

PREPARATION GUIDELINES FOR UDFCD MAINTENANCE SITE PLAN

Overview

The Urban Drainage and Flood Control District (District) is now requiring that a Maintenance Site Plan (Plan) be submitted for all pond projects as a condition of maintenance eligibility. The Plan shall consist of a single sheet that includes all the necessary information for long-term maintenance of the site, and shall generally conform to the attached half-size examples and the guidelines that follow. Any comments must be addressed by the Engineer until the Plan has been formally approved by the District. Graphical elements included on the sheet are to reflect as-built Record Drawing information associated with the completed project.

Contents of Maintenance Site Plan

The following outline shall be used to guide the development of the Maintenance Site Plan. Some items may not apply to all projects, and any unique features may warrant inclusion of additional information if pertinent to the anticipated maintenance of the site.

Section 1 - Project Information

1.0 General Information

- A. UDFCD Drainageway
- B. Property Owner / Local Government Agency
Include contact number.
- C. Design Engineer
Include contact number.
- D. Project Completion Date
Can be listed in drawing title, as shown in example.

1.1 Hydraulic Information

- A. Online or Offline Facility?
- B. Flow Rates
All applicable flow rates should be listed, e.g. base flow, design flow, any storm flows that were evaluated, etc. Detention facilities should include inflow and outflow rates.
- C. Facility Description
Include additional design information for the facility, including volumes, water surface elevations, and surface types for forebays and micropools.
- D. Outlet Type
- E. WQCV Drain Time

1.2 Miscellaneous Information

A. Project Survey Information

Include survey control information and at least one on-site "Maintenance Control Point" established during construction for use during maintenance activities.

B. Seed Mix

C. Mow Area

Include area in acres and description of mow limits.

D. Long Term Monitoring Requirements

If applicable, list monitoring requirements such as 404 Permit Reports or any other required monitoring.

Section 2 - Project Notes

2.0 General Facility Description

Include function, flow source, flow pattern through project, any special features, and any additional information that may be helpful in understanding the basic workings of the facility.

2.1 Maintenance Notes

A. Maintenance Frequency

B. Equipment and Special Tools Required

C. Power Source (*if applicable*)

2.2 Maintenance Procedure

A. Dewatering

B. Sediment Removal

C. Debris Removal

D. Site Inspection

List all general features and equipment that should be inspected to ascertain additional maintenance needs. See attached examples.

E. Materials Testing

List any contaminant testing requirements for sediment removed from the pond.

F. Post-Maintenance Considerations

Any additional maintenance-related tasks should be listed here. These may include restoring flow patterns, replacing or removing stoplogs, or additional cleanup requirements.

Section 3 – Site Plan

3.0 Vicinity Map

3.1 Plan View

All major features of the facility should be labeled, including the following:

- *Trickle Channel*
- *Forebay, longest reach distance required from access road*
- *Micropool, longest reach distance required from access road*
- *Entrance Structure*
- *Outlet Structure*

In addition, special maintenance-related information should be identified:

- *Maintenance Control Pont location and elevation*
- *Maintenance entrance / access road / gates / turnarounds. List applicable information such as road material, width, maximum grade, etc.*
- *Power source*
- *Weight-restricted areas*
- *Wetland or natural areas to avoid*

3.2 Hydraulic Profile

- *Major features*
- *Permanent pool elevations*
- *Other applicable water surface elevations*
- *Flow direction*
- *Shading identifying forebay and micropool sediment removal zones*

Section 4 – Details

- 4.0 Trickle Channel Section
- 4.1 Maintenance Road
- 4.2 Inlet Structure
- 4.3 Forebay Release Structure
- 4.4 Outlet Structure

Submittal Requirements

The Engineer shall submit one 22"x34" and one 11"x17" Maintenance Site Plan with the project's as-built Record Drawings. The UDFCD Design & Construction and Maintenance Programs will review and comment on the Plans. Any comments shall be addressed by the Engineer until approval has been granted by the District. Once approval has been granted, the final submittal shall include:

- Two 22"x34" Maintenance Site Plans (one mylar, one bond)
- One 11"x17" plan
- CD-ROM containing the AutoCAD file and a PDF of the plan

