COLORADO
Colorado Water Conservation Board
Department of Natural Resources

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John Hickenlooper, Governor

Robert Randall, DNR Executive Director

Lauren Ris, CWCB Acting Director

TO: Colorado Water Conservation Board Members

FROM: Chris Sturm, Watershed and Flood Protection Section

DATE: May 17, 2017

AGENDA ITEM: 13. Fish and Wildlife Resources Fund (FWRF) – River Run Phase III

Background:
The Fish and Wildlife Resources statute (attached), § 37-60-122.2, authorized the Fish and Wildlife Resources Fund in 1987. It was amended in 2002 to help mitigate the impacts of existing water facilities. The River Run Project on the South Platte River downstream of Chatfield Reservoir is Phase III of a three phase flood control project implemented by Uban Drainage and Flood Control District (UDFCD). This channel section has undergone significant degradation due to Chatfield Reservoir and a reduced incoming sediment load, which has resulted in a very wide and shallow channel with little to no aquatic and wetland habitat. The first phase has been completed and the second phase is funded and under construction. The cost for Phase III is $4.7 million. UDFCD is requesting that CWCB support a grant of $439,500 in order to complete this phase of a $14 million dollar improvement on the South Platte River.

Discussion:
UDFCD proposes to install four grade-control structures, narrow and deepen the channel, and create wetland and riparian benches to improve fish habitat through the 2000 foot reach. The proposed project will improve ecological structure and function on the river and adjacent riparian areas, while maintaining the flood-control characteristics required by US Army Corps of Engineers. The FWRF grant will go towards extra expenses associated with installing four smaller drop structures suitable for upstream fish migration and safe boat passage downstream. The structures also allow for increased riffle, pool, and riparian habitat. Absent the FWRF grant, UDFCD will proceed with one large drop structure that does not achieve multiple objectives for environmental and recreational water uses. Both project alternatives allow for flood water conveyance.

Staff recommendation:
Staff has reviewed UDFCD's FWRF application (attached) and found it in conformance with Board Policy 15 (attached). Staff recommends that the Board approve a non-reimbursable expenditure up to $439,000 from the Fish and Wildlife Resource Fund for the purpose of providing matching dollars to the River Run Phase III Project. This amount represents 9.3% of the total project cost.

River Run Project

Arapahoe County, Colorado

Fish and Wildlife Resources Fund Grant

Submitted by:

Urban Drainage and Flood Control District

Submitted to:

Colorado Water Conservation Board

Section 3.1: Applicant Information

Date of Submittal: April 7, 2017

Name of Project: River Run Project

Applicant Contact Information:

Laura Kroeger
Urban Drainage and Flood Control District (UDFCD)
2480 West 26th Avenue, Suite 156-B
Denver, Colorado 80211
Phone: 303-455-6277
Fax: 303-455-7880
lkroeger@udfcd.org

Organization Type: Special District

Applicant Federal Employer ID Number (FEIN): 84-0599780

Submitted By:

Name: Laura Kroeger

Date: April 7, 2017

Received By:

Name: _____

Date: _____

Section 3.2: Project Summary Form

Project Location Information

Nearest Town or City	City of Sheridan
County	Arapahoe
Township/Range/Section	T5S, R68W, Sections 4, 5, and 9
Latitude/Longitude	39.641547°N/105.015188°W
State Senate District	District 26
State Representative District	District 3
Stream Name and Watershed	South Platte River, Middle South Platte River-Cherry Creek Watershed
Water Division	1 (South Platte River Basin)
Water District	8 (South Platte: Cheesman to Denver Gage)

Figure 1 in Appendix A is a vicinity map for the project area.

Land Ownership

Name of Landowner: Colorado Water Conservation Board (Appendix A, Figure 2)

Evidence of ownership or easements for river restoration work:

☑ □ Enclosed □ Will forward if requested □ Not yet available (explain timeline)

Grant Request

Total Project Cost	$4,700,000
Grant Request	$439,500
List Funding Sources:	
Project Sponsors Trust/Project Account	$2,502,000
UDFCD 2017/2018 Budget	$1,050,000
Arapahoe County 2017/2018 Budget	$698,500
Trout Unlimited	$10,000
Total Budgeted	$4,700,000

Project Description

UDFCD is requesting funding for the River Run Project, a proposed river restoration project along the South Platte River in Arapahoe County, Colorado. The purpose of the project is to enhance the South Platte River to improve aquatic, wetland, and riparian habitat; provide boat passage through this channel section; and maintain flood conveyance and grade control. The project is needed due to the significant degradation of the channel through the project area and partial failure of existing grade-control structures, which has likely created barriers for fish passage and safety hazards for river users.

Section 3.3: Technical Narrative Description

Project Need/Definition of the Problem

UDFCD is proposing river restoration along about 2,000 linear feet of the South Platte River in Sheridan, Arapahoe County, Colorado (project area, Appendix A). The channel improvements will improve aquatic, wetland, and riparian habitat; provide boat passage and recreation through this river reach; and maintain flood conveyance and grade control. This reach of the South Platte River was part of a Flood Risk Reduction Project implemented by the United States Army Corps of Engineers (USACE) in the 1970s following the devastating flood of 1965. The reach has been channelized because of encroachment from development.

Currently, this section of channel contains one large boulder drop structure that has partially failed and hinders movement of aquatic organisms through this river reach. This channel section has also undergone significant degradation due to Chatfield Reservoir and a reduced incoming sediment load, which has resulted in a very wide and shallow channel with little to no aquatic and wetland habitat. UDFCD proposes to install four grade-control structures, narrow and deepen the channel, and create wetland and riparian benches to improve fish habitat and movement through the reach and allow for boat passage (Appendix B Construction Plan Set). The proposed project would improve the ecological functions and services on the river and adjacent riparian areas, while maintaining the flood-control characteristics required by USACE for the project.

The River Run Project was broken out into three phases based on funding (Appendix A, Figure 1). The first phase has been completed and the second phase is funded and under construction. The third phase of work described above is what is being requested for funding by the Fish and Wildlife Resources Fund Grant (Appendix A, Figures 1 and 2). The cost for Phase III is $4.7 million. UDFCD is requesting the Colorado Water Conservation Board support a grant of $439,500 in order to complete the third phase of a $14 million dollar improvement on the South Platte River.

Without a grant from the Fish and Wildlife Resources Fund, Phase III will be redesigned to replace the large existing drop with another large structure that will be less expensive to construct. The smaller drop structures would improve movement of aquatic organisms, provide riffle and pool habitat for fish and other aquatic organisms, and allow for the creation of wetland and riparian benches that would provide wildlife habitat for the many species that use the South Platte River as a migration corridor or foraging habitat. Without the smaller drop structures, these ecological improvements will not be possible. A decision on the design needs to be determined by August 2017. Construction can begin in October 2017.

Project Goals and Objective

The purpose of the proposed action is to enhance the South Platte River through the project area to improve aquatic, wetland, and riparian habitat; provide boat passage through this channel section; and maintain flood conveyance and grade control. The need of the proposed action is due to the significant degradation of the channel through the project area and partial failure of an existing grade-control structure, which has created barriers for fish passage and safety hazards for river users.

Following are the identified objectives of the project:

- Replace existing drop structure – Movement of boulders and exposed sheetpile has compromised the channel grade and has created hazards to river users.

- Realign the channel and modify the channel profile – Establish a low-flow channel with emergent vegetated benches, create sinuosity in the low-flow channel, and redistribute the existing hydraulic gradient to reduce long flat stretches in the channel.
- Maintain flood conveyance.
- Reintroduce native vegetation on the channel and banks (no woody vegetation proposed – Requirement of the Flood Readiness Branch of the USACE).
- Bury and plant existing exposed riprap with native grasses and herbaceous vegetation.
- Recreational enhancement – Construct a safe boat passage, viewing areas, and upland park spaces.
- Improve river health – Improve wetland/riparian habitat, sediment transport, movement of aquatic organisms, and water quality.
- Connectivity – Provide access through the river corridor and to the river's edge and a regional trail connection with no at-grade street crossings.

Aquatic Resources

Existing Conditions: Several native fish species are known to occur within or near the project area, including creek chub, fathead minnow, green sunfish, white sucker, longnose dace, channel catfish, Johnny darter, Iowa darter, and mosquitofish (Colorado Parks and Wildlife (CPW) 2012). Gamefish species known to occur within or near the project area include rainbow trout, brown trout, walleye, and smallmouth bass. The large drop structure in the project area is likely a migration barrier that prevents fish passage. Fish habitat in the project area is likely used for feeding, and potentially breeding, since the drop structures prevent migration to upstream spawning locations. The wide and shallow channel also provides poor quality habitat for aquatic species, with little variation in channel depth, increased temperature, and no shelter provided. The ability of fish to migrate upstream and downstream and physical diversity in the channel is critical for native fish species in the South Platte River.

Benefits: With the implementation of the proposed action, aquatic habitat would significantly improve through the project area. The large drop structure that is currently a migration barrier for fish would be removed. The project includes installing four smaller drop structures that would improve fish and other organism movement and create more drop-pool sequences that provide habitat for aquatic species. The project would also include reshaping the channel to provide a narrower and deeper channel, which would reduce temperatures, increase riffles, and redistribute the hydraulic gradient. Boulder clusters and jetties would also be installed, which would improve aquatic habitat by providing shade and shelter and support a narrower and deeper channel. UDFCD contacted CPW, which determined that the proposed redesign of the drop structures would assist with habitat improvements in the project area reach and overall improve the aquatic environment in the metro reach of the South Platte River (Appendix B). UDFCD has also partnered with Denver Trout Unlimited to include additional fish habitat structures called LUNKERS, which create overhead cover for fish by creating an undercut bank.

Terrestrial Resources

Existing Conditions: Smooth brome, sand dropseed, cheatgrass, Canadian horseweed, and Canada thistle dominate the uplands along the riverbanks. Due to the project area being within a flood-control facility, little woody vegetation is present along the riverbanks. The riparian habitat that is present primarily consists of intermittent patches of sandbar willow, Russian olive, and Siberian elm trees. All of the banks within the project area are lined with riprap, with many sections of the riprap exposed and containing no vegetation.

Benefits: With the implementation of the proposed action, the upland and riparian resources would improve throughout the project area. The proposed project includes creating more floodplain benches to provide riparian habitat and restabilizing the banks with native riparian and upland seed. The areas with exposed riprap would be regraded and restored as native uplands. Creating wetland/riparian benches and burying exposed riprap would enhance the wildlife habitat along this reach of the river.

Recreation and Education

Existing Conditions: The Mary Carter Greenway Trail occurs along the western bank of the river through the project area. This trail is a heavily used pedestrian and cycling trail within an urban corridor. The Broken Tee Golf Course in Englewood is directly north of the project area. Due to the steep banks and limited access, little fishing occurs in the project area. The large drop structures also are a hazard for boating through the project area.

Benefits: With the implementation of the proposed action, several recreational components would be improved throughout the project area. The large drop structure would be removed and smaller drop structures would be constructed to improve boat passage and safety. Access points to the river itself would be constructed to increase fishing, recreational activities, and educational opportunities within the project area. Several schools have already shown interest in using the area for outdoor experiential education.

Technical Feasibility of the Proposed Project

Proposed improvements have been designed to meet the project goals. The following is a summary of the proposed improvements:

- Channel stabilization – Replace failing existing grade-control drop structure built as part of the original flood control project with a series of four smaller drop structures that are boatable and more conducive to fish movement.
- Low-flow thalweg – Create a narrow low-flow channel for increased depth, velocity, and sinuosity ("creek within a river") to improve habitat, aesthetics, and recreation.
- Bank stabilization – Bury riprap, boulder jetties, and terraced boulders.
- Access to river bottom – Create local access trails to the channel.
- View areas – Create cobble bar areas, terraced boulder seating areas, and river overlooks.
- Vegetation – Create an emergent bench with riparian and aquatic plants in the channel and on the banks and plant upland species on the upper banks and out of the channel.

As proposed, River Run Phase III will not adversely impact the ability of the river to control flooding. Structures will be designed to withstand 100-year flood events. The proposed channel grade and bank stabilization structures are consistent with similar structures constructed as part of the original project. The vegetation proposed would not decrease the channel design capacity based on hydraulic analysis. The proposed improvements would not affect the current operations of the channel (Appendix C).

Maintenance of the proposed project will be similar to the existing channel. A revision to the operations and maintenance manual will be submitted at a later date. In-river construction will be performed during the fall and winter when flooding is least likely. Temporary construction structures, such as cofferdams, will be removed prior to spring runoff.

All permitting for the project has been completed. A Clean Water Act Section 404 permit was authorized for the entire River Run Project on December 9, 2015 and does not expire until December 8, 2018. The 404

permit included a Clean Water Act 401 certification from the Colorado Department of Public Health and Environment. An environmental assessment was also completed for the project as part of the Section 408 process with the USACE. A Section 408 modification permit has been obtained by the USACE for this project.

Project Implementation Plan

The goals of the project will be achieved by construction of structures and other design elements that satisfy multiple design objectives simultaneously as previously described. Planning, design, and permitting have been completed. Naranjo Civil Constructors (Contractor) has been selected to build the project. The Contractor built Phase I, is currently building Phase II, and will build Phase III. Final implementation (construction) will be as follows:

- Install temporary construction erosion- and sediment-control best management practices (BMPs) (e.g., vehicle tracking, concrete washout, silt fence/waddles at the tops or toes of the banks, and construction access roads).
- Dewater one-half of the river to allow surface water to continue to flow around work area. All river structures and bank work will be completed in a "dry" condition for best results and to minimize sediment discharges downstream. Sheet pile will be used as the primary dewatering material. Seepage and subsurface water will be pumped to a settlement basin.
- Install structures, grade floodplain benches/vegetation benches, install boulder jetties/vanes, and install bank stabilization installed on one side of the river.
- Dewater the unfinished side of the river using the same approach as above.
- Install the remaining structures and bank stabilization and finish channel/bank grading.
- Install post-construction erosion control using coconut erosion-control blankets on all slopes at 4:1 and steeper and all banks that could experience active river flow.
- Plant vegetation and provide temporary watering until established.
- Remove temporary construction erosion-control BMPs once vegetation is established.

Project Time Schedule

The Phase III design is complete, all permits and easements have been obtained, and costs have been negotiated. The Contractor will be completing River Run Phase II in early summer 2017 and will be ready to start the river work for Phase III in October 2017 if funding is obtained. The construction will take about 9 months to complete.

Monitoring Plan

The Colorado Water Conservation Board (CWCB) is the project sponsor for the USACE's original project that is being modified by the proposed river restoration project. The CWCB partners with UDFCD to maintain the channel. The UDFCD is financially supported by a property tax mill levy specifically collected for the South Platte River. CWCB and UDFCD annually inspect the reach with the USACE to ensure the reach is maintained as designed. UDFCD performs river management services six times a year that consist of a crew walking the reach to provide vegetation management, removing debris and trash, and identifying any potential problem areas.

In addition to the above maintenance, the Section 404 permit for the River Run Project requires annual monitoring for a period of at least 5 years after construction has been completed. The monitoring report documents the conditions of the project area, including the establishment of wetland and riparian habitat,

and if the project was constructed as planned. The monitoring reports will be submitted to the USACE on an annual basis.

Qualifications of the Applicant

UDFCD has been working with local government partners for more than three decades designing, building, and maintaining projects along the South Platte River in the Denver metro area. Project Partners is an alternative project delivery method developed by UDFCD to provide the best value projects. One of the principles of Project Partners is having the right team of experts at the right time to lead projects. This is accomplished by working with prequalified consultants and contractors who are engaged in both the design and construction phases. The River Run Project team leads for design and construction, McLaughlin Whitewater Design Group and Naranjo Civil Constructors, respectively, have proven success records with UDFCD.

The project team met the schedule and budget for the River Run Phase I with a total project cost of $6 million and the work exceeded expectations. River Run Phase II construction is currently underway and is on track to finish within the schedule and budget as well, with a total project cost of $3.3 million.

Coordination Plan and Public Involvement

UDFCD, Arapahoe County, and the city of Sheridan are the major funding sponsors of the River Run Phase III Project. Trout Unlimited is also collaborating on the project and has been actively involved in developing LUNKER structures for improved fish habitat that they are funding. Partners also include the city of Englewood, South Suburban Parks and Recreation District, and Great Outdoors Colorado, all of which made financial contributions to the first two phases. See Appendix D for support letters.

At the onset of the River Run Project, all the partners worked together to draft and agree upon the Principles of Cooperation. The project team also developed a project charter to clearly identify goals, objectives, roles, and responsibilities. Both of these planning tools have helped successfully guide the implementation of the first two phases of work and has informed the team for the completion of Phase III.

Planning and Public Outreach

- In 2014, the South Platte Working Group – a collaboration between UDFCD, Arapahoe County, and the municipalities and special districts situated along the Platte in Arapahoe County – completed and published The South Platte River Corridor Vision 2014, where this reach of the river was identified as a short-term priority project.
- A public open house was held on November 12, 2014 at the Broken Tee Golf Course in Englewood to give an opportunity for the public to obtain more information about River Run Project as well as provide feedback. More than 30 business owners, community leaders, and residents attended the open house. All of those attending shared positive feedback and support for this project.
- Sheridan, Englewood, and UDFCD conducted public outreach by setting up displays at Sheridan's National Night Out and Englewood's FunFest. These events were particularly targeted to getting diverse and underserved populations engaged. The turnout was solid and the most common public comment was "When will it be built?"
- Concept designs have been completed since 2014 and are posted at the Broken Tee Golf Course, Englewood Recreation Center, Sheridan Recreation Center, and Malley Senior Recreation Center.

Appendices

Appendix A Maps

Appendix B Construction Plan Set

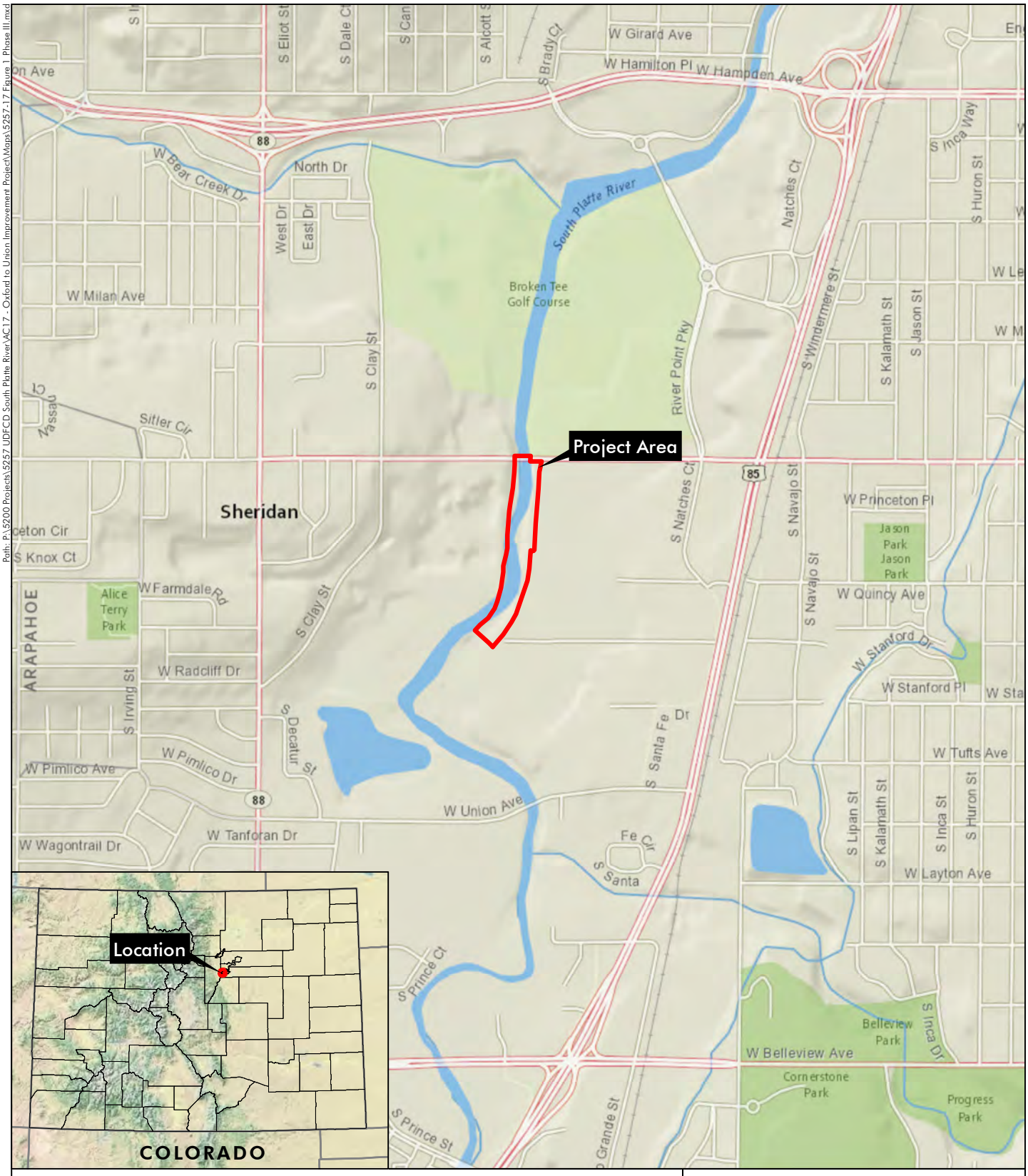
Appendix C Analysis of Flood Impacts

Appendix D Support Letters

Appendix E Scope of Work and Budget

Appendix F Contract Materials

Appendix A Maps



River Run Project Phase III

Sections 4, 8, and 9, T5S, R68W; 6th PM
UTM NAD 83: Zone 13N; 498679mE, 4387755mN
Latitude, Longitude: 39.639580°N, 105.015394°W
USGS Fort Logan, CO Quadrangle
Arapahoe County, Colorado

0 750 1,500 feet

N

Figure 1
Vicinity Map

Prepared for: UDFCD
File: 5257-17 Figure 1 Phase III.mxd [dlH]
March 24, 2017

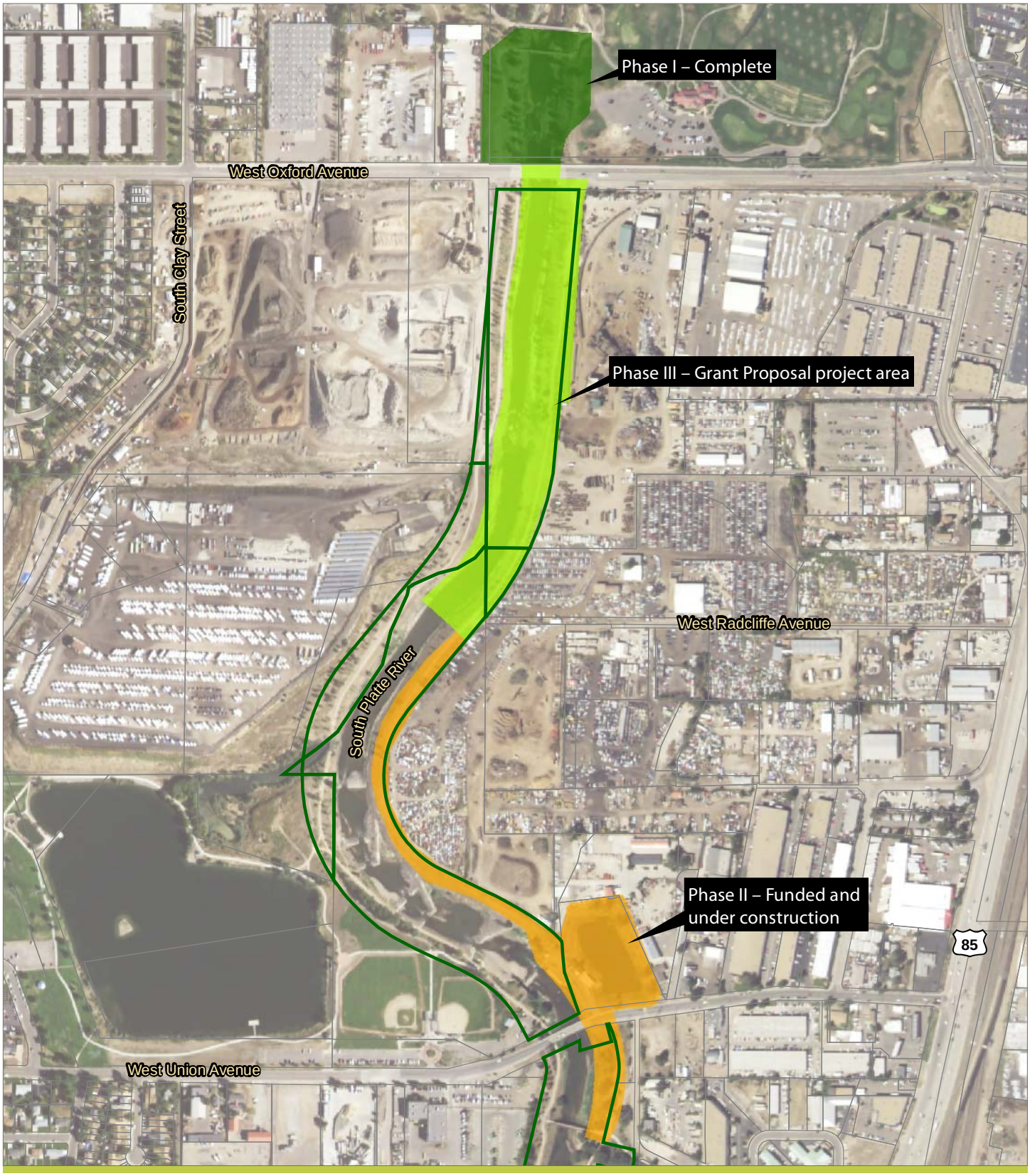
ERO Resources Corp.

