

TABLE OF CONTENTS

ITEM	PAGE
CHAPTER I - INTRODUCTION	1
A. STUDY AREA	1
B. PROJECT OBJECTIVES	1
C. PURPOSE AND SCOPE.....	1
D. PREVIOUS STUDIES AND PROJECTS.....	1
1. U.S. Army Corps of Engineers.....	2
2. Department of the Interior	2
3. Other Agencies	3
CHAPTER 2 - MUSTANG RANCH DETENTION FACILITY	4
A. DESCRIPTION OF FACILITY	4
B. FEATURES ASSOCIATED WITH FLOOD PROTECTION LEVEE EASEMENTS (FPLE).....	4
C. FEATURES ASSOCIATED WITH CHANNEL IMPROVEMENT EASEMENTS	5

LIST OF TABLES

TABLE		PAGE
Table 1	MUSTANG RANCH DETENTION FACILITY LEVEE DESIGN.....	5

LIST OF ATTACHMENTS

Attachment A	Levee Designs for Mustang Ranch Detention Facility
Attachment B	Response to Comments

LIST OF PLATES

Plate 1	Location Map
Plate 2	Mustang Ranch Detention Facility Features
Plate 3	Mustang Ranch Typical Detention Facility Levee Section
Plate 4	Mustang Ranch Real Estate Requirements, Inlet Weir and Conveyance Channel
Plate 5	Mustang Ranch Real Estate Requirements, Detention Basin and Outlet

CHAPTER I INTRODUCTION

A. STUDY AREA

The Truckee River originates at Lake Tahoe in eastern California, flows through the cities of Reno and Sparks in an easterly direction, and eventually drains into Pyramid Lake in northern Nevada, as shown in **Plate 1**. Steamboat Creek is the largest tributary to the Truckee River in the Reno area and enters the Truckee River near Vista. Evans and Dry creeks, two tributaries to Steamboat Creek, combine below Highway 395 to form Boynton Slough.

The study area for the project is divided into three portions: (1) the floodplain of the Truckee River between Booth Street and U.S. Highway 395 (Downtown Reno Reach); (2) the floodplain of the Truckee River from Highway 395 to Vista, along with the nearby floodplains of Steamboat Creek and Boynton Slough (Truckee Meadows Reach); and (3) the floodplain of the Truckee River between Vista and Pyramid Lake (Lower River Reach).

This report specifically addresses real estate requirements for the Mustang Ranch Area located along the Truckee River near the community of Lockwood in Storey County.

B. PROJECT OBJECTIVES

The Truckee Meadows area is subject to severe flooding from the Truckee River and its primary tributary, Steamboat Creek, during periods of high rainfall and snowmelt runoff. This project is investigating opportunities for flood damage reduction, ecosystem restoration and recreation. This report specifically addresses the flood damage reduction aspects of the project.

C. PURPOSE AND SCOPE

The purpose of this report is to provide real estate requirements for the proposed Mustang Ranch Detention Facility located along the Truckee River downstream from the community of Lockwood in Storey County.

This work was conducted under contract #DACW05-01-0-0018, Delivery Order 7. This report will provide information for other ongoing planning elements of the project.

D. PREVIOUS STUDIES AND PROJECTS

The Truckee Meadows Project was authorized for construction in the Water Resources Development Act (WRDA) of 1988 based on a 1985 Feasibility Report. During pre-construction, engineering, and design (PED), a reevaluation of project benefits and costs determined that the project, as then formulated, was no longer feasible due primarily to significant increases in land costs. A re-analysis was completed in a reconnaissance study completed in August 1997. The Corps reactivated the PED phase of the project in March 1998 with the first step to conduct a General Re-evaluation Report and EIS (GRR/EIS). At the request of the local sponsors, a Community Coalition process was initiated in April 2000 to assist in the formulation and selection of project alternatives.

Numerous studies have been completed that relate to environmental restoration, water use, hydrology, flooding, and urban development within the Reno/Sparks area and the Truckee River watershed.

1. U.S. Army Corps of Engineers

Draft Real Estate Requirements, Downtown Reno Reach and Mustang Ranch Detention Facilities. February 2003.

Flood Damage Reduction Alternatives Design Paper, Truckee Meadows Flood Damage Reduction and Ecosystem Restoration Project. September 2002.

