

Landscape Rehabilitation

Final Design Report

Apache Junction Floodway & FRS
Apache Junction Outlet & Bulldog Floodway

Buckhorn-Mesa Watershed
Maricopa & Pinal Counties, Arizona

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



A303.603

Landscape Rehabilitation

Final Design Report

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ROGERS GLADWIN & HARMONY, INC.
LANDSCAPE ARCHITECTURE AND PLANNING

345 E. Toole, Suite 201
Tucson, Arizona 85701
602/622-2302

May 1987

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Introduction

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INTRODUCTION

Project Description

The Buckhorn-Mesa Watershed containing the Apache Junction FRS and Floodway, the Bulldog Floodway, and Apache Junction Outlet is located in northwestern Pinal County, in the south central portion of Arizona (Fig. 1). The site is 30 miles east of Phoenix. Floodwaters drain from the Utery, Goldfield, and Superstition Mountains onto the wide alluvial fan which spreads south and southeast into the valley north of Apache Junction.

Project components consist of one planned floodwater retarding structure --- Apache Junction FRS, a planned outlet structure --- Apache Junction Outlet, and two flood channels --- Bulldog Floodway and Apache Junction Floodway. Floodwaters collected and diverted through the project empty into the Signal Butte FRS and are eventually released into the Salt River (Fig. 2).

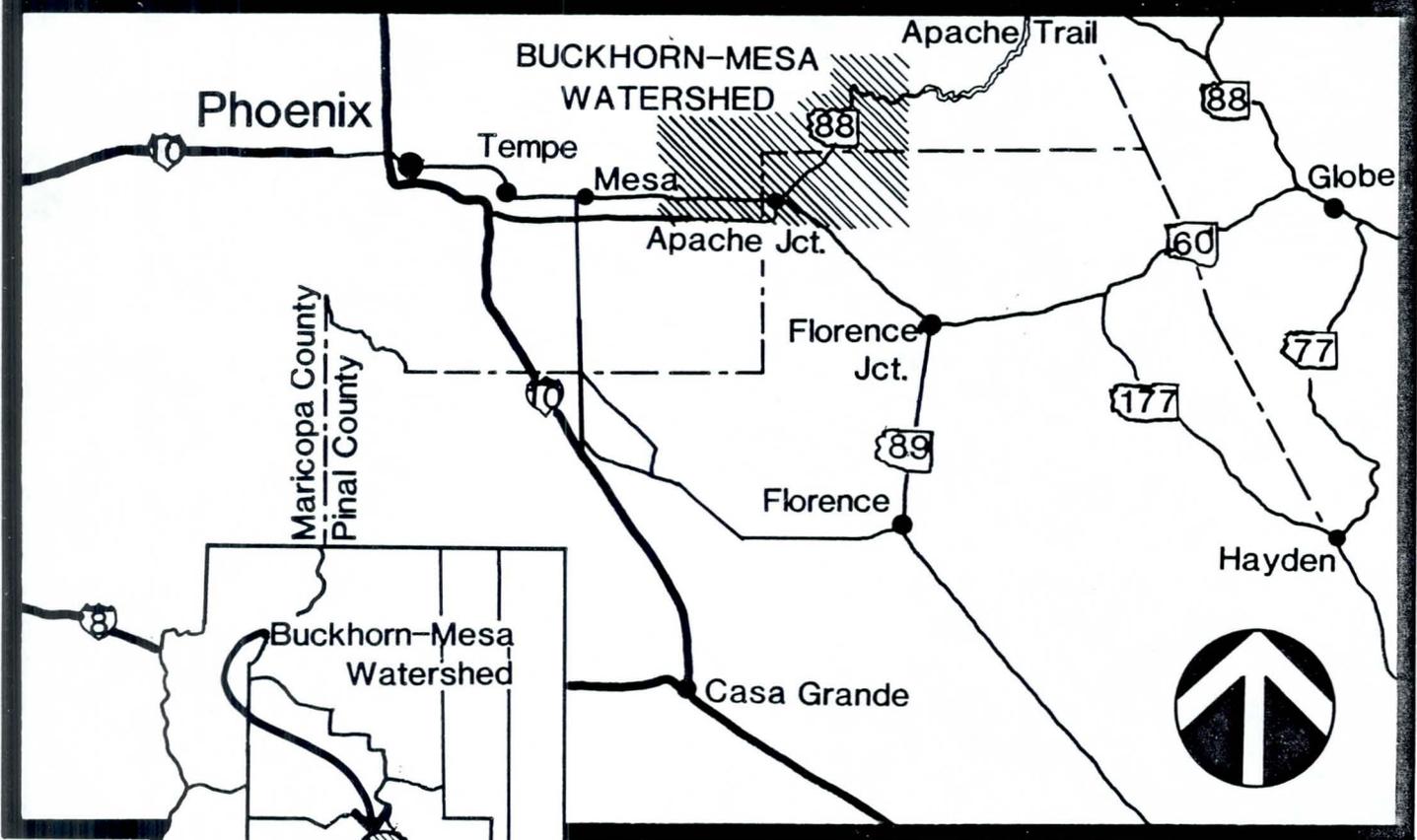
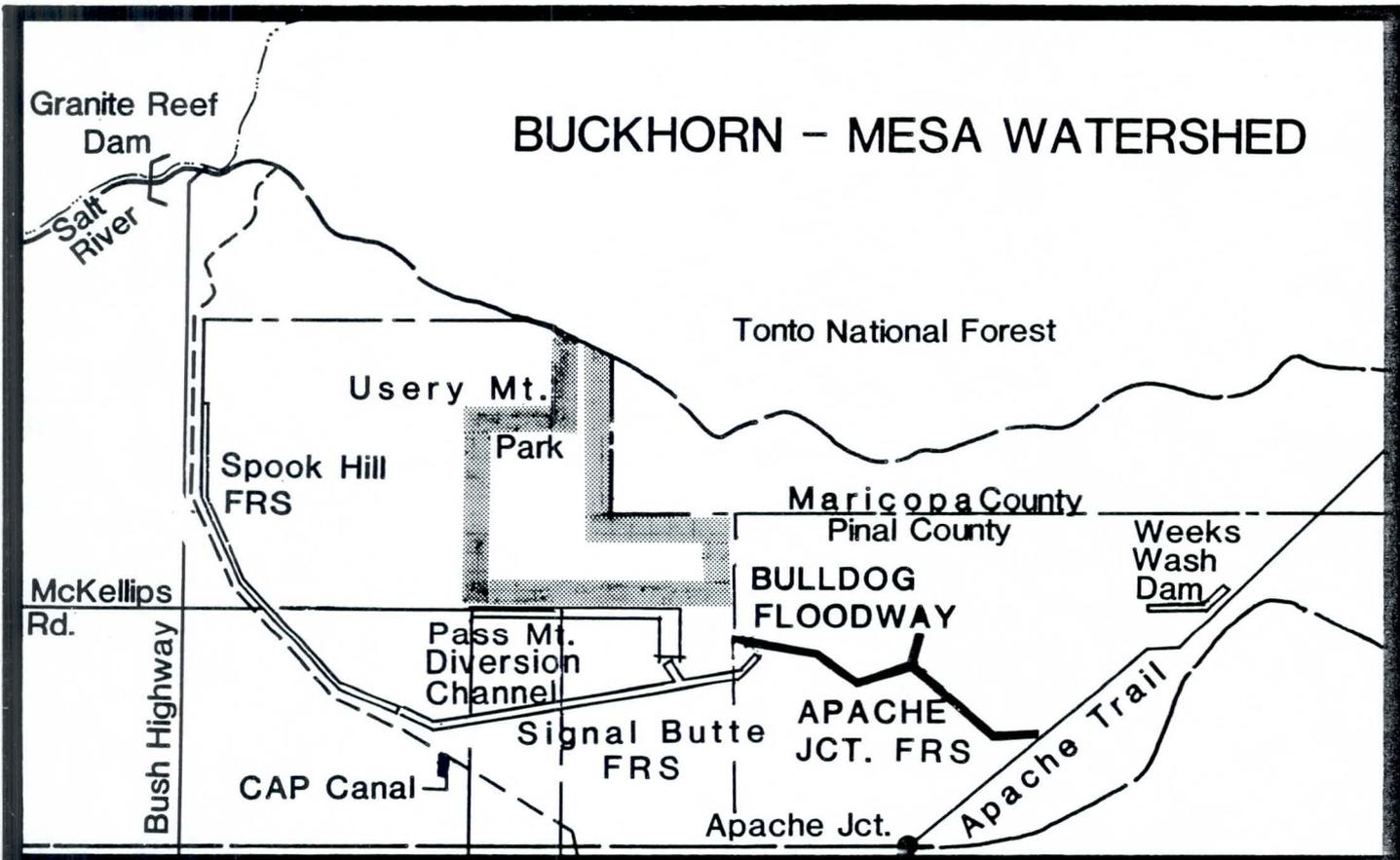
Apache Junction Floodway

Apache Junction Floodway will be a channel approximately 1/4 mile long and will transport water to the Apache Junction FRS. The beginning of the floodway is adjacent to the Apache Trail Highway. A few commercial and residential buildings are in close proximity to the structure. The channel is concrete lined. Two grouted riprap weir inlets are provided at points where existing washes drain into the channel. The channel empties into the Apache Junction FRS at a large grouted rock energy dissipator. The floodway is paralleled on both sides by maintenance roads and is fenced on both sides to prevent access by off-road vehicles.

Apache Junction FRS

Apache Junction FRS will be a reservoir-type earthen dam, approximately 1.36 miles long. The FRS will collect and retard flood waters from Apache Junction Floodway and from the mountain slopes to the north. The dam will have a maximum height of 20 feet as it spans a drainage valley south of Tonto National Forest. The FRS is located south of the SRP powerline transmission corridor and north of Apache Junction. Idaho Road and Brown Road intersect at the top of the dam. A large spillway is part of the dam structure. At the upstream base of the dam is a sediment and retarding basin within the construction borrow pit.

BUCKHORN - MESA WATERSHED



LOCATION MAP

Figure 1

Apache Junction Outlet

Apache Junction Outlet will be a concrete lined channel, approximately 1/2 mile in length, connecting the Apache Junction FRS and Bulldog Floodway. Maintenance roads parallel the sides of the structure.

Bulldog Floodway

Bulldog Floodway will be a channel approximately 1.29 miles long that will transport water released from the Apache Junction FRS into the Signal Butte FRS. The floodway transects the SRP powerline transmission corridor. The channel has earthen and concrete lined sections, and a grouted riprap energy dissipator provides the transition between the two sections. Maintenance roads parallel the concrete portion of the structure. One maintenance road runs along the north edge of the earthen structure. Seven grouted spillway aprons are provided at points where existing washes drain into the channel. The channel is fenced on both sides to prevent access by off-road vehicles. Three spoil disposal areas adjacent to the floodway will be used for disposal of sediment trapped in the floodway.