PROJECT INFORMATION

1.0 GENERAL INFORMATION
 A. UDFCD DRAINAGEWAY #4602, COTTONWOOD CREEK
 B. PROPERTY OWNER: CHERRY CREEK BASIN WATER QUALITY AUTHORITY
 303-778-4525
 C. DESIGN ENGINEER: MULLER ENGINEERING COMPANY
 303-988-4939

1.1 HYDRAULIC INFORMATION
 A. ONLINE OR OFFLINE FACILITY? ONLINE

B. FLOW RATES

	INFLOW	OUTFLOW
NORMAL LOW-FLOW	1-3 CFS	1-3 CFS
FULL WQCV	4400 CFS	15 CFS
100-YEAR	4400 CFS	4400 CFS

C. POND DESCRIPTION

	WSEL	VOLUME	DEPTH	INVERT	SURFACE TYPE
MICROPOOL	5611.06	0.10 AF (160 CY)	2.06 FT	5609.0	EARTH
SEDIMENT BASIN	5611.00	0.57 AF (920 CY)	2.0 FT	5609.0	EARTH
WQCV	5616.75	11.6 AF			
TOTAL CAPACITY	5622.00	37.3 AF (100-YR + 1/2 WQCV)			

D. OUTLET TYPE: TWO-STAGE WATER QUALITY OUTLET STRUCTURE WITH POND BYPASS CAPABILITY AND SEPARATE OVERFLOW WEIR FOR LARGE STORM EVENTS
E. WQCV DRAIN TIME: 40 HOURS

1.2 MISCELLANEOUS INFORMATION
 A. PROJECT SURVEY: PLANNIMETRIC SURVEY AND TOPOGRAPHY WAS PREPARED BY MILLER ENGINEERING AND SURVEYING INC., DATED APRIL 1997, JOB NO. 3294. SURVEY FOR CHERRY CREEK VISTA 17 AND DESIGN OF PEORIA STREET WAS PREPARED BY CARROL AND LANGE. TOPOGRAPHY BY MILLER WAS RAISED 0.50' TO MATCH DATUM FOR SURVEY BY CARROLL AND LANGE FOR CHERRY CREEK VISTA 17 (BASED ON USGS, 1992). HORIZONTAL CONTROL SHOWN IS BASED ON MILLER SURVEY.
 SURVEY CONTROL POINT: WEST QUARTER CORNER OF SECTION 24, TOWNSHIP 5 SOUTH, RANGE 67 WEST (ALUMINUM CAP STAMPED LS 10717) ELEV. = 5631.04, NORTHING: 112,512.595, EASTING: 106,597.840.
 MAINTENANCE CONTROL POINT: SOUTH END OF SPILLWAY CRESTWALL AT FLOODWALL (SEE SITE PLAN FOR LOCATION), MARKED BY "X" CHISELED INTO TOP OF WALL. ELEV. = 5616.75

B. SEED MIXES:

UPLAND SEED			WETLAND SEED		
COMMON NAME	VARIETY	% OF MIX BY WEIGHT	COMMON NAME	VARIETY	% OF MIX BY WEIGHT
Woolly sedge	Native	1	Woolly sedge	Native	1
Nebraska sedge	Native	0.01	Nebraska sedge	Native	0.01
Blue grama	Livingston	5	Blue grama	Livingston	5
Buffalograss	Native	5.95	Buffalograss	Native	5.95
Inland saltgrass	Native	3	Inland saltgrass	Native	3
Baltic rush	Native	0.04	Baltic rush	Native	0.04
Prairie cordgrass	Native	15	Prairie cordgrass	Native	15
Sand dropseed	Native	5	Sand dropseed	Native	5
Switchgrass	Arriba	28	Switchgrass	Arriba	28
Western wheatgrass	Arriba	37	Western wheatgrass	Arriba	37

C. MOW AREA: 1.5 AC
 THE MOW AREA IS GENERALLY BOUNDED BY SIDEWALKS ON THE EAST AND SOUTH, THE ACCESS ROAD ON THE NORTH, AND THE DENSE COTTONWOOD CREEK VEGETATION ON THE WEST. MOW LIMITS SHOULD BE WITHIN APPROXIMATELY 1 VERTICAL FOOT OF THE NORMAL WATER SURFACE ELEVATION. GRASSES SHOULD BE MAINTAINED AT A HEIGHT OF 4 TO 6 INCHES.