Flood Ecosystem Restoration Alternatives Design Paper, Truckee Meadows Flood Damage Reduction and Ecosystem Restoration Project. September 2002.

Flood Damage Reduction Alternatives Report Addressing Downtown Reno Bridges, Truckee Meadows, Nevada. June 2002.

Design and Cost Estimates for Flood Damage Reduction, Downtown Reno Reach, Truckee Meadows, Nevada - Feasibility Report. May 2000.

Truckee Meadows, Nevada, Information Paper. April 2000.

Progress Report. Truckee River FLO-2D Simulation Flooding Under Existing Conditions. March 1999.

Truckee Meadows, Nevada. Reconnaissance Re-Evaluation Report. August 1997.

Truckee Meadows, Reno-Sparks Metropolitan Area, Nevada, Office Report. May 1991.

Truckee Meadows, Reno-Sparks Metropolitan Area, Nevada, Feasibility Report. February 1985.

Truckee Meadows, Reno-Sparks Metropolitan Area, Nevada, Documentation Report. October 1983.

Truckee Meadows Investigation (Reno-Sparks Metropolitan Area), Stage 2 Report. December 1979.

Plan of Study, Truckee Meadows Investigation, Nevada. July 1977.

2. Department of the Interior

U.S. Bureau of Reclamation. *Truckee-Carson River Basin Study.* Western Water Policy Review Advisory Commission. March 1997.

U.S. Geological Survey. *Environmental and Hydrological Settings of the Las Vegas Valley Area and the Carson and Truckee River Basins, Nevada and California, Water Resources Investigations Report 96-4087.* 1996.

3. Other Agencies

Washoe County Department of Comprehensive Planning. *Washoe County Comprehensive Plan, Volumes 1 and 2. Reno, Nevada. 1996.*

Nevada State Department of Water Resources. *1995 - 2015 Washoe County Comprehensive Regional Water Management Plan, Washoe County, Nevada. November 1996.*

Federal Emergency Management Agency. *Flood Insurance Study, Washoe County, Nevada. 1994.*

CHAPTER 2 MUSTANG RANCH DETENTION FACILITY

This chapter describes the features of the Mustang Ranch Detention Facility and the real estate requirements for those features. The primary features of the detention facility include a diversion channel, storage area, and inlet and outlet weirs. The easements identified for the facility include Flood Protection Levee Easements (FPLE), Channel Improvement Easements (CIE) and Temporary Construction Easements (TCE).

A. DESCRIPTION OF FACILITY

The Mustang Ranch Detention Facility would be located immediately downstream from the community of Lockwood on the south (right) bank of the Truckee River. This offstream storage facility would divert and store a portion of the Truckee River flood flows in order to reduce the peak discharge and volume of water carried downstream. This facility would include an ogee inlet weir, a leveed earthen diversion channel, and a leveed storage area, as shown in **Plate 2**. The ogee weir would be approximately 1,000 feet in length and the crest elevation would range from 4,344 to 4,341 feet. An earth-lined trapezoidal channel would convey flows from the weir into the leveed storage area. The diversion channel would be approximately 6,950 feet in length and would require approximately 6,950 feet of levee along the northern (left) bank, and 1260 feet of levee along the south (right) bank. Approximately 4,160 feet of levees would be required to construct the storage area. The maximum water surface elevation in the storage area, based on hydraulic modeling runs, would be 4342 feet. The maximum capacity would be just under 1,200 acre-feet.

B. FEATURES ASSOCIATED WITH FLOOD PROTECTION LEVEE EASEMENTS (FPLE)

Levees will be utilized to convey flows from the inlet weir to the detention basin. A risk and uncertainty (R&U) factor of 4.5 feet was used in the design of the levees for the Mustang Ranch Detention Facility. Required structure heights for the levees were determined by comparing the with project design water surface elevation against the existing ground surface elevation, while then adding 4.5 feet of R&U. Attachment A provides levee design details.

The allowable slope of the levee is determined by the strength of the underlying ground, and the width of the levee at its base is determined, in turn, by both the required height and sideslopes. The allowable landside and waterside levee slopes are determined by the strength of the underlying soils, the levee fill material, and the width of the levee crown. Table 1 provides levee design criteria for the Mustang Ranch Detention Facility.