These four project components function together to provide a complete flood control system. The purpose of this flood control project is to reduce floodwater damage and provide erosion control for land that is valuable for anticipated urban development, agriculture, and rangeland. The project will provide flood control for the Buckhorn-Mesa Watershed and the Central Arizona Aqueduct, as well as minimizing floodwaters to the Apache Junction/Gilbert and Williams/Chandler Watersheds.

Project Map

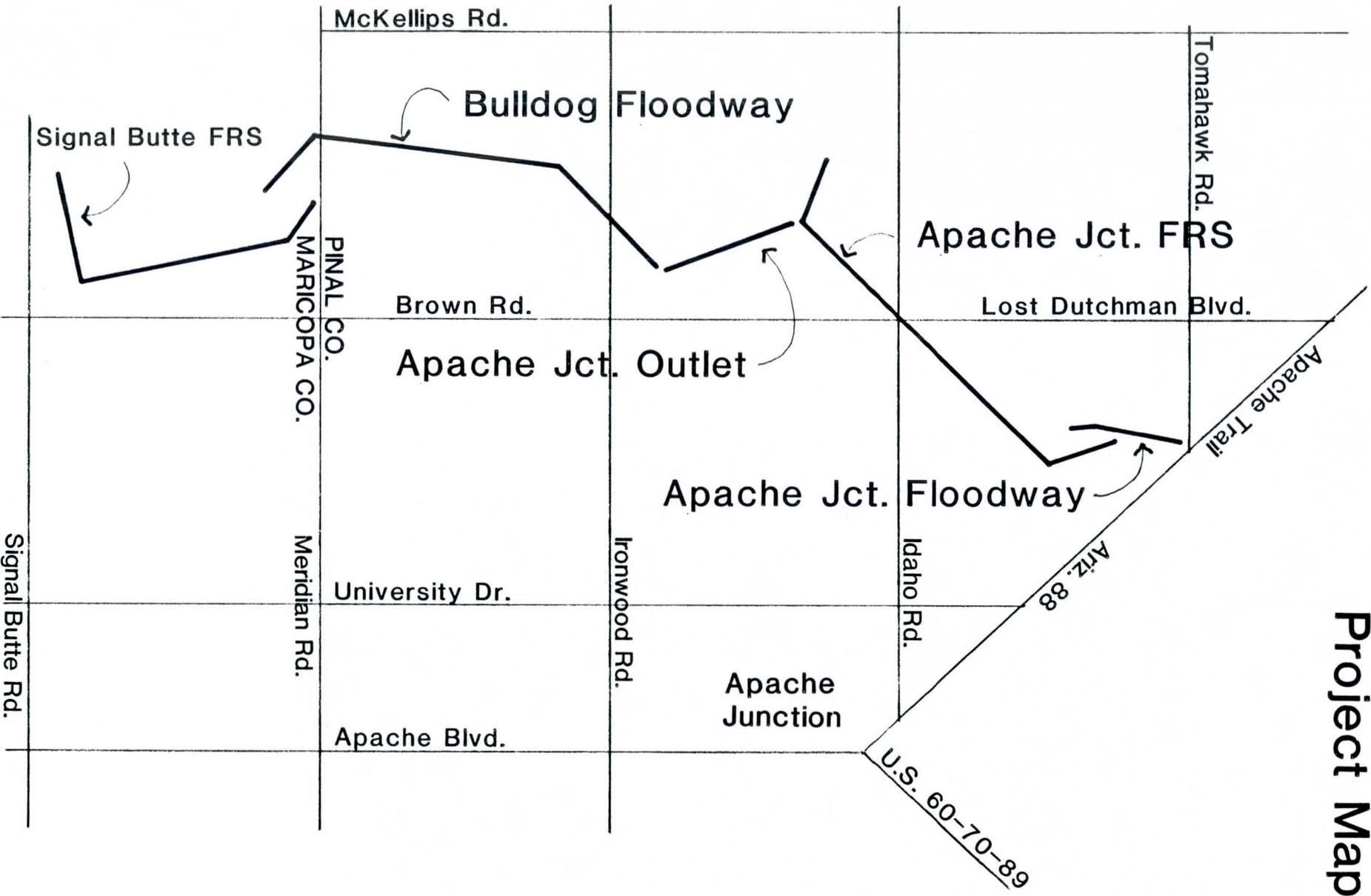


Figure 2

Summary of Work

Phase I and II

Rogers, Gladwin & Harmony, Inc. was retained by the Soil Conservation Service to provide a visual analysis of Apache Junction FRS and Floodway and Bulldog Floodway. The results of the visual analysis and research were presented in the Landscape Resources Report, which described and graphically depicted design alternatives to mitigate the impact of flood control structures on the environment.

Phase II presented design alternatives that had previously been evaluated and tested during the design and construction of the Soil Conservation Service Signal Butte/Pass Mountain project. Information collected from field study and research during the visual analysis and landscape rehabilitation report phase of this project was also used to assist in development of design alternatives.

Phase III

The Final Design Report, Construction Drawings, Specifications, Bid Schedule, Cost Estimate and Operations and Maintenance manual were prepared by a team of Rogers, Gladwin & Harmony landscape architects with report production support from staff. The following presents the study team members' responsibilities.

Technical Staff

Principal-in-Charge
Project Manager
Project Planners

Robert Gladwin, ASLA
Jeff Johnson, ASLA
Karen Novak
Patricia Waterfall
Doug Terpstra
Christine Schlittenhart

Report Production

**Summary Of Landscape
Rehabilitation Treatments**

Protection of Existing Vegetation

Delineate and enforce strict construction limits to protect as much existing vegetation as possible. The contractor will be held liable for the cost of rehabilitating any vegetation or soil disturbed outside these limits in accordance with Section H, FAR 52.236-9 (a) and (b) of SCS regulations.

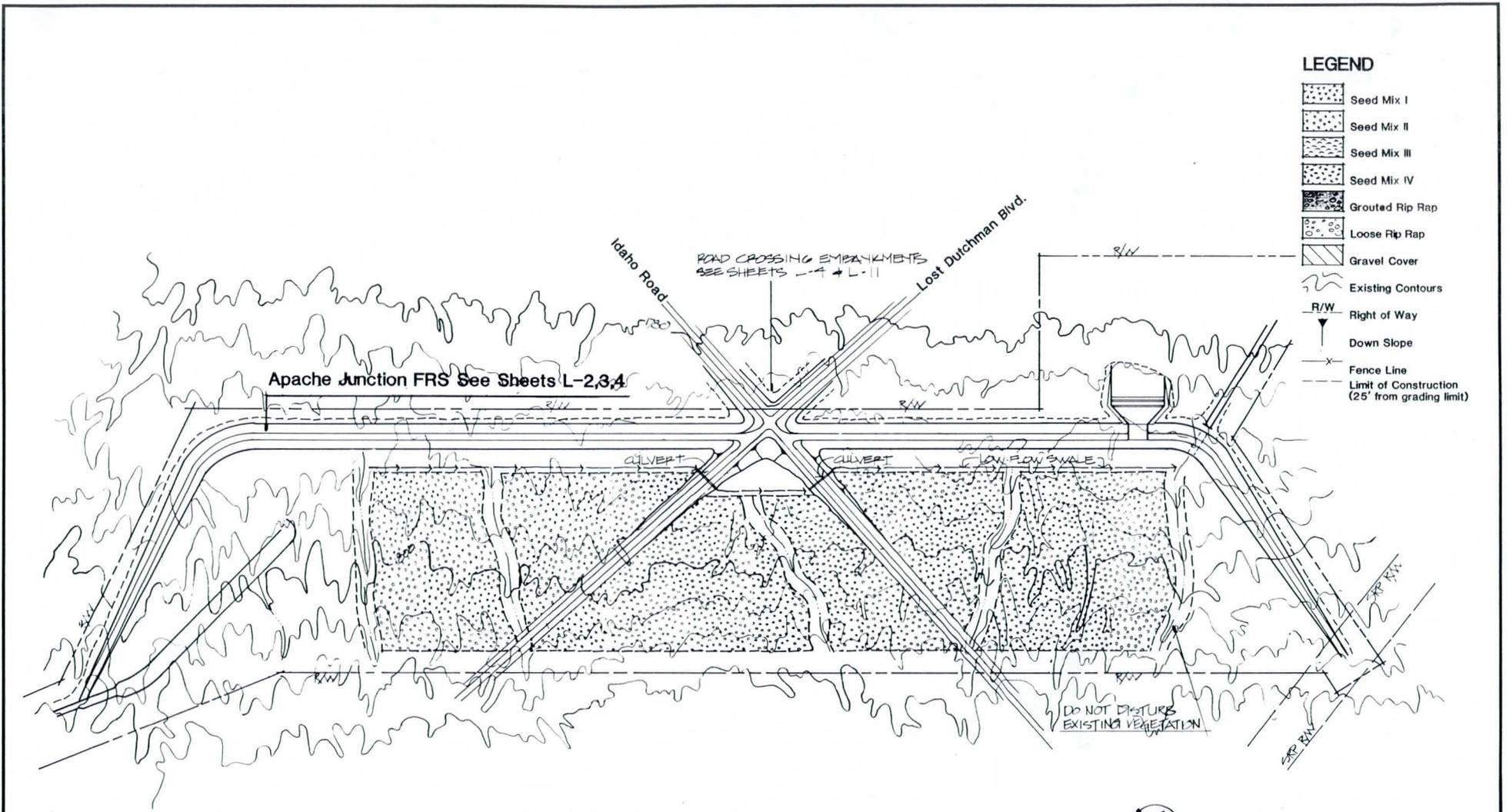
- A. Provide staking and flagging at all construction limits. The general contractor shall not be allowed to enter areas outside the designated construction limits except as absolutely necessary for construction access.
- B. Preserve existing vegetation within 50 feet of the centerline of major watercourses in the FRS basin (Fig. 3).

Soil Preparation Techniques

Because supplementary irrigation will not be used to aid in reestablishing vegetation on this project, conservation of soil moisture and creation of microenvironments suitable for seed germination are critical. The retention of surface runoff has been identified as the key to the success of non-irrigated revegetation. The following soil preparation techniques will be used to help assure successful revegetation of the areas affected by construction of the flood control structures.