Path: P:\5200 Projects\5257 UDFCD South Platte River\AC17 - Oxford to Union Improvement Project\Maps\5257-17 Figure 1 Phase III.mxd

River Run Project

Phase I
Phase II
Phase III
Arapahoe County Assessor's Parcel
Colorado Water Conservation Board Property

0 300 600 feet



Appendix B Construction Plan Set

SOUTH PLATTE RIVER RUN PARK
PHASE II & III - FINAL DESIGN

MAY, 2016

UDFCD CONTRACT # 15-10.4

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

CITY OF ENGLEWOOD

CITY OF SHERIDAN

COLORADO WATER CONSERVATION BOARD

SOUTH SUBURBAN PARKS AND RECREATION DISTRICT

APPROVED BY: DATE:

PAUL A. HINDMAN
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

DAVID BENNETTS
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

LAURA A. KROEGER
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

DOROTHY HARGROVE
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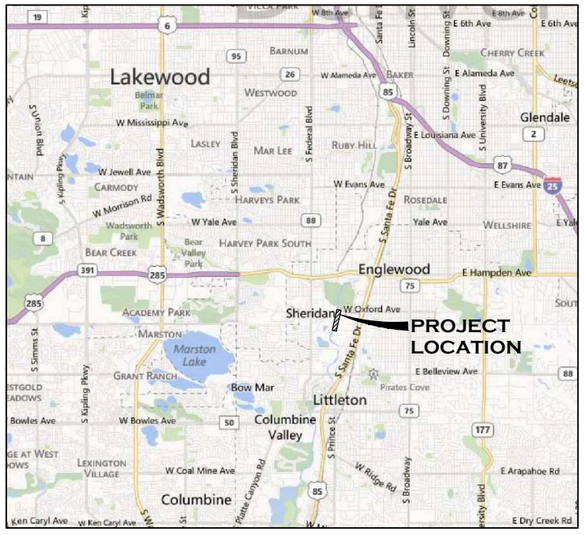
DEVIN GRANBERY
CITY OF SHERIDAN

BRETT COLLINS
SOUTH SUBURBAN PARKS AND RECREATION DISTRICT

KEVIN HOUCK
COLORADO WATER CONSERVATION BOARD



VICINITY MAP
NTS

DRAWING LIST

INDICATES PHASE II & III PACKAGE

SHEET NO.	SHEET NAME	
C-1	COVER SHEET	
C-2	LEGEND	
C-3	RIVER PLAN & PROFILE	STA. 1731+50 TO STA. 1744+25
C-4	RIVER PLAN & PROFILE	STA. 1744+25 TO STA. 1756+00
C-5	RIVER PLAN & PROFILE	STA. 1756+00 TO STA. 1768+00
C-6	RIVER PLAN & PROFILE	STA. 1768+00 TO STA. 1780+00
C-7	RIVER PLAN & PROFILE	STA. 1780+00 TO STA. 1792+00
C-8	HARVESTING AND DEMOLITION PLAN	NORTH OF OXFORD AVENUE
C-9	HARVESTING AND DEMOLITION PLAN	AT OXFORD AVENUE BRIDGE
C-10	HARVESTING AND DEMOLITION PLAN	SOUTH OF OXFORD AVENUE BRIDGE
C-11	HARVESTING AND DEMOLITION PLAN	AT DROP #5
C-12	HARVESTING AND DEMOLITION PLAN	AT DROP #6
C-13	HARVESTING AND DEMOLITION PLAN	AT UNION AVENUE
C-14	RIVER PLAN	STA. 1731+75 TO STA. 1737+00
C-15	RIVER PLAN	STA. 1737+00 TO STA. 1742+50
C-16	RIVER PLAN	STA. 1742+50 TO STA. 1747+75
C-17	RIVER PLAN	STA. 1747+75 TO STA. 1753+25
C-18	RIVER PLAN	STA. 1753+25 TO STA. 1757+50
C-19	RIVER PLAN	AT UNION AVENUE
C-20	DROP #1	DETAIL PLAN
C-21	DROP #1	BOAT CHUTE DETAIL PLAN
C-22	DROP #1	TYPICAL SECTIONS
C-23	DROP #1	TYPICAL SECTIONS
C-24	DROP #2	DETAIL PLAN
C-25	DROP #2	BOAT CHUTE DETAIL PLAN
C-26	DROP #2	TYPICAL SECTIONS
C-27	DROP #2	TYPICAL SECTIONS
C-28	DROP #2	FISH PASSAGE DETAIL
C-29	DROP #3	DETAIL PLAN
C-30	DROP #3	BOAT CHUTE DETAIL PLAN
C-31	DROP #4	DETAIL PLAN
C-32	DROP #4	BOAT CHUTE DETAIL PLAN
C-33	DROP #3 AND #4	TYPICAL SECTIONS
C-34	DROP #3 AND #4	TYPICAL SECTIONS
C-35	DROP #5	DETAIL PLAN
C-36	DROP #5	BOAT CHUTE DETAIL PLAN
C-37	DROP #5 TYPICAL CREST	AND EXISTING SHEETPILE SECTIONS
C-38	DROP #5	TYPICAL SECTIONS
C-39	DROP #6	DETAIL PLAN
C-40	DROP #6	BOAT CHUTE DETAIL PLAN
C-41	DROP #6	TYPICAL SECTIONS
C-42	DROP #6	TYPICAL SECTIONS
C-43	DROP STRUCTURES SHEET PILE	DETAILS
C-44	DROP #1 AND #2 EAST ACCESS TRAIL	PLAN AND PROFILE
C-45	DROP #1 AND #2 WEST ACCESS TRAIL	PLAN AND PROFILE
C-46	TRAIL WALL PLAN	AT OXFORD AVENUE
C-47	UNDERPASS WALL SECTIONS	AT OXFORD AVENUE
C-48	UNDERPASS WALL ELEVATIONS	AT OXFORD AVENUE
C-49	UNDERPASS WALL SECTIONS	AT UNION AVENUE
C-50	TRAIL WALL PLAN	AT UNION AVENUE
C-51	WEST SIDE PARKING LOT	GRADING AND LAYOUT PLAN
C-52	WEST SIDE PARKING STORM OUTFALL	PLAN AND PROFILE
C-53	STORM SEWER OUTFALL DETAILS	AT OXFORD AVENUE
C-54	STORM SEWER OUTFALL DETAILS	AT UNION AVENUE
C-55	STORMWATER OUTFALL PLAN	AT OXFORD AVENUE
C-56	STORM OUTFALL DETAILS	AT OXFORD AVENUE
C-57	REGIONAL TRAIL AREA DRAIN PLAN	
C-58	AREA DRAIN	PLANS AND PROFILES
C-59	AREA DRAIN	PLANS AND PROFILES
C-60	UNION AVENUE INTAKE STRUCTURE	PLAN
C-61	UNION AVENUE INTAKE STRUCTURE	AND MISC. STRUCTURAL DETAILS
C-62	UNION AVENUE INTAKE STRUCTURE	PLANS
C-63	UNION AVENUE INTAKE STRUCTURE	SECTIONS AND ELEVATIONS
C-64	UNION AVENUE INTAKE STRUCTURE	SECTIONS AND DETAILS
C-65	UNION AVENUE INTAKE STRUCTURE	DETAILS
C-66	BOULDER	TYPICAL DETAILS
C-67	MISCELLANEOUS RIVER	DETAILS
C-68	STORMWATER	DETAILS
C-69	PARKING LOT	DETAILS
C-70	JETTY TYPE II	DETAILS
C-71	TUNING BLOCK	DETAILS
C-72	ADJUSTABLE BOAT CHUTE	DETAILS
C-73	JUNCTION VAULT	DETAILS
C-74	JUNCTION VAULT COVER	DETAILS
C-75	EROSION CONTROL PLAN	STA. 1731+50 TO STA. 1744+25
C-76	EROSION CONTROL PLAN	STA. 1744+25 TO STA. 1756+00
C-77	EROSION CONTROL PLAN	STA. 1756+00 TO STA. 1768+00
C-78	EROSION CONTROL PLAN	STA. 1768+00 TO STA. 1780+00
C-79	EROSION CONTROL PLAN	STA. 1780+00 TO STA. 1792+00
C-80	EROSION CONTROL DETAILS	
C-81	EROSION CONTROL DETAILS	
C-82	EROSION CONTROL DETAILS	
C-83	SUGGESTED TRAFFIC CONTROL	TRAIL DETOUR PLAN
C-84	SOUTH PLATTE RIVER SECTIONS	
C-85	SOUTH PLATTE RIVER SECTIONS	
L1.2-L1.11	TRAIL LAYOUT AND MATERIALS PLAN	
L1.12	PARKING LOT LAYOUT AND MATERIALS PLAN	
L2.2-L2.10	GRADING PLAN AND PROFILE	
L3.1-L3.3	ENLARGEMENT PLAN	
U1.1, U1.2	OXFORD AVE. UNDERPASS	
U1.3, U1.4	UNION AVE. UNDERPASS	
CS1.1-CS1.5	TRAIL CROSS SECTIONS	
L4.2-L4.12	LANDSCAPE PLAN	
L4.13	PLANTING DETAILS	
L5.1	KEY - MATURE RIVER VEGETATION PLAN	
L5.2-L5.6	MATURE RIVER VEGETATION PLAN	
L5.7	SECTIONS - MATURE RIVER VEGETATION PLAN	
D1.1-D1.5	SITE DETAILS	
FL1.1	FORMLINER ELEVATION	
I4.2-I4.12	LANDSCAPE AND IRRIGATION PLAN	
I4.13	IRRIGATION DETAILS	
E1	GENERAL CONSTRUCTION NOTES	
E2	SITE PLAN	

PREPARED BY:

McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
1390 Lawrence St. Suite 100 Denver, CO 80204 303.892.5566 www.dhmdesign.com
DHM DESIGN
RJ McNutt & ASSOCIATES, INC. CIVIL ELECTRICAL ENGINEERS
1140 38TH AVENUE GREELEY, COLORADO 80634
GREELEY: (970) 330-3266 FAX: (970) 330-3445 FACSIMILE: (970) 330-3667
CLOSE ASSOCIATES, LLC
14405 W. Colfax Ave., Suite 275, Lakewood, CO 80401 Phone 303-589-9000 www.CloseAssociates.net

MERRICK PROJ. NO. 6511741908

PERMIT REVIEW SET
NOT FOR CONSTRUCTION

811 Know what's below. Call before you dig.

C-1

R:\1 MWD\ ACTIVE JOBS\OXFORD UDFCD\DRAWINGS – AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_COVER Last Saved: May 13, 2016

LEGEND - EXISTING

- 4950 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 4950 — PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- DECIDUOUS TREE
- CONIFEROUS TREE
- WATER VALVE
- FIRE HYDRANT
- POWER POLE
- GUY ANCHOR FOR POWER POLE
- ELECTRIC BOX
- IRRIGATION VALVE
- IRRIGATION BOX / HAND HOLD
- METAL/CONCRETE GUARD POST (BOLLARD)
- SANITARY SEWER MANHOLE
- STORM SEWER MANHOLE
- WATER MANHOLE
- STORM SEWER INLET
- LIGHT POLE
- SIGN (TRAFFIC - NO PARKING)
- TELEPHONE UTILITY PEDESTAL
- OH — OVERHEAD POWER/TRANSMISSION LINES
- UE — UNDERGROUND ELECTRIC LINES
- G — UNDERGROUND GAS LINE
- W — W — UNDERGROUND WATER LINE
- UT — UNDERGROUND TELEPHONE LINE
- SS — UNDERGROUND SANITARY SEWER LINE
- ST — UNDERGROUND STORM SEWER LINE
- CONCRETE CURB, FLOWLINE & DRAIN PAN ALONG PUBLIC ROADS
- EXISTING SHEET PILE
- EXISTING WETLAND AREA
- EXISTING RIPRAP
- EXISTING SUBSURFACE RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- EXISTING CONCRETE

LEGEND - PROPOSED

- PROPOSED CONCRETE (PLAN)
- PROPOSED CONCRETE (SECTION)
- PROPOSED GROUTED BOULDERS
- PROPOSED IMPORT COBBLE W/ NATIVE SANDS MIXED
- PROPOSED INTAKE STRUCTURE DECKING
- PROPOSED FEATURE BOULDER
- PROPOSED SOIL RIPRAP
- PROPOSED SUBSURFACE SOIL RIPRAP
- PROPOSED COBBLE COVERED SOIL RIPRAP
- PROPOSED CRUSHER FINES TRAIL
- PROPOSED SCULPTED CONCRETE
- PROPOSED BOULDER WALL
- BOUNDARY OF AT-GRADE GROUTED BOULDERS
- X:1 — SUBSURFACE SLOPE LINE (GROUTED BOULDER/RIPRAP)
- SUBSURFACE FLAT SLOPE LINE (RIPRAP)
- TOP OR TOE OF BANK
- 69.0 — ESTIMATED EXISTING SUBSURFACE ELEVATION
- 63.8 X:1 — SUBSURFACE SLOPE LINE (GROUTED BOULDER/RIPRAP) TOE ELEVATION. TRANSITION TOE ELEVATIONS LINEARLY BETWEEN SPOT ELEVATIONS
- HARVEST RIPRAP
- HARVEST LARGE BOULDERS
- HARVEST GROUTED BOULDERS
- DEMOLISH STRUCTURE
- PROPOSED SHEET PILE
- SD — PROPOSED STORM DRAIN PIPE

GENERAL STRUCTURAL NOTES:

FOUNDATION, EXCAVATION, AND BACKFILL

FOUNDATION DESIGN BASED ON GEOTECHNICAL REPORT, FROM CTL/THOMPSON, DATED JULY 3, 2013. CONTRACTOR SHALL REVIEW THE SOILS REPORT WHICH IS AVAILABLE IN THE ENGINEER'S OFFICE.
STRUCTURES MAY GENERALLY BE PLACED ON INSITU MATERIALS SCARIFIED TO 8 INCHES AND RECOMPACTED AT OPTIMUM MOISTURE CONTENT. A QUALIFIED SOILS ENGINEER SHALL INSPECT THE OPEN EXCAVATION TO VERIFY THE FOUNDATION BEARING MATERIAL AND THE PLACEMENT OF THE COMPACTED FILL MATERIALS. SEE PROJECT SPECIFICATIONS FOR SOIL COMPACTION AND BEDROCK EXCAVATION REQUIREMENTS.

CONCRETE

DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI CODES AND REPORTS 350 AND 350.5.
ALL CONCRETE, EXCEPT PIPE ENCASEMENT, SHALL DEVELOP 4500 PSI COMPRESSIVE STRENGTH WITHIN 28 DAYS, UNLESS OTHERWISE NOTED.
ALL CONCRETE SHALL MEET THE MINIMUM CEMENT AND FLY ASH QUANTITIES, MAXIMUM WATER CEMENTITOUS MATERIAL RATIO AND OTHER CRITERIA CALLED FOR IN THE SPECIFICATIONS. ALL CONCRETE SHALL CONTAIN CLASS F FLY ASH, SEE SPECIFICATIONS.
SEE DRAWINGS FOR SIZES AND LOCATIONS OF HOLES, SLEEVES, REGLETS, BOLTS, NOTCHES, DRIPS, EMBEDDED ITEMS, ETC.
IN WALLS, ALL CONSTRUCTION JOINTS SHALL BE VERTICAL, NO HORIZONTAL JOINTS ARE PERMITTED, EXCEPT AS SHOWN ON THE DRAWINGS.

REINFORCEMENT

DETAILING, FABRICATION, AND PLACEMENT SHALL BE IN ACCORDANCE WITH ACI 350 AND 315, UNLESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS.
STEEL REINFORCEMENT SHALL BE NEW, DEFORMED BILLET STEEL, MEETING ASTM STANDARD A 615, #4 BARS AND LARGER SHALL BE GRADE 60 STEEL; #3 BARS AND DESIGNATED REINFORCEMENT SHALL BE GRADE 40; SHOP DRAWINGS SHALL BE MARKED ACCORDINGLY. GRADE 60 DOWELS SHALL NOT BE BENT IN THE FIELD AFTER PLACING.
REINFORCEMENT IN ALL WALLS AND SLABS SHALL BE CONTINUOUS AROUND CORNERS OR CORNER BARS PROVIDED BOTH VERTICAL AND HORIZONTAL OR AS DETAILED ON THE DRAWINGS.
LAP ALL TENSION SPLICES ACCORDING TO ACI 350-06, CLASS B, AND ALL COMPRESSION SPLICES 30 BAR DIAMETERS, EXCEPT AS NOTED ON THE DRAWINGS.
SEE DRAWINGS FOR TRIM BARS, WHICH ARE REQUIRED ON ALL SIDES OF OPENINGS AND PIPES.
PROVIDE CONCRETE COVER FOR REINFORCEMENT AS FOLLOWS:
3" FOR CONCRETE DEPOSITED AGAINST THE GROUND; 2" FOR HORIZONTAL BARS LARGER THAN #6 AND 1-1/2" FOR HORIZONTAL #6 BARS OR SMALLER, ELSEWHERE, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
ALL CONCRETE REQUIRES REINFORCEMENT.
WHERE REINFORCEMENT IS NOT SHOWN ON THE DRAWINGS, THE CODE FOR "ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES" (ACI 350-06), SHALL BE REFERRED TO FOR THE PROPER REINFORCEMENT.
PROVIDE CORROSION PROTECTED ACCESSORIES FOR ALL CONCRETE SURFACES. TACK WELDING OF REINFORCING BARS IS NOT PERMITTED.

STRUCTURAL STEEL

DESIGN FABRICATION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST AISC AND AWS SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A 36 U.N.O.
ALL WELDING OR GAS CUTTING SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS OF THE AMERICAN WELDING SOCIETY CODE D1.1, LATEST REVISION.
NEW AND UNSPLICED MATERIAL TO BE USED THROUGHOUT. ALL BOLTS SHALL BE A 325 BOLTS, UNLESS NOTED OTHERWISE. ALL WELDED CONNECTIONS SHALL BE WELDED USING E-60XX ELECTRODE UNLESS OTHERWISE SHOWN.
ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION U.N.O.
STAINLESS STEEL SHALL BE TYPE 304.

NOTE:

SURVEY COMPLETED BY MERRICK & COMPANY ON FEBRUARY 18TH, 2013

VERTICAL DATUM: NAVD88

HORIZONTAL DATUM: NAD83, STATE PLANE, COLORADO CENTRAL ZONE, MODIFIED GROUND

COMBINED SCALE FACTOR = 0.999730297

811 Know what's **below.** **Call** before you dig.

PERMIT REVIEW SET
NOT FOR CONSTRUCTION

Number	Revision Description	By	Date

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

LEGEND

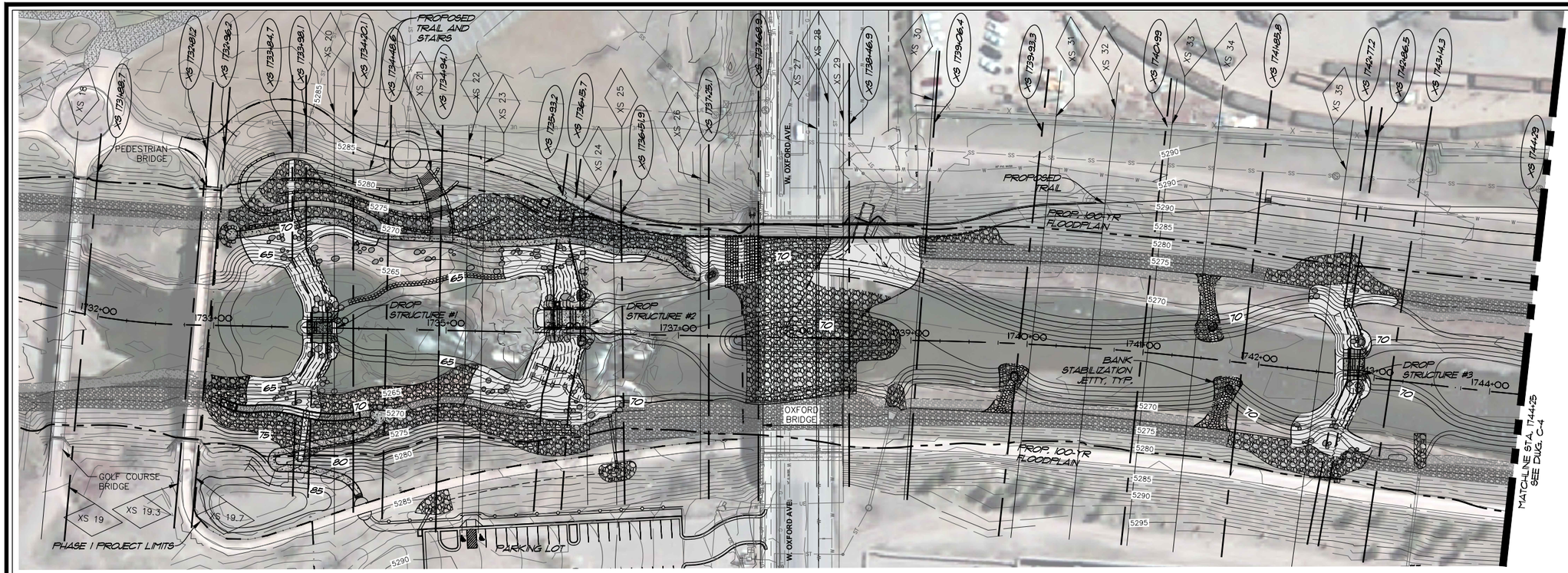
Laughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: AKA
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-2

R:\1 MWDG ACTIVE JOBS\OXFORD UDFCD\DRAWINGS - AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_LEGEND Last Saved: May 19, 2016

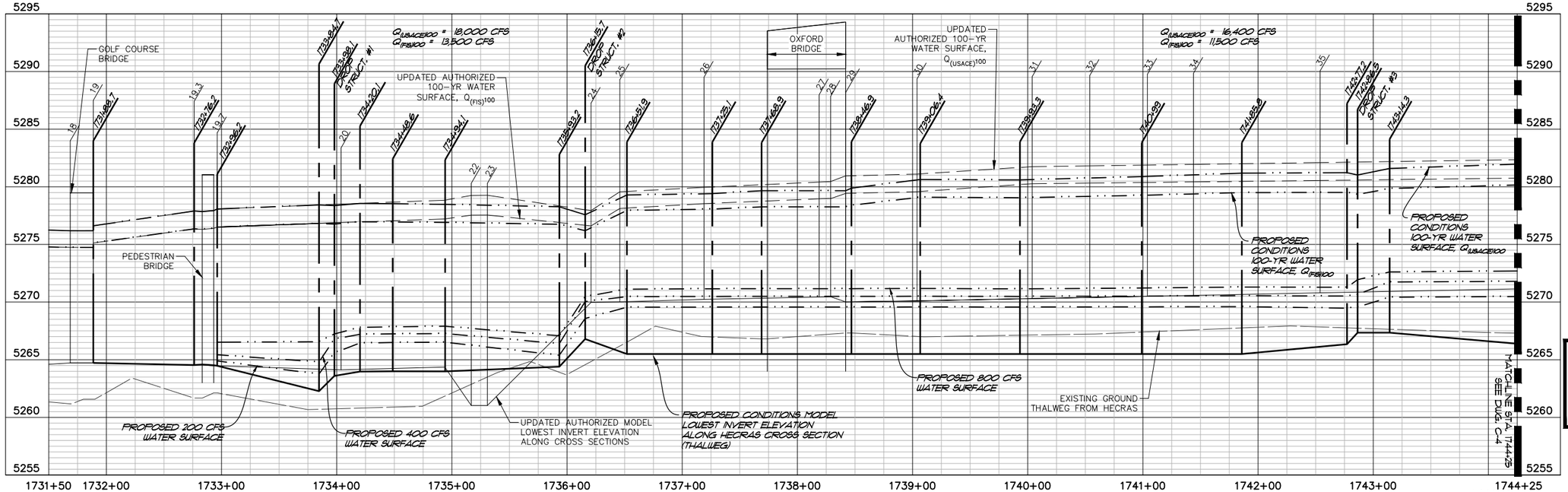


50 0 50 100

1 inch = 50 feet
IF SHEET SIZE IS NOT ANSI D (22"X34")
THEN GRAPHIC SCALE MUST BE USED
CONTOUR INTERVAL = 1'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- PROPOSED CONCRETE
- PROPOSED GROUTED BOULDERS
- PROPOSED IMPORT COBBLE W/ NATIVE SANDS MIXED
- PROPOSED FEATURE BOULDER
- PROPOSED SOIL RIPRAP
- PROPOSED CRUSHER FINES TRAIL
- XS 35 — UPDATED AUTHORIZED MODEL CROSS - SECTION
- XS 1742+77.2 — PROPOSED CONDITION MODEL CROSS - SECTION



PROFILE VIEW - STA. 1731+50 TO 1744+25

HOR. 1" = 50'
VER. 1" = 5'

FOR INFORMATION ONLY.
DO NOT USE FOR CONSTRUCTION LAYOUT.
SEE DWGS C-14 THROUGH C-19 FOR RIVER CHANNEL GRADING

PERMIT REVIEW SET
NOT FOR CONSTRUCTION

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UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1731+50 TO STA. 1744+25