**TABLE 1
MUSTANG RANCH DETENTION FACILITY LEVEE DESIGN**

Reach	Landside Slope (horizontal to vertical)	Waterside Slope (horizontal to vertical)	Levee Crown Width (feet)
Mustang Ranch Detention Facility	3:1	3:1	20

Levee modifications will require a FPLE that extends 15 feet (Right of Way, ROW) from the waterside toe of the levee to 15 feet from the landside toe of the levee. Levee construction will require a 25 feet TCE on both the waterside and landside of the levee. The typical levee section is shown in **Plate 3**. The FPLE, TCE, and CIE for Mustang Ranch Detention Facility are shown in **Plates 4 and 5**.

C. FEATURES ASSOCIATED WITH CHANNEL IMPROVEMENT EASEMENTS

Several of the features for the Mustang Ranch Detention Facility require CIE. These features include the inlet weir, diversion channel, storage area, culvert and outlet weir. CIE were identified by all areas inundated by flows diverted to the storage area.

The inlet weir is located immediately downstream from the community of Lockwood. The area located between Truckee River and the inlet weir as well as the footprint for the weir was identified as a CIE. A 25 feet TCE is located around the perimeter of the inlet weir.

A majority of the diversion channel is leveed along the left (north) bank and confined by natural topography on the right (south) bank. A CIE was identified for all areas located between the levee toe and the corresponding left bank contour. In areas where the diversion channel is leveed on both banks, a CIE was identified for the area between waterside toe of each levee.

The storage area is confined by levees to the north and east. Levees will be constructed to a height of 4,346.5 feet M.S.L. Similar to the diversion channel, the storage area is confined by natural topography to the south. A CIE was identified for areas located between the waterside levee toe and the corresponding contour on the south bank.

