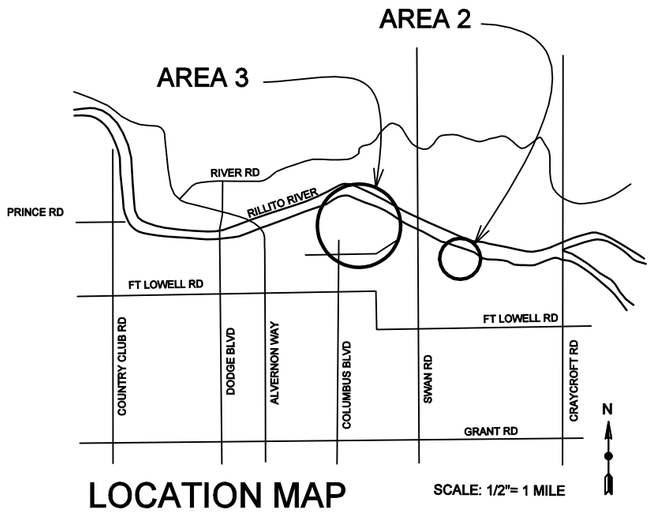
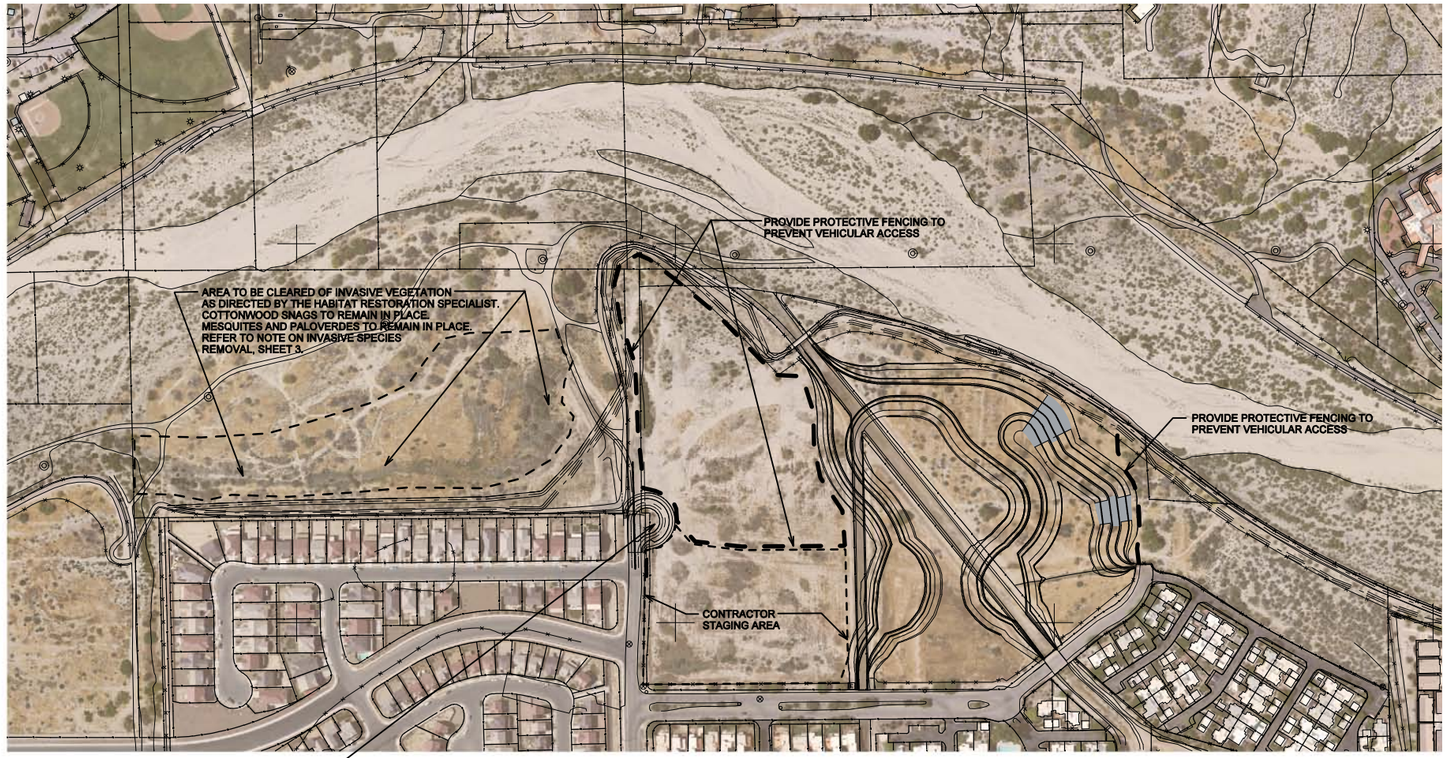


LOCATION MAP

SCALE: 1/2"= 1 MILE

Sheet Index:



AREA 3

100 50 0 100 200 400

SCALE: 1"= 200'

AREA 2

100 50 0 100 200 400

SCALE: 1"= 200'

PREPARED BY:

RECON

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RECON JOB #4400
DATE PRINTED: 1/2/2007

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

PROJECT LOCATION

SUBMITTED BY:
CHIEF. DESIGN BRANCH

DATE APPROVED:

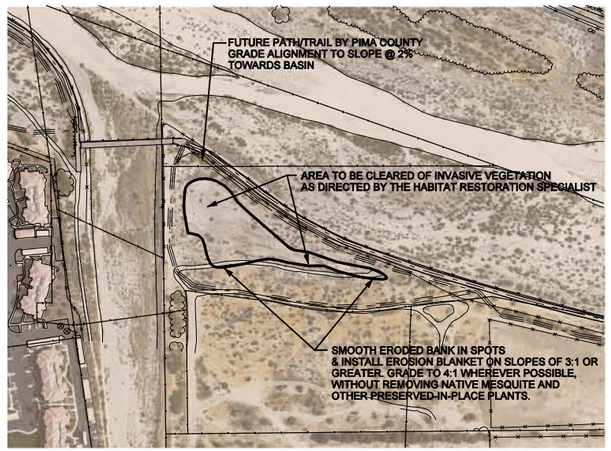
SPEC. NO.

DISTRICT FILE NO.

SHEET 1 OF 10 SHEETS

100 50 0 100 200
SCALE: 1"= 200'

N



AREA 2

TABLE 1 - CHANNEL DIMENSIONS

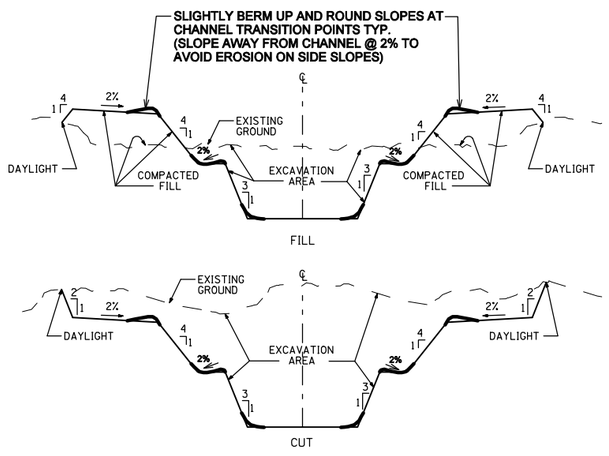
WESTERN CHANNEL						
STA	W	LFB	T	HFB	B	CS/FS
14+08	EXISTING					
13+67	EXISTING					
12+91	23	4	10	12	15	VARIES
12+43	23	4	10	12	15	VARIES
12+43 - 10+00	*W	4	10	12	15	VARIES
10+00	23	4	10	12	15	VARIES
7+38	23	4	10	12	15	VARIES
7+38 - 5+80*	*W	4	10-30	12	15	VARIES
5+80 - 4+21*	*W	4	30-EXISTING	12-0	15-0	VARIES
4+21*	MATCH EXISTING					

CENTRAL CHANNEL						
STA	W	LFB	T	HFB	B	CS/FS
16+62	EXISTING					
15+40	33	4	10	24	15	VARIES
15+40 - 13+40	*W	4	10	24	15	VARIES
13+40	33	4	10	24	15	VARIES
10+53	33	4	10	24	15	VARIES
10+53 - 7+37*	*W	4	10	24	15	VARIES
7+37	33	4	10	24	15	VARIES
6+72	33	4	10	24	15	VARIES
6+72 - 5+80*	*W	4	10	24	15	VARIES
5+80 - 4+48*	*W	4 - EXISTING	10 - EXISTING	24 - 0	15 - 0	VARIES
4+48*	MATCH EXISTING					