- A. Till soil prior to seeding to provide a rough surface. Clods and rocks should remain on the surface (Fig. 4). Soil moisture conditions are critical for tilling. Tillage operations should be suspended when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed. The contractor should work closely with the landscape architect, SCS or flood control personnel to choose the optimum time for tillage.
- B. Apply fertilizer at a rate of 100 pounds per acre to all areas to be seeded. A hard prill type of fertilizer with a guaranteed analysis of 16% nitrogen, 8% phosphorous, 4% potash and containing trace elements is recommended. Fertilizer chosen should have all required nutrients in homogenous form, not stimulate unnecessary leaf growth, and be competitively priced.
- C. Apply gravel mulch to selected structure slopes. This will provide microcatchments to hold runoff and provide shade for seedlings. It will also provide texture to help reduce visual impact.

Figure 3



LEGEND

-  Seed Mix I
-  Seed Mix II
-  Seed Mix III
-  Seed Mix IV
-  Grouted Rip Rap
-  Loose Rip Rap
-  Gravel Cover
-  Existing Contours
-  R/W Right of Way
-  Down Slope
-  Fence Line
-  Limit of Construction (25' from grading limit)

Apache Junction FRS See Sheets L-2,3,4

ROAD CROSSING EMBANKMENTS
SEE SHEETS L-4 & L-11

CULVERT

CULVERT

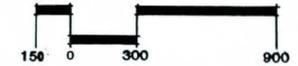
FLOW FLOW SWALE

DO NOT DISTURB
EXISTING VEGETATION



North

SCALE: 1"=300'-0"



NOTE: FLOOD STRUCTURES ARE EXISTING.
REFER TO SCS DRAWING NO. 86002-AZ-CH

LANDSCAPE REHABILITATION

BORROW PIT
BUCKHORN-MESA W.P.P.
PINAL COUNTY, ARIZONA

**U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

Designed <i>KN</i>	Date <i>7/82</i>	Approved by _____
Drawn <i>MV</i>	Title <i>7/82</i>	_____
Traced _____	Title _____	_____
Checked <i>JJ</i>	Sheet <i>8/86</i>	No. 7 of 14

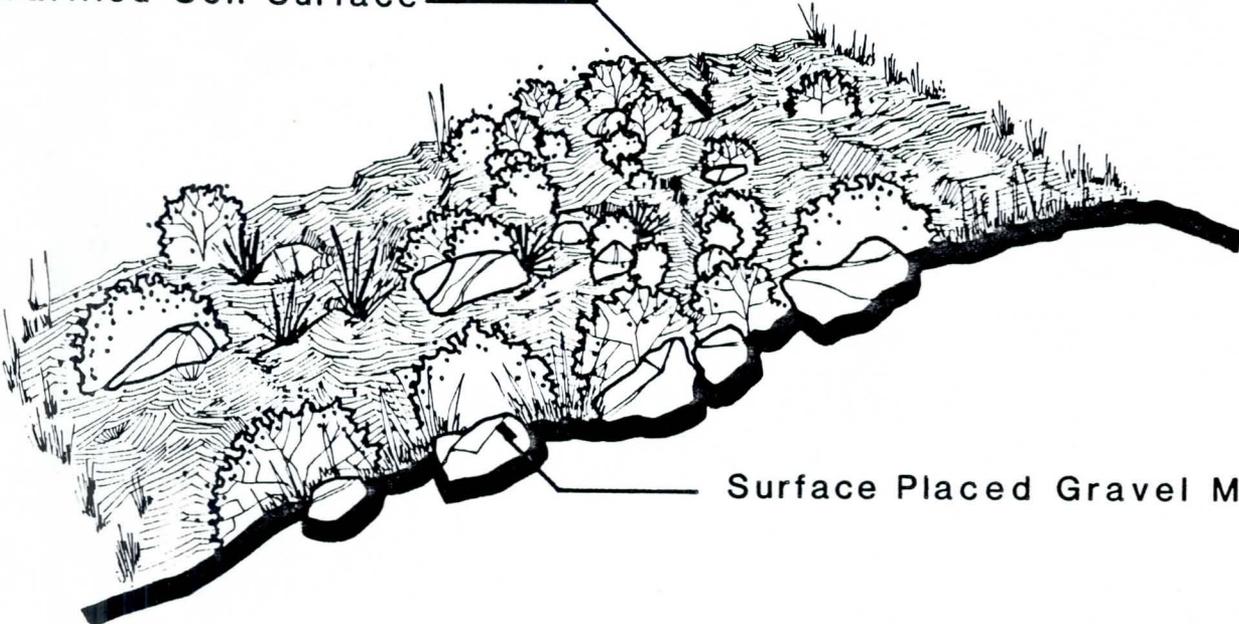
L-6

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PLANTING PLAN

Scarified Soil Surface



Surface Placed Gravel Mulch

Soil Surface Modification

Figure 4

Revegetation

Revegetation of areas disturbed by construction will help reduce erosion of slopes, siltation of channels and basins, and will mitigate the visual impact of the project on the surrounding environment. To promote visual continuity and consistency with the surrounding ecosystem, plant selection is based on an inventory of existing vegetation species and their population densities. Most of the project area will be revegetated by seeding native plants. Alternates for each seed mix are provided in case certain components are not available at the time of construction. Use of alternates shall be approved by the Contracting Officer. Priority areas will receive container plantings.

Recommended Seed Mixes

A. Seed Mix Type I: Right of Way Revegetation

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Cercidium microphyllum Foothill palo verde	2 oz.	4 oz.
Ambrosia deltoidea Triangle leaf bursage	1.5 lb.	3.0 lb.
Encelia farinosa Brittle bush	0.5 lb.	1.0 lb.
Sphaeralcea ambigua Globe mallow	0.5 lb.	1.0 lb.
Cassia covesii Desert senna	0.75 lb.	1.5 lb.
Artistida purpurea Purple three awn	2.0 lb.	4.0 lb.
Festuca megalura Foxtail fescue	1.0 lb.	2.0 lb.

Alternates

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Prosopis juliflora var. velutina Velvet mesquite	2 oz.	4 oz.
Ambrosia dumosa White bursage	1.0 lb.	2.0 lb.
Plantago insularis Indian wheat	0.5 lb.	1.0 lb.
Schismus barbatus Arabian grass	1.0 lb.	2.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.	3.0 lb.

B. Seed Mix II: Structure Slopes and the FRS Borrow Pit

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Atriplex canescens Fourwing salt bush (dewinged)	2 oz.	4 oz.
Ambrosia deltoidea Triangle leaf bursage	1.5 lb.	3.0 lb.
Encelia farinosa Brittle bush	0.5 lb.	1.0 lb.
Sphaeralcea ambigua Globe mallow	0.5 lb.	1.0 lb.
Cassia covesii Desert senna	0.75 lb.	1.5 lb.
Aristida purpurea Purple three awn	2.0 lb.	4.0 lb.
Festuca megalura Foxtail fescue	1.0 lb.	2.0 lb.

Alternates

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Atriplex lentiformis Quail bush	0.75 lb.	1.5 lb.
Ambrosia dumosa White bursage	1.0 lb.	2.0 lb.
Plantago insularis Indian wheat	0.5 lb.	1.0 lb.
Schismus barbatus Arabian grass	1.0 lb.	2.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.	3.0 lb.

C. Seed Mix III: Channel Side Slopes

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Sphaeralcea ambigua Globe mallow	1.0 lb.	2.0 lb.
Cassia covesii Desert Senna	0.75 lb.	1.5 lb.
Aristida purpurea Purple three awn	2.0 lb.	4.0 lb.
Festuca megalura Foxtail fescura	2.0 lb.	4.0 lb.

Alternates

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Plantago insularis Indian wheat	0.5 lb.	1.0 lb.
Baileya multiradiata Desert marigold	0.5 lb.	1.0 lb.
Schismus barbatus Arabian grass	1.0 lb.	2.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.	3.0 lb.

D. Seed Mix IV: Roadway Embankments

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Prosopis juliflora velutina Velvet mesquite	3 oz.	6 oz.
Sphaeralcea ambigua Globe mallow	1.0 lb.	2.0 lb.
Cassia covesii Desert senna	0.75 lb.	1.5 lb.
Aristida purpurea Purple three awn	2.0 lb.	4.0 lb.
Festuca megalura Foxtail fescue	2.0 lb.	4.0 lb.

Alternates

<u>Species</u>	<u>PLS Rate/Ac</u>	
	Drill	Broadcast
Cercidium floridum Blue palo verde	3 oz.	6 oz.
Plantago insularis Indian wheat	0.5 lb.	1.0 lb.
Baileya multiradiata Desert marigold	0.5 lb.	1.0 lb.
Schismus barbatus Arabian grass	1.0 lb.	2.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.	3.0 lb.