**Attachment A
Mustang Ranch Detention Facility Levees**

Description	Elevation Data										Levee Calculations										Landside/Waterside Footprints				
	X	Y	Ground Elev	Water Elev	Containment	R&U	Total Design Elevation	Reqd. Structure Height	Structure Design Height for Continuity	Structure Type	Structure Length	Structure Design Height for Continuity	Crown Width	L.S. Slope	C.S. Area	Base Excavation	Levee Fill Volume	Erosion Control	Aggregate	Levee Waterside Footprint	Levee Landside Footprint	Waterside Structure and ROW	Landside Structure and ROW	Total	
			(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT ²)	(CY)	(CY)	(SY)	(CY)	(FT)	(FT)	(FT)	(FT)	(FT)
Channel Levee - North Bank																									
beginning of diversion channel and north bank levee	2329091	14861481	4340	4344	L	4.5																			
	2329221	14861185	4340	4344	L	4.5	4349	8.5	8.5	levee	323.4	8.5	20	3.0:1	386.8	1701	4633	8248	60	36	36	51	51	101	
	2329452	14861036	4340	4344	L	4.5	4349	8.5	8.5	levee	274.3	8.5	20	3.0:1	386.8	1443	3930	6996	51	36	36	51	51	101	
	2329620	14860942	4336	4344	L	4.5	4349	12.5	12.5	levee	192.8	12.5	20	3.0:1	718.8	1356	5131	7229	36	48	48	63	63	125	
	2330004	14860769	4334	4344	L	4.5	4349	14.5	14.5	levee	420.7	14.5	20	3.0:1	920.8	3334	14345	18298	78	54	54	69	69	137	
	2330543	14860759	4336	4344	L	4.5	4349	12.5	12.5	levee	538.8	12.5	20	3.0:1	718.8	3792	14344	20207	100	48	48	63	63	125	
beginning of culvert	2330703	14860786	4334	4344	L	4.5	4349	14.5	14.5	levee	162.8	14.5	20	3.0:1	920.8	1290	5551	7081	30	54	54	69	69	137	
end of culvert	2330934	14860781	4334	4344	L	4.5	4349	14.5	14.5	levee	230.6	14.5	20	3.0:1	920.8	1828	7865	10032	43	54	54	69	69	137	
	2331429	14860818	4332	4343	L	4.5	4348	15.5	15.5	levee	496.4	15.5	20	3.0:1	1030.8	4155	18952	23085	92	57	57	72	72	143	
	2332152	14861118	4330	4343	L	4.5	4348	17.5	17.5	levee	783.0	17.5	20	3.0:1	1268.8	7250	36793	41106	145	63	63	78	78	155	
	2332474	14861459	4328	4343	L	4.5	4348	19.5	19.5	levee	468.5	19.5	20	3.0:1	1530.8	4754	26561	27407	87	69	69	84	84	167	
	2332873	14861805	4326	4343	L	4.5	4348	21.5	21.5	levee	528.3	21.5	20	3.0:1	1816.8	5831	35548	34076	98	75	75	90	90	179	
	2333214	14862308	4326	4343	L	4.5	4348	21.5	21.5	levee	607.4	21.5	20	3.0:1	1816.8	6704	40872	39179	112	75	75	90	90	179	
	2333414	14862781	4324	4342	L	4.5	4347	22.5	22.5	levee	513.7	22.5	20	3.0:1	1968.8	5898	37459	34676	95	78	78	93	93	185	
	2333445	14863009	4322	4342	L	4.5	4347	24.5	24.5	levee	230.4	24.5	20	3.0:1	2290.8	2850	19544	16931	43	84	84	99	99	197	
	2333439	14863111	4324	4342	L	4.5	4347	22.5	22.5	levee	102.0	22.5	20	3.0:1	1968.8	1171	7439	6887	19	78	78	93	93	185	
	2333438	14863221	4326	4342	L	4.5	4347	20.5	20.5	levee	109.6	20.5	20	3.0:1	1670.8	1161	6780	6738	20	72	72	87	87	173	
	2333509	14863522	4324	4342	L	4.5	4347	22.5	22.5	levee	309.9	22.5	20	3.0:1	1968.8	3558	22596	20917	57	78	78	93	93	185	
beginning of culvert	2333527	14863563	4326	4342	L	4.5	4347	20.5	20.5	levee	44.9	20.5	20	3.0:1	1670.8	476	2778	2761	8	72	72	87	87	173	
end of culvert	2333583	14863589	4326	4342	L	4.5	4347	20.5	20.5	levee	62.1	20.5	20	3.0:1	1670.8	658	3844	3821	12	72	72	87	87	173	
	2333726	14863719	4324	4342	L	4.5	4347	22.5	22.5	levee	192.8	22.5	20	3.0:1	1968.8	2213	14057	13013	36	78	78	93	93	185	