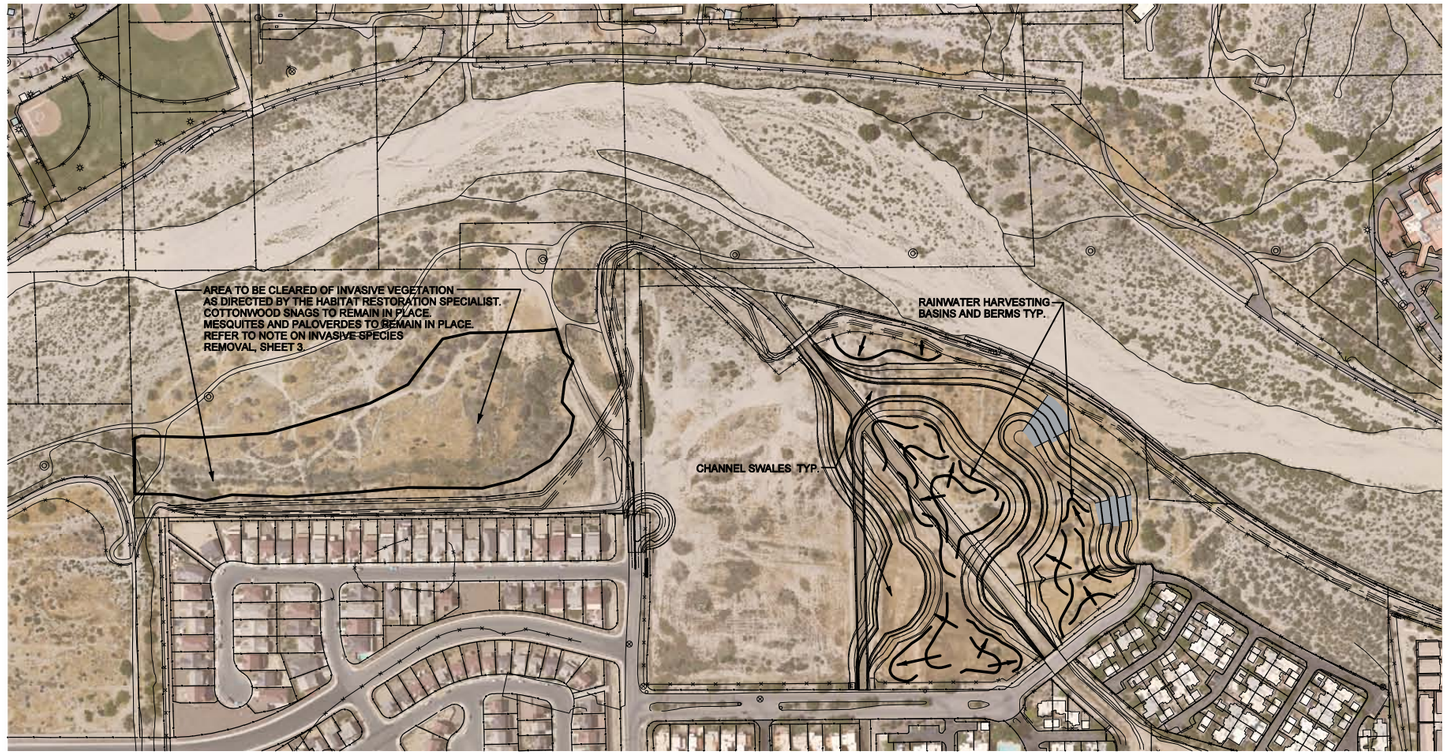
EASTERN CHANNEL						
STA	W	LFB	T	HFB	B	CS/FS
16+03	EXISTING					
15+93	EXISTING					
14+40	20	4	20	8	15	VARIES
13+90	20	4	20	14	15	VARIES
11+90	20	4	20	14	15	VARIES
11+20	20	4	20	24	15	VARIES
10+54	20	4	20	24	15	VARIES
10+54 - 7+37*	*W	4	20	24	15	VARIES

W --- WIDTH OF CHANNEL LOW FLOW
LFB --- WIDTH OF LOW FLOW BANK
T --- WIDTH OF TERRACE
HFB --- WIDTH OF HIGH FLOW BANK
B --- WIDTH OF BENCH
CS/FS --- WIDTH OF CUT OR FILL SLOPE

*W --- SEE SHEET C8 FOR DETAILS ON WIDTH
4+50*** --- CHANNEL DIMENSIONS APPLY ONLY TO LEFT OR RIGHT BANK (LOOKING DOWNSTREAM)



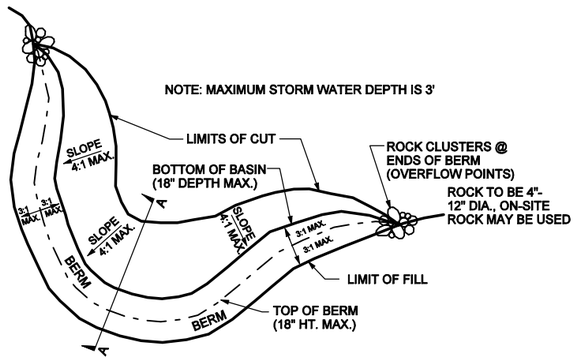
EARTHWORK SECTIONS
NOT TO SCALE
(SEE TABLE 1 FOR CHANNEL DIMENSIONS)



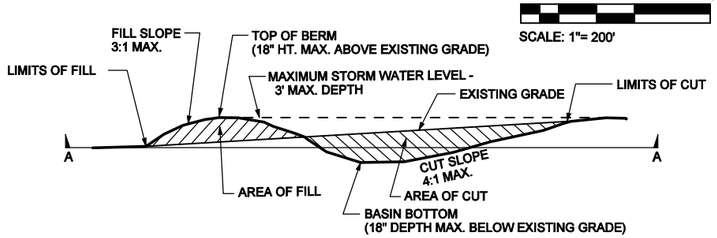
AREA 3

N

100 50 0 100 200 400
SCALE: 1"= 200'



REPRESENTATIVE BASIN/BERM CONFIGURATION DETAIL
PLAN N.T.S.



REPRESENTATIVE BASIN/BERM CONFIGURATION DETAIL
SECTION (HEIGHT & DEPTH MEASURED FROM EXISTING GRADE N.T.S.

NOTE: SEE SEPARATE ENGINEERING DRAWINGS FOR CHANNEL DESIGN & DETAILS

REGISTERED LANDSCAPE ARCHITECT
CERTIFICATE NO. 15870
LORI JONES WOODS
ARIZONA U.S.A.

PREPARED BY:
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DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

RILLITO RIPARIAN RESTORATION PROJECT
WORK PLAN FOR AREAS 2 & 3

GRADING CONCEPT WORK PLAN

SUBMITTED BY: DATE APPROVED:
CHIEF, DESIGN BRANCH

SPEC. NO.
DISTRICT FILE NO.

SHEET 2 OF 10 SHEETS

INVASIVE SPECIES TREATMENT TABLE

	Mechanical Treatment Options	Chemical Treatment Options	Timing	Important Considerations
TIER ONE: Heavy Control / Eradication				
Giant reed: *large, well-established clumps*	Remove biomass above 6 feet and haul offsite, then treat bases with herbicide	Glyphosate should be after flowering (late summer), either as a cut stump treatment or as a foliar spray.	Giant reed should be removed as soon as it is detected; seasonality is not important for mechanical removal, but herbicide application should occur once flowering is complete (late summer). Follow-up control should occur at least twice per year.	Litter to remain in place to continue to provide habitat for reptiles and small mammals.
Giant reed: *small clumps and new growth*	hand pulling, chainsaw, machete, shovel, or backhoe	Glyphosate should be after flowering (late summer), either as a cut stump treatment or as a foliar spray.		Use most appropriate method for least distrubance possible and completely remove all material to prevent resprouting.
Mexican paloverde: *large trees*	Larger trees that are to be removed due to proximity to the river path should be cut down, and the stumps immediately treated with herbicide as described below.	***For trees that are to be removed:*** Immediately (within 15 seconds) after tree is cut as close to the ground as possible, the stumps should be treated with herbicide (picloram or triclopyr, trade name Access) to prevent resprouting. ***For trees that are to remain in place:*** Holes are to be drilled near the base of the trunk, and picloram or triclopyr should be injected into the holes to kill the tree.	ANY	Trees should be monitored to ensure the herbicide is effective.
Mexican paloverde: *small trees*	Small individuals should be removed by bulldozer or pulling with a tractor to effectively remove all roots.	N/A	ANY	Follow up removal will be necessary as ground disturbance will encourage additional seedling germination and establishment.
Buffelgrass	Individual plants should be removed by shovel or digging bar immediately. Inflorescences should be clipped and securely bagged prior to digging out the plant to reduce the number of seeds that escape.	Glyphosate	Treat with glyphosate while it is actively growing.	Follow-up control should occur at least twice per year.
African sumac	Individual plants should be removed by shovel or digging bar immediately. Larger plants should be removed by bulldozer.	N/A	ANY	This species needs to be hauled off-site, even if there are no seeds, because it is allelopathic.
Salt cedar	N/A (vigorous resprouter)	Cut shrub near the ground and immediately (in less than 30 seconds) apply a triclopyr or glyphosate herbicide to the cut stump.	ANY	All cut vegetative material should be bagged and carried off-site. Follow-up control should occur at least twice per year. **Athel tree tamarisk (in the central portion of Area 3) shall not be removed unless otherwise directed by the Pima County Regional Flood control District.**

	Mechanical Treatment Options	Chemical Treatment Options	Timing	Important Considerations
TIER TWO: Control				
Bermuda grass	Mulching or Solarization.	Glyphosate kills both the tops of the plant and the roots. Apply to vigorously growing Bermuda grass that is not water stressed. Do not mow for 2 to 3 weeks before applying it and withhold water for 2 to 3 days after an application. For even more effective control, spray the area with glyphosate, leave it for up to 7 days, then cultivate the area to cut surface stolons and bring rhizomes to the surface to dry out. If it isn't cultivated, another application of glyphosate may be necessary when it begins to grow again.	Mulching / Solarization methods must occur during the hot summer months. Herbicide application should occur during vigorous, active growth.	Follow-up control should occur at least twice per year.
Soft feather pappusgrass	During the initial construction phase, all individuals should be removed in a careful manner to limit the amount of seedfall. Plants should be bagged and disposed of off-site.	Glyphosate or other approved herbicide should be applied while the plants are green and vigorously growing.	This species germinates with summer rains and should be treated immediate because it is an annual that sets seed quickly.	None.
Lehmann's lovegrass	Individual plants should be removed by shovel or digging bar.	Spot applications of herbicides may be used as deemed necessary by the Habitat Restoration Specialist.		
Rose natal grass	Individual plants should be removed by shovel or digging bar.	Spot applications of herbicides may be used as deemed necessary by the Habitat Restoration Specialist.	Summer.	
Russian thistle	Pull by hand to remove the plant before the seed heads have formed. This species may need to be removed more than once in a growing season.	Apply glyphosate when the plant is actively growing but prior to flowering. Herbicide application rates should wet the plant thoroughly. Chemical control may be preferred in some situations to limit ground disturbance.	Control methods should be applied before the plants set seed and while the plants are actively growing. Seeds are produced during the summer, by fall the plant dries out, breaks off and rolls away. Therefore, the optimal time to control Russian thistle is in the spring during active growth.	Follow-up control should occur at least twice per year.
London rocket & other winter mustards	Pull by hand to remove the plant before the seed heads have formed.	London Rocket is resistant to Group B/2 herbicides, known as ALS inhibitors (Inhibition of acetolactate synthase ALS [acetohydroxyacid synthase AHAS]).	Control methods should be applied before the plants set seed and while the plants are actively growing. Seeds are produced during the fall and winter.	
TIER THREE: Monitoring and Prevention (These species do not currently occur within the project area; however if they are detected once the project commences, they should be treated with the same urgency as Tier One species).				
Fountain grass	Individual plants should be removed by shovel or digging bar immediately. Inflorescences should be clipped and securely bagged prior to digging out the plant to reduce the number of seeds that escape.	Glyphosate	Treat with glyphosate while it is actively growing.	Follow-up control should occur at least twice per year.
Red brome	Manual removal of plants through pulling and hoeing can be effective if done before seeds mature, but is usually feasible only with small infestations. In small infestations, covering the ground with mulch or black plastic (solarization) will reduce plant growth.	Glyphosate	Plants should be treated immediately upon identification and before the seeds mature.	None
Starthistles	Small infestations can be hand-dug.	Mature plants are harder to control than immature plants in the rosette stage. Spot treatments of glyphosate or another herbicide approved by the Habitat Restoration Specialist.	Plants should be treated immediately upon identification and before the seeds mature.	Early detection and treatment is critical because once the plants flower, they can produce viable seeds within eight days.