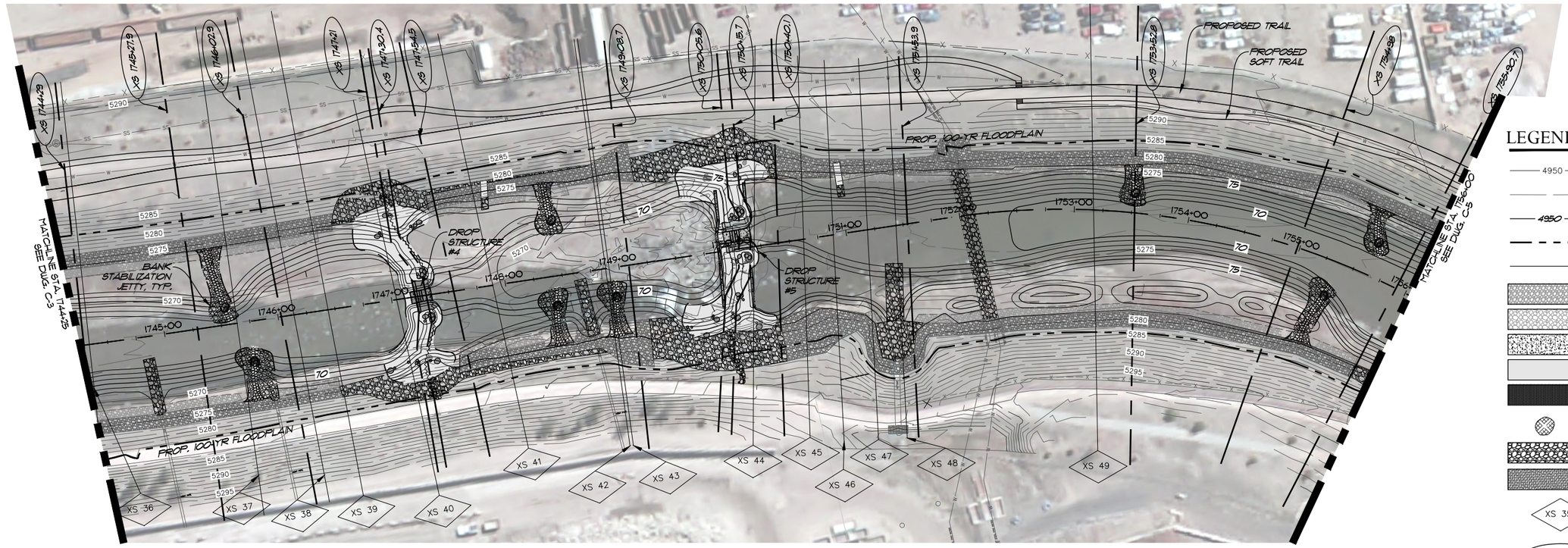
McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: AKA
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-3

R:\1 MWDG ACTIVE JOBS\OXFORD UDFCD\DRAWINGS - AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_RIVER P&P Last Saved: May 19, 2016



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CONTOUR INTERVAL = 1'

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- EXISTING CONTOUR MINOR
- 4950 — PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- PROPOSED CONCRETE
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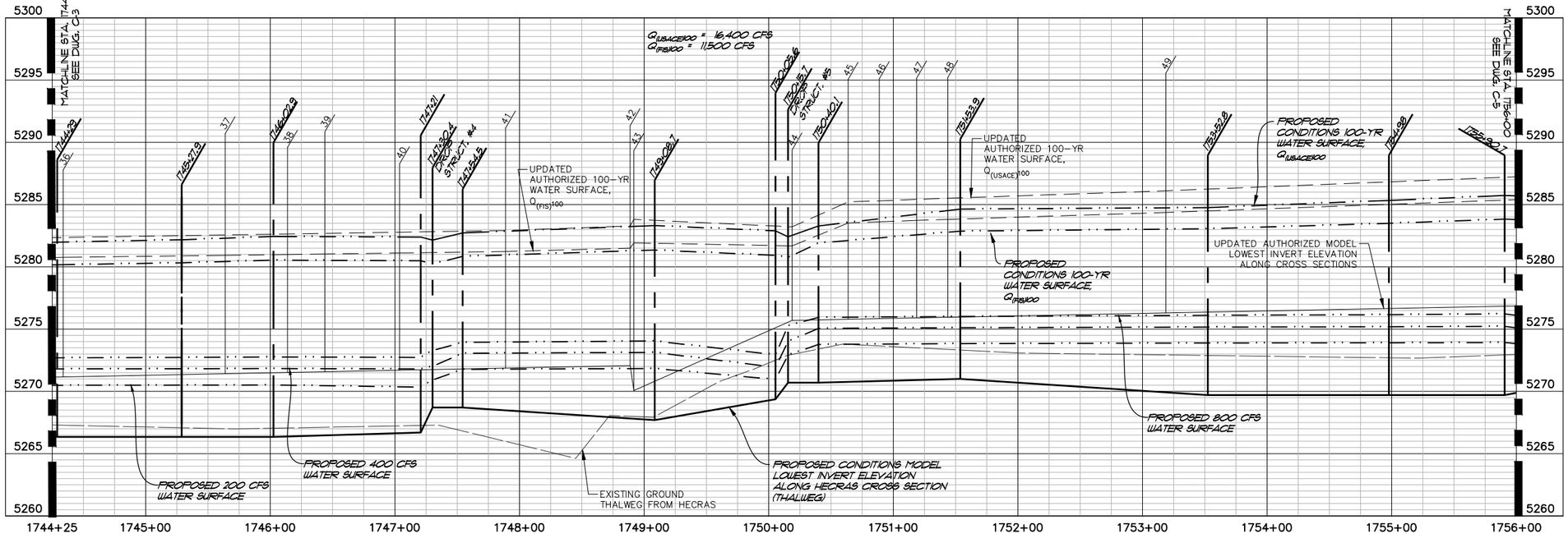


PROFILE VIEW - STA. 1744+25 TO 1756+00

HOR. 1" = 50'
VER. 1" = 5'

FOR INFORMATION ONLY.
DO NOT USE FOR CONSTRUCTION LAYOUT.
SEE DWGS C-14 THROUGH C-19
FOR RIVER CHANNEL GRADING

PERMIT REVIEW SET
NOT FOR CONSTRUCTION

811 Know what's **below.** **Call** before you dig.

Number	Revision Description	By	Date

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1744+25 TO STA. 1756+00

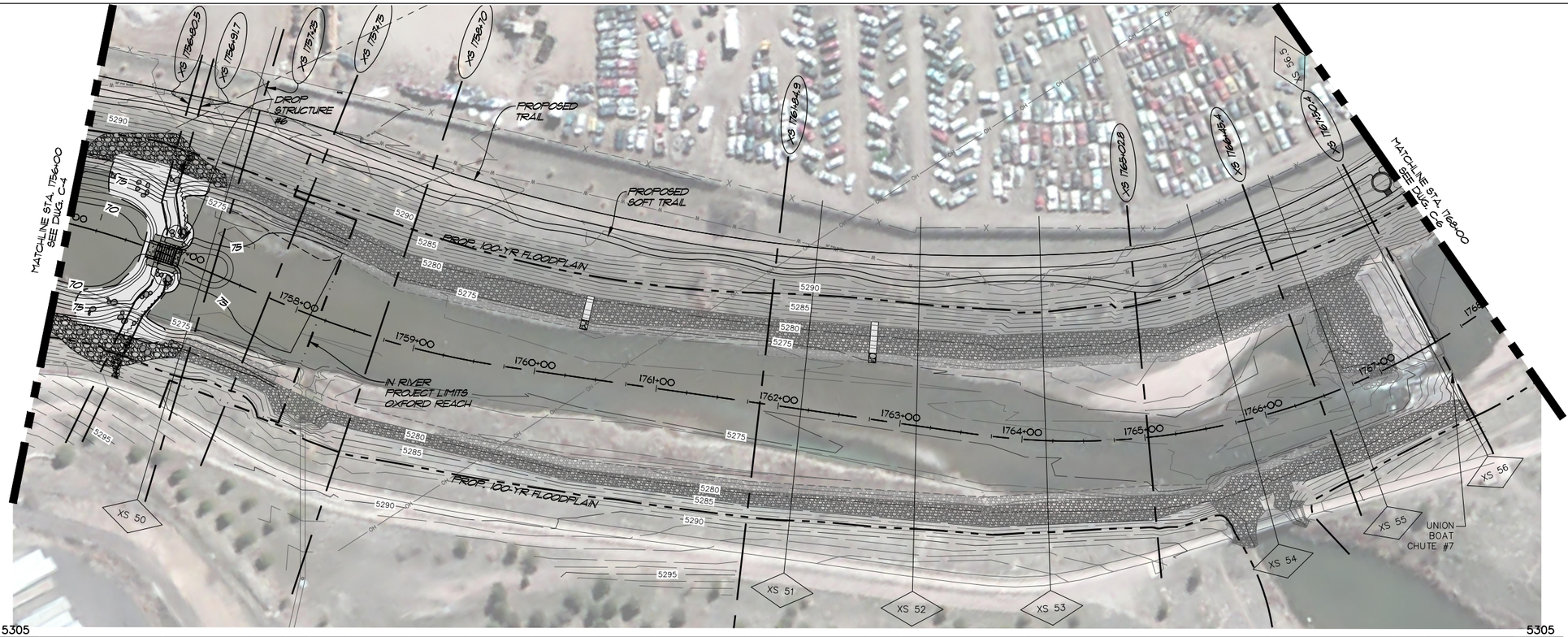
McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St. Denver, CO 80211
T303.964.3333 F303.964.3355

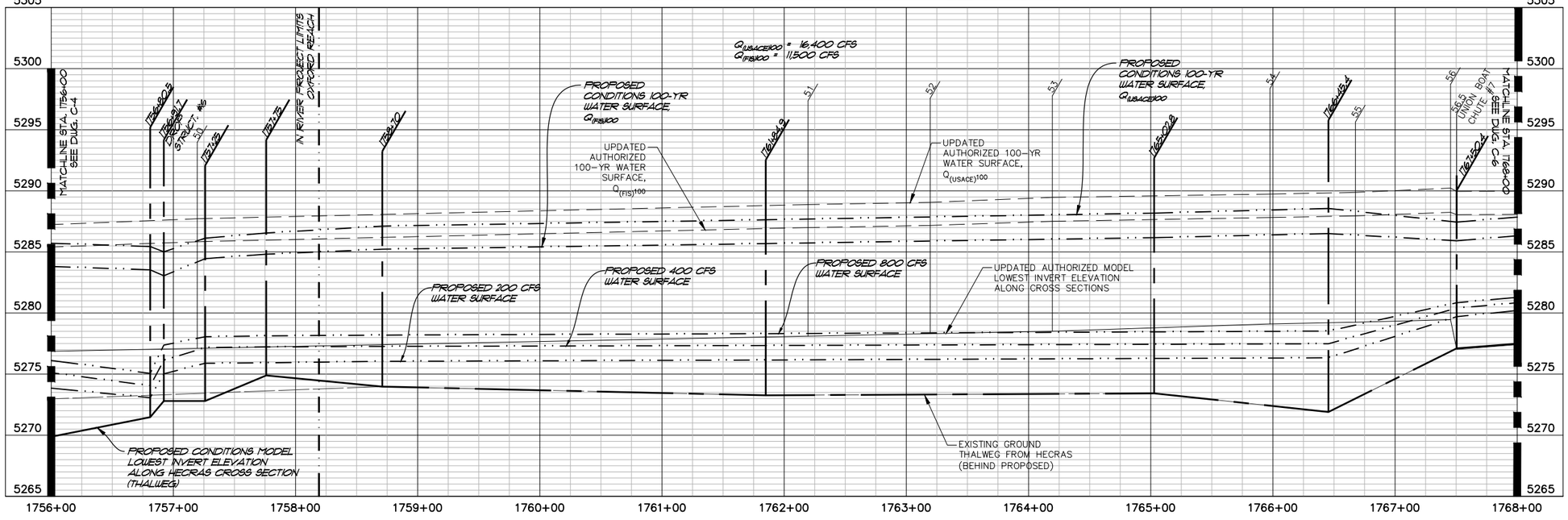
DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: AKA
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-4

R:\1 MWDG ACTIVE JOBS\OXFORD UDFCD\DRAWINGS - AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_RIVER P&P Last Saved: May 19, 2016





PROFILE VIEW - STA. 1756+00 TO 1768+00

HOR. 1" = 50'
VER. 1" = 5'

50 0 50 100

1 inch = 50 feet

IF SHEET SIZE IS NOT ANSI D (22"X34") THEN GRAPHIC SCALE MUST BE USED

CONTOUR INTERVAL = 1'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- PROPOSED CONCRETE
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- XS 35 — UPDATED AUTHORIZED MODEL CROSS - SECTION
- XS 1742+77.2 — PROPOSED CONDITION MODEL CROSS - SECTION

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SEE DWGS C-14 THROUGH C-19 FOR RIVER CHANNEL GRADING

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SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1756+00 TO STA. 1768+00

McLaughlin Whitewater design group
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Drawing Number:
C-5

R:\1 MMDG ACTIVE JOBS\OXFORD UDFCD\DRAWINGS - AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_RIVER P&P Last Saved: May 19, 2016

Oxford Union General List of Grasses and Grasslike Plants and Their Ecological Characteristics

Common Name	*Scientific Name*	Growing Season	Height (feet)	Growth Form	Wetland Designation	100% at Full Rate	%	Pls # / AC
Species for Upland Grassland Slopes (Code A3/ WGS1)								25
Crested Wheatgrass "Fairway"							30	
Western Wheatgrass "Ariba" or "Barton							30	
Sideoats Grama							20	
Blue Gramma							15	
Buffalo Grass (treated)							5	
Species for Riparian Floodplain, Grassland Terraces (Code RGs1/ RGs2)								
Big Bluestem	*Andropogon gerardii*	warm	3 to 6	bunchy, sod former		5.5	20	1.10
Switchgrass	*Panicum virgatum*	warm	2 to 5	bunchgr., sod w/ mow		2.0	5	0.10
Yellow Indiangrass	*Sorghastrum nutans*	warm	3 to 6	bunchy, sod former		5.0	15	0.75
Alkali Sacaton	*Sporobolus airoides*	warm	1 to 3	bunchgrass		1.0	5	0.05
Green Needlegrass	*Nassella viridula*	cool	1.5 to 3.5	bunchgrass		5.0	10	0.50
Western Wheatgrass	*Pascopyrum smithii*	cool	1 to 3	sod forming		8.0	20	1.60
Fults Alkaligrass	*Puccinellia distans*	cool	1 to1.5	bunchgrass		1.0	5	0.05
Canada Wildrye	*Elymus canadensis*	cool	2 to 4	short-lived,bunchgrass		5.0	20	1.00
Species for Herbaceous Wetland Areas (Code UGs2)								
Prairie Cordgrass	*Spartina pectinata*	warm	3.5 to 7	sod forming				1.00
Canada Wildrye	*Elymus canadensis*	cool	2 to 4	short-lived,bunchgrass				1.00
Switchgrass	*Panicum virgatum*	warm	2 to 5	bunchgr., sod w/ mow				0.10
Inland Saltgrass	*Distichlis spicata*	warm	0.5 to1.5	sod forming				0.75
Fowl Bluegrass	*Poa palustris*	cool	1 to1.5	bunchgrass				0.50
Nebraska Sedge	*Carex nebrascensis*	cool	1 to 2.5	sod forming				1.90
Woolly Sedge	*Carex lanuginosa*	cool	1 to 3	sod forming				0.10
Creeping Spikerush	*Eleocharis palustris*	cool	0.5 to 2	sod forming				0.10
Torrey's Rush	*Juncus torreyi*	cool	1 to 2.5	sod forming				0.10
Baltic Rush	*Juncus balticus*	cool	0.5 to 2.5	sod forming				0.60
American Threesquare	*Schoenoplectus pungens*		2 to 4		*obligate*			0.25
American Mannagrass	*Glyceria grandis*		4 to 5		*obligate*			0.50
Marsh Sunflower	*Helianthus nuttallii*		5		*facw*			0.10

(19,220 S.F.)

Irrigated Kentucky Bluegrass Sod

Existing Wetlands

(DISTURBED 17,681 S.F.)

3" Tree Trunk Diameter Approximately 6" Above Base
Existing Tree

NOTE: ALL PROPOSED PLANTS BELOW 100 YR. FLOODPLAIN ELEVATION ARE GRASSES/ HERBACEOUS. NO WOODY PLANTS ARE PROPOSED.

DHM DESIGN
900 S. Broadway
Suite 300
Denver, CO 80209
303.892.5566
www.dhmdesign.com

FOR CONSTRUCTION
PHASE I ONLY

WILLIAM NEUMANN 175 — 01/01/2008 Original Date of Licensure — 11/20/15 — STATE OF COLORADO LICENSED LANDSCAPE ARCHITECT

Number	Revision Description	By	Date
	FOR CONSTRUCTION – PHASE I ONLY		11/20/15
	PERMIT REVIEW		09/23/15

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVERSIDE TRAILHEAD
MATURE RIVER VEGETATION PLAN

McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: KD/BN
DETAIL: KD
CHECK: BN
DATE: NOVEMBER, 2015

PROJECT NUMBER
6511741908

Drawing Number:
L5.1

CITY OF ENGLEWOOD

BLUEGRASS SOD

100 YR. FLOODPLAIN

PROJECT LIMITS

OVERALL PROJECT ALIGNMENT

FLOW

PROPOSED CONCRETE TRAIL, TYP.

EXISTING ELM TREE (3)

DROP STRUCTURE #1

PROPOSED CONCRETE TRAIL COBBLESTONE BAR

DROP STRUCTURE #2

SOUTH PLATTE RIVER

PROPOSED CRUSHER FINES TRAIL

EXISTING ASH TREE

EXISTING NARROWLEAF COTTONWOOD TREE

PROPOSED CONCRETE TRAIL

EXISTING ELM TREE (2)

EXISTING NARROWLEAF COTTONWOOD TREE

EXISTING ELM TREE (5)

EXISTING ELM TREE

EXISTING CONCRETE TRAIL

MATCHLINE - SEE SHEET L5.3

LEGEND

- 100 YR. FLOODPLAIN
- EXISTING CONTOUR – MAJ.
- EXISTING CONTOUR – MIN.
- PROPOSED CONTOUR – MAJ.
- PROPOSED CONTOUR – MIN.
- BURIED RIP-RAP, RE: CIVIL
- EXISTING TREE
- UPLAND GRASSLAND SLOPES
- RIPARIAN FLOODPLAIN, GRASSLAND TERRACES
- HERBACEOUS WETLANDS
- IRRIGATED KENTUCKY BLUEGRASS SOD
- EXISTING WETLANDS

DHM DESIGN
900 S. Broadway
Suite 300
Denver, CO 80209
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www.dhmdesign.com

20 0 20 40

1 inch = 20 feet

IF SHEET SIZE IS NOT ANSI D (22"X34") THEN GRAPHIC SCALE MUST BE USED

CONTOUR INTERVAL = 1'

FOR CONSTRUCTION

PHASE I ONLY

WILLIAM NEUMANN 175 — 01/01/2008 Original Date of Licensure — 11/20/15 — STATE OF COLORADO LICENSED LANDSCAPE ARCHITECT

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UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
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RIVERSIDE TRAILHEAD
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DESIGN: KD/BN
DETAIL: KD
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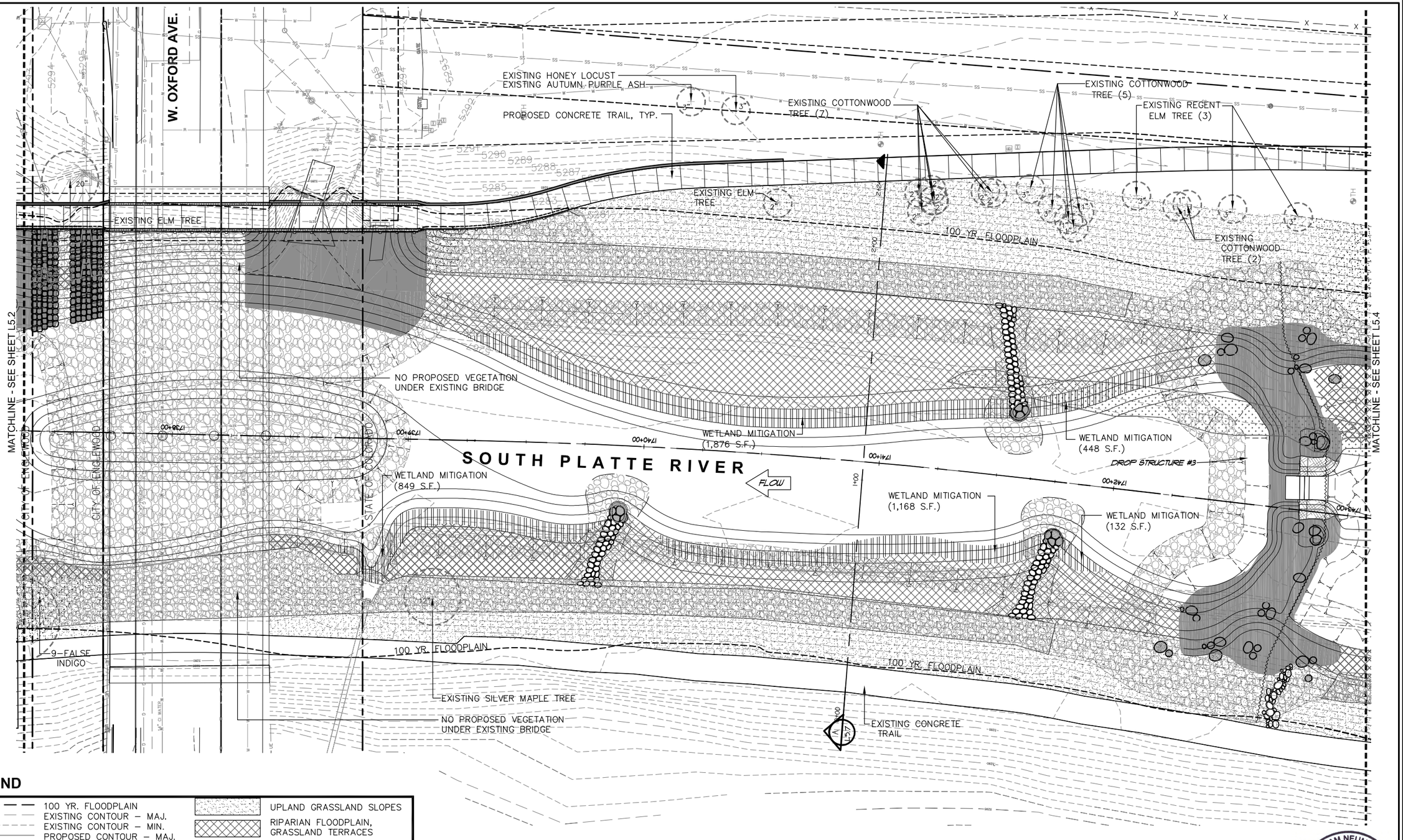
PROJECT NUMBER
6511741908

Drawing Number:
L5.2

X:\NEUMANN\SOUTH PLATTE RIVER NWE – 13094.60\07 – CD\CADD\SHEETS\RIPARIAN\OXFORD_RIVER VEGETATION PLAN_BASE – 2015-10-23 Last Saved: November 17, 2015



LEGEND

- 100 YR. FLOODPLAIN
- EXISTING CONTOUR – MAJ.
- EXISTING CONTOUR – MIN.
- PROPOSED CONTOUR – MAJ.
- PROPOSED CONTOUR – MIN.
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FOR CONSTRUCTION
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WILLIAM NEUMANN 175 — 01/01/2008 Original Date of Licensure — 11 Years — STATE OF COLORADO LICENSED LANDSCAPE ARCHITECT

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	PERMIT REVIEW		09/23/15

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SHERIDAN, COLORADO

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FINAL DESIGN

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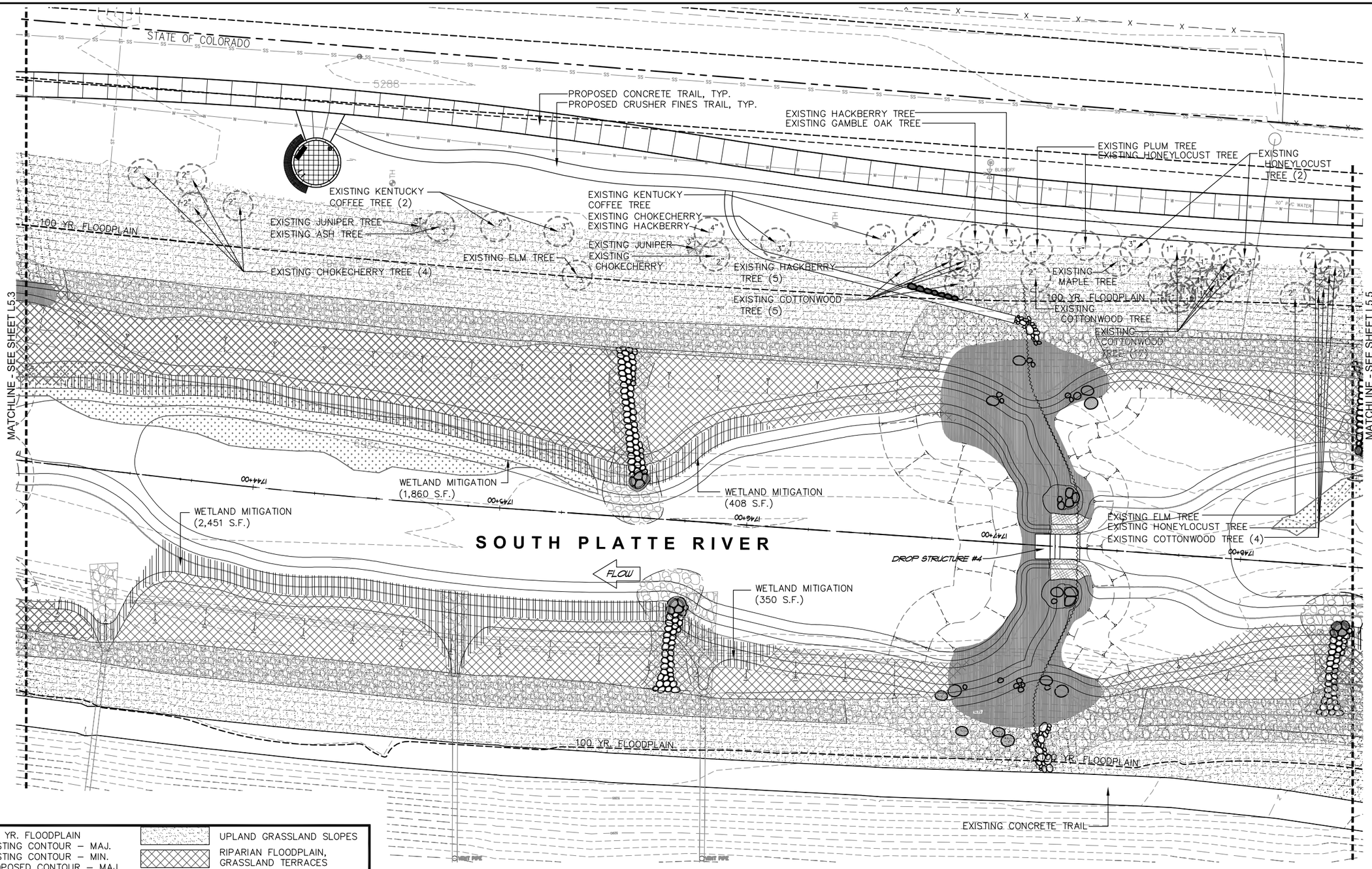
L5.3

X:\NEUMANN\SOUTH PLATTE RIVER MME - 13094.00\07 - CD\CADD\SHEETS\RIPARIAN\OXFORD_RIVER VEGETATION PLAN_BASE - 2015-10-23 Last Saved: November 17, 2015



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20 0 20 40
1 inch = 20 feet
IF SHEET SIZE IS NOT ANSI D (22"X34")
THEN GRAPHIC SCALE MUST BE USED
CONTOUR INTERVAL = 1'

FOR CONSTRUCTION
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WILLIAM NEUMANN 175
01/01/2008
Original Date of Licensure
11/20/15
STATE OF COLORADO
LICENSED LANDSCAPE ARCHITECT

Number	Revision Description	By	Date
	FOR CONSTRUCTION – PHASE I ONLY		11/20/15
	PERMIT REVIEW		09/23/15

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVERSIDE TRAILHEAD
MATURE RIVER VEGETATION PLAN

McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: KD/BN
DETAIL: KD
CHECK: BN
DATE: NOVEMBER, 2015
PROJECT NUMBER 6511741908

Drawing Number: L5.4

X:\NEUMANN\SOUTH PLATTE RIVER MVE – 13094.00\07 – CD\CAD\SHEETS\RIPARIAN\OXFORD_RIVER VEGETATION PLAN_BASE – 2015-10-23 Last Saved: November 17, 2015

EXISTING HONEYLOCUST TREE (2)

EXISTING COTTONWOOD TREE (2)

PROPOSED CONCRETE TRAIL, TYP.