	2333804	14863761	4324	4342	L	4.5	4347	22.5	22.5	levee	88.4	22.5	20	3.0:1	1968.8	1015	6444	5965	16	78	78	93	93	185	
end of diversion channel	2333941	14863855	4324	4342	L	4.5	4347	22.5	22.5	levee	253.9	22.5	20	3.0:1	1968.8	2915	18510	17135	47	78	78	93	93	185	
											6934.7					65353	353977	371788	1284	62	62	76	76	153	
Detention Basin Levee																									
beginning of basin	2333941	14863855	4324	4342	L	4.5	4347	22.5	22.5	levee	165.8	22.5	20	3.0:1	1968.8	1904	12093	11195	31	78	78	93	93	185	
	2333958	14863984	4324	4342	L	4.5	4347	22.5	22.5	levee	130.7	22.5	20	3.0:1	1968.8	1501	9531	8823	24	78	78	93	93	185	
	2333959	14864130	4326	4342	L	4.5	4347	20.5	20.5	levee	145.8	20.5	20	3.0:1	1670.8	1545	9023	8968	27	72	72	87	87	173	
	2333945	14864312	4324	4342	L	4.5	4347	22.5	22.5	levee	182.6	22.5	20	3.0:1	1968.8	2097	13315	12326	34	78	78	93	93	185	
	2333941	14864342	4322	4342	L	4.5	4347	24.5	24.5	levee	29.7	24.5	20	3.0:1	2290.8	367	2518	2181	5	84	84	99	99	197	
	2333913	14864537	4322	4342	L	4.5	4347	24.5	24.5	levee	197.2	24.5	20	3.0:1	2290.8	2439	16727	14491	37	84	84	99	99	197	
	2333913	14864645	4322	4342	L	4.5	4347	24.5	24.5	levee	108.0	24.5	20	3.0:1	2290.8	1336	9163	7938	20	84	84	99	99	197	
	2333957	14864790	4322	4342	L	4.5	4347	24.5	24.5	levee	152.2	24.5	20	3.0:1	2290.8	1882	12909	11183	28	84	84	99	99	197	
	2334633	14865451	4320	4342	L	4.5	4347	26.5	26.5	levee	945.2	26.5	20	3.0:1	2636.8	12533	92310	75147	175	90	90	105	105	209	
	2334864	14865617	4320	4342	L	4.5	4347	26.5	26.5	levee	283.7	26.5	20	3.0:1	2636.8	3762	27708	22556	53	90	90	105	105	209	
	2335034	14865740	4320	4342	L	4.5	4347	26.5	26.5	levee	210.0	26.5	20	3.0:1	2636.8	2785	20509	16696	39	90	90	105	105	209	
	2335390	14866019	4318	4342	L	4.5	4347	28.5	28.5	levee	452.5	28.5	20	3.0:1	3006.8	6402	50391	38689	84	96	96	111	111	221	
	2335430	14866041	4316	4342	L	4.5	4347	30.5	30.5	levee	45.4	30.5	20	3.0:1	3400.8	682	5713	4150	8	102	102	117	117	233	
	2335561	14866085	4316	4342	L	4.5	4347	30.5	30.5	levee	138.4	30.5	20	3.0:1	3400.8	2082	17436	12666	26	102	102	117	117	233	
	2335818	14866119	4318	4342	L	4.5	4347	28.5	28.5	levee	259.5	28.5	20	3.0:1	3006.8	3671	28897	22186	48	96	96	111	111	221	
	2335855	14866123	4316	4342	L	4.5	4347	30.5	30.5	levee	37.2	30.5	20	3.0:1	3400.8	560	4687	3405	7	102	102	117	117	233	
	2335911	14866131	4318	4342	L	4.5	4347	28.5	28.5	levee	56.6	28.5	20	3.0:1	3006.8	800	6300	4837	10	96	96	111	111	221	
	2336118	14866142	4322	4342	L	4.5	4347	24.5	24.5	levee	207.3	24.5	20	3.0:1	2290.8	2564	17587	15236	38	84	84	99	99	197	
	2336118	14866141	4324	4342	L	4.5	4347	22.5	22.5	levee	1.0	22.5	20	3.0:1	1968.8	11	73	68	0	78	78	93	93	185	
	2336228	14866150	4328	4342	L	4.5	4347	18.5	18.5	levee	110.4	18.5	20	3.0:1	1396.8	1071	5709	6125	20	66	66	81	81	161	
	2336384	14866174	4332	4342	L	4.5	4347	14.5	14.5	levee	157.8	14.5	20	3.0:1	920.8	1251	5382	6866	29	54	54	69	69	137	
	2336525	14866209	4334	4342	L	4.5	4347	12.5	12.5	levee	145.3	12.5	20	3.0:1	718.8	1022	3867	5448	27	48	48	63	63	125	
											4162.3					52267	371850	311180	771	83	83	98	98	196	
Channel Levee - South Bank																									
beginning of levee on south bank	2330352	14860718	4340	4342	L	4.5	4347	6.5	6.5	levee		6.5	20	3.0:1	256.8					30	30	45	45	89	
	2330673	14860708	4340	4342	L	4.5	4347	6.5	6.5	levee	321.16	6.													