Invasive Species Notes:

1. Invasive species shall be identified for removal in coordination with the Habitat Restoration Specialist. Removal shall be consistent with the directives included in the Invasive Species Management Plan. Species-specific treatments are summarized in the Invasive Species Treatment Table on this sheet.
2. The western basin of Area 3 will require intensive invasive treatment that will be coordinated with the Habitat Restoration Specialist, who will flag areas to be treated according to the Invasive Species Plan. In this particular area, mowing may be one of the preferred methods to be used. Because this area will not be planted or seeded, intensive control will be necessary to allow native species to re-establish.
3. Large clumps of Giant Reed (located in the western basin of Area 3) shall be cut and treated with herbicide, but the bases (up to 6 feet) shall remain in place to provide habitat for reptiles while the restoration plantings become established. Smaller clumps shall be entirely removed via mechanical means only.
4. If herbicide application is necessary, it shall be applied directly to individual plants and not broadcast on the soil. Herbicide will be applied only by personnel with all current and applicable applicator licensing from the State of Arizona. Herbicides shall be applied according to manufacturer's label, and all applicable safe-handling measures shall be followed.

Grading Notes:

1. The Arizona Department of Agriculture (AZDA), Tucson Office, shall be notified in writing of plans to clear, grade and/or conduct surface disturbing activities associated with the project at least 30 days in advance of clearing and grading activities. Notification shall be in conformance with the Arizona Native Plant Law, Arizona Revised Statutes, Chapter 7, as administered by the AZDA.
2. The Contractor shall cause the project site to be Blue-Staked prior to the start of any excavation or trenching work, and shall be familiar with plans showing utility locations. Engineering Plans shall be reviewed to identify the locations of known underground utility and telephone lines. Blue-Staking shall be kept current during the course of the project.
3. Rainwater Harvesting Berm/Basin Grading Drawings are diagrammatic. Drawings are intended to show the approximate locations and grading limits for basins. All berms/basins shall be located within the project limits. Minor adjustments in the location and layout may be necessary. Final layout must be approved in the field by Landscape Architect.
4. Berm/Basin staking: Locations and outlines shall be field staked by the Contractor and then field-evaluated and approved by USACE, Pima County, and the Landscape Architect prior to any surface disturbance. Minor adjustments in layout may be made in order to best capture rainwater runoff. Contractor shall receive written authorization to initiate surface area preparation and basin construction after basin locations and layout are approved by the Landscape Architect.
5. Surface Area Preparation: Surface area shall be raked and the raked surface materials (i.e., rock, woody debris, and vegetative materials) shall be set aside prior to berm/basin construction. This material shall be distributed over the new soil surface of the basin after all excavation, planting, and irrigation installation is complete. Rough rake the surface to blend with adjacent undisturbed soil surface.
6. Berm/Basin excavation: In order to best capture and temporarily hold rainwater and surface runoff during storm events, the berms/basins shall be built such that excavated material is removed (Cut) from the higher elevation area of the basin (upslope) and placed (Filled) along the lower elevation area (downslope) in a low berm, according to the following parameters:
   - Cut and fill soil material shall be balanced among all of the basin/berm elements, and to the extent possible, within each individual basin/berm.
   - Berms/Basins shall be dug, shaped and contoured using hand tools and mechanical equipment. Cut slopes of basins shall not exceed 4:1 (i.e., 25% slope) and in most cases will be less steep.
   - Fill slopes of low berms forming the basin containment shall not exceed 3:1 (i.e., 33% slope) without authorization by Landscape Architect or Habitat Restoration Specialist. Where authorized, fill slopes over 3:1 shall receive erosion control blanket.
   - Maximum depth of any basin shall not exceed 18" (below existing grade); maximum height of berms shall not exceed 18" (above existing grade). This will result in a difference in elevation of 3', measured from low point of basin to top of berm.
   - Rock and boulders that are excavated shall be utilized to stabilize the side slopes of the low berms and shall be clustered at the ends to prevent erosion at times of overflow. Broken concrete and other inorganic debris shall be removed from site.
   - Excavated soil shall be place in 6" maximum layers (lifts) to form low berms. Firmly tamp down soil in each lift before adding the next 6" lift. Spray with water after each lift is placed.
7. Final Shaping and Draining: Once excavation and fill work is complete at each berm/basin, and the containment berm is firmly tamped down, apply water in a gentle spray to wet the entire surface area without eroding the berm slopes. Let dry. Re-tamp fill areas and use hand tools and rock as-needed to repair and reshape surface as-needed and as-directed by Landscape Architect or Habitat Restoration Specialist. Fill basin with water, taking all precautions necessary to avoid erosion. Let drain completely and reshape as necessary where settlement has occurred and to insure a 3' difference in elevation between basin bottom and top of berm. Contact Landscape Architect or Habitat Restoration Specialist if a basin does not completely drain within 24 hours. Rough rake all surface areas receiving hydroseed and incorporate surface material previously set aside (per note 5 above), and blend with adjacent undisturbed soil surface.

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 16870 LORI JONES WOODS ARIZONA U.S.A.

PREPARED BY:
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RECON JOB #4400
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U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

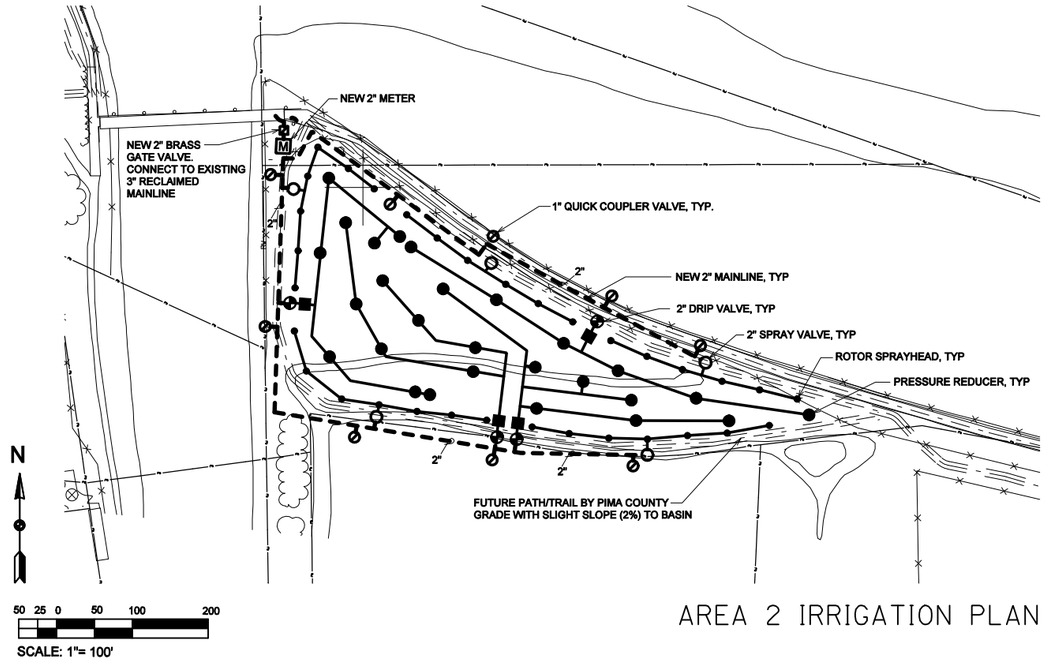
RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

GRADING NOTES & INVASIVE SPECIES TREATMENT TABLE

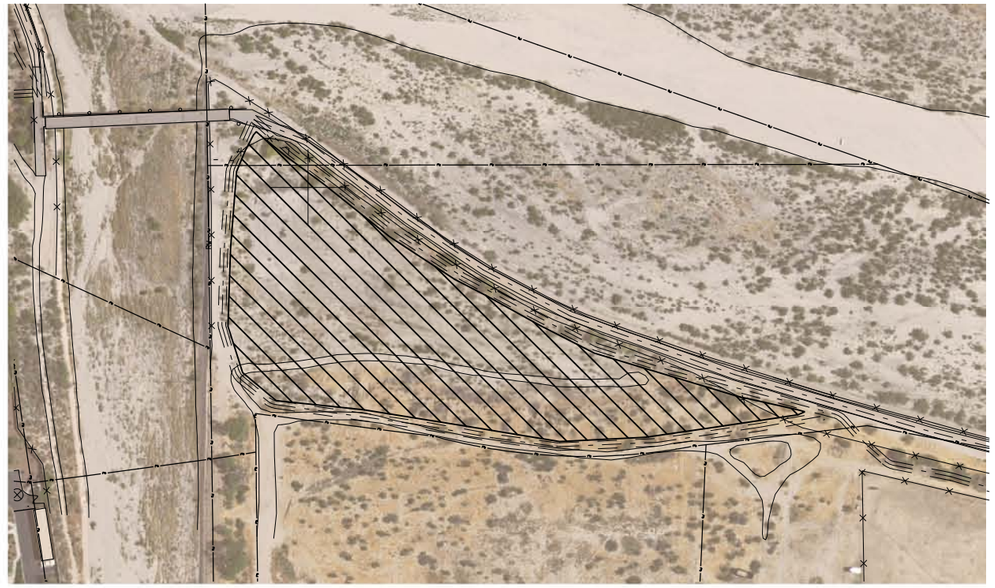
SUBMITTED BY: DATE APPROVED:
CHIEF, DESIGN BRANCH

SPEC. NO.
DISTRICT FILE NO.