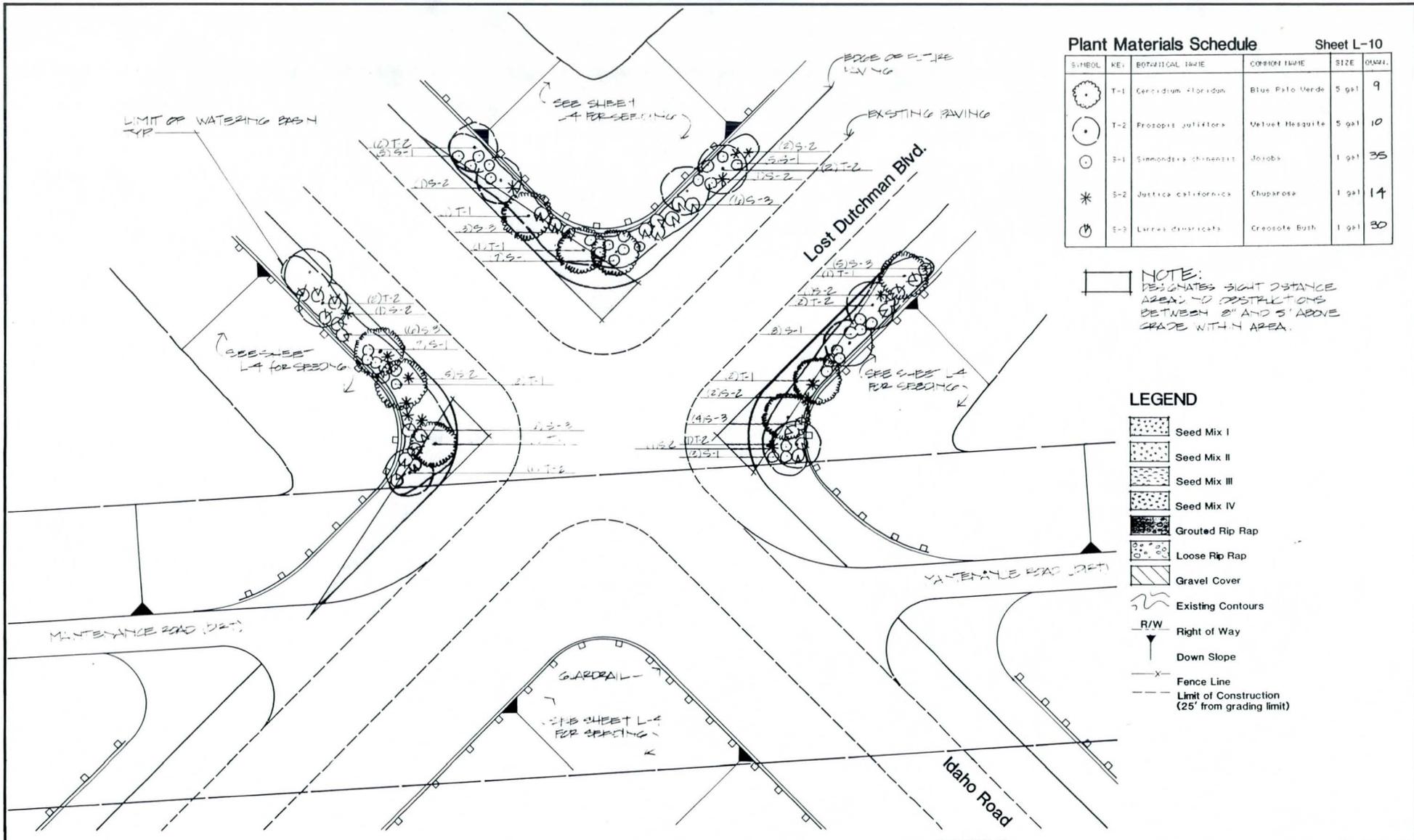
Seed Mix Application

- A. Conduct seeding operations between October 15 and December 1 to take advantage of favorable moisture and temperature conditions prevalent during the winter season.
- B. Application methods
 1. Range drill - All areas with slopes flatter than 3.5:1 receiving Seed Mix I and Seed Mix II as shown on the plans:
 - * apply hard prill fertilizer at 100 pounds per acre.
 - * till to 8 inch depth, leave soil surface rough.
 - * apply seed with rugged terrain type drill equipped with depth bands, packer wheels, an agitator, and a legume box.
 - * apply straw mulch and crimp in place.
 2. Dry broadcast - Areas with slopes greater than 3.5:1 receiving Seed Mix I, II, III, and IV as shown on the plans.
 - * till to 8 inch depth, leave soil rough.
 - * dry broadcast hard prill fertilizer at 100 pounds per acre and seed at recommended rates.
 - * apply straw mulch to areas not receiving gravel mulch, crimp in place.
 - * apply tackifier to straw mulch during mulch application process.

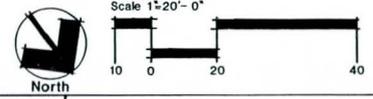
Container Plantings at Road Crossings

- A. Install container plants to screen linear views of the Bulldog Floodway and the Apache Junction FRS from road crossings. (Fig. 5 and 6).
- B. Create a continuous gravel mulch basin around container plants so splash from truck watering hoses will not disturb planted materials.
- C. Grade nearby roads and surrounding terrain so runoff water drains into gravel basins.

Figure 5



NOTE: FLOOD STRUCTURES ARE EXISTING.
REFER TO SCS DRAWING NO. 86002-AZ-CH



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PLANTING PLAN

FRS Crossing at Lost Dutchman Blvd. & Idaho Road Sta. 74+00 to 80+00

LANDSCAPE REHABILITATION

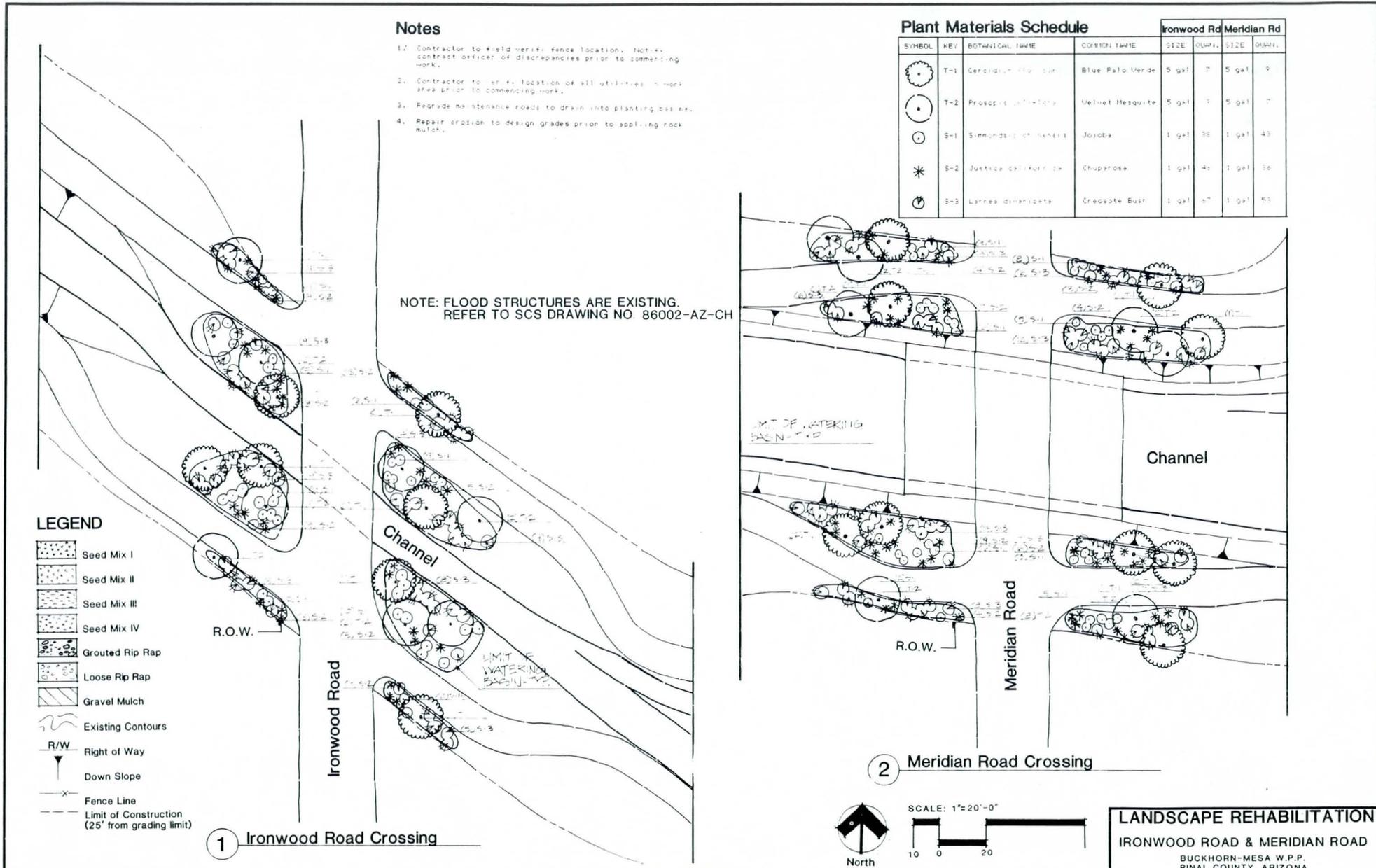
APACHE JUNCTION FRS

BUCKHORN-MESA W.P.P.
PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by JD	Date 4/87	Approved by	
Drawn by JD	Date 4/87	Traced	
Checked by JD	Date 4/87	Sheet No 12 of 14	Drawing No L-11

Figure 6



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 LANDSCAPE ARCHITECTURE AND PLANNING

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 Tucson, Arizona 85701
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PLANTING PLAN
 Floodway Crossings at Ironwood
 and Meridian Roads

LANDSCAPE REHABILITATION
IRONWOOD ROAD & MERIDIAN ROAD
 BUCKHORN-MESA W.P.P.
 PINAL COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed _____	Date _____	Approved by _____
Drawn _____	Title _____	
Traced _____	Title _____	
Checked _____	Sheet No. _____	Drawing No. L-11
	of _____	

Special Construction

The following landscape rehabilitation techniques will help reduce the visual impact of the project or enhance soil moisture conditions, promoting establishment of vegetative cover.

Visual Impact Mitigation

Treat new concrete and grouted structures with integral color pigment to match the surrounding soils. It is recommended that Davis Colors "Omaha Tan" integral color pigment be used.

How can you get soil from channel bottoms and energy dissipators? The channel is completed to finish grade.