**ATTACHMENT B
RESPONSE TO COMMENTS MADE TO THE DRAFT REAL ESTATE
REQUIREMENTS REPORT**

COMMENTS FROM JIM WEIR, CIVIL DESIGN SECTION

Comment 1:

Include in the final submittal the aerial photo raster files that are used as back ground on the plates.

Response:

Concur

Action:

The aerial photo raster files will be included on a CD along with the submittal of the Mustang Ranch Real Estate Report and the Revised Draft Downtown Reno Real Estate Report.

Explanation:

The aerial photos were not included in the draft submittal to avoid data duplication. It was believed that the Corps had these photos on file.

Comment 2:

At the down stream end of the Mustang Ranch detention facility, it appears that the outlet channel does not connect back to the river. Is this as designed or an oversight?

Response:

Concur

Action:

The outlet channel footprint will be extended to the existing Truckee River channel in the Mustang Ranch Real Estate Report.

Comment 3:

Plates 2 through 7 show design parameters and assumptions for floodwalls. Add a similar plate for levees.

Response:

Concur

Action:

Plate 3 is included in the Final Mustang Ranch Detention Facility Report that illustrates design parameters and assumptions for levees at the Mustang Ranch Detention Facility. These design parameters incorporate geotechnical requirements discussed during the March 3, 2003 Geotechnical Meeting (Meeting summary included at end of Attachment B).

Comment 4:

At the Mustang Ranch facility the top of the levees are set to the design water surface elevation. There is no allowance for risk and uncertainty in the design. If this is truly the intent then it needs to be justified. If a suitable allowance for risk and uncertainty needs to be added then this facility needs to be redesigned. The design of this facility in this report is the same as in Flood Damage Reduction Alternatives, Truckee Meadows, September 2002, so the 2002 report may also have to be revised.

Response:

Concur

Action:

Based on the March 3, 2003 Geotechnical Meeting and the March 28, 2003 email from Bruce Shaffer, a risk and uncertainty factor of 4.5 feet was used for the designs at the Mustang Ranch Detention Facility.

COMMENTS FROM ROGER NORRIS, STRUCTURAL DESIGN SECTION***ON-BANK FLOODWALLS*****Comment 1:**

The report (pg.4) states that typical cross section and dimensions for on-bank floodwalls are shown on Plate 2. It also states (on pg. 5) that a typical cross section is shown on Plate 3. The wall design on plate 3 does not appear to be consistent with that shown on Plate 2.

Response:

Concur

Action:

A note will be placed on Plate 3 in the Revised Draft Downtown Reno Real Estate Report for clarification.

Explanation:

Plate 2 displays the basis for design of the on-bank floodwall itself (i.e. floodwall dimensions). Plate 3 illustrates the easement footprints that are required with the use of an on-bank floodwall. The difference in the appearance of the floodwall in Plate 3 compared to Plate 2 was done for simplicity and was not meant to suggest there would be a change in floodwall cross section.

Comment 2:

Plate 2 does not have the MWH logo on it. Does this mean that the designs were obtained from somewhere else? What design criteria are these designs based on? Designs should be based on COE Design Criteria for Hydraulic Structures; i.e. Retaining and Floodwall Walls Design Manual (EM 1110-2-2502) and Strength Design Criteria (EM 1110-2-2104). Please provide calcs. that support the range of designs for this project.

Response:

Concur

Action:

Calculations were supplied to Roger Norris for review.

Explanation:

On-bank floodwall designs (Plate 2) were based on previously developed cross-sections presented in the Reno-Sparks-Truckee Meadows Flood Damage Reduction and Environmental Restoration In-Progress Review Report of November 2000. Designs were reviewed by a MWH structural engineer.

Comment 3:

Plate 2 Floodwall Dimension Table – Why are Wall Ht., H-values presented all the way up to 36 ft. for on-bank floodwalls? The alternatives tables in attachment B indicate max. wall design hts. are only up to about 14 ft. for the on-bank floodwalls. The tables do indicate max. wall design hts. up to about 30 ft. for the in-channel floodwalls. Please clarify.

Response:

Concur

Action:

The table in Plate 2 of the Revised Draft Downtown Reno Real Estate Report will be truncated to reflect only floodwall heights that are present in this reach for the 5 Downtown Reno alternatives.

Explanation:

The dimension table used in Plate 2 is a standard template that had been used for other reaches of the Truckee Meadow Project. For this reach, on-bank floodwall heights do not exceed 16 feet. All floodwall heights above 16 feet in the table on Plate 2 will be truncated.

Comment 4:

On Plate 2, are keys or cutoff walls req'd for all wall hts.? It would seem that they would only be req'd above a certain ht. for stability purposes. The size of the cutoff wall is nearly constant for all wall hts. Are they being utilized primarily to protect against underseepage? Please clarify.

Response:

Concur

Action:

Language will be included in the Revised Draft Downtown Reno Real Estate Report that describes the rationale (i.e. reduction of underseepage) for the minimum key depth.

Explanation:

Keys or cutoff walls for all on-bank heights are included for all cut-off wall heights primarily for underseepage. As stated previously, these on-bank floodwall designs were based on previously developed cross-sections presented in the Reno-Sparks-Truckee Meadows Flood Damage Reduction and Environmental Restoration In-Progress Review Report of November 2000. These designs are feasibility level designs that are expected to be refined upon identification and selection of a recommended alternative plan during the design phase.