SHEET 3 OF 10 SHEETS



AREA 2 IRRIGATION PLAN



AREA 2 PLANTING ZONES

LEGEND

ENHANCEMENT = SEEDING + ENHANCEMENT CONTAINER PLANTING

Key to Symbols on Plan:

- New 2" Brass Gate Valve (Hammond 2HV667 or approved equal.) Connect to existing 3" reclaimed irrigation mainline with new 2" mainline
- New 2" Water Meter- brass, mechanical ("Master Meter" or approved equal)
- New 1" Brass Quick Coupler Valve (RainBird 5NP, or approved equal, with locking purple cover. Install in valve box with locking purple cover.)
- New 2" Irrigation Mainline (reclaimed/non-potable/ Schedule 40 PVC purple color)
- 2" Valve serving spray irrigation zone, typ. Battery operated (Glass-filled nylon construction with stainless steel; plastic scrubber to prevent clogging; purple flow control handle to signify non-potable water system; control with battery operated, DC latching solenoid in screw-on plastic adapter. RainBird 200-PESB-PRSD NP-HAN2 with Easy Rain Controller- or approved equal.) Install Valves in jumbo valve box with locking purple cover (Carson 1220 or approved equal).
- PVC lateral line to Spray/Sprinkler heads (See separate detail for typical layout, head placement and piping diagram)
- Rotor Sprinkler Heads, typ. Install each on swing joint, per detail.
- 2" Valve serving drip irrigation zone, typ. (See above valve notes)
- 2" Filter, on Drip Zones only. (with 200 mesh stainless steel screen; Rain Bird 200C-SC 200 200 SS or approved equal.)
- PVC lateral line to Drip Zone Pressure Reducers connecting to Landscape Dripline (See separate detail for Pressure Reducer typical layout, placement and piping diagram)
- 40 psi Pressure Reducer, typ (Rain Bird PSI-M40X-100) or approved equal.) Install each PR in 10" round valve box with purple cover.

NOTES:

1. ALL PIPING, COMPONENTS AND VALVE BOXES SHALL BE COLOR PURPLE, INDICATING NON-POTABLE IRRIGATION SYSTEM.
2. SEE SHEETS 9 & 10 FOR TYPICAL LAYOUT AND PIPING DIAGRAMS FOR SPRINKLER/SPRAY AND DRIP IRRIGATION SYSTEMS.
3. SEE SHEET 9 FOR AREA 3 SPRINKLER/SPRAY IRRIGATION SYSTEM LAYOUT & SEE SHEET 10 FOR AREA 3 DRIP IRRIGATION SYSTEM LAYOUT.
4. LOCATION OF IRRIGATION COMPONENTS IS SHOWN DIAGRAMMATICALLY. FINAL PLACEMENT SHALL BE FIELD APPROVED BY LANDSCAPE ARCHITECT. ALL SPRAY HEADS SHALL BE INSTALLED TO AVOID OVER-SPRAY ONTO CURBS, PAVEMENT AND PEDESTRIAN PATHS.

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 16870 LORI JONES WOODS ARIZONA U.S.A.

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RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

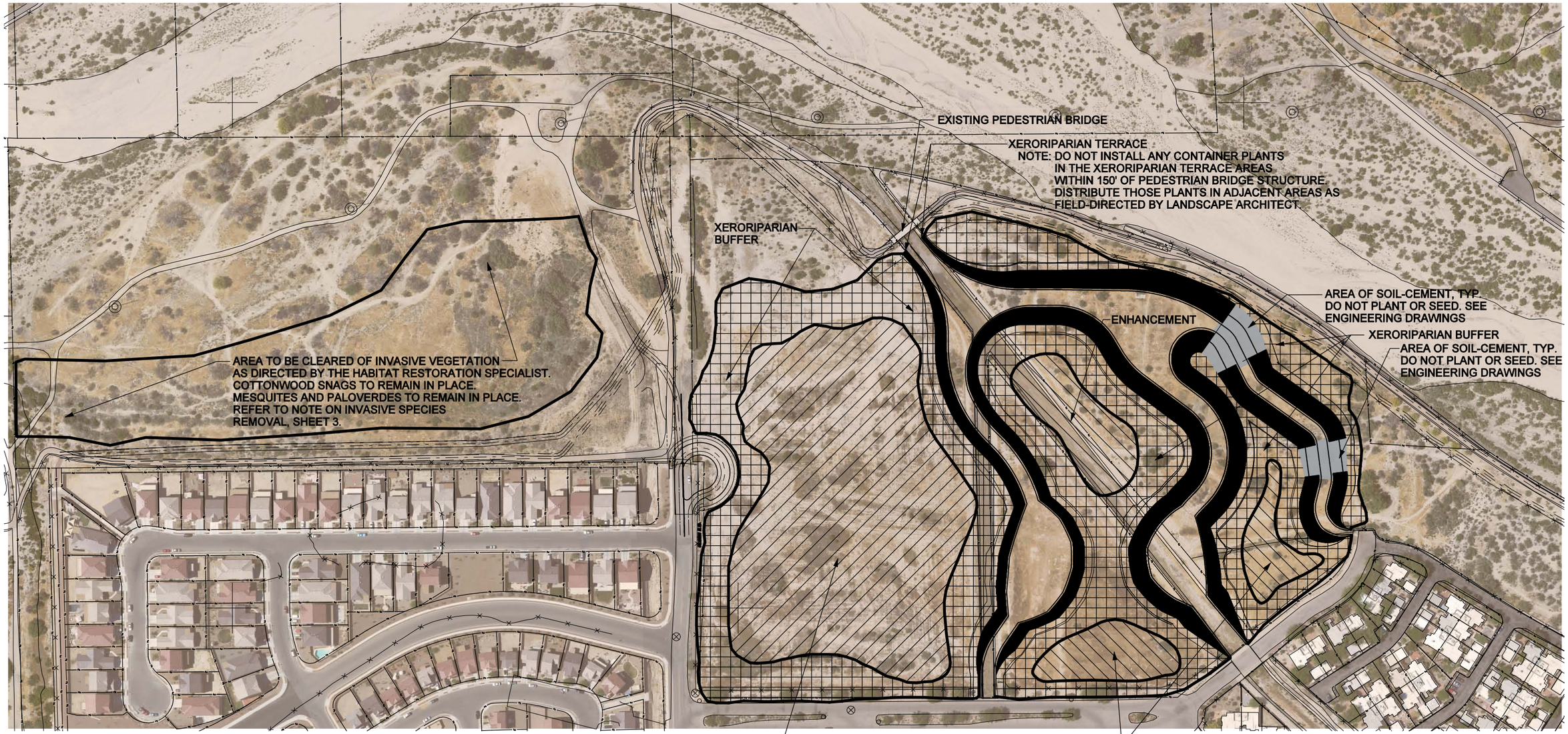
AREA 2 PLANTING ZONES & IRRIGATION WORK PLAN

SUBMITTED BY: DATE APPROVED:
CHIEF, DESIGN BRANCH

SPEC. NO.
DISTRICT FILE NO.

SHEET 4 OF 10 SHEETS

VALUE ENGINEERING PAYS



AREA 3

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

REVEGETATION TREATMENT AREAS

- CHANNEL BOTTOM = NO PLANTING OR SEEDING
- XERORIPARIAN TERRACE = SEEDING + RIPARIAN CONTAINER PLANTING
- XERORIPARIAN BUFFER = SEEDING + RIPARIAN CONTAINER PLANTING (LOWER DENSITY)
- ENHANCEMENT = SEEDING + ENHANCEMENT CONTAINER PLANTING
- SEED ONLY

N

50 25 0 50 100 200

SCALE: 1"= 100'

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 15970 LORI JONES WOODS ARIZONA U.S.A.

PREPARED BY:

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RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

AREA 3 PLANTING ZONES

SUBMITTED BY: CHIEF, DESIGN BRANCH

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SPEC. NO.

DISTRICT FILE NO.

SHEET 5 OF 10 SHEETS

SAFETY PAYS

RIPARIAN CONTAINER PLANTS

TREES: at least 4 species

Acacia constricta
Acacia greggii
Parkinsonia florida
Chilopsis linearis
Prosopis velutina
Sambucus mexicana

SHRUBS: at least 5 species

Abutilon spp. (A. abutiloides, and/or *A. incanum)*
Anisacanthus thurberi
Atriplex spp. (A. canescens, and/or *A. lentiformis, A. polycarpa)*
Brickellia coulteri
Celtis pallida
Dodonea viscosa
Lycium spp. (L. berlandieri, L. andersonii, L. exsertum, and/or *L. fremontii)*
Zizyphus obtusifolia

SMALL PERENNIALS: at least 12 species

Acourtia wrightii
Aristolochia watsonii
Bothriochloa barbinodis
Bouteloua curtipendula
Brickelllia coulteri
Chloris virgata
Clematis drummondii
Cucurbita digitata
Datura wrightii
Dicliptera resupinata
Digitaria californica
Glandularia gooddingii
Gossipium thurberi
Heteropogon contortus
Hilaria belangeri
Hilaria mutica
Maurandya antirrhiniflora
Muhlenbergia porteri
Pappophorum mucronulatum
Passiflora mexicana
Ruellia nudiflora
Sarcostemma cynanchoides
Sphaeralcea spp. (S. emoryi, laxa, and/or ambigua)
Sporobolus spp. (S. airoides, S. contractus, and/or *S. cryptandrus)*
Trixis californica
Vitis arizonica

ENHANCEMENT CONTAINER PLANTS

TREES: include all 4 species

Acacia constricta
Chilopsis linearis
Parkinsonia microphylla
Prosopis velutina

SHRUBS: at least 8 species

Aloysia wrightii
Atriplex spp. (A. canescens, A. lentiformis, and/or *A. polycarpa)*
Celtis pallida
Hymenoclea salsola
Hyptis emoryi
Isocoma tenuisecta
Janusia gracilis
Larrea tridentata
Opuntia engelmannii and/or O. phaecantha