PROJECT NOTES

2.0 GENERAL FACILITY DESCRIPTION
 THIS FACILITY IS AN EXTENDED DETENTION BASIN WITH WQCV INTENDED TO REDUCE SEDIMENT LOADS, THEREBY IMPROVING WATER QUALITY IN COTTONWOOD CREEK AND THE RECEIVING WATERS OF CHERRY CREEK RESERVOIR. THE POND HAS TWO INFLOW SOURCES - COTTONWOOD CREEK (ENTERING FROM THE NORTHWEST) AND PEORIA TRIBUTARY B (ENTERING FROM THE SOUTHEAST). THE POND RELEASES INTO COTTONWOOD CREEK.

UNDER NORMAL OPERATING CONDITIONS, COTTONWOOD CREEK FLOWS ENTER THE POND THROUGH AN INLET STRUCTURE. THIS STRUCTURE CAN ALSO BE USED TO DIRECT CREEK FLOWS TO THE OUTLET STRUCTURE, BYPASSING THE POND. FLOWS FROM BOTH COTTONWOOD CREEK AND PEORIA TRIBUTARY B PASS THROUGH A SEDIMENT BASIN AND MEANDERING WETLAND CHANNEL BEFORE REACHING THE WATER QUALITY OUTLET STRUCTURES. DURING STORM EVENTS, THE POND EXCEEDS THE WATER QUALITY CAPTURE VOLUME AND ALL EXCESS FLOWS OVERTOP THE CREST WALL AT THE PEORIA STREET TRIPLE BOX CULVERT.

A LIFT STATION IS LOCATED NORTH OF THE SITE. THIS FACILITY IS OWNED AND MAINTAINED BY THE ARAPAHOE COUNTY WATER AND WASTEWATER AUTHORITY, 303-790-4830.

2.1 MAINTENANCE NOTES

A. MAINTENANCE FREQUENCY
 ROUTINE MAINTENANCE TASKS, INCLUDING MOWING, DEBRIS REMOVAL, AND SWEEPING OF THE PEDESTRIAN CROSSING, SHOULD BE PERFORMED ON AN AS-NEEDED BASIS. MOWING FREQUENCY IS TYPICALLY 3-4 TIMES PER YEAR, AND DEBRIS REMOVAL AND SWEEPING SHOULD BE DONE PRIOR TO THE SUMMER STORM SEASON AND FOLLOWING SIGNIFICANT RAINFALL EVENTS. IN ADDITION, THE PROPERTY OWNER SHOULD PERFORM A SITE INSPECTION ON AN ANNUAL BASIS TO EVALUATE THE NEED FOR ADDITIONAL MAINTENANCE, INCLUDING SEDIMENT REMOVAL, EROSION CONTROL, REVEGETATION, AND STRUCTURAL REPAIRS. IF ADDITIONAL MAINTENANCE IS REQUIRED, THE PROPERTY OWNER MAY REQUEST ASSISTANCE FROM UDFCD.

B. EQUIPMENT AND TOOLS REQUIRED
 STOPLOGS FOR INLET STRUCTURE (USED TO DIRECT WATER INTO BYPASS PIPE - CONTACT UDFCD TO OBTAIN PREFABRICATED PANEL)
 KEY FOR SEGEGATE IN OUTLET STRUCTURE (#27 MASTER KEY - CONTACT UDFCD)
 TWO (2) SIX-INCH ELECTRIC PUMPS
 LONG-REACH TRACK EXCAVATOR
 TANDEM DUMP TRUCKS

C. ELECTRICAL SERVICE
 AN ELECTRICAL PANEL IS LOCATED ALONG THE ACCESS DRIVE FOR USE DURING MAINTENANCE OPERATIONS. SERVICE IS 100 AMP, 120/240 VOLT, SINGLE-PHASE SERVICE WITH TWO 30 AMP, 240 VOLT RECEPTACLES AND TWO 20 AMP, 120 VOLT RECEPTACLES. GAS-POWERED EQUIPMENT IS NOT PERMITTED DUE TO NOISE RESTRICTIONS. THERE IS A 6" METAL CONDUIT WITH FLEXIBLE MARKERS UNDER THE ACCESS DRIVE WHICH CAN BE USED TO PROTECT ELECTRICAL CORDS DURING MAINTENANCE.