IN-CHANNEL FLOODWALLS**Comment 5:**

To support the footprints presented in the tables, it would be appropriate to include another plate for the design of the in-channel floodwalls which also act as retaining walls, similar to Plate 2.

Response:

Concur

Action:

A plate containing in-channel floodwall design characteristics, similar to Plate 2, will be included in the Revised Draft Downtown Reno Real Estate Report.

Explanation:

Table 1 included footing width requirements for floodwalls in the Downtown Reno Reach.

COMMENTS FROM HENRI MULDER, GEOTECHNICAL DESIGN SECTION**Comment 1:**

The levees (including detention basin embankments) should be designed to the following criteria and geometry:

Minimum 20-foot wide crown with 16-foot wide gravel patrol road

3H:1V landside and waterside slopes

Minimum 20-foot wide right-of-way (maintenance easement) on the landside

Minimum 15-foot wide right-of-way on the waterside

The side slopes have been flattened to 3H:1V because the most recent borrow testing (Oct 2000) at the channel widening site (located along the south bank Truckee River between McCarran Blvd. and Steamboat Creek). The borrow material is just within our specs for suitable material.

Response:

Concur

Action:

The levee designs for the Final Mustang Ranch Real Estate Report have been modified, based on the March 3, 2003 Geotechnical Meeting, to include:

Minimum 20-foot wide crown with 18-foot wide gravel patrol road
3H:1V landside and waterside slopes
Minimum 15-foot wide right-of-way (maintenance easement) on the landside and
waterside of the levee (as agreed to in the March 3, 2003 Geotechnical Meeting)

The levee designs in the Revised Draft Downtown Reno Real Estate Report, based on the March 3, 2003 Geotechnical Meeting, will include:

Minimum 20-foot wide crown with 18-foot wide gravel patrol road
3H:1V landside and waterside slopes
Minimum 20-foot wide right-of-way (maintenance easement) on the landside
Minimum 15-foot wide right-of-way on the waterside

Comment 2:

Floodwalls should have a minimum 20-foot wide right-of-way on the landside and 15-foot right-of-way on the waterside.

Response:

Concur

Action:

Floodwall designs will be modified in the Revised Draft Downtown Reno Real Estate Report based on the March 3, 2003 Geotechnical Meeting. If space is available, designs are to add an additional waterside right-of-way to the existing floodwall design to maintain a 20-foot right-of-way on the landside and 15-foot right-of-way on the waterside.

Floodwalls are not applicable to Mustang Ranch Detention Facility.

Comment 3:

The report does not show levees or floodwalls along Peoples Ditch (re: Plates 17, 21, and 24). The 1985 feasibility report and 1997 reconnaissance report show levees along Peoples Ditch. The ditch is a tributary of North Truckee Drain and it parallels the south side Interstate 80 from North Truckee Drain to about 2500 feet west of Sparks Blvd. It then turns north and crosses under I-80.

Response:

Not relevant to Downtown Reno or Mustang Ranch Detention Facilities.

Action:

None. This comment pertains to the Truckee Meadows Reach that is not part of this Real Estate Study. However, this comment was addressed in the March 3rd Geotechnical Meeting.

COMMENTS FROM CADASTRAL SECTION

None

End of Comments

GEOTECHTICAL COMMENTS FOR TRUCKEE MEADOWS AREA (HWY 395 TO VISTA) AND MUSTANG RANCH DETENTION BASIN**MEETING SUMMARY****March 3, 2003****1:30 PM – 4:30 PM****I. Attendance**

Jim Weir, COE Civil Design
Henri Mulder, COE Geotech
Tore Pearson, COE Planning
Mary Paasch, MWH
Keith Wallace, MWH

II. Discussion Items**1. *Levee Side Slopes***

MWH Truckee Meadows Design Paper (Sept 2002): Landside slopes are 2:1 or 2.5:1 for non-detention basin levees (i.e. levees with water on one side). Waterside slopes are 3:1 for all levee types. As detention facilities have water on both levee slopes, both side slopes were designed at 3:1. These designs are based on the Truckee Meadows-Summary of Geotechnical Conclusions Memo dated 14 September 2000, provided by Mike Campbell in Feb/March of 02.