Opuntia spp. (O. spinosior, O. fulgida, O. leptocaulis, O. arbuscula, and/or O. versicolor)

SMALL PERENNIALS: at least 10 species

Ambrosia deltoidea
Bouteloua rothrockii
Cucurbita digitata
Datura wrightii
Digitaria californica
Glandularia (Verbena) gooddingii
Heteropogon contortus
Hibiscus spp. (H. denudatus, H. biseptus, and/or *H. coulteri)*
Muhlenbergia porteri
Porophyllum gracile
Proboscidea parviflora
Psilostrophe cooperi
Sphaeralcea spp. (S. emoryi, and/or *S. ambigua)*
Sporobolus cryptandrus
Stephanomeria pauciflora
Trixis californica
Zinnia pumila

SEED MIX

SHRUBS: at least 6 species and minimum of 5 PLS/acre

Ambrosia deltoidea
Atriplex spp. (A. canescens, A. lentiformis, and/or *A. polycarpa)*
Calliandra eriophylla
Celtis pallida
Encelia farinosa
Larrea tridentata

SMALL PERENNIALS: at least 10 species and minimum of 8 PLS/acre

Aristida purpurea
Aristida ternipes
Bahia absinthifolia
Baileya multiradiata
Bouteloua curtipendula
Bouteloua rothrockii
Cucurbita digitata
Datura wrightii
Digitaria californica
Erioneuron pulchellum
Glandularia (Verbena) gooddingii
Muhlenbergia porteri
Oenothera caespitosa
Porophyllum gracile
Proboscidea parviflora
Psilostrophe cooperi
Senna covesii
Sphaeralcea spp (S. ambigua S. laxa, and/or *S. emoryi)*
Zinnia pumila

ANNUAL HERBS: at least 8 species and minimum of 5 PLS/acre

Allionia incarnata
Bouteloua aristidoides
Bouteloua barbata
Datura discolor
Escholzia californica ssp. mexicana
Evolvulus arizonicus
Hordeum pusillum
Hymenothrix wislizenii
Kallstroemia grandiflora
Lesquerella gordonii
Lupinus sparsiflorus
Nama demisssum
Nicotiana obtusifolia
Orthocarpus purpurascens
Poa bigelovii
Pectis papposa
Phacelia distans
Plantago ovata
Proboscidea parviflora
Salvia columbariae
Sphaeralcea coulteri
Tidestromia lanuginosa

Plant Material Quantities per Acre

	Trees/acre	Shrubs/acre	Small Perennials/acre	Seed/acre
Xeroriparian Terrace	85	255	383	18 PLS
Xeroriparian Buffer	55	165	248	18 PLS
Enhancement Area	35	105	158	18 PLS
Seed-Only Area	0	0	0	18 PLS

Plant Material Quantities for Total Project Area

	Trees (15 gal)	Shrubs (5 gal)	Small Perennials (1 gal)	Seed
Xeroriparian Terrace (3 acres)	255	765	1149	54 PLS
Xeroriparian Buffer (9 acres)	495	1485	2232	162 PLS
Area 3 Enhancement Area (2 acres)	70	210	316	36 PLS
Area 2 Enhancement Area (3 acres)	105	315	474	54 PLS
Seed-Only Area (6 acres)	0	0	0	108 PLS
TOTAL	**925**	**2775**	**4171**	**414 PLS**

REVEGETATION & PLANTING NOTES:

1. All planting and Landscape Restoration work shall be performed in accordance with these Work Plan Drawings and Specification Notes.

2. Plant layout is to be approved in field by Landscape Architect or Habitat Restoration Specialist prior to actual planting and irrigation work.

3. Revegetation and planting work shall be coordinated with grading and irrigation work. Planting shall not be initiated until channel grading is complete and approved, and irrigation system is installed sufficient to provide immediate water upon planting. Work that is completed or in-progress shall be protected during the planting process. Contractor shall notify the USACE Construction Manager of any field conditions which prevent the installation of the irrigation system as shown. Contractor shall complete notification of USACE and Blue-staking prior to the start of any excavation work.

4. The Contractor shall protect and preserve in place all existing vegetation except those species that are identified by the Invasive Species Management Plan or Habitat Restoration Specialist for removal. Any vegetation that is not identified for removal by the Invasive Species Management Plan, and that is damaged or removed by the Contractor, shall be replaced at the Contractor's expense with container stock of same species and size as damaged or removed material.

5. All native species protected by state and local laws shall remain in place undisturbed, even if they occur within an area identified for clearing and weed removal. The Habitat Restoration Specialist will identify all trees and shrubs to be preserved in place with flagging in the field.

6. Surface Area Preparation: Surface area at planting locations shall be raked and the raked surface materials (i.e., rock, woody debris, and vegetative materials) shall be set aside nearby prior to planting. This material shall be distributed over the new soil surface around the plantings after planting is complete. Rough rake the surface to blend with adjacent undisturbed soil surface.

7. Container Plants: Nursery stock shall be unpruned; multi-stemmed trees and shrubs are desirable and shall not be pruned at any point during project installation or maintenance, unless as a safety precaution. Container plants shall be stored in the fenced and locked staging area until installation. Plants in the holding area will be irrigated as necessary, and organized in groups according to vegetation community/final location.

8. Planting, Staking and Fertilizing: Shall be in accordance with planting details of this Work Plan. Fertilizer tabs shall be applied to plantings as shown, in these quantities: (1) per 1-gallon plant; (2) per 5-gallon plant; (4) per 15-gallon plant. Decomposed Granite will not be used for container planting. All plantings (except cacti) shall be planted such that they have a shallow basin surrounding them, per the planting details, to facilitate the capture of rainwater. All container plants shall be protected with wire cages on the same day of installation, per the planting details. No container plants will be installed in the channel bottoms.

9. Seeding: Only locally native seed will be used that is appropriate for the local habitat. The final seed mix shall be approved by the Habitat Restoration Specialist; if seed of a particular species is not available at the time of seed application, the Habitat Restoration Specialist may make substitutions. Seed shall be applied to prepared areas between October 1 and May 1. Prior to mixing hydroseed ingredients, the tank and hose used to apply the hydroseed mix will be thoroughly rinsed with water at least three times to ensure anyprevious seed mix is removed. After the initial cleaning, the tank does not require washing between batches, providing the same hydroseed mix is being applied. The hydroseed mix will contain M-binder, which does not prolong seed germination. The organic binder should be applied at a rate of 200 pounds/acre with 2,000 pounds/acre of wood fiber. The seed/slurry will be mixed thoroughly before, and continuously during, application. The hydroseed mix will be applied in an even and consistent manner. No seeds will be applied to the channel bottoms. Any excess seed shall be applied to the area on the far east side of Area 3.

10. Irrigation: All container plantings shall be served by an automatic irrigation system per the irrigation details. Any changes shall be approved by the Landscape Architect.

11. Erosion Control Blanket: Contractor shall install erosion control blanket on areas where otherwise unprotected slopes are steeper than 3:1. Material shall be 100% biodegradable, double net straw-coconut fiber matrix with jute netting top and bottom ('North American Green BioNet, #SC150BN'). Apply material per manufacturer's specifications after hydroseeding is complete. Unroll blanket material down the slope (perpendicular to contours) without stretching, allowing it to fully contact the soil. Secure with 6" wire staples @ 3" on-center max (1staple/sq. yd. min). All staples should be driven flush to the ground. Staple all edges and provide 3"-5" material overlaps at parallel edges. The beginning and end of each roll should be secured by anchoring the matting into 6"X6" trenches and providing a 12" overlap, secured with staples @ 12" o.c.

12. Maintenance: All required planting and irrigation shown here shall be maintained during the life of the project. Maintenance during installation and during a one year Landscape Establishment period of the plant materials and the irrigation system is the responsibility of the Contractor and shall consist of regular watering, fertilizing, clearing landscape areas of debris and weeds, the removal and replacement of dead plant materials with like types and sizes, and keeping the irrigation system in working order. Active management of invasive species according to the Invasive Management Plan is the responsibility of the Contractor during the one year Landscape Establishment period.

13. Guarantee: Contractor shall guarantee all plantings for one year from the date of written final job acceptance by USACE and Pima County, including replacement of dead or dying plants, and repair of any backfill settlement. All plants shall be alive and thriving before final job acceptance is granted.

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

REGISTERED LANDSCAPE ARCHITECT — CERTIFICATE NO. 15970 — LORI JONES WOODS — ARIZONA U.S.A.

PREPARED BY:
RECON
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1927 Fifth Avenue San Diego, California 92101 619.308.9333
RECON JOB #4400
DATE PRINTED: 1/2/2007

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

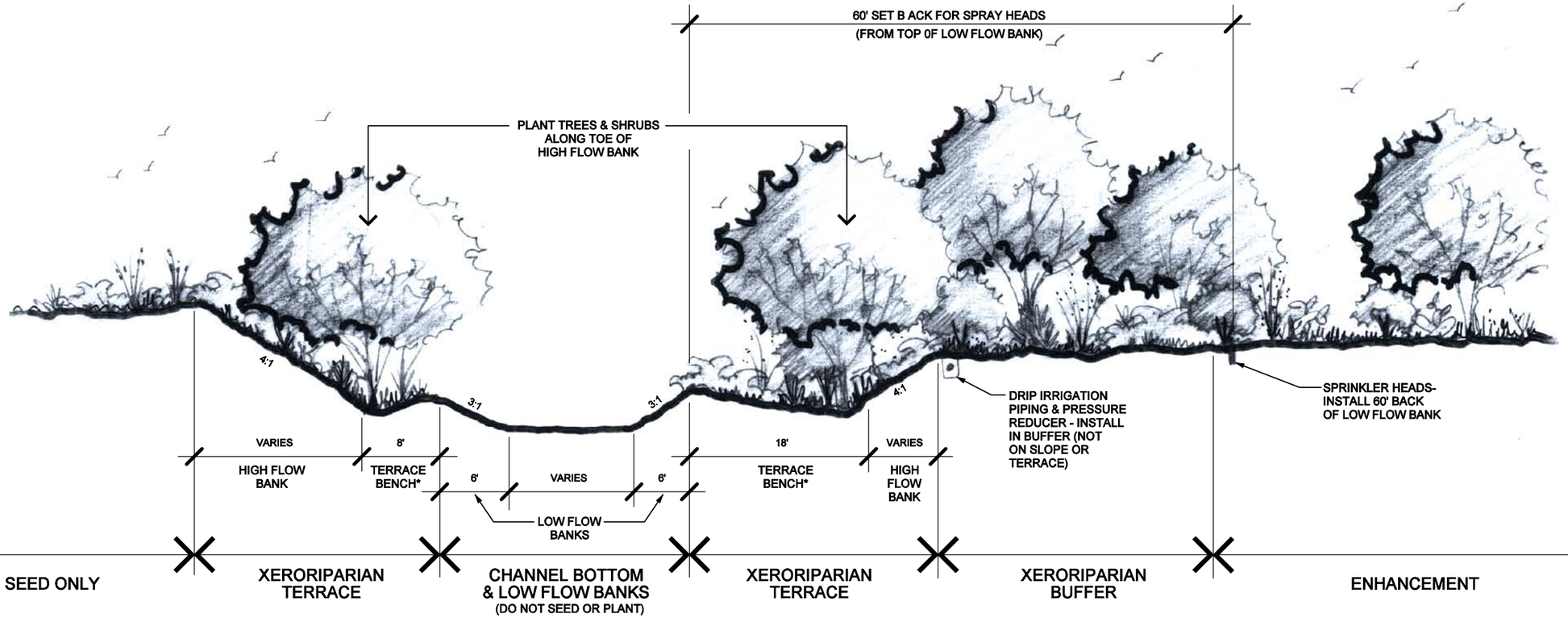
RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