PROPOSED CRUSHER FINES TRAIL, TYP.

100 YR. FLOODPLAIN

WETLAND MITIGATION (533 S.F.)

DROP STRUCTURE #5

WETLAND MITIGATION (600 S.F.)

WETLAND MITIGATION (248 S.F.)

WETLAND MITIGATION (1,994 S.F.)

SOUTH PLATTE RIVER

WETLAND MITIGATION (4,856 S.F.)

OVERALL PROJECT ALIGNMENT

FLOW

MATCHLINE - SEE SHEET L5.4

MATCHLINE - SEE SHEET L5.6

CMP PIPE

STATE OF COLORADO

EXISTING PLAINS COTTONWOOD TREE

EXISTING WILLOW TREE (3)

EXISTING COTTONWOOD TREE (4)

EXISTING CONCRETE TRAIL

LEGEND

- 100 YR. FLOODPLAIN
- EXISTING CONTOUR – MAJ.
- EXISTING CONTOUR – MIN.
- PROPOSED CONTOUR – MAJ.
- PROPOSED CONTOUR – MIN.
- BURIED RIP–RAP, RE: CIVIL
- EXISTING TREE
- UPLAND GRASSLAND SLOPES
- RIPARIAN FLOODPLAIN, GRASSLAND TERRACES
- HERBACEOUS WETLANDS
- IRRIGATED KENTUCKY BLUEGRASS SOD
- EXISTING WETLANDS

DHM DESIGN
900 S. Broadway
Suite 300
Denver, CO 80209
303.892.5566
www.dhmdesign.com

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DATE: NOVEMBER, 2015

PROJECT NUMBER
6511741908

Drawing Number:
L5.5

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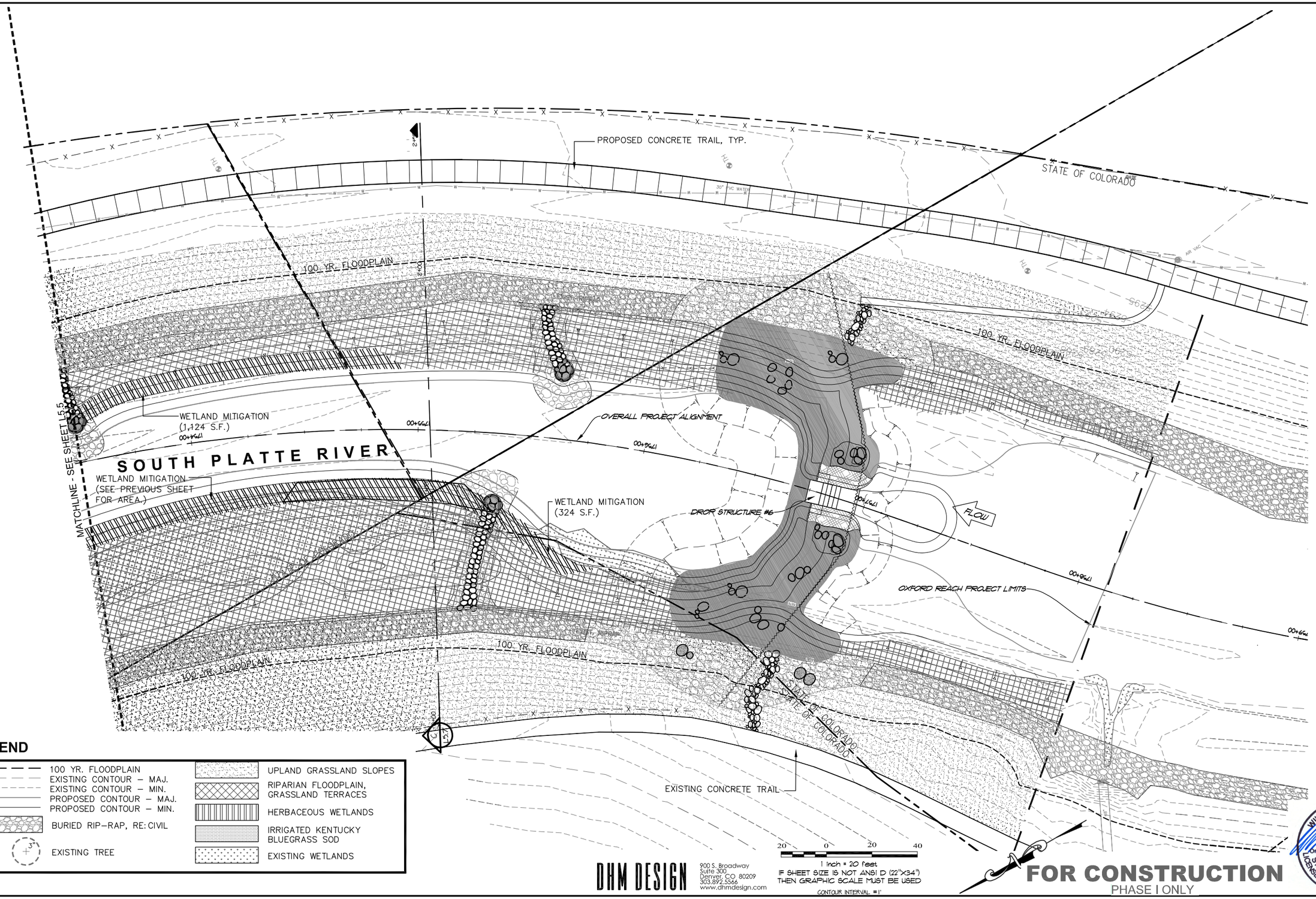

LEGEND

- 100 YR. FLOODPLAIN
- EXISTING CONTOUR – MAJ.
- EXISTING CONTOUR – MIN.
- PROPOSED CONTOUR – MAJ.
- PROPOSED CONTOUR – MIN.
- BURIED RIP–RAP, RE: CIVIL
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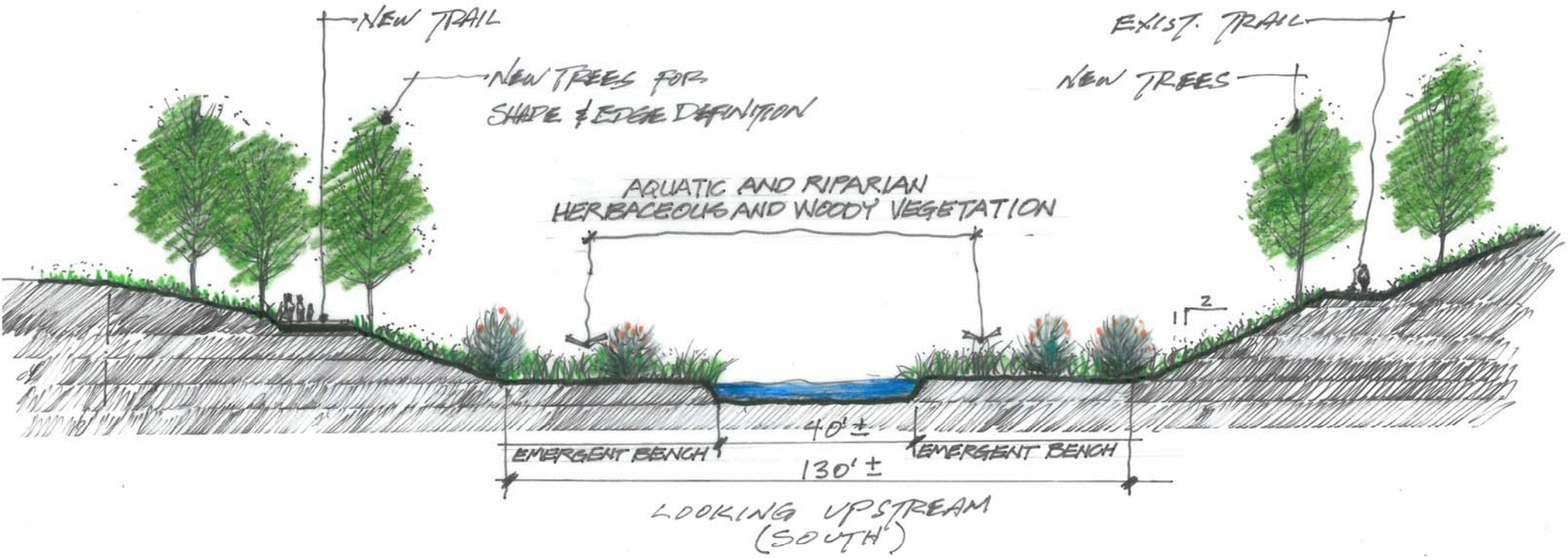

NEW TRAIL
NEW TREES FOR SHADE & EDGE DEFINITION
EXIST. TRAIL
NEW TREES
AQUATIC AND RIPARIAN HERBACEOUS AND WOODY VEGETATION
1
2
40' ±
EMERGENT BENCH
EMERGENT BENCH
130' ±
LOOKING UPSTREAM (SOUTH)

Appendix C Analysis of Flood Impacts

McLaughlin Whitewater design group

A DIVISION OF MERRICK & COMPANY

MEMORANDUM

To: File

From: Ben Nielsen, P.E., Mathew Accardo, E.I.T.

Date: March 2014

RE: South Platte River Run Park – Flood Analysis

Hydraulic Flood Analysis

The project reach is located in a USACE FRRP facility. It is therefore required that any modifications to the channel provide adequate conveyance of high flows. To verify equivalent conveyance, one-dimensional hydraulic modeling was conducted using HEC-RAS v4.1.0 software. 100-year flood water surface elevation profiles for the proposed project were compared to the USACE channel design with the Union Avenue Boat Chutes included (Corrected Effective Model). Water surface elevations for the proposed project at or below the USACE design water surface elevations (as modified) indicate equivalent conveyance capacity. This analysis is intended to identify potential impacts on channel capacity from proposed modifications not establish base flood elevations or develop flood hazard mapping.

Two Effective Models, SOPFINAL.DAT and SOPHAUN.DAT, for the original USACE channel design were provided to MWDG by UDFCD and CWCB. Duplicate Effective Models were generated by converting the HEC-2 Effective Models to HEC-RAS. Limits of the Effective Models are located in the project reach near the diversion for the City of Englewood raw water intake (Union Boat Chute #1). Therefore, a single continuous model was developed by combining the two Effective Models. Two changes were required to get the Effective Model to run in HEC-RAS software. First, the cross sections were renumbered to increase going upstream and the original section numbers were moved to the description box in the model. Second, insignificant distance (0.01 ft) was added to the cross sections at bridge locations. The Duplicate Effective Model in HEC-RAS was compared to the Effective Model HEC-2 output. Appendix C includes a water surface comparison table. There are two areas of significant change, which are explained as follows.

1. The Duplicate Effective water surface is higher at Oxford Bridge resulting from different bridge modeling routines between the two models. As a check, the bridge geometry was coded in as a cross section instead of a bridge; the water surface upstream of the bridge should not be lower than this condition because it negates pier losses and other form losses included in the bridge routines. The water surface closely matched the Duplicate Effective Model and was higher than the Effective Model HEC-2 output. Therefore, we believe that

the bridge routine used in the Duplicate Effective Model more accurately predicts the flood conditions in this reach.

2. The second difference occurs in the stilling basin for the former low head diversion dam near Union Ave. The Duplicate Effective Model water surface is higher than the Effective Model HEC-2 output, which is likely a result of ineffective flow area in the pool bottom that was accounted for in the HEC-2 model, but did not transfer to the HEC-RAS model. This difference is limited to a short distance near the location of the hydraulic jump and area of energy dissipation in the pool. This area is irrelevant since the channel bathymetry was significantly altered when the historic dam was replaced with a series of drop structures in the 1990s (Union Avenue Boat Chutes).

The Duplicate Effective Model was modified to create the Corrective Effective Model. The Union Avenue Boat Chutes were added to the model based on record drawings and the vertical datum adjusted to NAVD 88. Boundary conditions and Manning's roughness values from the Effective Models were unchanged in the Corrected Effective Model.

The Proposed Conditions Model was developed based on proposed channel modifications as described within this report and shown on the design drawings. Cross sections in the model were created with topographic survey data, proposed design geometry, and anticipated roughness. In the project reach, cross sections were added at bridges, existing and proposed controls, drop structures and pools. Roughness for proposed vegetation and in-river elements are included in the model. The downstream model boundary condition was set to the 100-year water surface elevation of the Corrected Effective Model. A normal depth of 0.1% was used for the upstream model boundary condition. All hydraulic models used in the flood analysis are available upon request.

Table 1 – Model Results Comparison of Corrected Effective and Proposed Conditions 100-year Water Surface Elev.

Description	Proposed River Station	Proposed 100-yr WSE	USACE Corrected Effective 100-yr WSE*	Change (ft)
Upstream Boundary	179081.6	5304.47	5304.65	-0.18
Pedestrian Bridge @ Big Dry Creek	178738.1	5303.43	5304.08	-0.65
Union Bridge	178344.6	5303.09	5303.09	0.00
Englewood Intake Structure	178086.2	5302.49	5302.52	-0.03
Union Boat Chute #1	177993.6	5299.70	5299.90	-0.20
Union Boat Chute #2	177724.7	5295.96	5296.03	-0.07
Union Boat Chute #3	177446.3	5293.39	5293.47	-0.08
Union Boat Chute #4	177320.9	5291.38	5291.81	-0.43
Union Boat Chute #5	177120.4	5289.35	5289.78	-0.43
Union Boat Chute #6	177005.3	5288.18	5288.25	-0.07
Union Boat Chute #7	176750.4	5285.91	5288.13	-2.22
Downstream of Boat Chute #7	176184.9	5286.36	5286.99	-0.63
Whitewater Feature #6	175690.2	5284.80	5285.80	-1.00
Downstream of WW Feature #6	175300	5283.35	5284.39	-1.04
Whitewater Feature #5	175016.1	5281.12	5281.78	-0.66
Downstream of WW Feature #5	174907.1	5281.73	5282.21	-0.48
Whitewater Feature #4	174728.1	5280.60	5281.58	-0.98
Downstream of WW Feature #4	174601.2	5280.71	5281.43	-0.72
Whitewater Feature #3	174283.2	5279.43	5281.10	-1.67
Downstream of WW Feature #3	174161.6	5279.55	5281.00	-1.45
Oxford Bridge	173846.9	5278.39	5280.18	-1.79
Whitewater Feature #2	173621	5276.63	5276.69	-0.06
Downstream of WW Feature #2	173511.1	5277.20	5277.61	-0.41
Whitewater Feature #1	173421.5	5276.95	5277.12	-0.17
Counterweir/Pedestrian Bridge	173296.2	5276.27	5276.27	0.00
Downstream boundary	173188.7	5275.45	5275.45	0.00

*Water surface elevations graphically interpreted from HEC-RAS profile results

Results from the Proposed Conditions Model were compared to the Corrective Effective Model (see Table 1). Distances in the Corrective Effective Model are not consistent with the topographic survey and Proposed Conditions Model. For example, the total distance from the Oxford Avenue Bridge to the Union Avenue Bridge in the Corrected Effective Model is approximately 140’ longer than surveyed. Distances in the Corrective Effective Model were changed to match field surveyed bridge and control structure locations. This allowed meaningful comparison of the Corrective

Effective and Proposed Conditions Model results. Profiles of the 100-year water surface elevations are attached. Results comparison of the Proposed Conditions and Corrected Effective Models indicates that the proposed channel modifications provide at least equivalent conveyance of 100-year flood flows.

Selection of channel roughness for the hydraulic models has a significant impact on the results. Manning's "n" values for the Effective Model in the proposed project reach range from 0.03 to 0.052 in the channel bottom and from 0.035 to 0.05 for the banks. Manning's "n" values for the Effective Model were unchanged for this analysis. In the Proposed Conditions model, vegetation was added:

- South of Oxford Avenue - Approximately 2' above the low flow thalweg invert elevation up to the top of both bank between drop structures
- North of Oxford Avenue – On both banks outside of proposed park improvements
- Above 100-yr Flood Water Surface – Dense vegetation including trees at or near top of banks

A Manning's "n" value of 0.07 was selected for modeling in-river vegetation based on the roughness used in the 2003 USACE Section 1135 report conveyance analysis. A flume study was conducted by the USACE titled "ERDC/CHL TR-00-25" in October 2000, where willows of various characteristics were tested for resistance to flow. According to the study, willow growth of 8 feet high, 6 feet wide, a density of 1 plant per square foot, and a flow depth of 8 feet results a roughness value of 0.07. Manning's "n" values used for the channel bottom are 0.03 and 0.025 for center boat chutes. A Manning's value of 0.1 was used for dense vegetation, including trees, at the top of the banks.

A sensitivity analysis was conducted to evaluate the effect of increased vegetation roughness on flood conveyance. Roughness values in the Proposed Conditions model were increased from 0.07 to 0.1. Proposed 100-year water surface elevations were below the Corrected Effective model water surface throughout the project with the exception of a localized rise of approximately 0.2 foot for 100 feet near Drop #5.

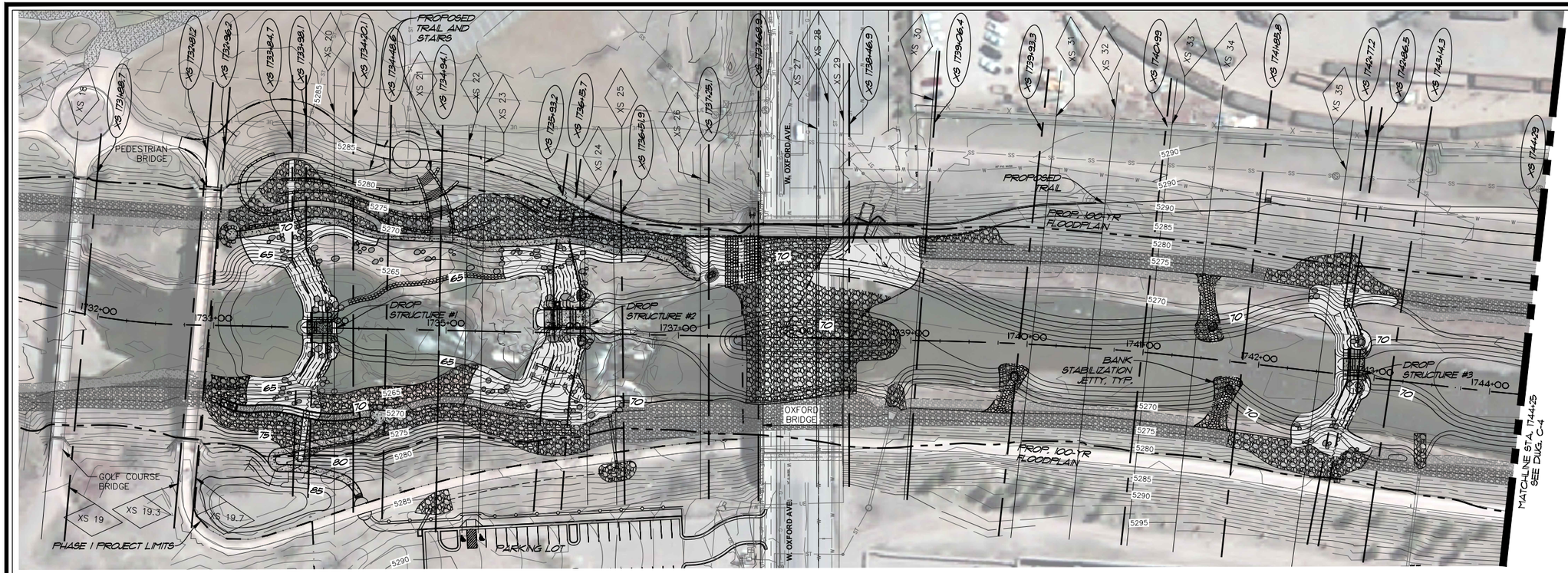
Proposed river vegetation has been designed (See Design Drawings). The vegetation modeled is beyond the intended vegetation, in particular the density of woody vegetation, and resulting hydraulic roughness. Although woody vegetation in the channel is planned, dense woody vegetation throughout the reach is not. Further discussion and detail regarding planned vegetation is presented later in this section.

Several stationing conventions have been used for the project reach. Stationing in the original USACE construction plans increases from upstream to downstream. HEC-RAS requires that model stationing increase from downstream to upstream. Cross section numbering in the Effective Model was changed to meet required HEC-RAS station conventions. USACE design/construction stationing is listed for each cross section in the description field in the model. Proposed Conditions Model stationing was developed based on the report by Wright Water Engineers, Inc. titled "Flood Hazard Area Delineation, South Platte River, Denver Metropolitan Area, Sand Creek to Oxford Avenue" dated September 1985 and the project channel centerline. Federal Emergency

Management Administration (FEMA) flood hazard (FIRM) mapping downstream of the USACE channel improvements was developed from this study. Bridge locations and corresponding cross section stations were used to correlate the project stationing and the 1985 study. The centerline alignment was defined by MWDG based on recent topographic survey work. Effective and Proposed Conditions Models stationing were coordinated for comparison using common locations such as bridges and control structure crests.

Orthometric height differences exists between National Geodetic Vertical Datum 1929 (NGVD 29) and the North American Vertical Datum 1988 (NAVD 88). Recent topographic survey work completed for the project and used for hydraulic modeling is referenced to NAVD 88 whereas the Effective Model and original channel design is on the NGVD 29 datum. Using the datum conversion application on the National Geodetic Survey website and the project latitude and longitude, a correction of +3.022 feet resulted. Comparison of topographic survey data for the Boat Chute #1 crest (site of original Union Weir) with the crest elevation from the original USACE design and hydraulic model indicates a correction of +3.1'. In addition, a correction of 3.1' was used for recent flood hazard mapping completed by Moser and Associates in 2010 downstream of Oxford Avenue. A correction of +3.1' was applied to the Effective Model to adjust to NAVD 88.