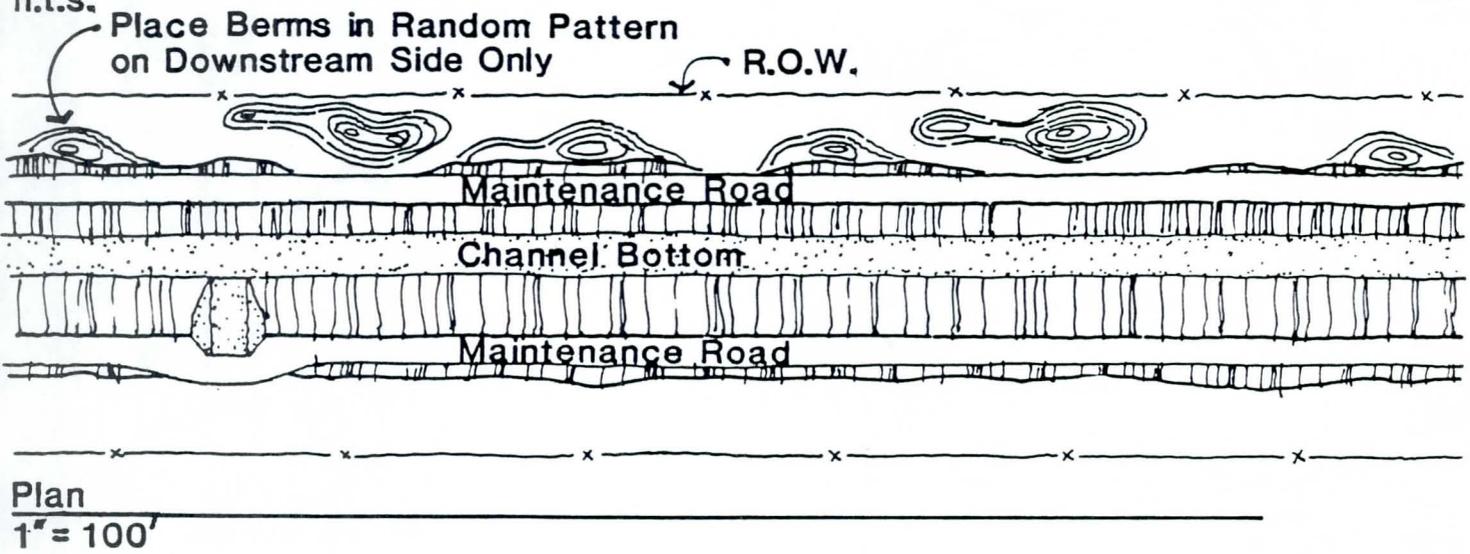
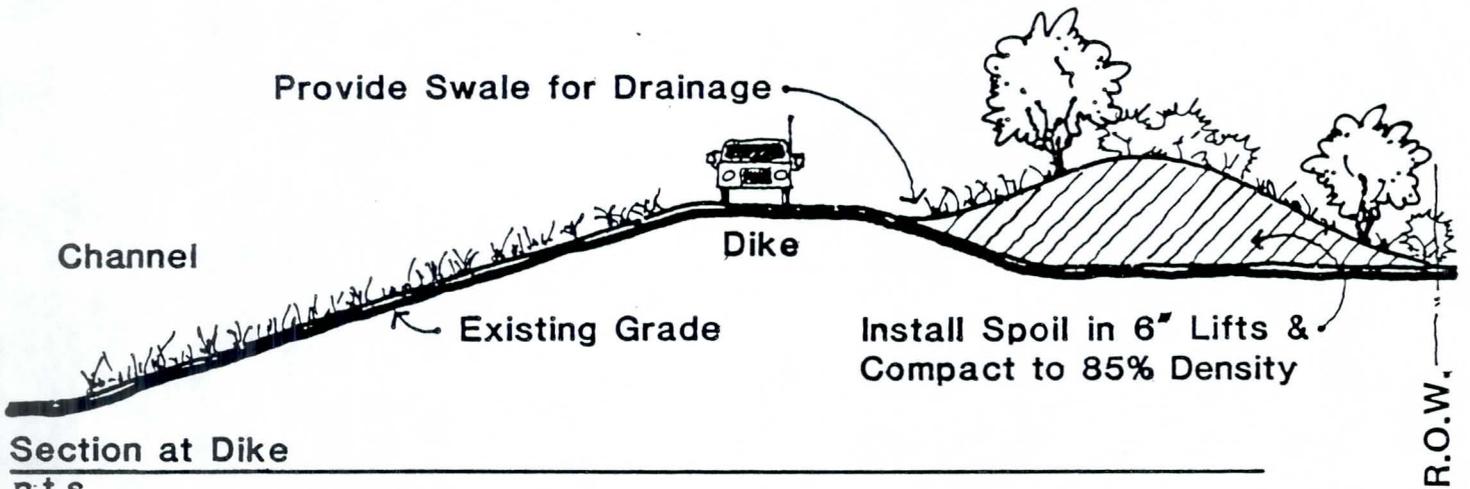
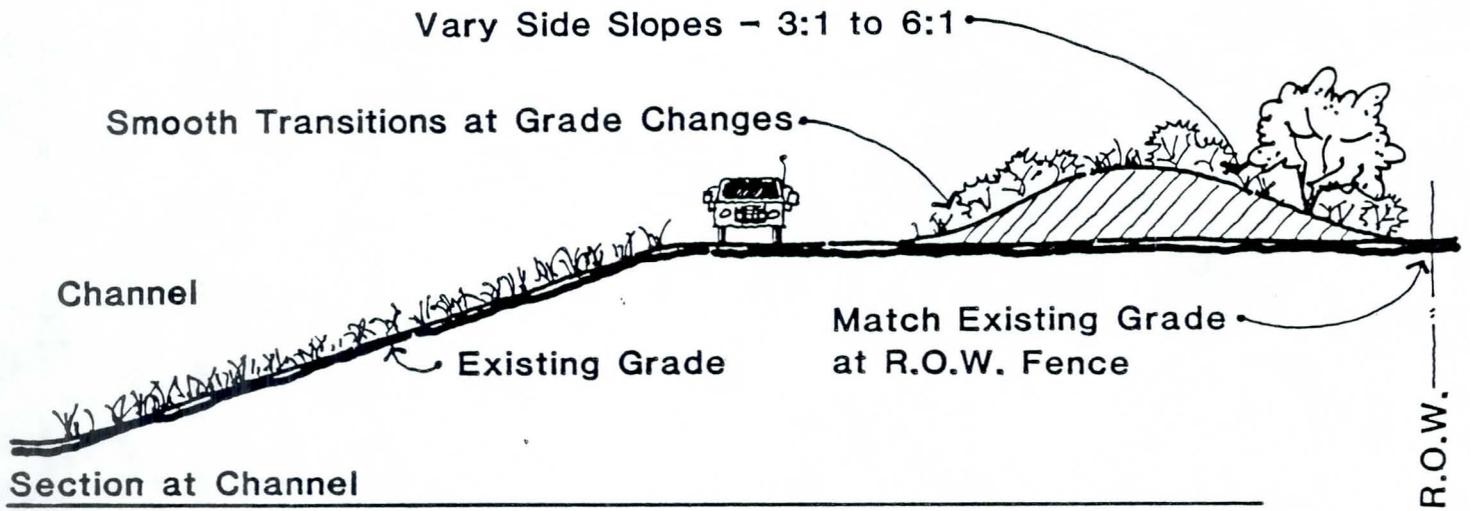
Construct screening berms along the downstream side of Apache Junction Floodway and Outlet, and Bulldog Floodway with spoil removed from channel bottoms and energy dissipators (Fig. 7). The purpose of these berms is to screen the project from existing residences and reduce the visual impact of structures from the road crossings. Prior to construction, blend spoil to form a homogeneous mixture. Incorporate hard prill fertilizer into the top 6 inches of spoil and reseed. Berms will be constructed by the local sponsor during the Operations and Maintenance phase.

Enhancement of Soil Moisture Conditions

Construct retention berms on interfluvial zones around pockets of significant vegetation to trap and hold runoff (Fig. 8). This work will be done by the local sponsor during the Operations and Maintenance phase.

Landscape Establishment Period

The landscape contractor will be required to provide all labor and materials, including seed, container plants, topsoil, water, fertilizer and other chemicals necessary to promote and guarantee successful establishment of vegetative cover. The Landscape Establishment Period for all container plants shall be for a period of 90 days. The 90 day establishment period will be required to expire within the performance time allocated under this contract. Replacement stock will not be subject to a 90 day establishment period. Inspections should be made by the SCS every 30 days to ensure timely compliance with these requirements.

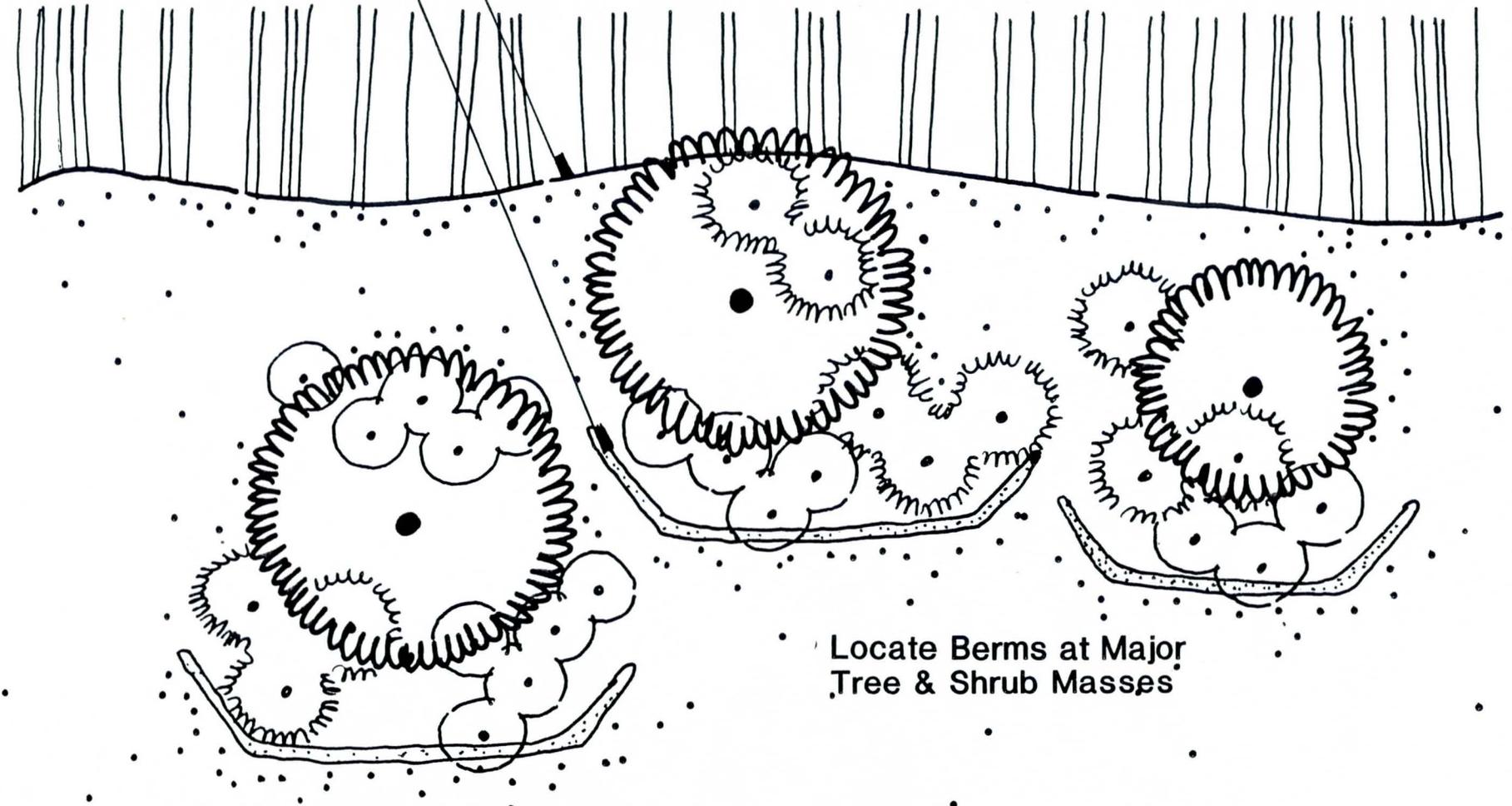


Screening Berms

Figure 7

Toe of Structure Slope
Retention Berm (Typ.)