PLANTING NOTES & TABLES

SUBMITTED BY:
DATE APPROVED:
CHIEF. DESIGN BRANCH

SPEC. NO.
DISTRICT FILE NO.

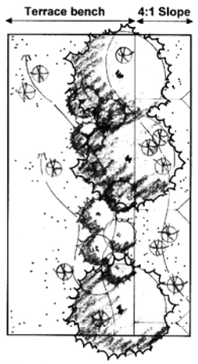
SHEET 6 OF 10 SHEETS



REPRESENTATIVE PLANTING CROSS-SECTION

NOT TO SCALE

* NOTE: TERRACE BENCH ON EAST CHANNEL IS 18' WIDE,
AND IS 8' WIDE ON THE WEST & CENTRAL CHANNELS.
REFER TO ENGINEERING DRAWINGS FOR OTHER DIMENSIONS



Notes:

Plant trees and shrubs along toe of high-flow bank (not on slope.)

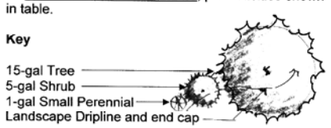
For Irrigation, install PVC pipe and pressure reducer components (that serve this area) in the adjacent Xeroriparian Buffer.

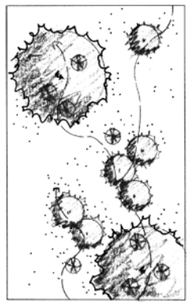
Landscape Dripline and end caps are only irrigation components to be installed in the Xeroriparian Terrace.

Planting Template: Xeroriparian Terrace
(Approximately 1500 sq.ft. area shown above)

Seed entire surface area and plant with plant materials on Riparian Container Plant List, per densities shown in table.

Key

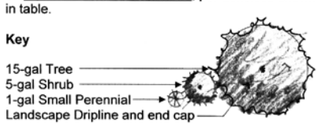


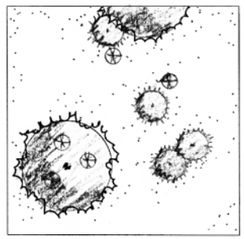


Planting Template: Xeroriparian Buffer
(Approximately 1500 sq.ft. area shown above)

Seed entire surface area and plant with plant materials on Riparian Container Plant List, per densities shown in table.

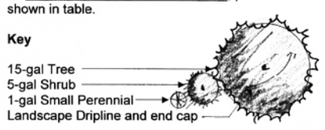
Key





Planting Template: Enhancement
(Approximately 1500 sq.ft. area shown above)
Seed entire surface area and plant with plant materials on Enhancement Container Plant List, per densities shown in table.

Key



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RECON JOB #4400
DATE PRINTED: 1/2/2007

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

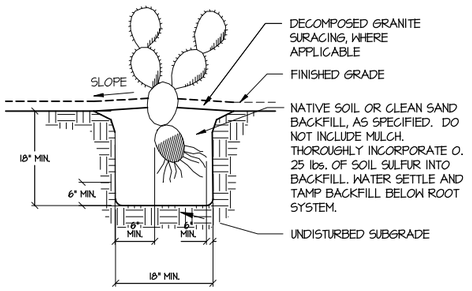
RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

PLANTING SECTION & TEMPLATES

SUBMITTED BY:
CHIEF, DESIGN BRANCH
DATE APPROVED:
SPEC. NO.
DISTRICT FILE NO.
SHEET 7 OF 10 SHEETS

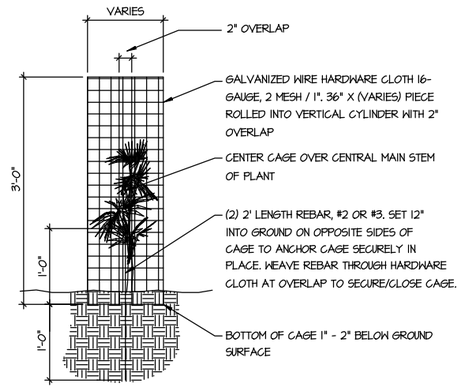
NOTES:
1. DO NOT CREATE BASIN AT BASE OF CACTUS. SLOPE BACKFILL AWAY FROM PLANT.
2. BURY ONE FULL PAD, MINIMUM.
3. THIS DETAIL APPLIES TO SALVAGED STOCK OF THE GENUS OPUNTIA.



SCALE: N.T.S.

ISSUED:	STANDARD DETAIL	DETAIL NO.
11/05	PLANTING /SALVAGED NATIVE PLANTS:	P–107
REVISED:	PRICKLY PEAR AND CHOLLA CACTUS PLANTING – SALVAGED CUTTING	SHEET 1 OF 1
MO/YR		

NOTE: DECOMPOSED GRANITE NOT APPLICABLE AT THIS SITE.

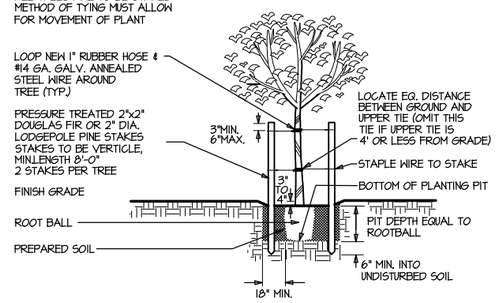


PROTECTIVE PLANT CAGE DETAIL

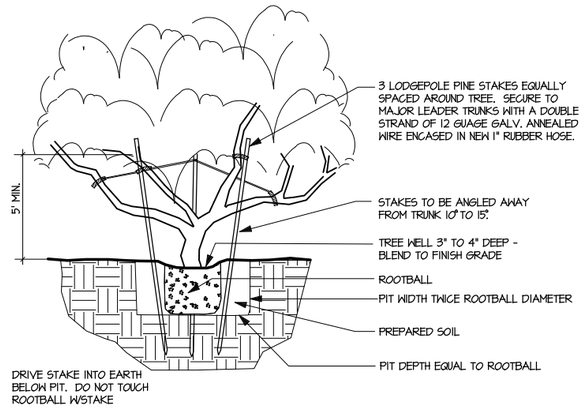
Note: Each planting of 1 gallon size and larger shall receive a metal wire cage to protect against wildlife damage. Cages shall be assembled on-site from 36" wide pieces of hardware-cloth, ½" mesh, formed into vertical cylinders and anchored in place with 2' lengths of #3 rebar (or #2, if available). Rebar shall be woven through a 2" overlap of the hardware cloth to secure closure, and driven 1' into the ground. Larger cages may need an additional rebar stake to stabilize. Cages shall be centered over the central main stem of plant, with a minimum of 1"-2" set below grade. Size of cages shall be as follows:

Plant Size:	Diameter of Cage	Length of Hardware Cloth Required (approx.)
1 gallon	12"	3'
5 gallon	16"	4'
15 gallon	24"	6'

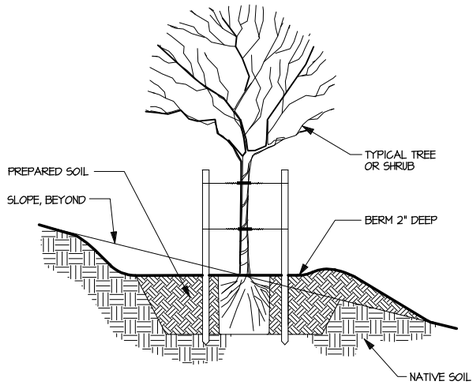
NOTE:
ALL TREES ARE TO BE STAKED METHOD OF TYING MUST ALLOW FOR MOVEMENT OF PLANT



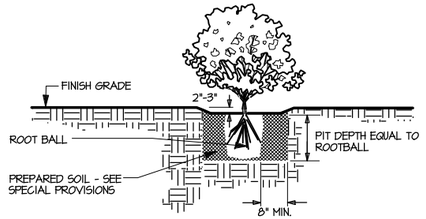
TREE PLANTING DETAIL
NTS



MULTI TRUNK TREE PLANTING DETAIL
NTS



TREE & SHRUB PLANTING ON SLOPE DETAIL
NTS



SHRUB PLANTING DETAIL
NTS

Soil Specification for Plantings:

Prepared Soil Backfill Mix for planting holes shall consist of 4 parts native soil thoroughly mixed with 1 part soil conditioner/mulch. Remove non-soil materials (e.g., rocks, sticks, brush, roots, plastic, refuse) of 1" size or larger from native soil before mixing soil with mulch. Soil conditioner/mulch shall be premixed with sulfur (4 pounds per cubic yard) and ammonium phosphate 16-20-0 (2 pounds per cubic yard). Soil conditioner/mulch shall be composted, pass a 1 inch sieve, and shall not contain poultry, animal or human waste, pathogenic viruses, fly larvae, insecticides, herbicides, fungicides or poisonous chemicals that would inhibit plant growth. Add fertilizer tabs to each planting hole per Note 10 on Planting Notes & Tables, Sheet 6.

