID 510				
GROUND COVER	<u>QTY</u>	BOTANICAL NAME	COMMON NAME	<u>CONT</u>	REMARKS
	9,140 Each	Carex wahuensis	Carex	4" Pot	24" O.C. Triangular Spacing Ensure No Conflict With ECM Stakes And Anchors. Install Hydro-Mulch Mix With Geobinder (No Grass Seed) Over All Planting Areas
PLANT SCHEDU	LE PID 474				
HYDRO-MULCHING	<u>QTY</u>	BOTANICAL NAME	COMMON NAME	CONT	REMARKS
	510 SY 510 SY	Cynodon dactylon Lolium multiflorum	Common Bermuda Grass Annual Rye Grass	Seed Seed	See Specs For Grass Seeding Rate
PLANT SCHEDU	LE PID 417				
HYDRO-MULCHING	<u>QTY</u>	BOTANICAL NAME	COMMON NAME	<u>CONT</u>	REMARKS
	1,490 SY 1,490 SY	Cynodon dactylon Lolium multiflorum	Common Bermuda Grass Annual Rye Grass	Seed Seed	See Specs For Grass Seeding Rate
PLANT SCHEDU		DOTANICAL MANG	00111011 11115	CONT	DEMARKS
HYDRO-MULCHING	<u>QTY</u>	BOTANICAL NAME	<u>COMMON NAME</u>	<u>CONT</u>	REMARKS
	940 SY 940 SY	Cynodon dactylon Lolium multiflorum	Common Bermuda Grass Annual Rye Grass	Seed Seed	See Specs For Grass Seeding Rate



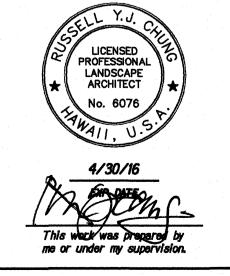
LEGEND FOR AS-BUILT POSTINGS

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Double line for as-built deletion

Roadway Text for as-built posting



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLANT SCHEDULE

PID 518, 519, 510, 474, 417 \$ 418

SLOPE IMPROVEMENTS FOR EROSION CONTROL

AT VARIOUS SITES ON OAHU, PHASE 7

Project No. HWY-0-04-16

Scale: As Shown Date: April 2016

SHEET No. LP-12 OF 12 SHEETS