Berms to be Installed During
Operations and Maintenance Phase



Locate Berms at Major
Tree & Shrub Masses

Runoff Retention Berms

**Final Review
Comments and Responses**



United States
Department of
Agriculture

Soil
Conservation
Service

West National Technical Center
511 N. W. Broadway, Room 547
Portland, Oregon 97209-3489

Don

Subject: ENG - Apache Junction Floodway, FRS and Outlet, Date: February 19, 1987
Bulldog Floodway - Landscape, Phase III.

To: Ralph M. Arrington, State Conservation Engineer, ^{File code:}
SCS, Phoenix, Arizona

Attached is a copy of the Design Review Report for final design of the Landscape Rehabilitation for Apache Junction - Bulldog Wash. Leland Saele will be bringing copies of the report, red-lined drawings and specifications for discussion during the week of February 23-27, 1987.

The work will need to be resubmitted for coapproval following appropriate action on comments in the review report. The report includes comments by Gary Wells, Landscape Architect, MNTC.

Robert Middlecamp
Acting Head, Engineering Staff

Attachment

cc:
Gary W. Wells, Landscape Architect, SCS, Lincoln, Nebraska (w/attach)
Acting Head, Design Unit, Engineering Staff, WNTC (w/o attach)
Verne M. Bathurst, State Conservationist, SCS, Phoenix, Arizona (w/o attach)

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
WEST NATIONAL TECHNICAL CENTER
Engineering Staff
Portland, Oregon
February 19, 1987

DESIGN REVIEW REPORT

Job : Landscape Rehabilitation, Apache Junction FRS, Floodway and Outlet
and Bulldog Floodway
Project : Buckhorn-Mesa Watershed
Location : Maricopa and Pinal Counties, Arizona
Authority: PL 566
Phase : Final

Summary: Several comments from the Phase II review have not yet been addressed. In addition, we have a number of comments on the specifications and a few items on the drawings that need to be considered before this job can be recommended for coapproval.

Description of Job: The job consists of preparing a landscape design, drawings and specifications for the above projects that will be constructed under a separate contract. Specific landscape work includes vegetative plantings for visual improvement, seeding, soil moisture retention measures and vegetative establishment.

Scope of Review: The following material prepared by Landscape Architecture Consultants, Rogers Gladwin & Harmony, Inc., was reviewed:

1. Landscape Specifications, dated January 1987, including bid schedule.
2. Landscape Rehabilitation, Construction Drawings, Phase III, dated January 1987.
3. Plan for Operation and Maintenance, undated.

Rewiew Comments: The final design report with the exception of editorial discrepancies appears satisfactory. The construction specifications are considerably better than those prepared for Pass Mountain-Signal Butte, but there are still a number of problem areas that need to be corrected. Some corrections are also needed on the drawings.

A. General

1. The figure numbers in the Design Report text do not correspond to the illustration numbers.

2. On page 2, of the O & M Plan, a statement is made to "irrigate container plantings to maintain healthy growth". It would be more desirable to provide a method for scheduling the amount and frequency of irrigation. The use of a tensiometer (see attachment 1) is one potential method. The irrigation engineer should be consulted for more information.

3. A number of comments by Gary Wells, in his review of Phase II, were not addressed and are still appropriate. See comments 12 through 16 on attachment 2.

B. Specifications:

1. Pages 6-5 and 6-9, items 7.a.(2), (3), (4), (5), (6) and 7.b.(2), (3), (4), (5), (6) respectively. These statements, regarding portions of the main body of the specification that do not apply, can be deleted. It is understood that when a material or procedure is not specified in the "items of work" that information regarding this material or procedure in the main body of the specification does not apply.

2. Page 6-8 and 6-12, items 7.a.(14)bb. and 7.b.(15)aa. respectively. The eight inches of depth specified in the items of work conflicts with the 4 - 6 inches called for in the main body of the specification. A clarification statement is needed in the items of work, such as, "In Section 4., Seedbed Preparation and Treatment, The tilled depth of 4 to 6 inches does not apply. The soil shall be tilled in a direction parallel ..." etc from paragraph bb. and aa. as appropriate.

3. Page 6-12 item 7.b.(15)aa. Specifying the Contracting Officer for approval of construction operations is not appropriate where the operation is day to day type work that can be approved by the government representative. In this case government representative should be used.

4. Page 21-5. We suggest that uniform spreading of waste material on the slopes of the O. & M. road be specified in item 12.a.(4).

5. Seed mix #4, as called for on sheet L-5 of the drawings, needs to be included in the specifications.

6. The bid schedule does not agree with the drawings or specifications.

7. Specification 61, Loose Rock Riprap, includes bid items for Check Dams and Retarding Basins, neither of which are shown on the drawings. Details and location will need to be shown if they are intended as part of this contract.

8. Several material specifications have been included, none of which apply to this job.

C. Drawings

1. The drawings do not show the limits and type of seed mix in the borrow area between station 74+00 and station 80+00. Also, is there any special treatment or plantings planned in the vicinity of the large culverts under Idaho Road and Lost Dutchman Boulevard in this same reach?

2. Other editorial comments are noted in red on copies of the drawings and specifications.

Richard M. Saele
Submitted

Paul J. Monville act 2-20-87
Approved Date

IRRIGATION SCHEDULING:

Some method of determining when to irrigate and how much water to apply should be included in the operation and maintenance plan. The method should be developed for the specific site conditions. The SCS Arizona Irrigation Engineer, Lee Hardy, should be consulted for specific recommendations.

Following is an example for a trickle irrigated shrub (depths depend upon the plant variety and soil conditions):

1. Start irrigating when the 24" tensiometer reads 0.7 atmospheres.
2. Stop irrigating when the 24" tensiometer reads zero.
3. Increase set time if the 48" depth tensiometer does not return to zero after an irrigation.
4. Reduce set time if 48" tensiometer reads zero before an irrigation.

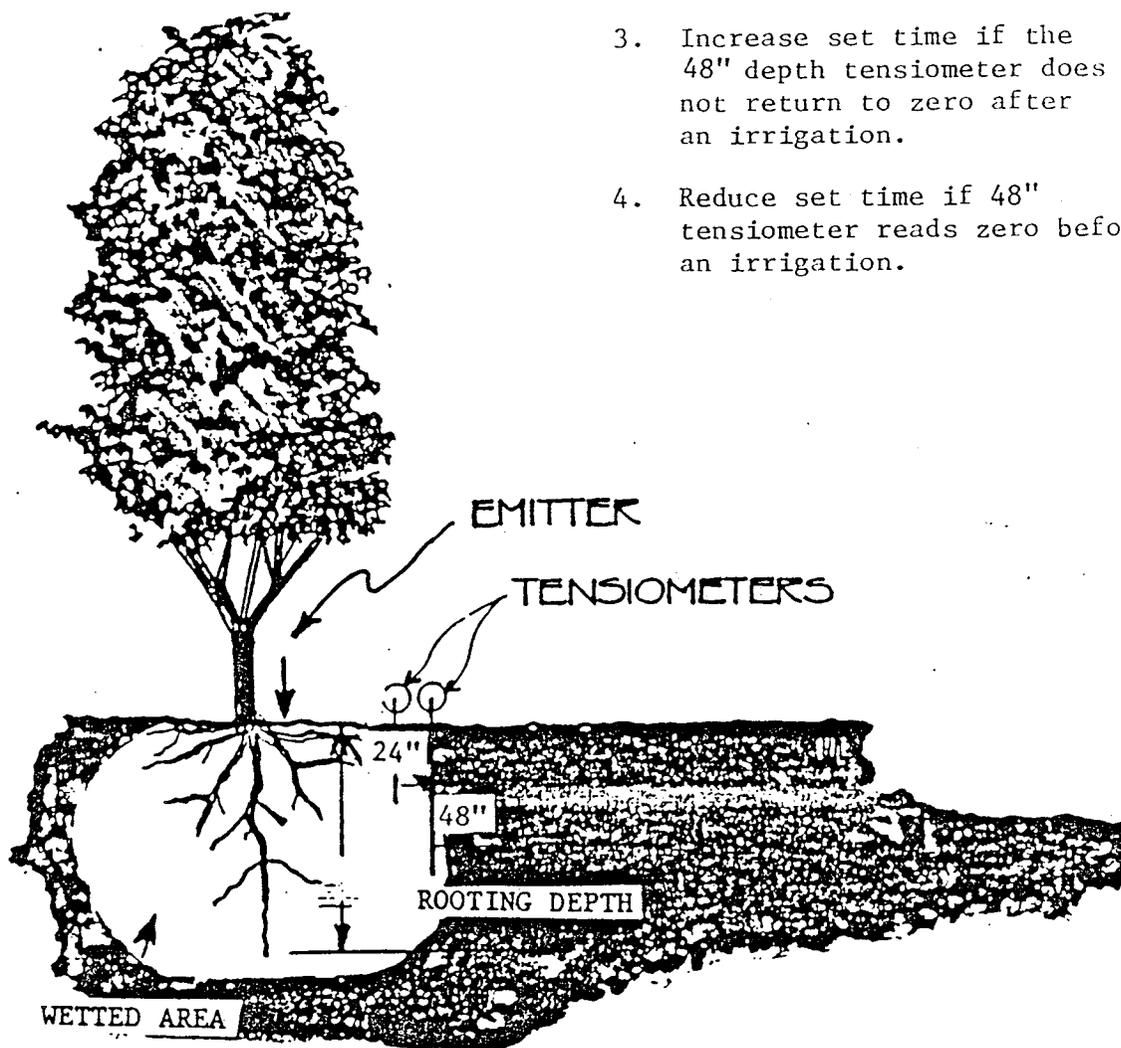


Figure 1 - Typical wetted bulb around a shrub and location of tensiometers.

Ralph M. Arrington

-2-

10. p. 27, Bid Item Schedule--There is no explanation of bid item 4. The construction drawings do not show this item either.

11. p. 28, Engineer's Cost Estimate--The unit price for soil preparation and seeding is less than what is shown on page 9.

Construction Drawings

12. p. L-3, L-4--The drawings indicate that the gravel mulch will create a straight edge. For visual resource purposes it would be more desirable to have a gradual transition.

13. p. L-10--The details on page L-12 indicate that gravel mulch will be used around tree and shrub masses. Will the entire area be mulched in this case? If so, label mulch area. If not, what will be used in the area between plants?

14. p. L-10--A velvet mesquite interferes with the visibility triangle on the southwest corner. Relocate outside triangle.