----------END MEMORANDUM----------

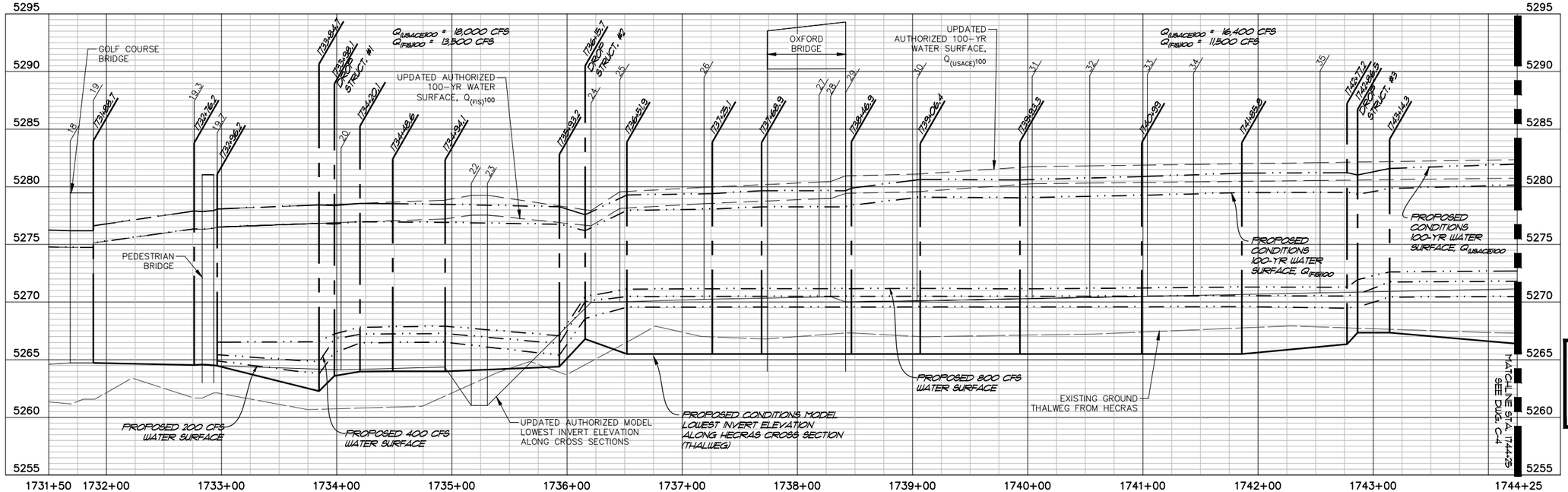


50 0 50 100

1 inch = 50 feet
IF SHEET SIZE IS NOT ANSI D (22"X34")
THEN GRAPHIC SCALE MUST BE USED
CONTOUR INTERVAL = 1'

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- PROPOSED CONCRETE
- PROPOSED GROUTED BOULDERS
- PROPOSED IMPORT COBBLE W/ NATIVE SANDS MIXED
- PROPOSED FEATURE BOULDER
- PROPOSED SOIL RIPRAP
- PROPOSED CRUSHER FINES TRAIL
- XS 35 — UPDATED AUTHORIZED MODEL CROSS - SECTION
- XS 1742+77.2 — PROPOSED CONDITION MODEL CROSS - SECTION



PROFILE VIEW - STA. 1731+50 TO 1744+25

HOR. 1" = 50'
VER. 1" = 5'

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DO NOT USE FOR CONSTRUCTION LAYOUT.
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FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1731+50 TO STA. 1744+25

McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: AKA
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-3

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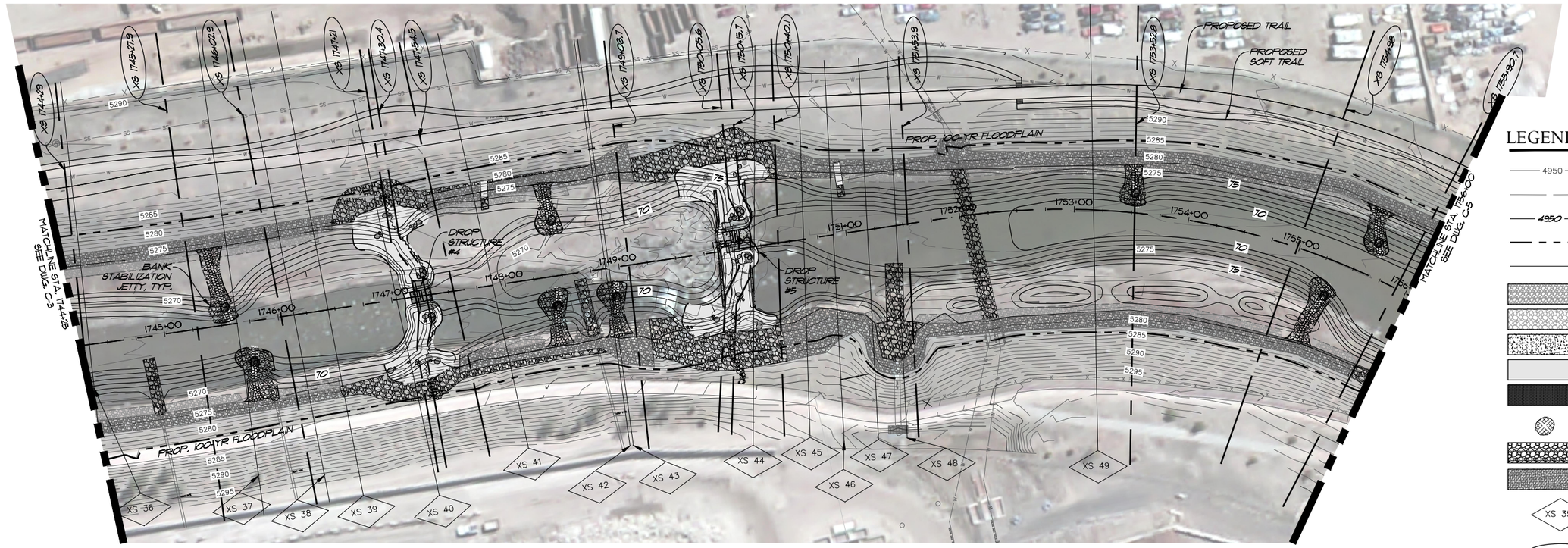

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- 4950 — PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
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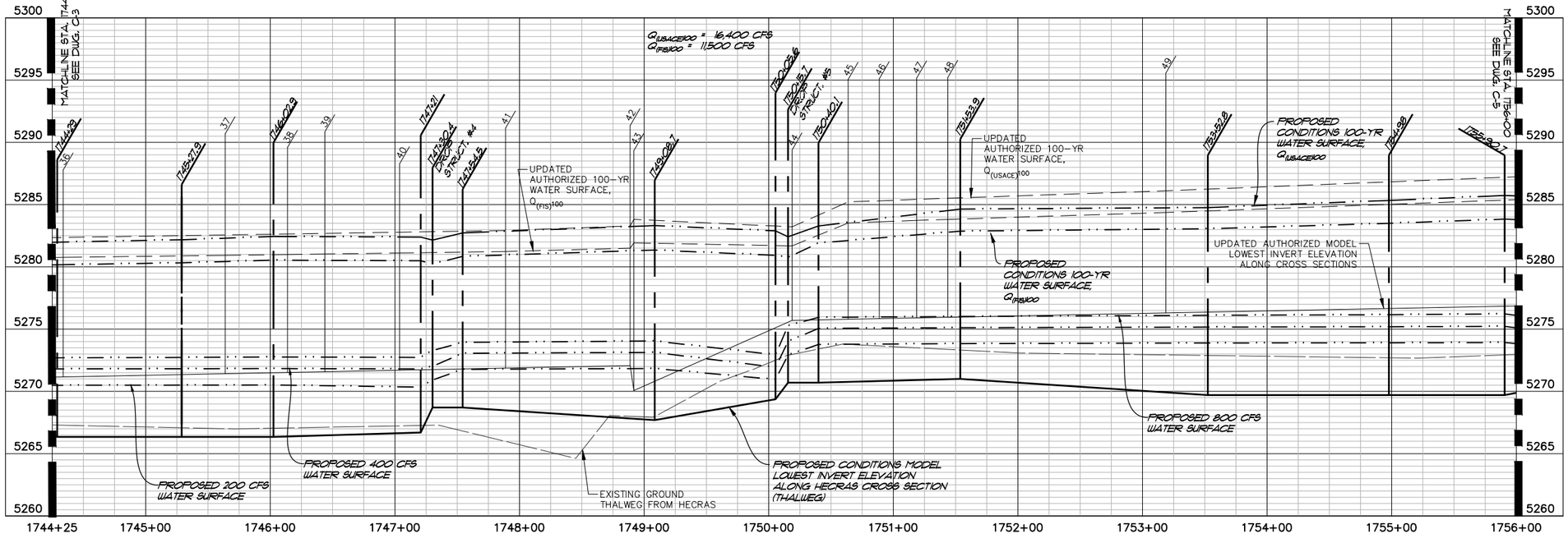

PROFILE VIEW - STA. 1744+25 TO 1756+00

HOR. 1" = 50'
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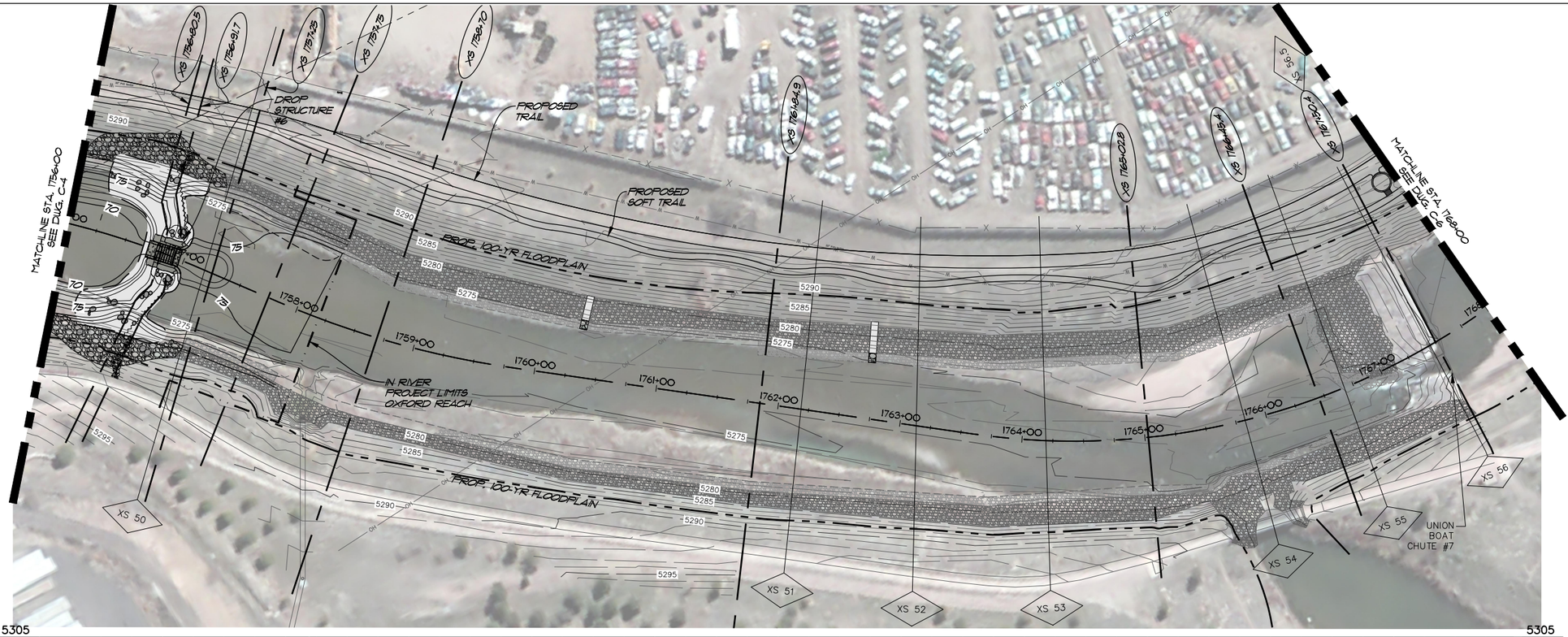

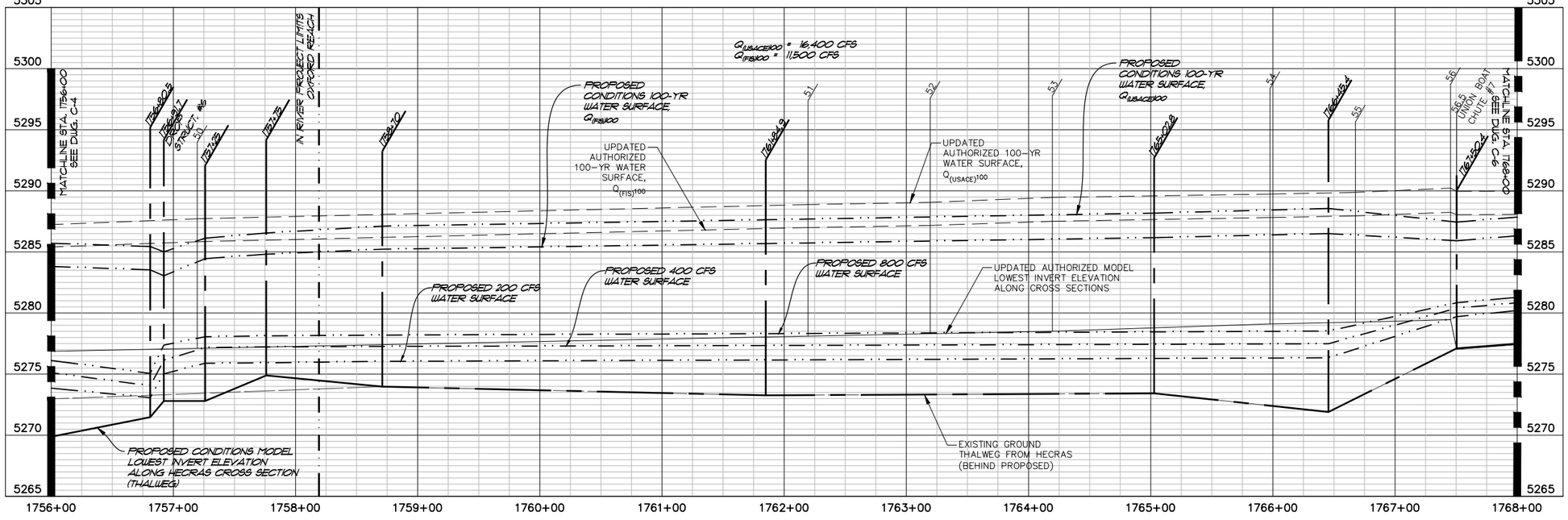

PROFILE VIEW - STA. 1756+00 TO 1768+00

HOR. 1" = 50'
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50 0 50 100

1 inch = 50 feet

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Drawing Number:
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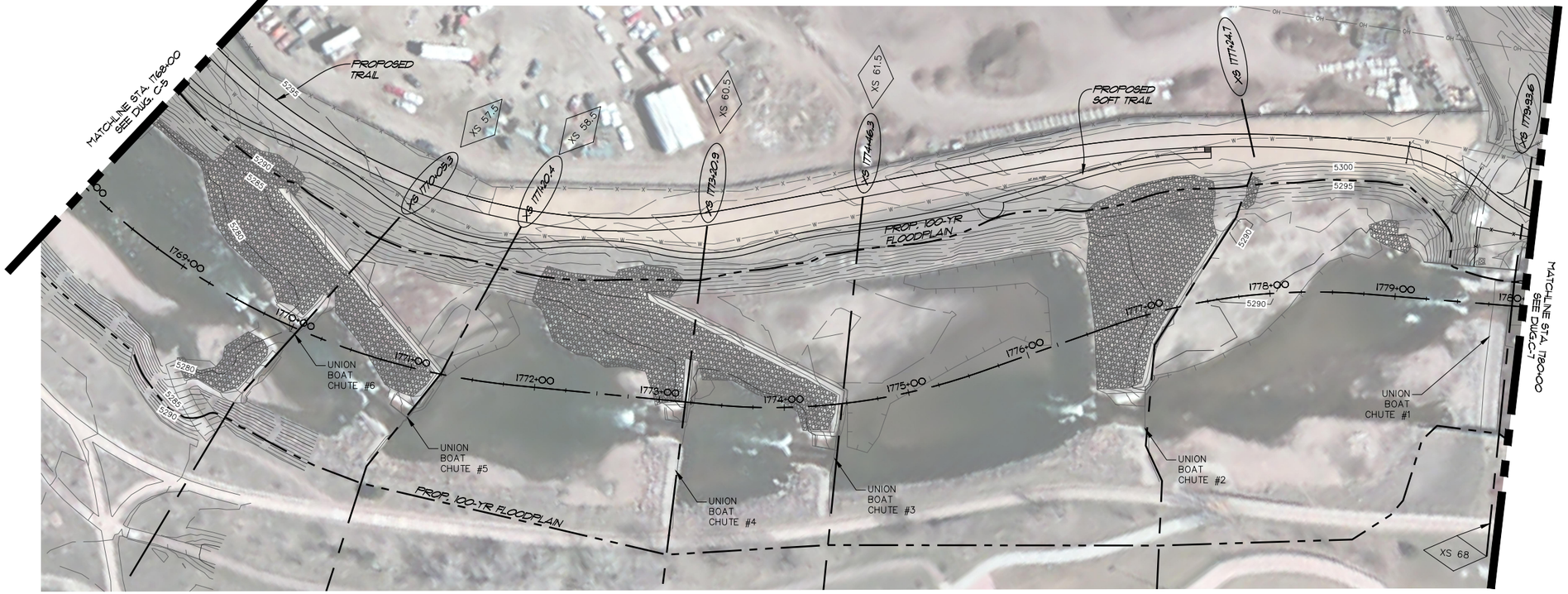

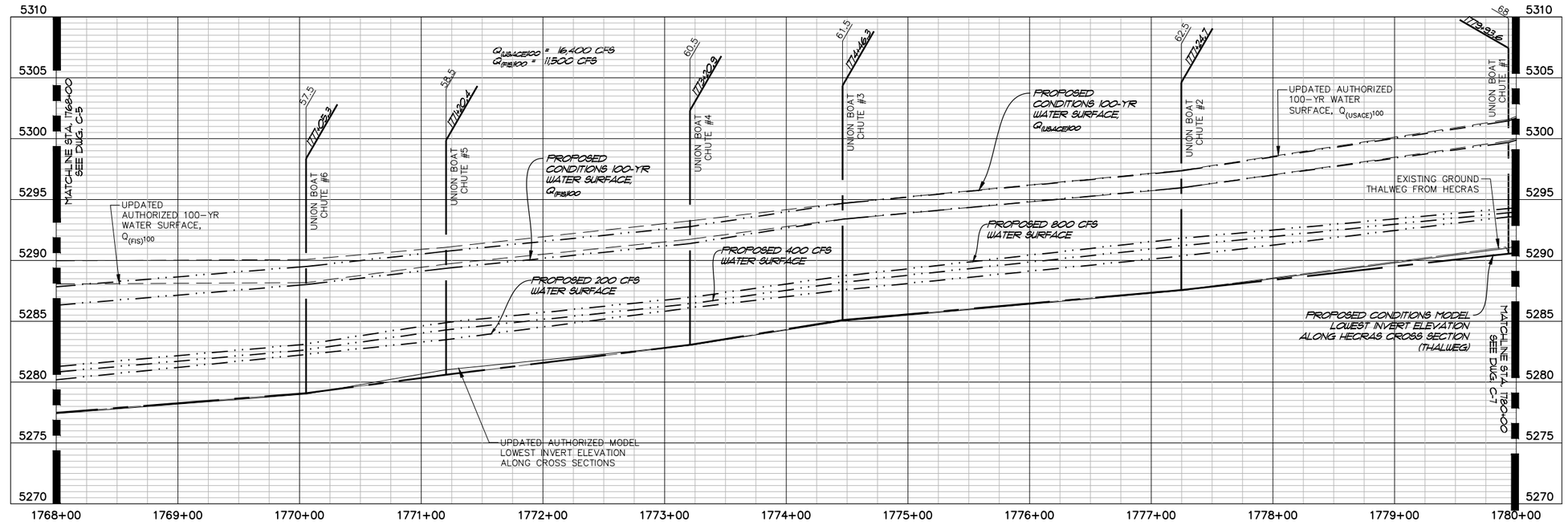

PROFILE VIEW - STA. 1768+00 TO 1780+00

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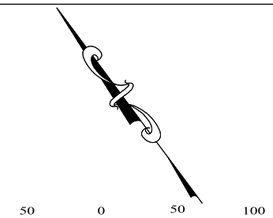
VER. 1" = 5'



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- PROPOSED CRUSHER FINES TRAIL
- XS 35 — UPDATED AUTHORIZED MODEL CROSS - SECTION
- XS 1742+77.2 — PROPOSED CONDITION MODEL CROSS - SECTION

FOR INFORMATION ONLY.
DO NOT USE FOR CONSTRUCTION LAYOUT.
SEE DWGS C-14 THROUGH C-19 FOR RIVER CHANNEL GRADING

PERMIT REVIEW SET
NOT FOR CONSTRUCTION

811 Know what's below. Call before you dig.

Number	Revision Description	By	Date

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1768+00 TO STA. 1780+00

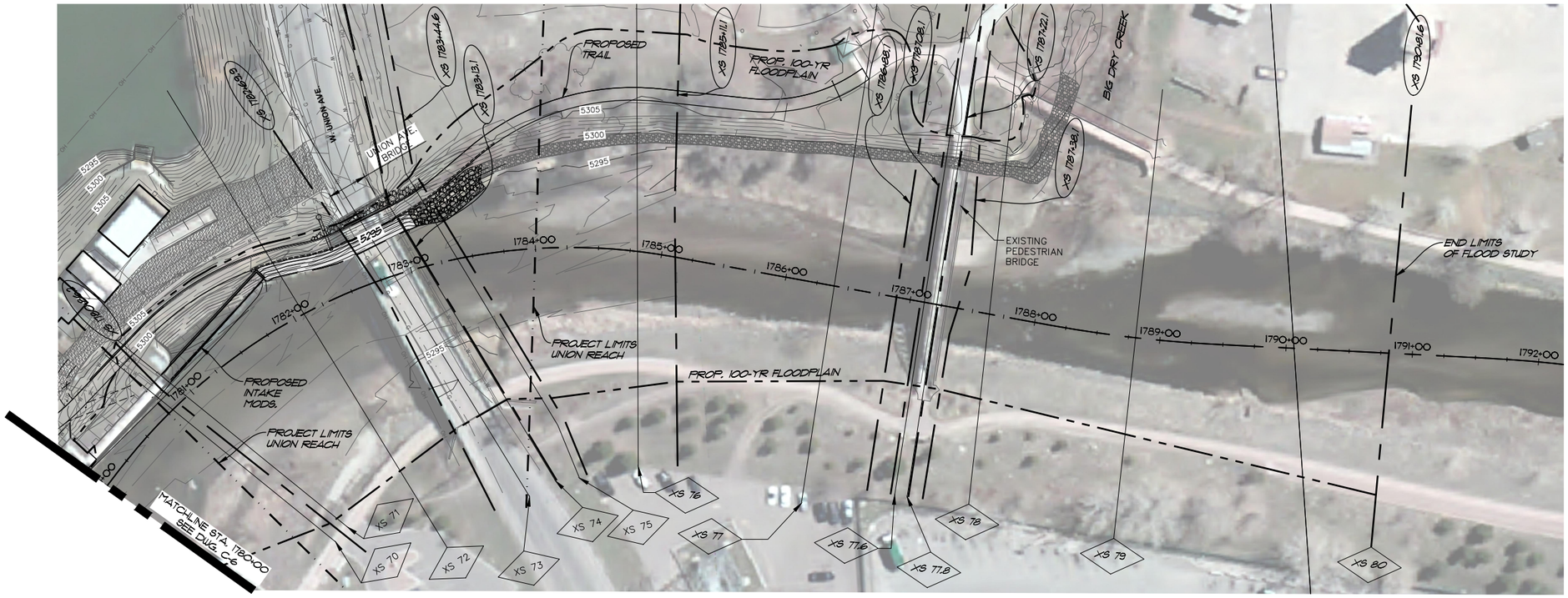
Laughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T 303.964.3333
F 303.964.3355

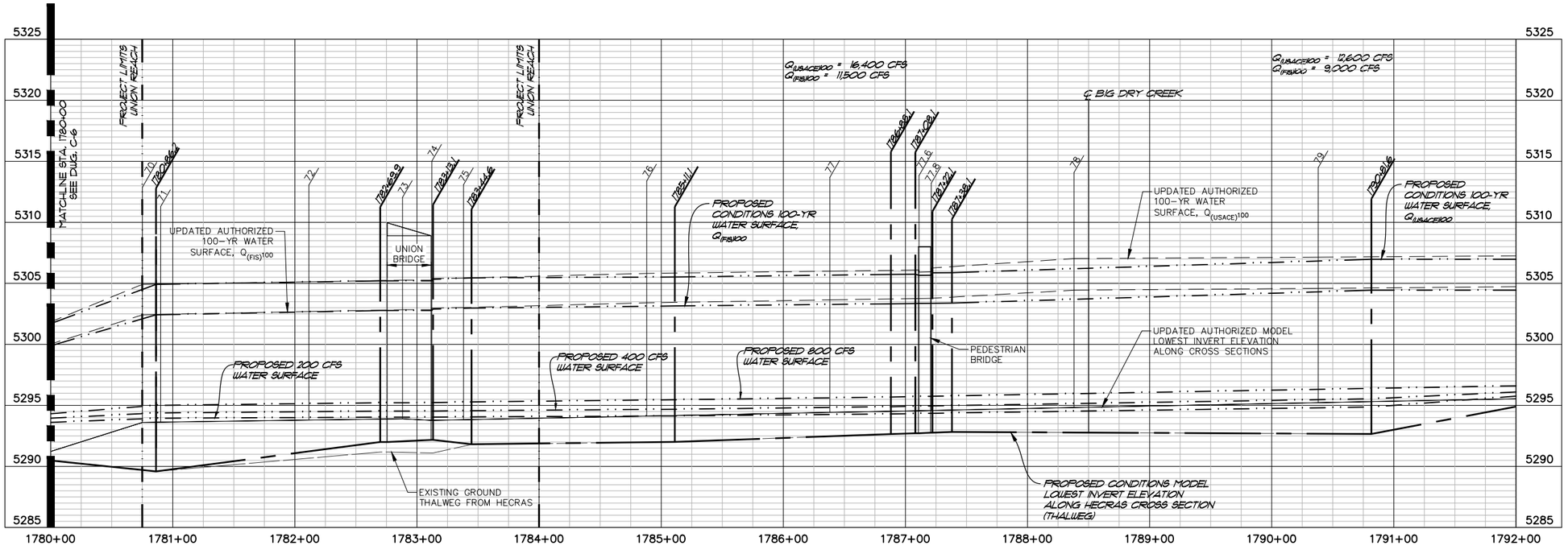
DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: AKA
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-6

REV1 MWOD ACTIVE JOBS\OXFORD UDFCD\DRAWINGS — AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_RIVER P&P Last Saved: May 19, 2016





PROFILE VIEW - STA. 1780+00 TO 1792+00

HOR. 1" = 50'
VER. 1" = 5'

50 0 50 100

1 inch = 50 feet

IF SHEET SIZE IS NOT ANSI D (22"X34") THEN GRAPHIC SCALE MUST BE USED

CONTOUR INTERVAL = 1'

LEGEND

- 4950 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 4950 — PROPOSED CONTOUR MAJOR
- PROPOSED 100-YR FLOODPLAIN
- PROPOSED CONTOUR MINOR
- EXISTING RIPRAP
- EXISTING RIPRAP - LARGE BOULDERS
- PROPOSED CONCRETE
- PROPOSED GROUTED BOULDERS
- PROPOSED IMPORT COBBLE W/ NATIVE SANDS MIXED
- PROPOSED FEATURE BOULDER
- PROPOSED SOIL RIPRAP
- PROPOSED CRUSHER FINES TRAIL
- XS 35 — UPDATED AUTHORIZED MODEL CROSS - SECTION
- XS 17.42+77.2 — PROPOSED CONDITION MODEL CROSS - SECTION

FOR INFORMATION ONLY. DO NOT USE FOR CONSTRUCTION LAYOUT. SEE DWGS C-14 THROUGH C-19 FOR RIVER CHANNEL GRADING

PERMIT REVIEW SET
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Know what's below. Call before you dig.