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 15970 LORI JONES WOODS ARIZONA U.S.A.

PREPARED BY:
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NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

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U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

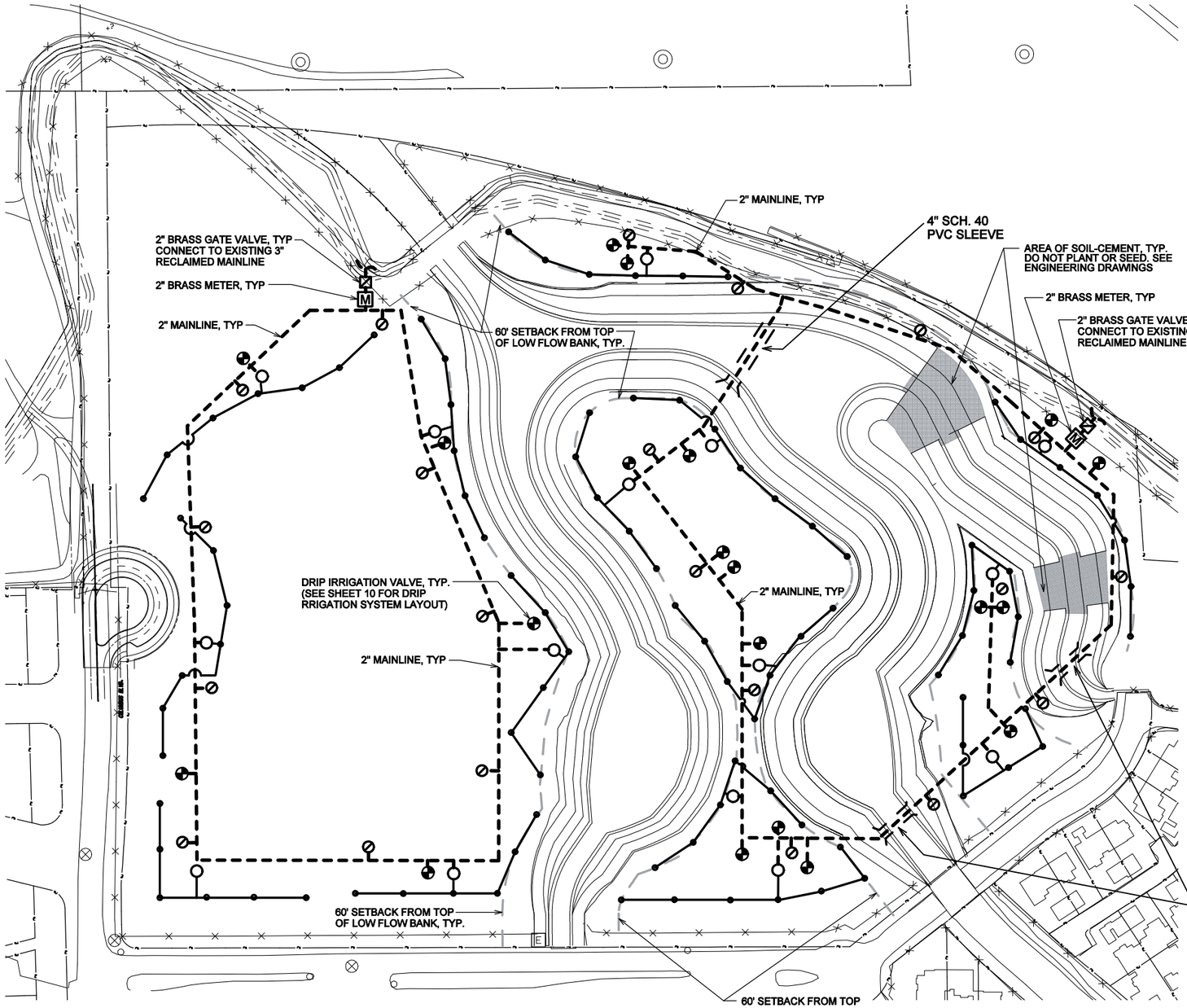
RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

PLANTING DETAILS

SUBMITTED BY: DATE APPROVED:
CHIEF, DESIGN BRANCH

SPEC. NO.
DISTRICT FILE NO.

SHEET 8 OF 10 SHEETS

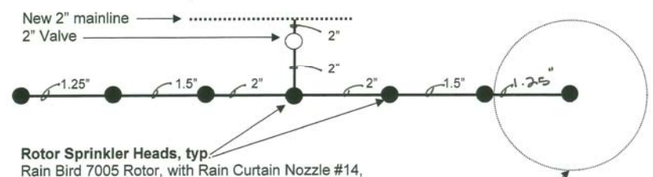


Key to Symbols on Plan:

- New 2" Brass Gate Valve (Hammond 2HV667 or approved equal.) Connect to existing 3" reclaimed irrigation mainline with new 2" mainline
- New 2" Water Meter- brass, mechanical ("Master Meter" or approved equal)
- New 1" Brass Quick Coupler Valve (RainBird 5NP, or approved equal, with locking purple cover. Install in valve box with locking purple cover.)
- New 2" Irrigation Mainline (reclaimed/non-potable/ Schedule 40 PVC purple color)
- 2" Valve serving spray irrigation zone, typ. Battery operated (Glass-filled nylon construction with stainless steel; plastic scrubber to prevent clogging; purple flow control handle to signify non-potable water system; control with battery operated, DC latching solenoid in screw-on plastic adapter. RainBird 200-PESB-PRSD NP-HAN2 with Easy Rain Controller- or approved equal.) Install Valves in jumbo valve box with locking purple cover (Carson 1220 or approved equal).
- PVC lateral line to Spray/Sprinkler heads (See separate detail for typical layout, head placement and piping diagram)
- Rotor Sprinkler Heads, typ. Install each on swing joint, per detail.
- 2" Valve serving drip irrigation zone, typ. (See above valve notes)
- 2" Filter, on Drip Zones only. (with 200 mesh stainless steel screen; Rain Bird 200C-SC 200 200 SS or approved equal.)
- PVC lateral line to Drip Zone Pressure Reducers connecting to Landscape Dripline (See separate detail for Pressure Reducer typical layout, placement and piping diagram)
- 40 psi Pressure Reducer, typ (Rain Bird PSI-M40X-100) or approved equal.) Install each PR in 10" round valve box with purple cover.

Irrigation Detail: Typical Layout and Piping Diagram for Sprinkler / Spray System

Not to Scale



Rotor Sprinkler Heads, typ
Rain Bird 7005 Rotor, with Rain Curtain Nozzle #14, and nonpotable rubber cover (purple);
Model# RBY 7005-NP-14
14.3 GPM @ 60 PSI; Space @ 60' on center, and adjust to full-circle (360) coverage, 60'radius.
Install 6-7 heads per valve, in 'T' alignment, as shown here and on plan.

Piping:

- **PVC**: Size as noted above. Use Schedule 40 PVC (purple) for all 2" pipe. Use Class 200 PVC (purple) for pipe <2".

NOTES:

1. ALL PIPING, COMPONENTS AND VALVE BOXES SHALL BE COLOR PURPLE, INDICATIING NON-POTABLE IRRIGATION SYSTEM.
2. SEE SHEET 10 FOR AREA 3 DRIP IRRIGATION SYSTEM LAYOUT.
3. SEE SHEET 4 FOR AREA 2 DRIP & SPRINKLER/SPRAY IRRIGATION SYSTEM LAYOUT.
4. INSTALL SPRAY HEADS 70' FROM CURBS & PATH AND 60' FROM TOP OF LOW FLOW BANK.

N

40 20 0 40 80 160

SCALE: 1"= 80'

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 18970 LORI JONES WOODS ARIZONA U.S.A.

PREPARED BY:

RECON

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REVISIONS

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

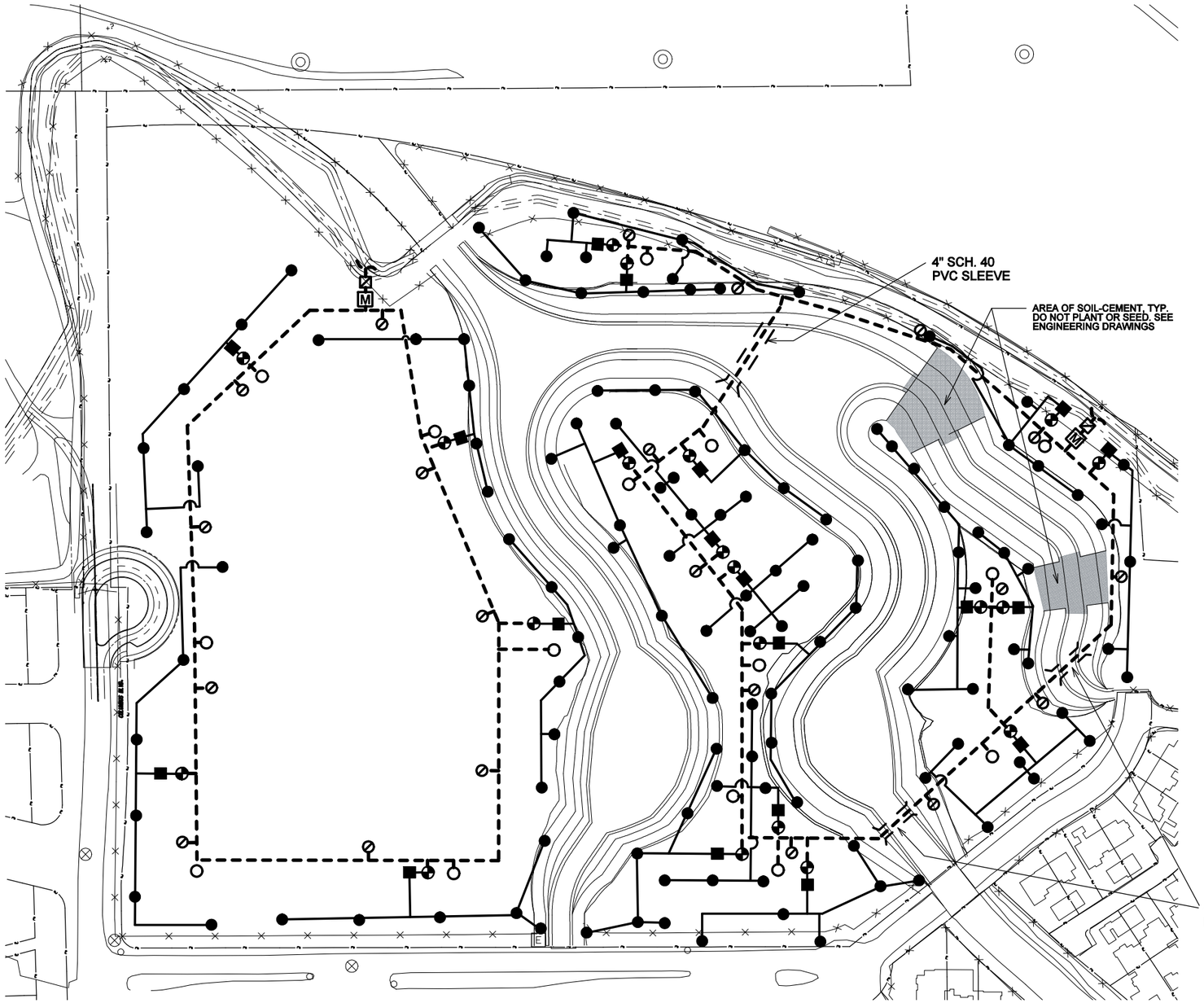
DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