Geotechnical Comment: Both waterside and landside slopes for all levee types should be 3:1.

Discussion/Resolution Design will be changed according to Geotechnical Comment, all levee side slopes will be 3:1. Henri explained that the change in design is based on testing of borrow materials in areas of proposed “benching”. Mary explained that the “benching “ was only incorporated into one of the three alternatives (i.e. community coalition plan). Borrow sites identified during previous design efforts.

2. *Levee Crown Width*

MWH Truckee Meadows Design Paper (Sept 2002): All levee types have a 12-foot crown width consisting of 10-foot maintenance road plus a 1-foot shoulder on both the landside and waterside. This design is based on all previous Truckee Meadows levee designs ('85, '97, and May 2000), which include 12-foot crown widths.

Comment: All levees incorporated into detention facilities (i.e. UNR Farms and Mustang Ranch) should have a 20-foot crown with a 18-foot maintenance road, plus a 1-foot shoulder on both the landside and waterside. A 16-foot crown may be acceptable for non-detention facility levees if soil quality is adequate.

Discussion/Resolution: Design will be changed according to Geotechnical Comment, designs should assume levee 20-foot crown for all levees.

3. Waterside/Landside Easements

MWH Truckee Meadows Design Paper (Sept 2002): All levee and floodwall designs in the Truckee Meadows area, except in cases where a cutoff wall is used for seepage mitigation, incorporated 10-foot right-of-ways on the landside of the seepage remediation features. In areas with a cutoff wall, a 10-foot right-of-way is provided on the landside of the levee or floodwall structure. The Mustang Ranch Detention Facility included a 10-foot landside right-of-way.

These designs are based on the Geotech Memo on Truckee Meadows, Seepage Evaluation dated 26 June 2001.

Comment: All levees should have a 20-foot landside right-of-way & 15-foot waterside right-of-way. All floodwalls should have a 20-foot landside right-of-way & 15 foot waterside right-of-way.

Discussion/Resolution: For the Truckee Meadows Reach, landside easements will be based upon designs included in June 2001 Geotech Report. Designs are to add an additional waterside right-of-way of 15 feet to the existing levee designs. If space is available, designs are to add an additional waterside right-of-way to the existing floodwall designs. However, in most floodwall locations, this space is likely not available.

For the Mustang Ranch Detention Facilities, designs are to include a 15-foot right-of-way on both landside and waterside of the levee.

4. Design Changes

Implications of the design changes were also discussed:

- New footprints could increase real estate requirements by approximately 20-40% (very rough estimate) due to the increase in levee crown width, flattened levee side slopes, and the addition of waterside right-of-ways.
- In some areas, levee designs may need to be replaced with floodwall designs due to limited space.
- Changes in levee geometry will also increase costs. For the Truckee Meadows area, initial rough estimates are construction cost increases in the 20-30% range for additional fill material.

5. Peoples Ditch

MWH Truckee Meadows Design Paper (Sept 2002): No levees are included along the south side of Peoples Ditch.

Comment: The 1985 and 1997 designs included levees along Peoples Ditch.

Discussion: Peoples Ditch runs parallel to I-80 on the south side of the freeway and is a tributary to North Truckee Drain. During the mapping of the alternatives in spring of 2002, this area was discussed. For clarification on the matter, Mary Paasch had spoken with Paul Urban on the morning of this meeting (3-3-03). Peoples Ditch collects runoff from a relatively small drainage area. The required levees along Peoples Ditch would primarily be influenced by backwater from North Truckee Drain. Peoples Ditch was considered to be an interior drainage issue, and that a small pump station to collect and pump flows into North Truckee Drain was more viable than construction of levees or floodwalls along the extents of Peoples Ditch.

6. Mustang Ranch

The specific changes to the Mustang Ranch facilities were re-capped at the end of the meeting for clarification.

MWH will update Mustang Ranch crown width and right-of way, existing design already incorporates 3:1 side slopes on both the waterside and landside. The levee crown will be widened from 12 feet to 20 feet. A 15-foot right-of-way will be included along both the waterside and landside of the levee toe. An R&U factor of 4.5 feet will be added to the height of all levees at the Mustang Ranch facility. This is the same factor used for Downtown Reno and Truckee Meadows reaches.