15. p. L-10--Most of the plants are located on sloping ground. Wouldn't a runoff retention berm be appropriate? Also, a planting detail needs to be added on sheet L-12 to show slope planting technique.

16. p. L-11--Note at top of page indicates the contractor is to verify fence location. No fencing is indicated on drawing.

17. p. L-12--Multi-trunk tree planting detail. Need to indicate the depth of the Salt River Run rock.

We hope these comments are useful and if you have any questions, please feel free to contact Gary Wells, FTS 541-5318. Future needs for landscape architecture assistance should still be directed through the WNTC.

ROBERT L. GRAY
Head, Engineering Staff

cc:

Donald E. Wallin, Head, Eng. Staff, WNTC, SCS, Portland, OR
Thomas N. Shiflet, Director, MNTC, SCS, Lincoln, NE

USDA:SCS:GWells:clh:9/3/86

Attachment 2



United States
Department of
Agriculture

Soil
Conservation
Service

Midwest National Technical Center
Federal Building, Room 345
100 Centennial Mall North
Lincoln, NE 68508-3866

2/9/87 RBW
P. Monville -
L. Sacke LM
2/10/87

Convey comment
to AZ.

Subject: ENG - Apache Junction Floodway, FRS and Outlet, Date: February 5, 1987
Bulldog Floodway - Landscape - Phase III
Construction Documents, Buckhorn-Mesa WPP, AZ

?
They will be
included in
our letter to
state. LM

To: Don Wallin, Head
Engineering Staff
WNTC, SCS, Portland, OR

File code: 210-25

I have reviewed the Landscape Plans for Apache Junction Floodway, Arizona, and I have the following comments:

1. Final Design Report: The figure numbers in the text do not correspond to the illustration numbers.
2. Landscape Specifications: It is unclear why the material specifications are included in this document. It appears none of these materials are used in this contract.
3. O&M Plan: P.2 - A statement is made to "irrigate container plantings to maintain healthy vigor." It would be more desirable to provide a method for scheduling the amount and frequency of irrigation. The use of a tensiometer (see attachment 1) is one potential method. The irrigation engineer in the state office should be consulted.
4. Construction Drawings: It appears only one of my comments from my review of Phase II Construction Drawings, Sept. 3, 1986, was incorporated. (Comment 17 was addressed) Comments 12-16 are still appropriate. (see attachment 2)

?
←

If I can be of further assistance, please don't hesitate to call.


GARY W. WELLS
Landscape Architect
Engineering Staff

Attachments



**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**

3335 West Durango Street
PHOENIX, ARIZONA 85009

(602) 262-1501

Idle

LETTER OF TRANSMITTAL

DATE 2-26-87	JOB NO.
ATTENTION DON	
RE: APACHE - BULLDOG STRUCTURE NAMES	

DON PAULLUS
USDA - SOIL CONSERVATION SERVICE
201 E. INDIANOLA, SUITE 200
PHX, AZ 85012

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings
- Prints
- Plans
- Samples
- Specifications
- Copy of letter
- Change order
- COPY OF MEMO

COPIES	DATE	NO.	DESCRIPTION

THESE ARE TRANSMITTED as checked below:

- For approval
- For your use
- As requested
- For review and comment
- FOR BIDS DUE _____ 19 _____
- Approved as submitted
- Approved as noted
- Returned for corrections
- AS DISCUSSED
- Resubmit _____ copies for approval
- Submit _____ copies for distribution
- Return _____ corrected prints
- PRINTS RETURNED AFTER LOAN TO US

REMARKS: PER OUR DISCUSSION TODAY, I'LL USE "LOCATION MAP" FROM BLUEPRINTS AS CORRECT FOR STRUCTURE NAMES. RECOMMEND "LOCATION MAP", "FIGURE 1", P. 2, FROM LANDSCAPE REHABILITATION PRELIMINARY DESIGN REPORT BE CORRECTED / CLARIFIED, AS IT IS SOMEWHAT MISLEADING CURRENTLY. THANKS -

COPY TO _____

SIGNED: Kerla Buckley PROJ. MGR.



FLOOD CONTROL DISTRICT of Maricopa County

Interoffice Memorandum

CMT. NO.	SUBJECT: Nomenclature of Apache Junction structures	<input type="checkbox"/> FILE _____ <input type="checkbox"/> DESTROY _____
----------	---	---

TO: Kebba Buckley
 through
 Jay Paxson *JJP*

FROM: Catesby Moore

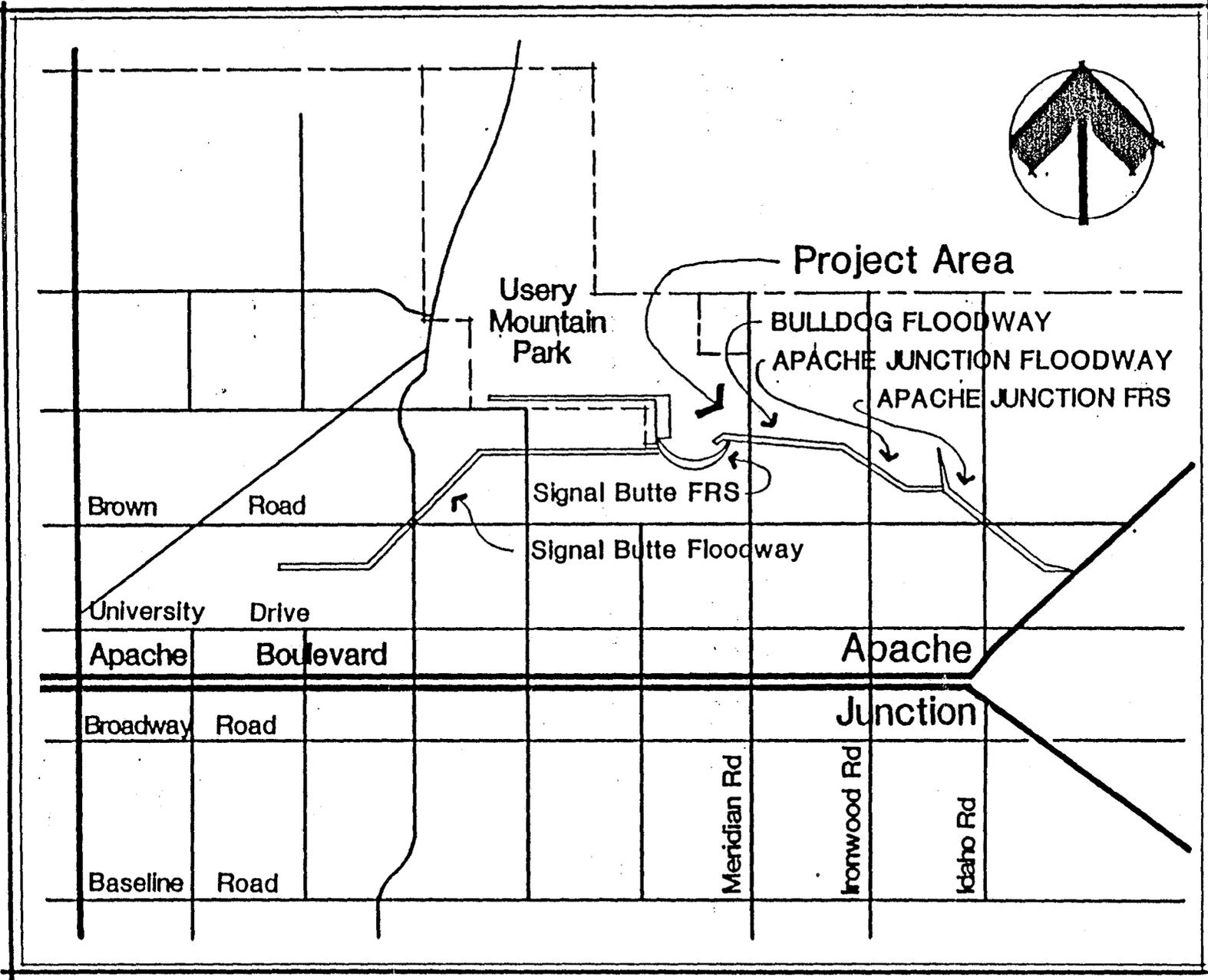
DATE: 2-19-87

In working with the Landscape Rehabilitation Plans for the Apache Junction FRS, Floodway and Outlet, some confusion arose as to the correct application of the various structure names. The two location maps attached will serve to illustrate the problem. Which structure is Apache Junction Floodway? Please advise SCS and request clarification.

Catesby

CM	KEB	2-26-87
FIRST MAP IS WRONG SEVERAL WAYS. SECOND MAP IS VERY GOOD AND HAS CORRECT NAMES, SAYS DON PAULLUS OF SCS. HAVE SENT WRITTEN REQUEST FOR FIRST MAP TO BE CLARIFIED. THANKS FOR IDENTIFYING!		