AREA 3 SPRINKLER/SPRAY IRRIGATION WORK PLAN

SUBMITTED BY:
CHIEF, DESIGN BRANCH
DATE APPROVED:
SPEC. NO.
DISTRICT FILE NO.
SHEET 9 OF 10 SHEETS



Key to Symbols on Plan:

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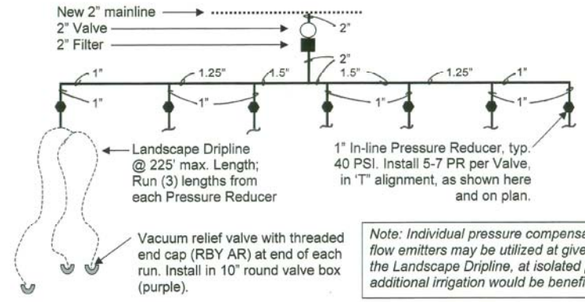
- PVC lateral line to Spray/Sprinkler heads (See separate detail for typical layout, head placement and piping diagram)
- Rotor Sprinkler Heads, typ. Install each on swing joint, per detail.
- 2" Valve serving drip irrigation zone, typ. (See above valve notes)
- 2" Filter, on Drip Zones only. (with 200 mesh stainless steel screen; Rain Bird 200C-SC 200 200 SS or approved equal.)
- PVC lateral line to Drip Zone Pressure Reducers connecting to Landscape Dripline (See separate detail for Pressure Reducer typical layout, placement and piping diagram)
- 40 psi Pressure Reducer, typ (Rain Bird PSI-M40X-100) or approved equal.) Install each PR in 10" round valve box with purple cover.

Irrigation Detail: Typical Layout and Piping Diagram for Drip Irrigation System

Not to Scale



Note: Individual pressure compensating, medium-flow emitters may be utilized at given locations along the Landscape Dripline, at isolated plants, or where additional irrigation would be beneficial.

Piping:

- **PVC**: Size as noted above. Use Schedule 40 PVC (purple) for all 2" pipe. Use Class 200 PVC (purple) for pipe <2".
- **Landscape Dripline**: Rain Bird Landscape Dripline with in-line, pressure-compensating emitters spaced 12" on center. Flow: 1.5 GPM/100' length of Dripline. (RBY LD-P-09-12). Layout dripline in a curvilinear pattern, as needed to best provide water to plantings.

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

REVISIONS

N

40 20 0 40 80 160

SCALE: 1"= 80'

NOTES:

1. ALL PIPING, COMPONENTS AND VALVE BOXES SHALL BE COLOR PURPLE, INDICATIING NON-POTABLE IRRIGATION SYSTEM.
2. SEE SHEET 9 FOR AREA 3 SPRINKLER/SPRAY IRRIGATION SYSTEM LAYOUT.
3. SEE SHEET 4 FOR AREA 2 DRIP & SPRINLER/SPRAY IRRIGATION SYSTEM LAYOUT.

REGISTERED LANDSCAPE ARCHITECT CERTIFICATE NO. 18970 LORI JONES WOODS ARIZONA U.S.A.

PREPARED BY:
RECON
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RECON JOB #4400
DATE PRINTED: 1/2/2007

U.S. ARMY ENGINEER DISTRICT
LOS ANGELES
CORPS OF ENGINEERS

DESIGNED BY:
DRAWN BY:
CHECKED BY:

RILLITO RIVER TUCSON, ARIZONA
T13S/R14E, PORTION OF SECTION 26

RILLITO RIPARIAN RESTORATION PROJECT WORK PLAN FOR AREAS 2 & 3

AREA 3 DRIP IRRIGATION WORK PLAN

SUBMITTED BY: CHIEF, DESIGN BRANCH

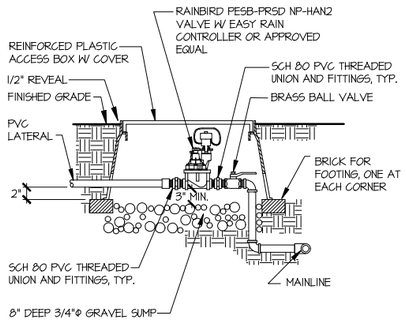
DATE APPROVED:

SPEC. NO.

DISTRICT FILE NO.

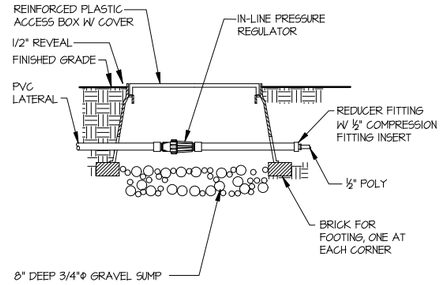
SHEET 10 OF 10 SHEETS

NOTES:
1. COMPACT SOIL AROUND VALVE BOX TO SAME DENSITY AS ADJACENT UNDISTURBED SOIL.
2. ALL THREADED PVC JOINTS SHALL BE WRAPPED WITH TEFLON TAPE.



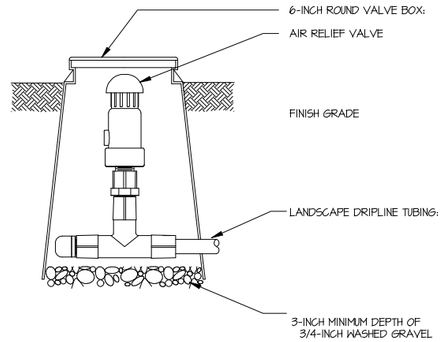
BATTERY CONTROLLED VALVE ASSEMBLY

SECTION **N.T.S.**



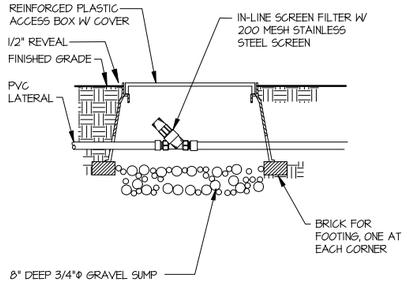
PRESSURE REDUCER ASSEMBLY

SECTION **N.T.S.**



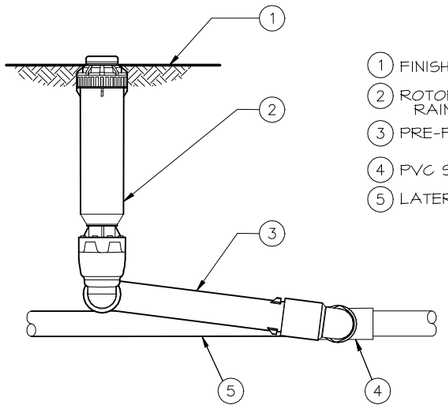
AIR/VACUUM RELIEF VALVE & FLUSHING END-CAP ASSEMBLY

SECTION **N.T.S.**



FILTER ASSEMBLY

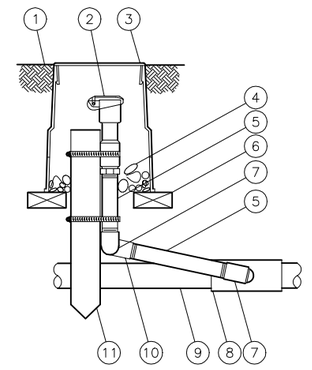
SECTION **N.T.S.**



1. FINISH GRADE
2. ROTOR POP-UP SPRINKLER: RAIN BIRD 7005
3. PRE-FABRICATED SWING JOINT
4. PVC SCH 40 TEE OR ELL
5. LATERAL PIPE

ROTOR SPRAY-HEAD ASSEMBLY

SECTION **N.T.S.**



1. FINISH GRADE/TOP OF MULCH
2. QUICK-COUPLING VALVE: RAIN BIRD MODEL 5NP OR APPROVED EQUAL
3. VALVE BOX WITH COVER
4. 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
5. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
6. BRICK (1 OF 2)
7. PVC SCH 40 STREET ELL
8. PVC SCH 40 TEE OR ELL
9. PVC MAINLINE PIPE
10. PVC SCH 40 ELL
11. 2" x 2" REDWOOD STAKE WITH STAINLESS STEEL GEAR CLAMPS OR EQUIVALENT SUPPORT SYSTEM

NOTE:
FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK COUPLING VALVE INLET SIZE.

QUICK COUPLER ASSEMBLY

SECTION **N.T.S.**

NORTH AMERICAN DATUM 83/ NORTH AMERICAN VERTICAL DATUM 88

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IRRIGATION DETAILS

SUBMITTED BY:
CHIEF. DESIGN BRANCH
DATE APPROVED:
SPEC. NO.
DISTRICT FILE NO.
SHEET 11 OF 10 SHEETS