Number	Revision Description	By	Date

UDFCD
SHERIDAN, COLORADO

SOUTH PLATTE RIVER RUN PARK
FINAL DESIGN

RIVER PLAN & PROFILE
STA. 1780+00 TO STA. 1792+00

McLaughlin Whitewater design group
A DIVISION OF MERRICK & COMPANY
2420 Alcott St
Denver, CO 80211
T303.964.3333
F303.964.3355

DESIGN: BAN, REM
DETAIL: BAN, MPA
CHECK: REM
DATE: MAY, 2016

PROJECT NUMBER
6511741908

Drawing Number:
C-7

R:\1 MWDD ACTIVE JOBS\OXFORD UDFCD\DRAWINGS - AUTOCAD\CONSTRUCTION DRAWINGS\OXFORD_RIVER P&P Last Saved: April 19, 2016

McLaughlin Whitewater design group

A DIVISION OF MERRICK & COMPANY

MEMORANDUM

To: File

From: Ben Nielsen, P.E., Mathew Accardo, E.I.T.

Date: June 2015

RE: South Platte River Run Park – Stability Analysis Summary

Hydrology

Flow rates and the frequency of water flowing in the river are critical to the:

- Design of in-river and bank improvements
- Flood Analysis, and
- Selection of vegetation

Several hydrologic analysis methods were performed to determine the hydrology for different design aspects. Exceedence analysis was performed to determine target design low/typical flows. Flow frequency analysis was conducted using the Pearson Log III Regression Method to determine key peak events, such as 1.5-year, 2-year and 5-year return intervals. River flow data from USGS stream gage #06710247 located in the Union Reach near the City of Englewood raw water intake was used in both methods. High flow hydrology, such as the 100-year event, that was developed for design of the original USACE FRRP facilities and from the FEMA Flood Insurance Study (FIS) were used for evaluation of flood conveyance (see USACE Hydraulic and FEMA Hydraulic Sections). Tables 1 and 2 provide a summary of the hydrology results.

During discussions with USACE, the Authorized 100-year flow is not clear. There are two 100-year flows that have been identified for the project reach: 13,500 cfs and 18,000 (both at Oxford Avenue). According to the revised hydrology from 1979 presented in the supplemental report titled "Phase 1 SUPP. To D.M. PC-20 Exhibit "A" – 4th Ind." to the "South Platte River, Colorado Chatfield Dam and Lake Supplement No. 1 Design Memorandum No. PC-20 Phase 1 Report Downstream Channel Improvement" dated December 1976, it appears that the 100-year flood flow for the reach is 16,400 cfs upstream of Oxford and 18,000 cfs downstream of Oxford. These flows are consistent with one of the flow data profiles in the HEC-2 files. However, a Section 1135 Report titled "Project Modifications for Improvement of the Environment, Hydraulic Analysis, Chatfield Downstream Channel Improvement, South Platte River" dated August 2003 used 13,500 cfs. In addition, 13,500 cfs is 100-year flow in the current FEMA FIS. The flood analysis evaluated both flows as requested by USACE.

Table 1 – South Platte River Run Park Flow Frequency Event Summary

Flow Frequency Event	Flow (cfs)	Source
1-yr	800	Stream Gage/Pearson Log III
1.5-yr	1,128	Stream Gage/Pearson Log III
2-yr	1,434	Stream Gage/Pearson Log III
5-yr	2,030	Stream Gage/Pearson Log III
Capacity of Channel D/S of Chatfield Reservoir	5,000	USACE Design Hydrology
100-yr @ Union Avenue	11,500	FEMA FIS Hydrology
100-yr @ Oxford Avenue	13,500	FEMA FIS Hydrology
100-yr @ Union Avenue	16,400	USACE Design Hydrology
100-yr @ Oxford Avenue	18,000	USACE Design Hydrology

Table 2 – South Platte River Run Park Typical Flow Hydrology Summary

Month	Average Daily Flow (cfs)	10% Exceed. Flow (cfs)	90% Exceed. Flow (cfs)	Days (Q>200cfs)	Days (Q>400cfs)	Days (Q>800cfs)	Days (Q>2000cfs)
Jan.	31	66	10	0	0	0	0
Feb.	44	88	12	0	0	0	0
Mar.	96	194	12	3	1	1	0
Apr.	215	458	22	11	4	2	0
May	401	914	28	18	9	4	1
Jun.	361	881	40	18	9	3	0
Jul.	272	589	24	15	8	1	0
Aug.	191	409	18	13	3	0	0
Sep.	77	176	16	2	0	0	0
Oct.	64	152	18	1	0	0	0
Nov.	42	100	10	0	0	0	0
Dec.	32	72	11	0	0	0	0
				81	**34**	**11**	**1**

Releases from Chatfield Reservoir are a primary source of water to the project reach. The Chatfield Reservoir Storage Reallocation project, currently in planning, has the potential to change operations and flow releases from the reservoir. According to the Draft Environmental Impact Statement (EIS) dated June 2012, "The primary objective of the reallocation is to help enable water providers to supply water to local users, mainly municipal, industrial, and agricultural needs, in response to rapidly increasing demand." Four alternatives are presented in the draft EIS including a no action alternative (Alternative 1). 20,600 acre-feet of flood storage capacity in the reservoir would be reallocated for water supply in the "tentatively Recommended Plan" (Alternative 3). In

order to store additional water, it appears that in general flow releases to the downstream South Platte River in April, May and June would be reduced. Water releases in July would increase slightly. According to the draft EIS, "the magnitude of differences in downstream flow between the alternatives (1 and 3) would be insignificant". Analysis in the Draft EIS suggests that the mean annual outflow from the Reservoir into the South Platte River for Alternative 1 would range from approximately 56.2 to 780.4 cfs compared to 54.2 to 759.3 cfs for Alternative 3.

Drop Structures

New and modified existing drop structures were designed per the "Urban Storm Drainage Criteria Manual" by UDFCD dated June 2001 Revised April 2008. Hydraulic conditions, such as drop, depth, and velocity, were determined with a HEC-RAS one-dimensional hydraulic model, TUFLOW two-dimensional hydraulic model, and physical model study. Headwater-Tailwater Curves were calculated for each drop structure (Attached). A seepage analysis was performed using the Lane's Weight Creep Method with recommended creep ratios from CTL Thompson. Sheet pile will be used to control seepage and reduce uplift pressures at each drop structure. Uplift analysis using flow nets was performed for the drop structures. Drop structures are armored with grouted boulders and reinforced concrete due to high shear stresses and impact forces related to supercritical flow and hydraulic jump formations. The banks downstream of each drop are armored to 60% of the hydraulic jump length (UDFCD criteria) as calculated based on "Open Channel Hydraulics" by Chow 1959. Subsurface grouted boulders and self-launching riprap are designed along the downstream edge of structure for scour protection. Calculations are included in available upon request. Table 3 below is a summary of drop structure seepage analysis results.

Table 3 – Seepage Analysis Results

Drop Structure	Subsurface Cutoff Depth Required	Cutoff Type
Drop #1	8 feet	Sheet Pile
Drop #2	10 feet	Sheet Pile
Drop #3	6 feet	Sheet Pile
Drop #4	6 feet	Sheet Pile
Drop #5	8 feet	Sheet Pile
Drop #6	8 feet	Sheet Pile

Scour Analysis

A scour analysis was conducted for drop structures, retaining walls, bridge abutments, and bridge piers. Scour was calculated based on "Computing Degradation and Local Scour Technical Guideline for Bureau of Reclamation" by Pemberton and Lara dated January 1984 (Pemberton) and "Hydraulic Engineering Circular No. 18 Evaluating Scour at Bridges Fifth Edition" by U.S. Department of Transportation dated April 2012 (HEC 18). Scour at the base (toe) of in-river

structures were evaluated using both regime-type and empirically developed methods in Pemberton. As recommended, an average of the expected scour from several methods was used to determine design scour depths. Three drop structures were used to calculate scour and results used for the other three drops with similar hydraulic conditions. Union Avenue and Oxford Avenue bridge abutments, proposed trail underpass walls (at bridges), and piers were evaluated by Pemberton and HEC 18. Scour calculations are available upon request. Table 4 is a summary of design scour depths.

Table 4 – Scour Analysis Results

Design Element	Scour Depth (ft)	Analysis Method
Oxford Bridge - Trail Underpass Retaining Walls	16.5	USBR - Average of Neill, Lacey, Blench
	18	FHWA - Laursen (Clear Water)
	17.5	Design Scour Depth
Oxford Bridge Pier	13	USBR - Jain
	11	FHWA - HEC-18
	12	Design Scour Depth
Union Bridge - Trail Underpass Retaining Walls	13	USBR - Average of Neill, Lacey, Blench
	12.5	FHWA - Laursen (Clear Water)
	13	Design Scour Depth
Union Bridge Pier	6	USBR - Jain
	7	FHWA - HEC-18
	7	Design Scour Depth
Drop Structures – 1 foot	12	USBR - Average of Zimmerman & Maniak, Lacey, Blench, Neill (average depth excluding outliers)
Drop Structures – 2 foot	13	USBR - Average of Schoklitsch, Zimmerman & Maniak, Neill, Blench (average depth excluding outliers)
Drop Structures – 3 foot	15	USBR - Average of Schoklitsch, Zimmerman & Maniak, Neill, Lacey, Blench (average depth excluding outliers)

Subsurface grouted boulders, sheet pile, self-launching riprap, and armoring have been designed to protect proposed in-river structures from scour. Bridge abutments and piers have been armored for scour depths calculated. MWDG and UDFCD had a meeting in spring of 2015 to discuss scour protection and design approach for channel banks and drop structures. The UDFCD design standard for scour protection on the South Platte River is 5 feet below the toe of slopes and pool bottom at drop structures. UDFCD confirmed the use of their typical scour standard for River Run Park drop structures and bank protection. Toe protection for drop structures with less than 3 feet of hydraulic drop has been designed with grouted boulders extending 5 feet below the pool bottom

with self-launching riprap for additional protection. At the largest drop structure (3 feet of hydraulic drop) grouted boulders have been extended to a depth of 7 feet below the pool with self-launching riprap. Bank protection, such as riprap and sloped grouted boulders, has been extended 5 feet below the toe of bank.

Bank Stabilization

Existing bank protection in the project reach is achieved with riprap armoring along both banks to approximately the 5,000 cfs river level. The following is a summary of proposed bank stabilization:

- Existing riprap will remain or, where disturbed, be replaced with riprap.
- Additional riprap will be added as necessary to maintain bank protection to the 5,000 cfs level (USACE channel protection standard).
- Based on UDFCD reports the existing riprap extends approximately 3-5' below the channel bottom at the toe of the banks. In areas where the existing channel bottom and proposed channel bottom are at the same elevation no additional toe riprap will be added.
- Riprap will be extended 5' below proposed toe of bank in areas of channel lowering per UDFCD toe protection criteria on the South Platte River.
- All riprap will be buried and planted (non-woody vegetation) per UDFCD standard details.
- Union Avenue Bridge – Grouted terraced boulders will be used for stabilization along the north bank under the bridge deck
- Oxford Avenue Bridge – Riprap will be used for stabilization

Riprap Sizing

Riprap was designed per the UDFCD Criteria Manual and HEC-11 method by the Federal Highway Administration. HEC-RAS and TUFLOW hydraulic models were used for evaluation of riprap. Type "M" riprap (d50 = 12") is currently used for bank stabilization. Calculations suggest smaller riprap is allowable. However, Type "M" riprap was selected to provide a higher level of protection for bank armoring. Riprap will be used for local scour at modified stormwater outfalls and was sized per UDFCD criteria.

Emergent Bench Stabilization

Low flow channel benches (emergent benches) will be stabilized with a combination of vegetation and boulder jetty structures. MWDG worked with UDFCD to develop an armoring approach that balances maintenance, risk, capital cost, and natural function. A summary of the armoring approach is as follows:

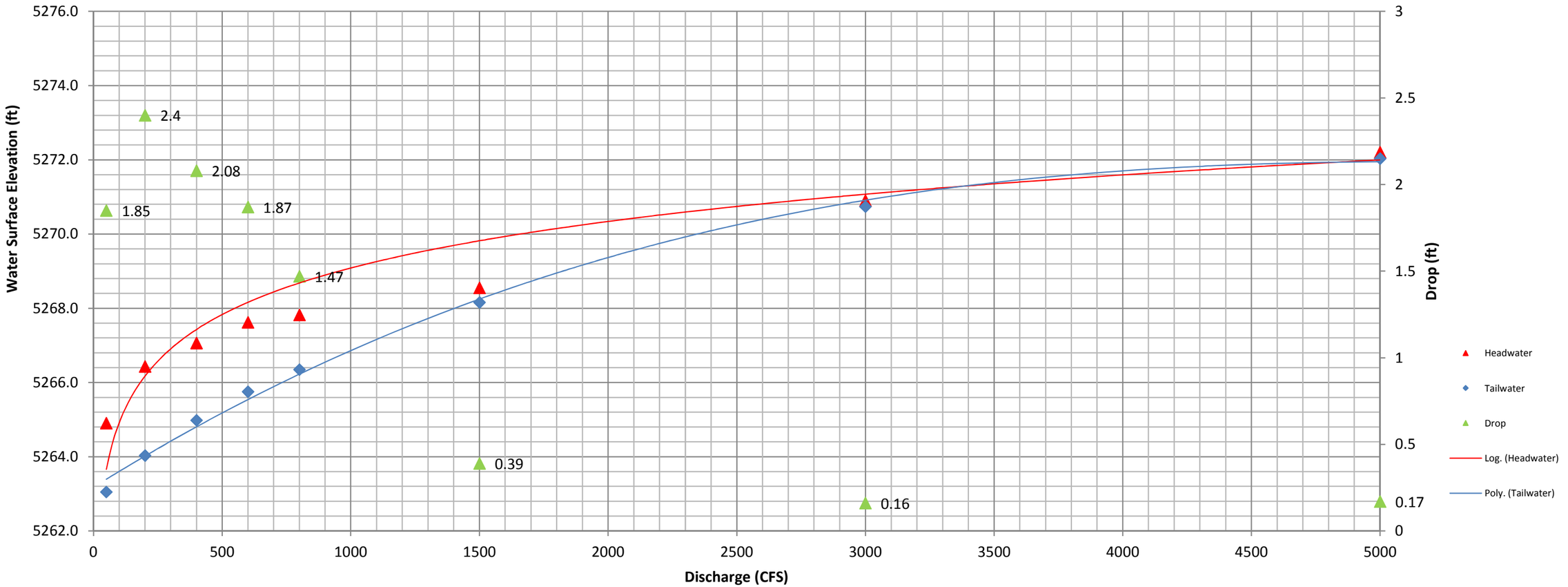
- The flood channel (overall river channel) is armored with buried riprap along banks
- Movement and scour of benches was deemed acceptable by UDFCD during high flow events (overtopping of benches)
- Balancing capital costs of armoring with maintenance cost was considered – after high flow events (2-year+) maintenance of benches will likely be required
- Boulder jetties at intervals between 100 to 300 feet were selected for bench stabilization
- Jetty scour protection to 5 foot depth

- Vegetation is needed for bench stability between jetties – level of scour protection from vegetation is dependent on timing of flows and density and type of vegetation established

----------END MEMORANDUM----------

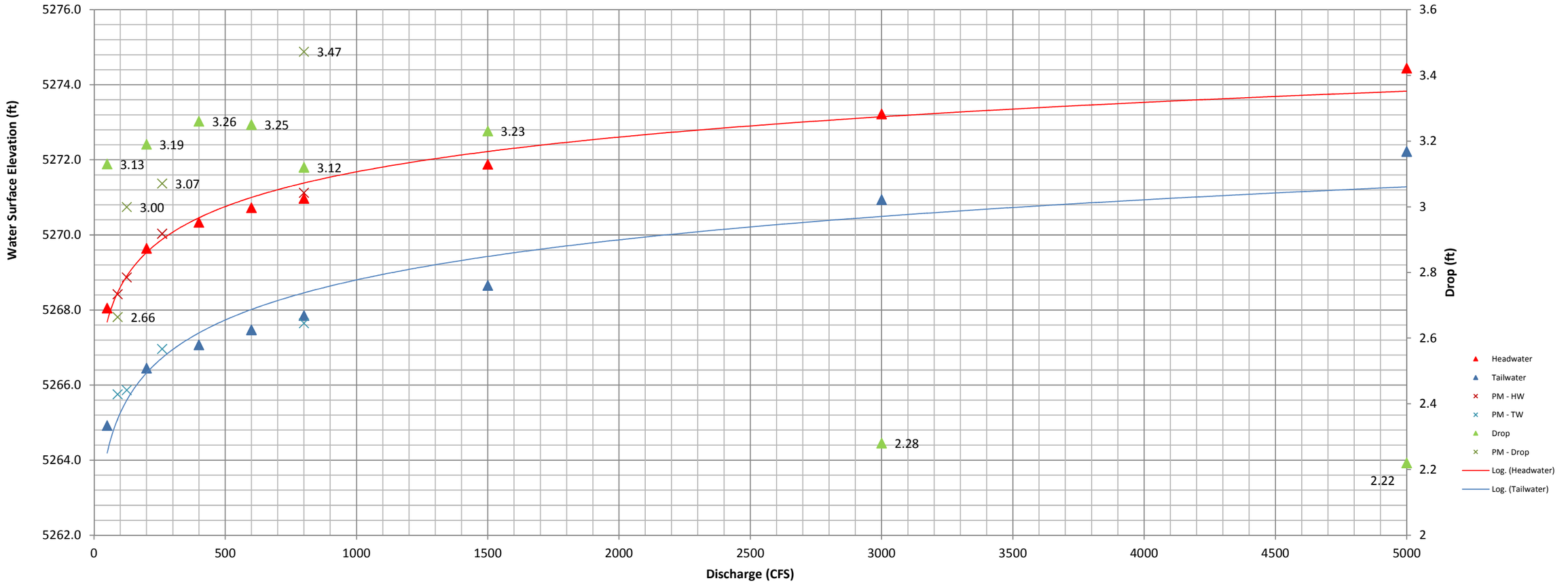
Drop #1 - Future DS Channel Grading
Proposed Headwater/Tailwater Curve

100-yr Drop = 0.2'



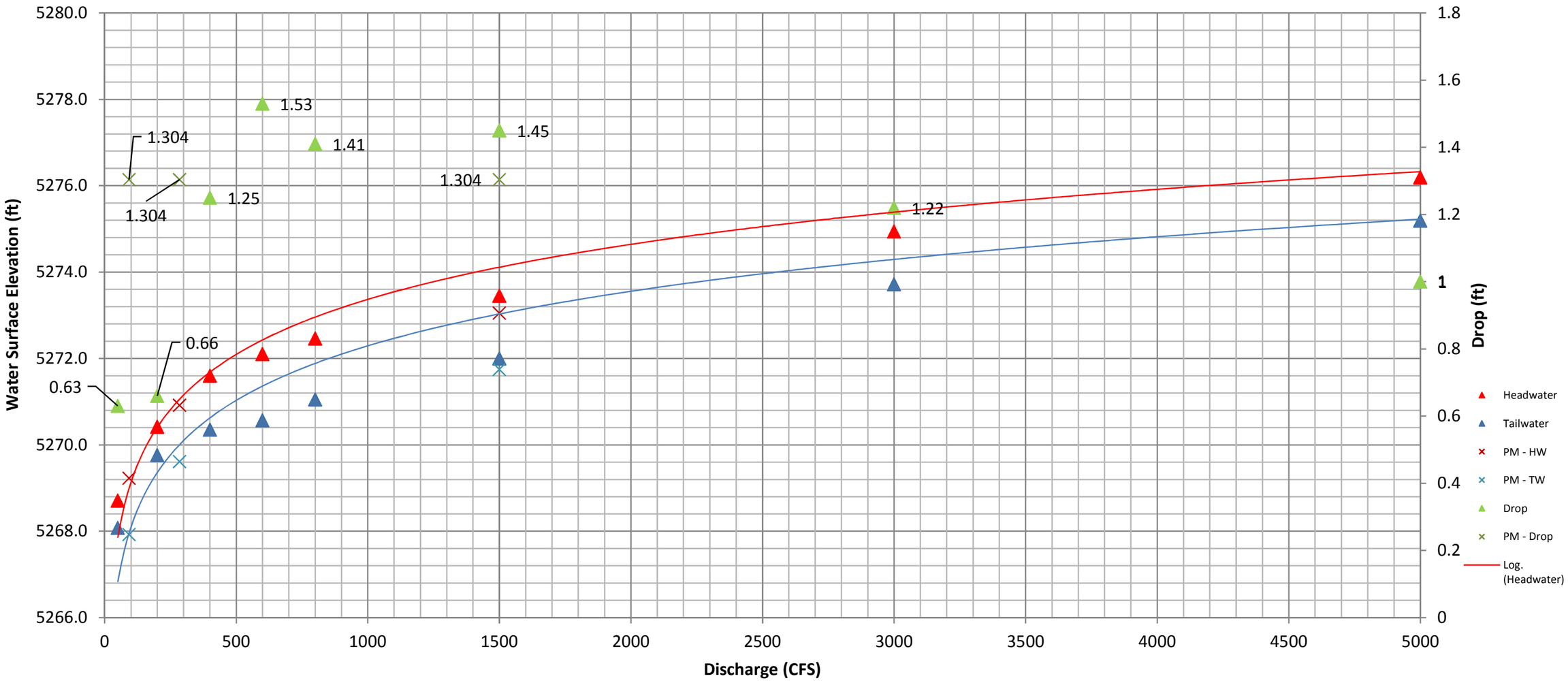
Drop #2
Proposed Headwater/Tailwater Curve

100-yr Drop = 2.2'



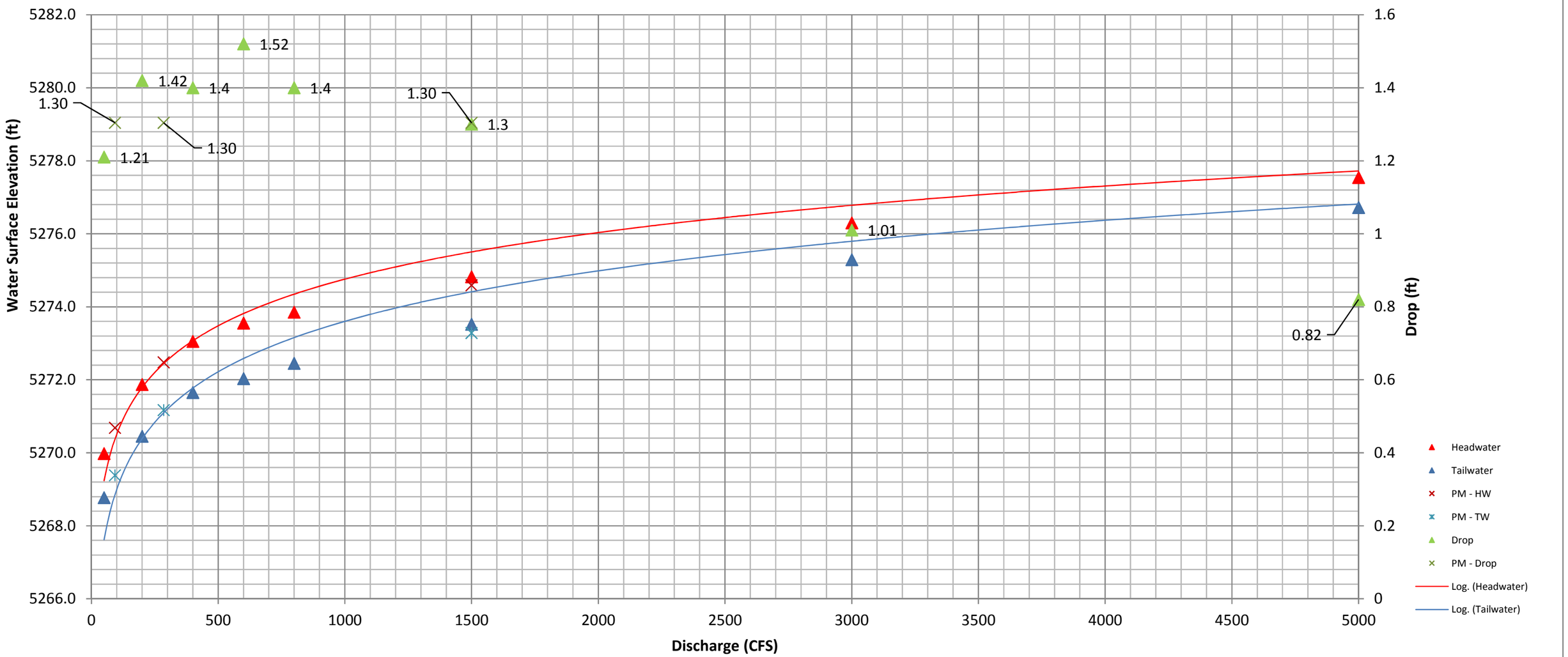
Drop #3
Proposed Headwater/Tailwater Curve