LOCATION MAP

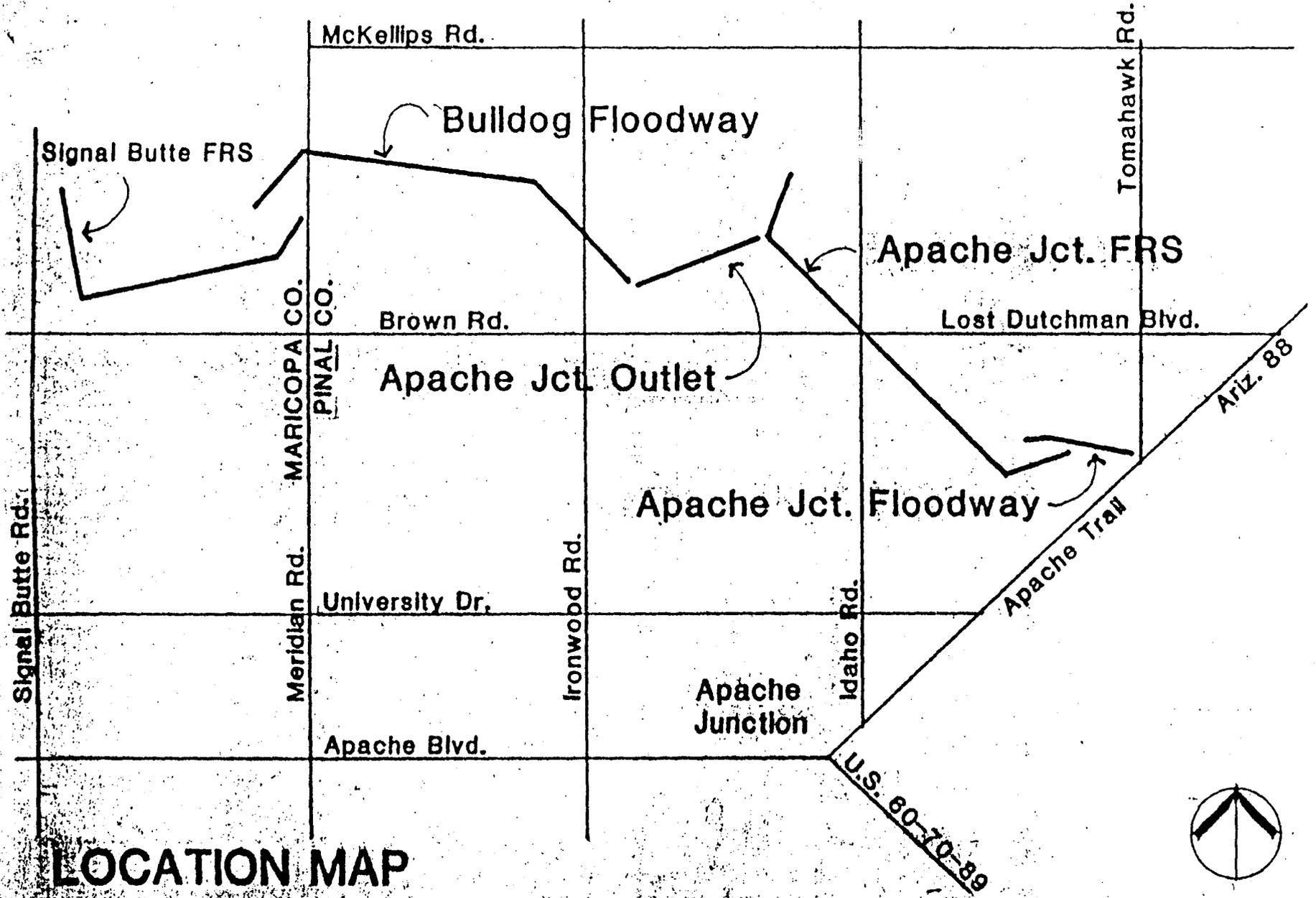


Map
taken from
Landscape
Rehabilitation
Preliminary
Design
Report

August 7, 1986

ERRORS

Figure 1



CORRECT



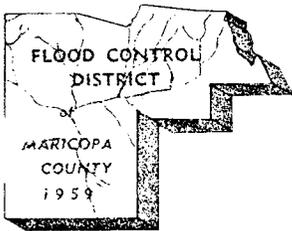
LOCATION MAP

Map taken from

MARICOPA NATURAL RESOURCE
SERV/ON DISTRICT

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

Landscap Rehabilitation REVIS
phasell
Blue print
Jan. 17 87



FLOOD CONTROL DISTRICT

of

Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-1501

D. E. Sagramoso, P.E., Chief Engineer and General Manager

BOARD of DIRECTORS
Fred Koory, Jr., Chairman
George L. Campbell
Carole Carpenter
Tom Freestone
Ed Pastor

FEB 13 1987

Ilde Chavez
U.S.D.A.
Soil Conservation Service
201 E. Indianola, Suite 200
Phoenix, AZ 85012

Re: Apache Junction FRS and Floodway, and Bulldog Floodway

Dear Ilde:

Per your request, we have reviewed the January 1987 Landscape Rehabilitation Phase III for the above structures. Our Revegetation Ecologists have the following comments, which we list by plan sheet number:

Page I-1

1. **General comments on seedmix alternatives.** Clarification is recommended in terms of how substitution of alternative species will be made, i.e., do "like" species substitute for "like" species? If similar species are substituted for one another, some confusion arises. In Seedmix II, for example, only 4 ounces of **Atriplex canescens** is specified per acre; however if **Atriplex lentiformis** is used as the alternative, 1.5 pounds is the specified amount per acre. The seed sizes of these two species is considerably different with **A. canescens** having, by far, the larger seed. Therefore, use of the specified amount of seed would result in vastly larger numbers of **A. lentiformis** seed for a comparatively smaller amount of **A. canescens**. Additionally, the alternatives for seed mixes III and IV offer no substitute for the perennial shrubs **Sphaeralcea ambigua** and **Cassia covesii**, instead offering only annual forbs and grasses.

2. **Seedmix II.** **Atriplex canescens** and its alternative **A. lentiformis** have been used extensively on FCD structures. These two saltbush species tend to be very rapid growing but also very short-lived, building up great quantities of dead wood. This results in a potentially severe fire hazard. Additionally, they have not demonstrated an ability to re-seed and re-establish themselves. We recommend the use of **Atriplex polycarpa** (desert saltbush) to avoid these problems. Also, the desert saltbush is a more drought tolerant plant and is better suited to the site.

Page L-10

1. The drawing on this page reflects incorrect plant counts.
 - a. For the southeast quadrant between Idaho Road and Lost Dutchman, shrub #3 (S-3) shows a count of 58; the correct count is 57.
 - b. In the center of the page shrub #2 (S-2) shows a count of 13, the correct count is 12.
2.
 - a. In the Plant Materials Schedule S-1 **Simmondsia chinensis** shows a count of 92; the correct count is 63.
 - b. In the Plant Materials Schedule S-2 **Justicia californica** shows a count of 39; the correct count is 48.
 - c. In the Plant Materials Schedule S-3 **Larrea divaricata** shows a count of 133; the correct count is 132.
3. It is our view that the roadway nodes are overplanted. Plant densities should be decreased by approximately one-half. Without benefit of permanent, automated irrigation system, or an extensive passive water harvesting system, competition for limited rainfall and runoff will drastically reduce the number of healthy, viable plants. Jojoba and chuparosa, because of their higher water requirements, will be particularly affected.

Page L-11

1. The comment under item 3, p. L-10, applies here as well. A passive water harvesting system, utilizing a specific grading plan designed to collect and concentrate naturally occurring runoff would greatly improve the success, aesthetics, and effectiveness of these planting nodes.
2. Detail 2 in the approximate center of Meridian Road: shrub #2, **Justicia californica**, shows a count of 9; the correct count is 10.
3. Plant Materials Schedule shows shrub #2, **Justicia californica**, shows a count of 46; the correct count is 47.

Letter to Idle Chavez
Page 3

Page L-12

Multi-trunk Tree Planting Detail:

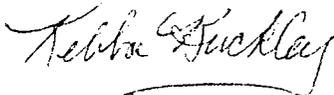
1. Add the size specification to the "Salt River Run Rock";
2. Remove the word "Salt" from "Salt River Run Rock" (this comment has been submitted for change on a previous occasion);
3. Show the staking detail more clearly. An additional drawing showing an expanded view of the staking technique would be useful.

Planting with Protective Wire Netting for 1-gallon Shrubs Detail:

1. Remove the word "Salt" from "Salt River Run Rock"; as comment 2 above.

If you have any questions, please call me or Jay Paxson, Revegetation Ecologist, at 262-1501.

Sincerely,



Kebba Buckley
Project Manager

Responses to Review Comments

West National Technical Center

A. General Comments

1. Figure numbers have been corrected.
2. The irrigation requirement has been expanded to provide for monthly watering, with the plant basin being filled twice at each watering. We are concerned about the potential for theft or vandalism of tensiometers if they were to be installed at this remote, unsupervised location.
3. Regarding comments by Gary Wells:
 - a. We have included a method for providing a transition in the plans and specs.
 - b. Final engineering plans for the Idaho/Lost Dutchman road crossing had not been completed at the time we made our initial Phase III submittal. After discussions with Ilde Chavez, we were directed to submit the landscape plan for this area as prepared for Phase II. We have since completed our design for this area. Mr. Wells' comments have been taken into account in our design.
 - c. Fencing has been deleted from all container planting plans as it is not affected by planting.

B. Specifications

1. For this particular project, we were directed by the SCS to handle deletions from the standard specification in this manner.
2. We have resolved this discrepancy.
3. This item has been changed as suggested.
4. Bid Item 4, Excavation, Common has been deleted from the plans. A swale has been provided for in the engineering plans.
5. Seed Mix Type IV has been added to the specs.
6. Bid Item numbers, where they are referenced, have been checked and corrected.
7. The Bid Items for check dams and retarding basins have been deleted from the plans and specs.
8. All Material Specifications have been deleted.

C. Drawings

1. The area referred to is at the Idaho/Lost Dutchman road crossing over the FRS. We have shown this area on our new sheet L-4 (seeding and gravel cover) and sheet L-11 (container planting). No special treatment is planned for the vicinity of

the culverts. Seed Mix Type IV, which includes mesquite, will be applied in this area. The mesquites will provide the necessary screening as they mature. This area is not regarded as a high priority area as it is hidden behind the FRS.

2. We have made the corrections noted on the redlined documents.

Midwest National Technical Center

1. The figure numbers have been corrected.
2. The Material Specifications have been deleted.
3. We have expanded on the irrigation requirements as noted previously.
4. Comments have been incorporated as noted previously.

Flood Control District of Maricopa County

A. General

1. The Location Map used on the plans has been included in the Final Design Report, and it replaces the one used in previous phases of the project.

B. Page I-1

1. The seed mixes shown in the plans and specs were developed from input provided by Jake Garrison, Carl Pachek and John York of SCS, Gatesby Moore and Jay Paxson of FCDMC, representatives of Hubbs Brothers Seed, Western Seed and ACRE, Inc., and our own professional experience in desert revegetation. Seeding rates are based on PLS content, the number of seeds per pound for each species, and the method of application. Alternatives are provided to preclude the need to make changes in the contract during the course of construction. According to seed suppliers, the only species that may be difficult to obtain are triangle leaf bursage and purple three-awn. We prefer to use these seed mixes, as they will also be used on the Pass Mountain/Signal Butte structures. The landscape rehabilitation for that project and the Apache Junction/Bulldog project will be bid as a single contract.
2. Saltbush was selected as a component of Seed Mix Type II because of its demonstrated ability to withstand periodic inundation. Very few arid adapted plant species have this tolerance, limiting the choice of species available. We did not use

desert saltbush because seed is not available in the quantities required for this project.

C. Page L-10 (now Page L-11)

1. We have double checked the plant counts on our latest design for this area.
2. Plant counts have been checked and corrected.
3. The plant densities for all road crossings are similar to those provided on the plans for the Pass Mountain/Signal Butte structures.

D. Page L-11 (now Page L-12)

1. Grading information in the form of drainage arrows and basin limit lines has been provided for all container planting plans.
2. All plant counts have been checked and corrected.

E. Page L-12 (now Page L-13)

1. The size spec for river run rock has been added to both details.
2. The word "Salt" has been removed from both details.
3. A separate detail for protective netting installation has been added to the plans.