100-yr Drop = 0.5'



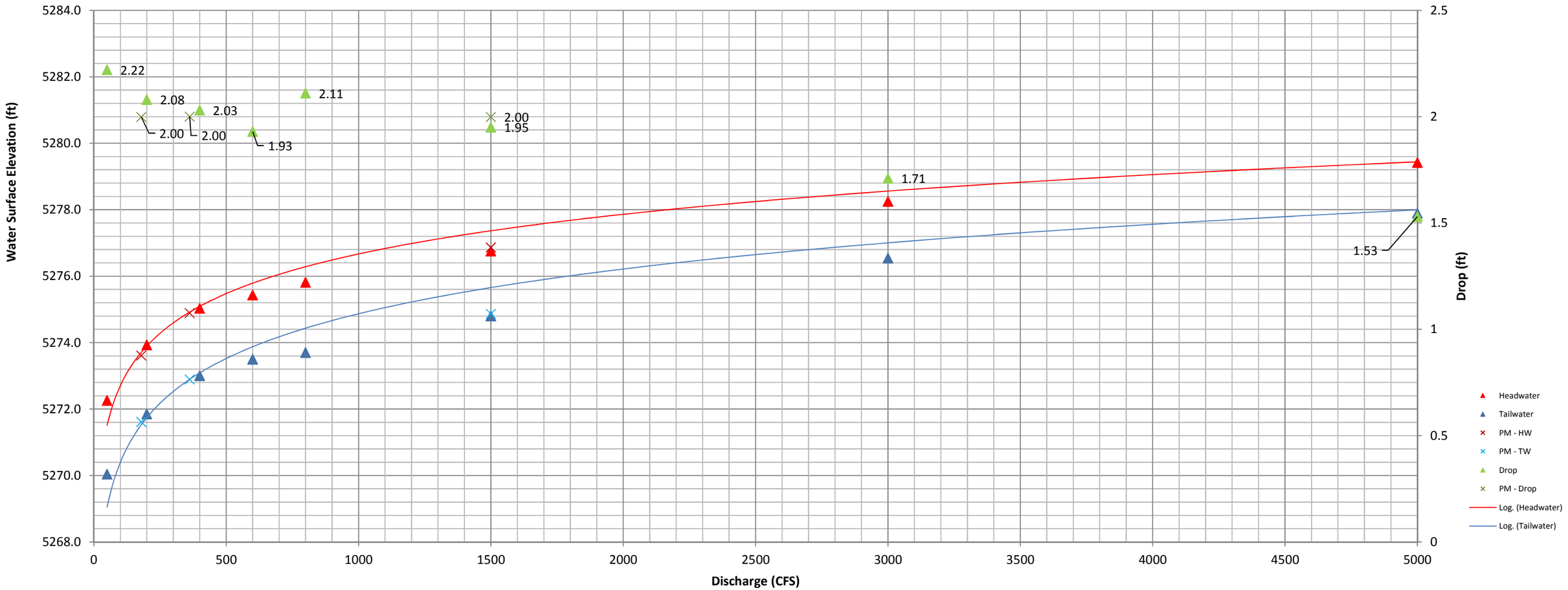
Drop #4
Proposed Headwater/Tailwater Curve

100-yr Drop = 0.4'



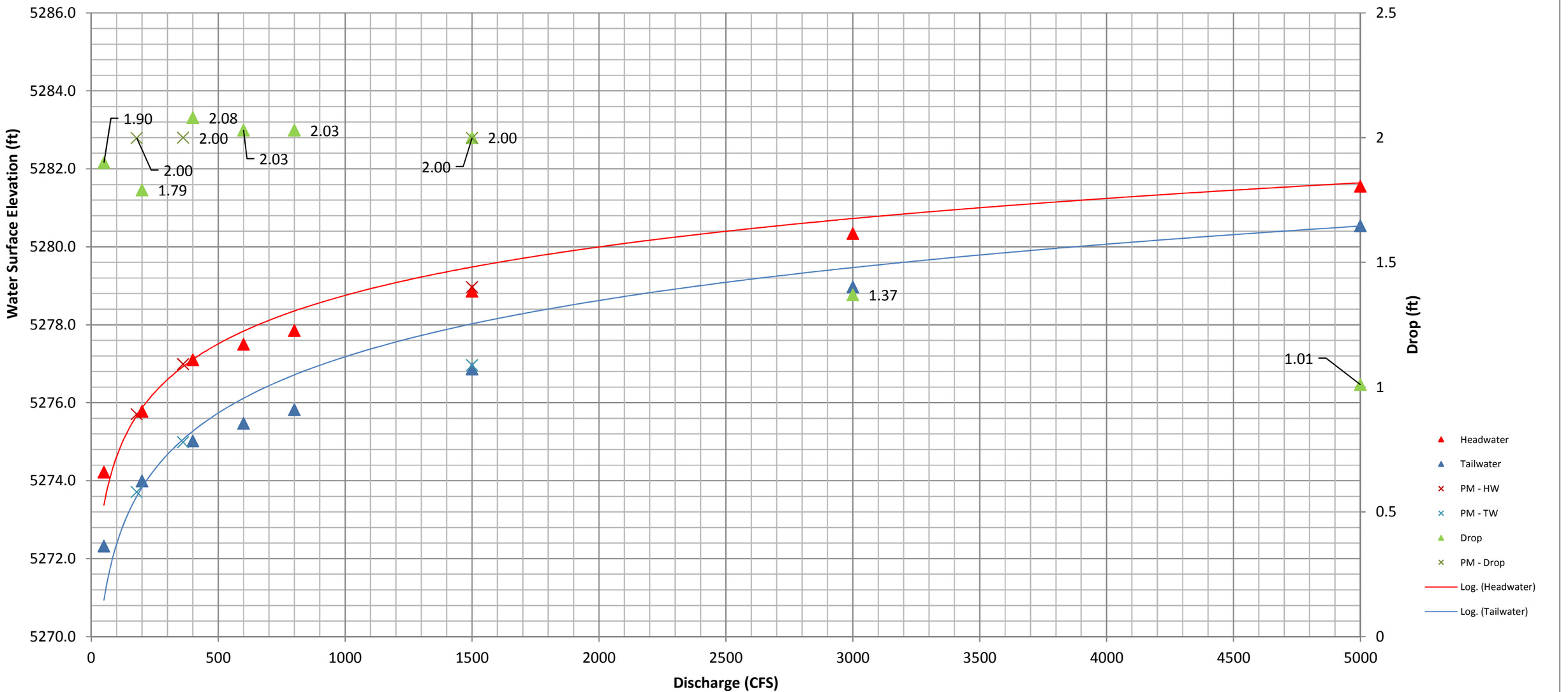
Drop #5
Proposed Headwater/Tailwater Curve

100-yr Drop = 0.8'



Drop #6
Proposed Headwater/Tailwater Curve

100-yr Drop = 0.2'



Appendix D Support Letters

COLORADO PARKS & WILDLIFE

6060 Broadway • Denver, Colorado 80216
Phone (303) 297-1192 • FAX (303) 291-7109
wildlife.state.co.us • parks.state.co.us

June 12, 2012

Joe Busto
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Dear Joe,
This letter is in regards to the project planned by the Colorado Water Conservation Board (CWCB) and Urban Drainage and Flood Control District to conduct habitat and recreation enhancements in the CWCB reach of the South Platte River; this reach is bordered on the south by South Platte Park and on the north by the confluence with Bear Creek. One of the proposed phases of this project is the redesign of the boat chutes at Union Avenue, which in their current form inhibit fish passage due to the extensive use of concrete.

Fish species present in this reach include native species such as fathead minnow, longnose dace, white sucker, green sunfish, channel catfish, Johnny darter, and Iowa darter. Gamefish species present include rainbow and brown trout, walleye, and smallmouth bass. Although no gamefish are stocked in this reach, they move into it from other stocked waters such as Chatfield and Bear Creek reservoirs, and the South Platte River within South Platte Park. Every year we hear more reports from anglers that they catch quality size bass and trout from the CWCB reach and further downstream within Denver city limits. In fact, the City of Denver has just received a Fishing Is Fun grant to improve fish habitat adjacent to the Grant Frontier and Overland parks. After these habitat improvements are completed, Colorado Parks and Wildlife (CPW) will begin stocking catchable rainbow trout in this section.

Because of the current use of the CWCB reach by native and game species and the planned future stocking in the City of Denver, your proposed redesign of the Union boat chutes will dovetail nicely with Denver's upcoming habitat improvement project. In the long run, your project will provide one more step in the overall improvement of the aquatic environment in the metro reach of the South Platte. Paul Winkle, the CPW Aquatic Biologist for the Denver metro area has already met with you on this subject and is willing to stay involved in technical consulting as your project progresses.

If you have any further questions, you can contact Paul Winkle at (303) 916-1043.

Sincerely,

Steve Yamashita
Northeast Region Manager

Cc: Kathi Green, Ken Kehmeier, Liza Hunholz, Melanie Kaknes, file

South Suburban
PARKS AND RECREATION

Administrative Office
6631 S. University Blvd.
Centennial, CO 80121-2913

phone 303.798.5131
fax 303.798.3030
ssprd.org

March 21, 2017

Fish and Wildlife Resources Fund Grant
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Dear Grant Committee:

South Suburban Park and Recreation District continues to partner with the Cities of Englewood and Sheridan, Arapahoe County Open Space, and Urban Drainage and Flood Control District (UDFCD) on making environmental improvements to the South Platte River Corridor from C-470 to Bates Avenue.

The goals of the River Run Phase III project are to improve aquatic, wetland, and riparian habitat along a central reach of the South Platte River between Union and Oxford Avenues, while maintaining the 100-year flood conveyance capacity.

In order for this project to become a reality, additional funding is needed to restore the natural beneficial functions of the South Platte River. Without additional funding for this project it will not come to fruition.

The District strongly endorses Urban Drainage and Flood Control District's effort in obtaining funding from the Fish and Wildlife Resources Fund Grant through the Colorado Water Conservation Board for the River Run Phase III project.

Sincerely,

Rob Hanna, Executive Director

CITY OF Englewood
PARKS, RECREATION AND LIBRARY

Fish and Wildlife Resources Fund Grant
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

March 21, 2017

Dear Grant Committee Members:

The City of Englewood endorses the Urban Drainage and Flood Control District's effort in obtaining the Fish and Wildlife Resources Fund Grant for the River Run Phase III project. The Cities of Englewood and Sheridan, along with South Suburban Parks and Recreation District, Arapahoe County Open Spaces and Urban Drainage have partnered together to develop a river improvement plan to increase river access, improve water quality and improve fish and wildlife habitat in the South Platte River between Union Avenue and Oxford Avenue.

More specifically, the River Run Phase III project will improve aquatic, wetland and riparian habitat along this important stretch of the South Platte River. The habitat improvements will not adversely impact the 100 year flood plain.

The City of Englewood is committed to this project as a recreational amenity for the citizens of the surrounding area and for the restoration of riparian and fishery habitat in and along the river.

The River Run Phase III project leverages tax dollars from the above mentioned local entities to provide a great natural resources benefit to the communities that the South Platte River serves.

Sincerely,

Dorothy Hargrove
Director of Parks, Recreation and Library Services

Shannon Carter | Director

ARAPAHOE COUNTY
PROTECT. CONNECT. ENJOY.

March 28, 2017

Fish and Wildlife Resources Fund Grant
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Dear Grant Committee:

Arapahoe County Open Spaces endorses the Urban Drainage and Flood Control District's (UDFCD) effort to obtain a Fish and Wildlife Resources Fund Grant through the CWCB for the River Run Phase III project. The Cities of Englewood and Sheridan, South Suburban Parks and Recreation District, Arapahoe County Open Spaces, and UDFCD have partnered together to develop a comprehensive river improvement plan to better oversee the South Platte River through the City of Sheridan.

The goals of River Run Phase III are to improve aquatic, wetland, and riparian habitat along a central reach of the South Platte River, while maintaining the 100-year conveyance. We've already seen great success along the South Platte with River Run Phases I and II. Both the public and environment have benefited immensely.

The River Run Park Phase III project is an excellent example of leveraging resources and agencies acting in concert to furnish the greatest benefit of river management to the community. Arapahoe County Open Spaces is proud to be part of this project, is committed to the restoration of the natural, and beneficial functions of the river. We invite you to be a part of this amazing effort.

Sincerely,

Shannon Carter, Director

6934 South Lima Street Unit A | Centennial, CO 80112 | 720-874-6540 | TDD 720-874-6574 | Fax 720-874-6743 | www.co.arapahoe.co.us

March 24, 2017

Fish and Wildlife Resources Fund Grant
Colorado Water Conservation Board
1313 Sherman Street, Suite 721
Denver, CO 80203

Dear Grant Committee:

The City of Sheridan wholeheartedly endorses the Urban Drainage and Flood Control District's (UDFCD) effort to obtain the Fish and Wildlife Resources Fund Grant through the CWCB for the River Run Phase III project. The Cities of Sheridan and Englewood along with the South Suburban Parks and Recreation District, Arapahoe County Open Space, and UDFCD have partnered together to develop a river improvement plan to better oversee the South Platte River through the City of Sheridan. This partnership has been in place and working wonders on the River for over five years.

Phases I and II of the River Run Project have been a huge success for our communities both from an environmental and economic development prospective. The goals of River Run Phase III are to improve aquatic, wetland, and riparian habitat along a central reach of the South Platte River, while maintaining the 100-year conveyance. Not only will this improve the health of the river, but also the aesthetic value of the South Platte River as a central focus of the Cities of Sheridan and Englewood.

The River Run Park Phase III project is an excellent example of leveraging resources (county, municipal, non-profit to name a few) and agencies acting in concert to furnish the greatest benefit of river management to the community. Thank you for being a part of this River effort.

The City of Sheridan is proud to be part of this project, and is fully committed to the restoration of the natural and beneficial functions of the river.

Sincerely,

C. Devin Granbery
City Manager

Appendix E Scope of Work and Budget

Scope of Work

GRANTEE and FISCAL AGENT
Urban Drainage and Flood Control District

PRIMARY CONTACT
Laura Kroeger

ADDRESS
2480 West 26th Avenue, Suite 156-B
Denver, Colorado 80211

PHONE
303-455-6277

PROJECT NAME
River Run Project

GRANT AMOUNT
$450,000

INTRODUCTION AND BACKGROUND
River Run Park is a multi-purpose project that will improve river resiliency, recreation, habitat, and access/connectivity, while maintaining flood protection for surrounding communities. The project is approximately 1 mile in length along and in the South Platte River from 1000 feet north of Oxford Avenue to 500 feet south of Union Avenue. Phase III (phase requesting CWCB funding) is all in-channel work from the Oxford Avenue bridge south approximately 2000 feet. It lies within a USACE Flood Risk Reduction Project (FRRP) called "Chatfield Downstream Channel Improvement Project". The project is located primarily in the City of Sheridan, Colorado. A small portion of the project at the southern end at Union Avenue is in the City of Englewood.

Proposed improvements have been designed to meet the project goals. The following is a summary of improvements:

- Channel Stabilization - Replace two failing existing grade control drop structures built as part of the original flood control project with a series of six lower drop structures that are boatable and more conducive to fish movement.*
- Low Flow Thalweg – Create a narrow low flow channel for increased depth, velocity and sinuosity "creek within a river" to improve habitat, aesthetics, and recreation.*
- Regional trail along east bank – Including two underpasses at Oxford & Union Avenues
- Storm Outfalls – Modify outfalls for regional trail
- Raw Water Intake – Modify City of Englewood raw water intake at Union Avenue.
- Bank Stabilization – Buried riprap, boulder jetties, and terraced boulders*
- Access to River Bottom – Local access trails into the channel, ADA access north of Oxford Avenue.

- View Areas – Cobble bar areas, terraced boulder seating areas, river overlooks.
- Vegetation – Emergent bench w/ riparian and aquatic plants in the channel and on banks, upland plants on upper banks and out of channel (Figure 2).*
- Trailheads – Parking and gathering areas for trail and river users north of Oxford Avenue.

*Included in Phase III work.

OBJECTIVES
The identified project goals are:

- Maintain Flood Conveyance & Protection
- Channel Stability – Replace two failed drop structures
- Improve System Resiliency - Incorporate more natural stream elements that reflect a healthy river system (habitat, sediment transport, fish movement, water quality)
- Recreational Enhancement – In-river and upland
- Connectivity – Access throughout the river corridor and to the river's edge
- Improve Aesthetics – Natural river appearance

TASKS

TASK 1 – Design

Description of Task
Analysis and design for all phases of River Run Park has been completed by a Colorado professionally licensed engineer. Analysis work included flood conveyance analysis, hydraulic modeling (1D, 2D, and physical model), structural analysis of concrete structures, stability analysis for drop structures and channel stabilization improvements, scour analysis, and stormwater detention and treatment. Design drawings were prepared to detail proposed improvements for construction. Specifications were prepared defining proposed materials and construction requirements.

Method/Procedure
Design was completed in progressive phases. Alternatives analysis was initially completed to identify the preferred alternative. Preliminary design was then completed for the preferred alternative. Initial permitting consultation was pursued with the preliminary design documents. Final design was completed including construction documents – design drawings and specifications.

Deliverable
Construction documents – design drawings and specifications
Technical memorandums and reports

TASK 2 – Construction Management

Description of Task
Management by design team during construction phase of project. Work includes review of progress payments, review of construction submittals, construction observation, materials testing, soils testing, progress meetings, responses to Requests for Information (RFIs), clarifications, and record drawings.

Method/Procedure
Part time during construction activities. Procedures and methods will be typical to the industry.

Deliverable
Clarifications, sketches, responses to questions/RFIs
Daily Observation Reports (including site photos)
Testing Reports – Soils and concrete
Record Drawings

TASK 3 – General Construction

Description of Task
Work completed by the Contractor (Naranjo Civil Constructors) including mobilization, dewatering, temporary access, on-site office, overheads, bonds, and insurance.

Method/Procedure
Methods/procedures for most of the work completed as part of this task are not applicable. Dewatering will be accomplished in phases for improvements constructed in the river. Surface water will be controlled by sheet pile coffer dams that isolate the work area. Coffers will first be installed on one side of the river effectively diverting the river to the other side. Seepage and infiltration flow into the work area will be pumped to a settlement basin before being discharged back to the river (State Permit obtained for discharge). Improvements will be constructed in a "dry" condition. Once the improvements are built the river is "flipped" – water then will flow over the improvements just constructed. The opposite side is dewatered similarly and improvements built. Temporary dewatering structures are removed once the full river width improvements are completed.

Deliverable
Constructed Project.

TASK 4 – Erosion and Sediment Control

Description of Task
Installation of Best Management Practices (BMPs) for controlling erosion and sediment from entering water ways or leaving the site. A Stormwater Management Plan (SWMP) has been prepared for the project. BMPs proposed include sheet pile coffer dams with settlement basins for pumped discharges, silt fence, waddles, vehicle tracking pads, concrete washout areas, stockpile stabilization, erosion control blanketing, hydromulch, and re-vegetation.

Method/Procedure
Erosion and sediment control procedures will be per the project SWMP, BMPs, and State of Colorado Stormwater Discharge Associated with Construction Activities permit (CORO30000).

Deliverable
Installation, maintenance, monitoring, SWMP documentation and eventual removal.

TASK 5 – Earthwork

Description of Task
Placement and compaction of fill, excavation, loading, stockpiling, hauling, and off-site disposal of soils.

Method/Procedure
Per project specifications. Compaction requirements vary – structural, open spaces/landscaped areas, etc. All excess soil will be hauled offsite and disposed of.

Deliverable
Constructed project.

TASK 6 – Drop Structures

Description of Task
Structures that span the river and control channel grade, limit degradation, provide recreation, and provide stabilization. Drop structures will be constructed with large boulders, reinforced concrete, grout, sheet pile (subsurface cutoffs), and riprap.

Method/Procedure
Drop structures will be constructed in a "dry" condition using dewatering measures (see Task 3 – Dewatering). Sheet pile is driven to design depths then large boulders are placed individually using an excavator. Grout is then placed around boulders using a concrete pumper truck and hose. Grout is vibrated to fill all voids between boulders and finished grade. Grout will be minimized to the extent practical. A center low-flow notch or chute will be constructed of reinforced sculpted and colored concrete to mimic native bedrock. Riprap mixed with on-site soils is placed along the downstream toe for scour protection.

Deliverable
Completed drop structures (4).

TASK 7 – Jetties

Description of Task
River structures jutting part way across the channel that stabilize the proposed low flow channel and emergent benches (floodplain terraces), and provide fish habitat. Jetties will be constructed of large boulders, grout (only portions in active flow), and riprap (below the surface).

Method/Procedure
Dewatering, boulder, grout, and riprap placement procedure same as Task 6 – Drop Structures. Boulders on banks and on emergent benches will be buried and planted.

Deliverable
Completed Jetty Structures (11).

TASK 8 – Channel Stabilization

Description of Task
USACE requires longitudinal channel stabilization along both banks up to a 5,000 cfs water surface elevation. The proposed project will install riprap to meet this criteria. For scour protection, riprap will be placed along bank toes to a depth of 5 feet. All channel riprap will be buried with on-site soils and planted.

Method/Procedure
Construction areas will be dewatered (see Task 3 – Dewatering). Riprap will be mixed with on-site soils, placed, and compacted in place. Existing exposed riprap will be buried with soil. All riprap above water line will be planted.

Deliverable
Completed channel stabilization.

TASK 9 – Vegetation

Description of Task
Native vegetation will be planted in the channel throughout the project including upland, riparian, and wetland zones. Woody vegetation in the river channel is not allowed by the USACE (Flood Readiness Branch). All vegetation below the 100-year flood water surface elevation will be herbaceous or grasses. Trees will be planted above the 100-year water level.

Method/Procedure
Once all in-river and bank construction is finished vegetation work will begin. Top soil will be placed and fine grading completed. Vegetation will be installed by seeding, planting wetland plugs, or individual plantings. Erosion control blanket will be installed. Temporary irrigation will be provided as necessary for establishment.

Deliverable
Vegetation in river channel.

REPORTING AND FINAL DELIVERABLE
Reporting: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

Funding Source

Source of Funds	Hold in Trust and Agency Account	Budgeted, Add Sept 2017	Grant Request	Total
UDFCD	$1,471,000	$1,050,000		$2,521,000
Arapahoe County	$846,000	$698,500		$1,544,500
City of Sheridan	$185,000	$0		$185,000
Trout Unlimited		$10,000		
CWCB			$439,500	$439,500
TOTALS	$2,502,000	$1,758,500	$439,500	$4,700,000

Budget & Timeline Table

Task	Description	Target Start Date	Target Completion Date	CWCB Funds	Other Funding Cash*	Other Funding In-Kind*	Total
1	Design	Jan-13	May-15		$460,000.00		$460,000.00
2	Construction Management	Oct-17	Jul-18		$460,000.00		$460,000.00
3	General Construction (mobilization, dewatering)	Oct-17	Jul-18		$900,000.00		$900,000.00
4	Erosion and Sediment Control	Oct-17	Jul-18		$40,000.00		$40,000.00
5	Earthwork	Nov-17	Apr-18		$300,000.00		$300,000.00
6	Drop Structures	Dec-17	May-18		$1,600,000.00		$1,600,000.00
7	Jetties	Dec-17	May-18		$300,000.00		$300,000.00
8	Channel stabilization	Dec-17	May-18	$400,000.00	$0.00		$400,000.00
9	Vegetation	Apr-18	Jul-18	$39,500.00	$200,500.00		$240,000.00
	TOTALS			**$439,500.00**	**$4,260,500.00**		**$4,700,000.00**

This table is a guide. Variations may be submitted. For example, if a task includes purchase of materials, a column that identifes cost per unit should be included.

*Please include new columns for different sources of cash and/or in-kind funding sources. Identify the funding source.

Appendix F Contract Materials

Grant Agreement

The agreement is made _____ (date) between the Department of Natural Resources, Colorado Water Conservation Board, 1313 Sherman Street, #721, Denver, CO 80203 hereinafter referred to as the "State" and _____, hereinafter referred to as the "Sponsor" or "Contractor".

RECITALS

Authority exists in the Law and Funds have been budgeted, appropriated and otherwise made available, from FUND _____, APPR ____, ORG ____, AGENCY ____, OBJ ____, GBL _____, the sufficient unencumbered balance thereof remains available for payment of a total of $_____, as Contract Encumbrance No. _____.

The agreement is entered into pursuant to the provisions of §37-60-122.2 (5) C.R.S.

The Colorado Water Conservation Board adopted Policy 15, effective September 12, 2002, outlining policies for consideration and approval of Fish and Wildlife Resource Fund Grant Applications.

The required approval, clearance and coordination have been accomplished from and with appropriate agencies.

Grant Award

Award is hereby made to the Sponsor in the amount of $_____ (approved grant amount) for performance of the scope of work (Scope of Work), which is attached as Exhibit A.

Terms and Conditions

1. Scope of Work
The Applicant will undertake the scope of work described in the attached scope of work.

2. Performance Period
The period of performance will be from approval date shown in the controller's signature block until _____, unless otherwise amended and agreed upon by both parties.

3. Schedule of Payments

   a. The State share of this project is not to exceed the approved grant amount list in **Grant Award** above, a maximum of $_____.
   b. Payment will be made upon submission of invoice and approval by the State, for work completed.
   c. The State reserves the right to inspect all projects prior to, during or at the conclusion of the project and/or periodically thereafter. A representative of the Applicant may be required to attend the inspection.

4. State's Limitation
The State's participation in the Project is limited to providing funds. The Sponsor is solely responsible for the development and implementation of the Project.

5. Financial Responsibility
   a. The Applicant shall maintain a complete record file of all receipts, expenditures and other written records which pertain to the use of the funds in the performance of this Agreement. Such record files shall be made available upon request at such reasonable times and places as agreeable to the parties of this Agreement.
   b. No later than thirty (30) working days after the date of completion of the Project or termination of the Agreement, the Applicant shall submit to the State a complete record of all receipts and expenditures and other written records related to the Project. Following the completion of the Project construction or termination of the Project, the State shall inspect the Project facilities and audit all expenditures made by the Applicant related to the Project as set forth above in "Scope of Work." If the State finds any expenditures were not made in accordance with this Agreement, the State may request, and the Applicant shall immediately refund monies used for those expenditures.

6. Assignment:
The rights and responsibilities of the parties under this contract shall not be assignable without the prior written approval of the State.

7. Successors and Assignments:
   a. All terms of the Agreement shall be binding on and inure to the benefit of the personal representatives, successors, or assigns of the parties.
   b. This Agreement is not assignable without written consent of both parties.

8. Integration of Understandings
This agreement is intended as the complete integration of all understandings between the parties. No prior or contemporaneous addition, deletion, or other amendment hereto shall have any force or effect whatsoever, unless embodied herein in writing. No subsequent novation, renewal, addition, deletion, or other amendment hereto shall have any force or effect unless embodied in a written Agreement executed and approved pursuant to the State Fiscal Rules.

9. Severability
To the extent that this Agreement may be executed and performance of the obligations of the parties may be accomplished within the intent of the Agreement, the terms of this Agreement are severable, and should any term or provision hereof be declared invalid or become inoperative for any reason, such invalidity or failure shall not affect the validity of any other term or provision hereof. The waiver of any breach of a term hereof shall not be construed as waiver of any other term.

10. Modification
This agreement is subject to such modifications as may be required by changes in Federal law, or their implementing regulations. Any such required modification shall automatically be incorporated into and be part of these agreement on the effective dates of such change as if fully set forth herein. Except as provided above, no modification of this agreement shall be effective unless agreed to in writing by both parties in an amendment to this agreement that is properly executed and approved in accordance with applicable law.

11. Termination for Convenience

The State may terminate this contract at any time the State determines that the purposes of the distribution of State moneys under the contract would no longer be served by completion of the project. The State shall effect such termination by giving written notice of termination to the Sponsor and specifying the effective date thereof, at least twenty (20) days before the effective date of such termination. In that event, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Sponsor under this contract shall, at the option of the State, be delivered by the

SPECIAL PROVISIONS

(Not for Use with Inter-Governmental Contracts)

1. CONTROLLER'S APPROVAL. CRS 24-30-202 (1)

This contract shall not be deemed valid until it has been approved by the Controller of the State of Colorado or such assistant as he may designate.

2. FUND AVAILABILITY. CRS 24-30-202 (5.5)

Financial obligations of the State of Colorado payable after the current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available.

3. INDEMNIFICATION.

The Contractor shall indemnify, save, and hold harmless the State, its employees and agents, against any and all claims, damages, liability and court awards including costs, expenses, and attorney fees incurred as a result of any act or omission by the Contractor, or its employees, agents, subcontractors, or assignees pursuant to the terms of this contract.

4. INDEPENDENT CONTRACTOR. 4 CCR 801-2

THE CONTRACTOR SHALL PERFORM ITS DUTIES HEREUNDER AS AN INDEPENDENT CONTRACTOR AND NOT AS AN EMPLOYEE. NEITHER THE CONTRACTOR NOR ANY AGENT OR EMPLOYEE OF THE CONTRACTOR SHALL BE OR SHALL BE DEEMED TO BE AN AGENT OR EMPLOYEE OF THE STATE. CONTRACTOR SHALL PAY WHEN DUE ALL REQUIRED EMPLOYMENT TAXES AND INCOME TAX AND LOCAL HEAD TAX ON ANY MONIES PAID BY THE STATE PURSUANT TO THIS CONTRACT. CONTRACTOR ACKNOWLEDGES THAT THE CONTRACTOR AND ITS EMPLOYEES ARE NOT ENTITLED TO UNEMPLOYMENT INSURANCE BENEFITS UNLESS THE CONTRACTOR OR THIRD PARTY PROVIDES SUCH COVERAGE AND THAT THE STATE DOES NOT PAY FOR OR OTHERWISE PROVIDE SUCH COVERAGE. CONTRACTOR SHALL HAVE NO AUTHORIZATION, EXPRESS OR IMPLIED, TO BIND THE STATE TO ANY AGREEMENTS, LIABILITY, OR UNDERSTANDING EXCEPT AS EXPRESSLY SET FORTH HEREIN. CONTRACTOR SHALL PROVIDE AND KEEP IN FORCE WORKERS' COMPENSATION (AND PROVIDE PROOF OF SUCH INSURANCE WHEN REQUESTED BY THE STATE) AND UNEMPLOYMENT COMPENSATION INSURANCE IN THE AMOUNTS REQUIRED BY LAW, AND SHALL BE SOLELY RESPONSIBLE FOR THE ACTS OF THE CONTRACTOR, ITS EMPLOYEES AND AGENTS.

5. NON-DISCRIMINATION.

The contractor agrees to comply with the letter and the spirit of all applicable state and federal laws respecting discrimination and unfair employment practices.

6. CHOICE OF LAW.

The laws of the State of Colorado and rules and regulations issued pursuant thereto shall be applied in the interpretation, execution, and enforcement of this contract. Any provision of this contract, whether or not incorporated herein by reference, which provides for arbitration by any extra-judicial body or person or which is otherwise in conflict with said laws, rules, and regulations shall be considered null and void. Nothing contained in any provision incorporated herein by reference which purports to negate this or any other special provision in whole or in part shall be valid or enforceable or available in any action at law whether by way of complaint, defense, or otherwise. Any provision rendered null and void by the operation of this provision will not invalidate the remainder of this contract to the extent that the contract is capable of execution.

At all times during the performance of this contract, the Contractor shall strictly adhere to all applicable federal and State laws, rules, and regulations that have been or may hereafter be established.

7. VENDOR OFFSET. CRS 24-30-202 (1) & CRS 24-30-202.4

Pursuant to CRS 24-30-202.4 (as amended), the State Controller may withhold debts owed to State agencies under the vendor offset intercept system for: (a) unpaid child support debt or child support arrearages; (b) unpaid balance of tax, accrued interest, or other charges specified in Article 21, Title 39, CRS; (c) unpaid loans due to the Student Loan Division of the Department of Higher Education; (d) owed amounts required to be paid to the Unemployment Compensation Fund; and (e) other unpaid debts owing to the State or any agency thereof, the amount of which is found to be owing as a result of final agency determination or reduced to judgment as certified by the controller.

8. SOFTWARE PIRACY PROHIBITION Governor's Executive Order D 002 00

No State or other public funds payable under this Contract shall be used for the acquisition, operation, or maintenance of computer software in violation of United States copyright laws or applicable licensing restrictions. The Contractor hereby certifies that, for the term of this Contract and any extensions, the Contractor has in place appropriate systems and controls to prevent such improper use of public funds. If the State determines that the Contractor is in violation of this paragraph, the State may exercise any remedy available at law or equity or under this Contract, including, without limitation, immediate termination of the Contract and any remedy consistent with United States copyright laws or applicable licensing restrictions.

9. EMPLOYEE FINANCIAL INTEREST. CRS 24-18-201 & CRS 24-50-507

The signatories aver that to their knowledge, no employee of the State of Colorado has any personal or beneficial interest whatsoever in the service or property described herein.

Effective Date: April 1, 2004

Sponsor to the State and shall become the State's property. The Sponsor shall be entitled to receive just and equitable compensation for any satisfactory services and goods delivered.

If the contract is terminated by the State as provided herein, the Sponsor will be paid an amount which bears the same ratio to the total compensation as the services satisfactorily performed bear to the total services of the Sponsor covered by this contract, less payments of compensation previously made. If this contract is terminated for cause, or due to the fault of the Sponsor, the Termination for Cause or Default provision shall apply.

12. Termination for Default

If, through any cause, the Sponsor shall fail to fulfill, in a timely and proper manner, its obligations under this contract, or if the Sponsor shall violate any of the covenants, agreements, or stipulations of this contract, the State shall thereupon have the right to terminate this contract for cause by giving written notice to the Sponsor of its intent to terminate and at least ten (10) days opportunity to cure the default or show cause why termination is otherwise not appropriate. In the event of termination, all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, and reports or other material prepared by the Sponsor under this contract shall, at the option of the State, become its property, and the Sponsor shall be entitled to receive just and equitable compensation for any services and goods delivered and accepted. The Sponsor shall be obligated to return any payment advanced under the provisions of this contract. This provision shall in no way limit the remedies available to the State in the termination provisions of this contract, or remedies otherwise available at law.

Notwithstanding the above, the Sponsor shall not be relieved of liability to the State for any damages sustained by the State by virtue of any breach of the contract by the Sponsor, and the State may withhold any payment to the Sponsor for the purposes of mitigating its damages until such time as the exact amount of damages due to the State from the Sponsor is determined.

If after such termination it is determined, for any reason, that the Sponsor was not in default, or that the Sponsor's action/inaction was excusable, such termination shall be treated as a termination for convenience, and the rights and obligations of the parties shall be the same as if the contract had been terminated for convenience, as described herein.

13. Order of Precedence

Any inconsistency or conflict in this agreement shall be resolved by giving precedence in the following order:

a) Special Provisions of Agreement
b) Grant Agreement
c) Exhibit A

SPECIAL PROVISIONS

THE PARTIES HERETO HAVE EXECUTED THIS CONTRACT

CONTRACTOR: URBAN DRAINAGE & FLOOD CONTROL DISTRICT

STATE OF COLORADO:

BILL OWENS GOVERNOR

By URBAN DRAINAGE & FLOOD CONTROL DISTRICT
Legal Name of Contracting Entity

By Executive Director KEN. A MACKENZIE

84-0599780
Social Security Number or FEIN

Department of _____

Signature of Authorized Officer

LEGAL REVIEW:
Attorney General, Ken Salazar

BY _____

KEN A. MACKENZIE
Print Name & Title of Authorized Officer

CORPORATIONS:
(A corporate attestation is required.)

Attest (Seal) By _____
(Corporate Secretary or Equivalent, or Town/City/County Clerk) (Place corporate seal here, if available)

ALL CONTRACTS MUST BE APPROVED BY THE STATE CONTROLLER

CRS 24-30-202 requires that the State Controller approve all state contracts. This contract is not valid until the State Controller, or such assistant as he may delegate, has signed it. The contractor is not authorized to begin performance until the contract is signed and dated below. If performance begins prior to the date below, the State of Colorado may not be obligated to pay for the goods and/or services provided.

STATE CONTROLLER:

Leslie M. Shenefelt

By _____

Date _____

SPECIAL PROVISIONS

(For Use Only with Inter-Governmental Contracts)

1. CONTROLLER'S APPROVAL. CRS 24-30-202 (1)

This contract shall not be deemed valid until it has been approved by the Controller of the State of Colorado or such assistant as he may designate.

2. FUND AVAILABILITY. CRS 24-30-202 (5.5)

Financial obligations of the State of Colorado payable after the current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available.

3. INDEMNIFICATION.

To the extent authorized by law, the contractor shall indemnify, save, and hold harmless the State against any and all claims, damages, liability and court awards including costs, expenses, and attorney fees incurred as a result of any act or omission by the Contractor, or its employees, agents, subcontractors, or assignees pursuant to the terms of this contract.

No term or condition of this contract shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protection, or other provisions for the parties, of the Colorado Governmental Immunity Act, CRS 24-10-101 et seq. or the Federal Tort Claims Act, 28 U.S.C. 2671 et seq. as applicable, as now or hereafter amended.

4. INDEPENDENT CONTRACTOR. 4 CCR 801-2

THE CONTRACTOR SHALL PERFORM ITS DUTIES HEREUNDER AS AN INDEPENDENT CONTRACTOR AND NOT AS AN EMPLOYEE. NEITHER THE CONTRACTOR NOR ANY AGENT OR EMPLOYEE OF THE CONTRACTOR SHALL BE OR SHALL BE DEEMED TO BE AN AGENT OR EMPLOYEE OF THE STATE. CONTRACTOR SHALL PAY WHEN DUE ALL REQUIRED EMPLOYMENT TAXES AND INCOME TAX AND LOCAL HEAD TAX ON ANY MONIES PAID BY THE STATE PURSUANT TO THIS CONTRACT. CONTRACTOR ACKNOWLEDGES THAT THE CONTRACTOR AND ITS EMPLOYEES ARE NOT ENTITLED TO UNEMPLOYMENT INSURANCE BENEFITS UNLESS THE CONTRACTOR OR THIRD PARTY PROVIDES SUCH COVERAGE AND THAT THE STATE DOES NOT PAY FOR OR OTHERWISE PROVIDE SUCH COVERAGE. CONTRACTOR SHALL HAVE NO AUTHORIZATION, EXPRESS OR IMPLIED, TO BIND THE STATE TO ANY AGREEMENTS, LIABILITY, OR UNDERSTANDING EXCEPT AS EXPRESSLY SET FORTH HEREIN. CONTRACTOR SHALL PROVIDE AND KEEP IN FORCE WORKERS' COMPENSATION (AND PROVIDE PROOF OF SUCH INSURANCE WHEN REQUESTED BY THE STATE) AND UNEMPLOYMENT COMPENSATION INSURANCE IN THE AMOUNTS REQUIRED BY LAW, AND SHALL BE SOLELY RESPONSIBLE FOR THE ACTS OF THE CONTRACTOR, ITS EMPLOYEES AND AGENTS.

5. NON-DISCRIMINATION.

The contractor agrees to comply with the letter and the spirit of all applicable state and federal laws respecting discrimination and unfair employment practices.

6. CHOICE OF LAW

The laws of the State of Colorado and rules and regulations issued pursuant thereto shall be applied in the interpretation, execution, and enforcement of this contract. Any provision of this contract, whether or not incorporated herein by reference, which provides for arbitration by any extra-judicial body or person or which is otherwise in conflict with said laws, rules, and regulations shall be considered null and void. Nothing contained in any provision incorporated herein by reference which purports to negate this or any other special provision in whole or in part shall be valid or enforceable or available in any action at law whether by way of complaint, defense, or otherwise. Any provision rendered null and void by the operation of this provision will not invalidate the remainder of this contract to the extent that the contract is capable of execution.

At all times during the performance of this contract, the Contractor shall strictly adhere to all applicable federal and state laws, rules, and regulations that have been or may hereafter be established.

7. SOFTWARE PIRACY PROHIBITION Governor's Executive Order D 002 00

No State or other public funds payable under this Contract shall be used for the acquisition, operation, or maintenance of computer software in violation of United States copyright laws or applicable licensing restrictions. The Contractor hereby certifies that, for the term of this Contract and any extensions, the Contractor has in place appropriate systems and controls to prevent such improper use of public funds. If the State determines that the Contractor is in violation of this paragraph, the State may exercise any remedy available at law or equity or under this Contract, including, without limitation, immediate termination of the Contract and any remedy consistent with United States copyright laws or applicable licensing restrictions.

8. EMPLOYEE FINANCIAL INTEREST. CRS 24-18-201 & CRS 24-50-507

The signatories aver that to their knowledge, no employee of the State of Colorado has any personal or beneficial interest whatsoever in the service or property described herein.

Effective Date: April 1, 2004

POLICY NUMBER: 15

SUBJECT: **CONSIDERATION AND APPROVAL OF FISH AND WILDLIFE RESOURCES FUND APPLICATIONS FOR INSTREAM FLOWS AND RIVER RESTORATION PROJECTS.**

EFFECTIVE DATE: September 12, 2002

POLICY: The Colorado Water Conservation Board (CWCB) will accept applications throughout the year for grants from the Fish and Wildlife Resources Fund for the appropriation or acquisition of instream flow water rights and river restoration construction projects to mitigate the effects of the construction, operation, and maintenance of water diversion, delivery, and storage facilities.

Applications for mitigation grants from the Fish and Wildlife Resources Fund will be accepted for the following types of projects:

1. The appropriation or acquisition of water rights for the purpose of preserving or improving the natural environment to a reasonable degree to mitigate the impact of an existing water facility.
2. River restoration feasibility studies and construction projects that are designed to directly mitigate or significantly improve the environmental impacts of existing water facilities.

The CWCB may, in any year, approve grants to fund any project in the above categories that the Board deems worthy of funding through the Fish and Wildlife Resources Fund. In order to protect the long-term integrity of the Fish and Wildlife Resources Fund, instream flow and river restoration projects mitigating the impacts of existing water supply facilities will be limited to 40% of the Fish and Wildlife Resources Fund balance as of July 1, 2002.

The project applicant must have completed a fully executed funding contract with the CWCB within 2 years of the grant authorization by the CWCB, or the Board will consider de-authorization of the grant.

PURPOSE: To establish an approval process for instream flow and river restoration construction project grants from the Fish and Wildlife Resources Fund.

APPLICABILITY: This policy and procedure applies to applications for instream flow or river restoration construction project grants from the Fish and Wildlife Resources Fund.

PROCEDURE: Prior to a Board meeting, the CWCB staff will prepare for the Board's consideration a summary of the technical, financial, and institutional characteristics of each proposed instream flow water right appropriation or acquisition, river restoration feasibility study or construction project. Each application will be reviewed for conformity with the goals and

objectives of the CWCB Strategic Plan. Grant applications will be considered only in the following two categories:

1. The appropriation or acquisition of water rights for the purpose of preserving or improving the natural environment to a reasonable degree to mitigate the impact of an existing water facility.
2. River restoration feasibility studies and construction projects that are designed to directly mitigate or significantly improve the environmental impacts of existing water facilities.

The Board will consider and CWCB staff will evaluate and recommend to the Board grant applications for appropriation or acquisition of water rights to be held by the Board based on the following project types:

- Instream flow water rights that assist in the administration of compact-entitled waters, or address problems relating to compact-entitled waters,
- Instream flow water rights that facilitate the resolution of federal water rights issues, and
- Instream flow water rights that assist in the recovery of threatened or endangered wildlife species or the conservation of existing wildlife species within riparian ecosystems.

The Board will consider and CWCB staff will evaluate and recommend to the Board grant applications for river restoration feasibility studies and construction projects based on the following:

- Soundness of the project design, work plan or plan of study,
- The need for the proposed project,
- The need for financial assistance.
- Financial, technical, or administrative participation or coordination by all affected local governments.

NOTE: Recognizing that future needs and responses to those needs cannot be predicted with certainty, the Colorado Water Conservation Board reserves the right to recommend for funding any instream flow acquisition, river restoration construction project, or study that it determines would mitigate the effects of an existing water supply facility and furthers the purposes of the Fish and Wildlife Resources Fund.

Approved by the CWCB
September 12, 2002
Agenda Item #16a

37-60-122.2. Fish and wildlife resources - legislative declaration - fish and wildlife resources fund - authorization.

(1) (a) The general assembly hereby recognizes the responsibility of the state for fish and wildlife resources found in and around state waters which are affected by the construction, operation, or maintenance of water diversion, delivery, or storage facilities. The general assembly hereby declares that such fish and wildlife resources are a matter of statewide concern and that impacts on such resources should be mitigated by the project applicants in a reasonable manner. It is the intent of the general assembly that fish and wildlife resources that are affected by the construction, operation, or maintenance of water diversion, delivery, or storage facilities should be mitigated to the extent, and in a manner, that is economically reasonable and maintains a balance between the development of the state's water resources and the protection of the state's fish and wildlife resources.

(b) Except as provided in this paragraph (b), the applicant for any water diversion, delivery, or storage facility which requires an application for a permit, license, or other approval from the United States shall inform the Colorado water conservation board, wildlife commission, and division of wildlife of its application and submit a mitigation proposal pursuant to this section. Exempted from such requirement are the Animas-La Plata project, the Two Forks dam and reservoir project, and the Homestake water project for which definite plan reports and final environmental impact statements have been approved or which are awaiting approval of the same, applicants for site specific dredge and fill permits for operations not requiring construction of a reservoir, and applicants for section 404 federal nationwide permits. If an applicant that is subject to the provisions of this section and the commission agree upon a mitigation plan for the facility, the commission shall forward such agreement to the Colorado water conservation board, and the board shall adopt such agreement at its next meeting as the official state position on the mitigation actions required of the applicant. In all cases the commission shall proceed expeditiously and, no later than sixty days from the applicant's notice, unless extended in writing by the applicant, make its evaluation regarding the probable impact of the proposed facility on fish and wildlife resources and their habitat and to make its recommendation regarding such reasonable mitigation actions as may be needed.

(c) The commission's evaluation and proposed mitigation recommendation shall be transmitted to the Colorado water conservation board. The board within sixty days, unless extended in writing by the applicant, shall either affirm the mitigation recommendation of the commission as the official state position or shall make modifications or additions thereto supported by a memorandum that sets out the basis for any changes made. Whenever modifications or additions are made by the board in the commission's mitigation recommendation, the governor, within sixty days, shall affirm or modify the mitigation recommendation which shall then be the official state position with respect to mitigation. The official state position, established pursuant to this subsection (1) shall be communicated to each federal, state, or other governmental agency from which the applicant must obtain a permit, license, or other approval.

(2) (a) Moneys transferred to the fish and wildlife resources fund pursuant to the provisions of section 37-60-121 (6) are hereby continuously appropriated to the Colorado water conservation board for the purpose of making grants pursuant to this subsection (2) and for offsetting the direct and indirect costs of the board for administering the grants. The interest earned from the investment of the moneys in the fund shall be credited to the fund.

(b) To the extent that the cost of implementing the mitigation recommendation made pursuant to subsection (1) of this section exceeds five percent of the costs of a water diversion, delivery, or storage facility, the board shall, upon the application of the applicant, make a mitigation grant to the applicant. The amount of the grant shall be sufficient to pay for the mitigation recommendation as determined by this section to the extent required above the applicant's five percent share. Any additional enhancement shall be at the discretion and within the means of the board. Under no circumstance shall the total amount of the grant exceed five percent of the construction costs of the project, or be disbursed in installments that exceed seventy percent of the amount of the grant during any fiscal year. Any mitigation cost in excess of ten percent of the construction costs of a project shall be borne by the applicant.

(c) An applicant may apply for an enhancement grant by submitting to the commission and the board an enhancement proposal for enhancing fish and wildlife resources over and above the levels existing without such facilities. The commission shall submit its recommendations on the proposal to the board for its consideration. The board, with the concurrence of the commission, may award a grant for fish and wildlife enhancement. Any such enhancement grant will be shared equally by the Colorado water conservation board's fish and wildlife resources fund and the division of wildlife's wildlife cash funds and other funds available to the division.

(d) For the purpose of this subsection (2), construction costs means the best estimate of the physical construction costs as fixed by the Colorado water conservation board as of the date of the grant application. Costs should be limited to design, engineering and physical construction and will not include the costs of planning, financing, and environmental documentation, mitigation costs, legal expenses, site acquisition or water rights.

(e) Species recovery grants from the fish and wildlife resources fund may be made for the purpose of responding to needs of declining native species and to those species protected under the federal "Endangered Species Act of 1973", 16 U.S.C. sec. 1531, et seq., as amended, in a manner that will carry out the state water policy.

(f) (Deleted by amendment, L. 2001, p. 692, § 28, effective May 30, 2001.)

(3) Decisions relating to the official state mitigation position made pursuant to paragraph (c) of subsection (1) of this section shall not be subject to judicial review.

(4) The board shall distribute mitigation and enhancement grants reasonably and equitably among water basins toward the end that those projects sponsored by beneficiaries east of the continental divide receive fifty percent of the money granted and those projects sponsored by beneficiaries west of the continental divide receive fifty percent of the money granted under this section.

(5) The general assembly hereby recognizes the role instream flows and river restoration projects play in mitigating the effects of the construction, operation, and maintenance of water diversion, delivery, and storage facilities. Therefore, the Colorado water conservation board and the operators of existing water diversion, delivery, or storage facilities projects are hereby authorized to apply directly to the board for moneys for projects to carry out the purposes of this section. The board is authorized to grant such moneys if it finds that such projects will further the purposes of this section.

Source: L. 87: Entire section added, p. 1297, § 5, effective July 13. **L. 97:** (1)(a) and (2)(a) amended and (2)(e) added, p. 1600, § 1, effective June 4. **L. 98:** (2)(f) added, p. 1004, § 5, effective May 27. **L. 99:** (2)(a) amended, p. 628, § 36, effective August 4. **L. 2001:** (2)(a), (2)(c), (2)(e), and (2)(f) amended, p. 692, § 28, effective May 30. **L. 2002:** (5) added, p. 456, § 28, effective May 23.