2.2 MAINTENANCE PROCEDURE

A. Dewatering
 TO DIVERT COTTONWOOD CREEK FLOWS AROUND THE POND, PLACE PLYWOOD OR 2X6 BOARDS IN STOPLOG SLOTS IN INLET STRUCTURE (OPENING IS 6" WIDE X 2'-6" HIGH) AND REMOVE EXISTING REDWOOD STOPLOGS IN FRONT OF THE BYPASS PIPE. FLOWS WILL PASS DIRECTLY THROUGH THE BYPASS PIPE TO THE OUTLET STRUCTURE.

TO SPEED INITIAL DRAINING OF POND, OPEN SLIDE GATE IN OUTLET STRUCTURE (WITH KEY) AND REMOVE ANY STOPLOGS PLACED IN THE STRUCTURE. ONCE THE POND IS DRAINED DOWN, CLOSE SLIDE GATE TO PREVENT BYPASS FLOW FROM ENTERING THE POND THROUGH THE OUTLET STRUCTURE.

TO COMPLETELY DRAIN THE POND, PLACE PUMPS IN THE MICROPOOL AND THE SEDIMENT BASIN. THE SEDIMENT BASIN IS GRADED TO DRAIN TOWARD THE INLET STRUCTURE. DISCHARGE HOSES MUST BE PLACED TO PREVENT EROSION - IDEALLY, IN THE BYPASS PIPE AND IN THE NORTH MANHOLE OF THE OUTLET STRUCTURE. IF THE PUMPS DO NOT HAVE FINE SCREENING AT THE INTAKES, DISCHARGE MAY BE DIRECTED TO THE WATER QUALITY DETENTION POND NORTH OF THE SITE TO REDUCE SEDIMENT IN THE DISCHARGE.

GROUNDWATER AND PEORIA TRIBUTARY B INFLOWS WILL REQUIRE CONTINUOUS PUMPING. INITIAL Dewatering MAY TAKE 24 TO 36 HOURS (ASSUMING TWO 6-INCH PUMPS RUNNING CONTINUOUSLY).

B. SEDIMENT REMOVAL

SEDIMENT MUST BE REMOVED FROM THE SEDIMENT BASIN AND MICROPOOL WHEN THEY HAVE REACHED 3/4 CAPACITY, AS DETERMINED BY THE PROPERTY OWNER.

THE RIPRAP ACCESS BENCH PROVIDES ACCESS TO THE SEDIMENT BASIN. EXCESS SEDIMENT SHOULD BE REMOVED WITH A TRACK EXCAVATOR AND PLACED IN A TANDEM DUMP TRUCK FOR REMOVAL OFFSITE. THE SURFACED AREA BETWEEN THE TWO OUTLET STRUCTURES SERVES AS A TURNAROUND FOR THE DUMP TRUCK. THE RIPRAP ACCESS BENCH MAY RUT DURING SEDIMENT REMOVAL - IF THIS OCCURS, THE RUTS SHOULD BE FLATTENED AS PART OF THE MAINTENANCE PROCEDURE.

REMOVAL OF EXCESS SEDIMENT FROM THE MICROPOOL CAN BE DONE WITH THE EXCAVATOR FROM THE SURFACED AREA WEST OF THE MICROPOOL. CARE SHOULD BE TAKEN NOT TO DAMAGE THE OUTLET STRUCTURE - HAND REMOVAL MAY BE NECESSARY IMMEDIATELY ADJACENT TO THE STRUCTURE.

ANY SEDIMENT BUILDUP IN THE OUTLET STRUCTURE SHOULD BE REMOVED. THIS MUST BE DONE BY HAND - MANHOLES PROVIDE ACCESS. ALL SEDIMENT MUST BE REMOVED OFFSITE. AS SEDIMENT WILL BE WET, CARE MUST BE TAKEN NOT TO TRACK OR DRIP MUD ONTO PEORIA STREET. TEMPORARY STOCKPILING ON SITE MAY BE NECESSARY TO DRAIN MATERIAL.

C. DEBRIS REMOVAL

DEBRIS BUILDUP IS EXPECTED AT THE INLET STRUCTURE, THE GRATES OF EACH OUTLET STRUCTURE, ALONG THE CREST WALL, AND IN THE PEDESTRIAN PORTION OF THE BOX CULVERT. ALL DEBRIS SHOULD BE COLLECTED AND DISPOSED OFFSITE.

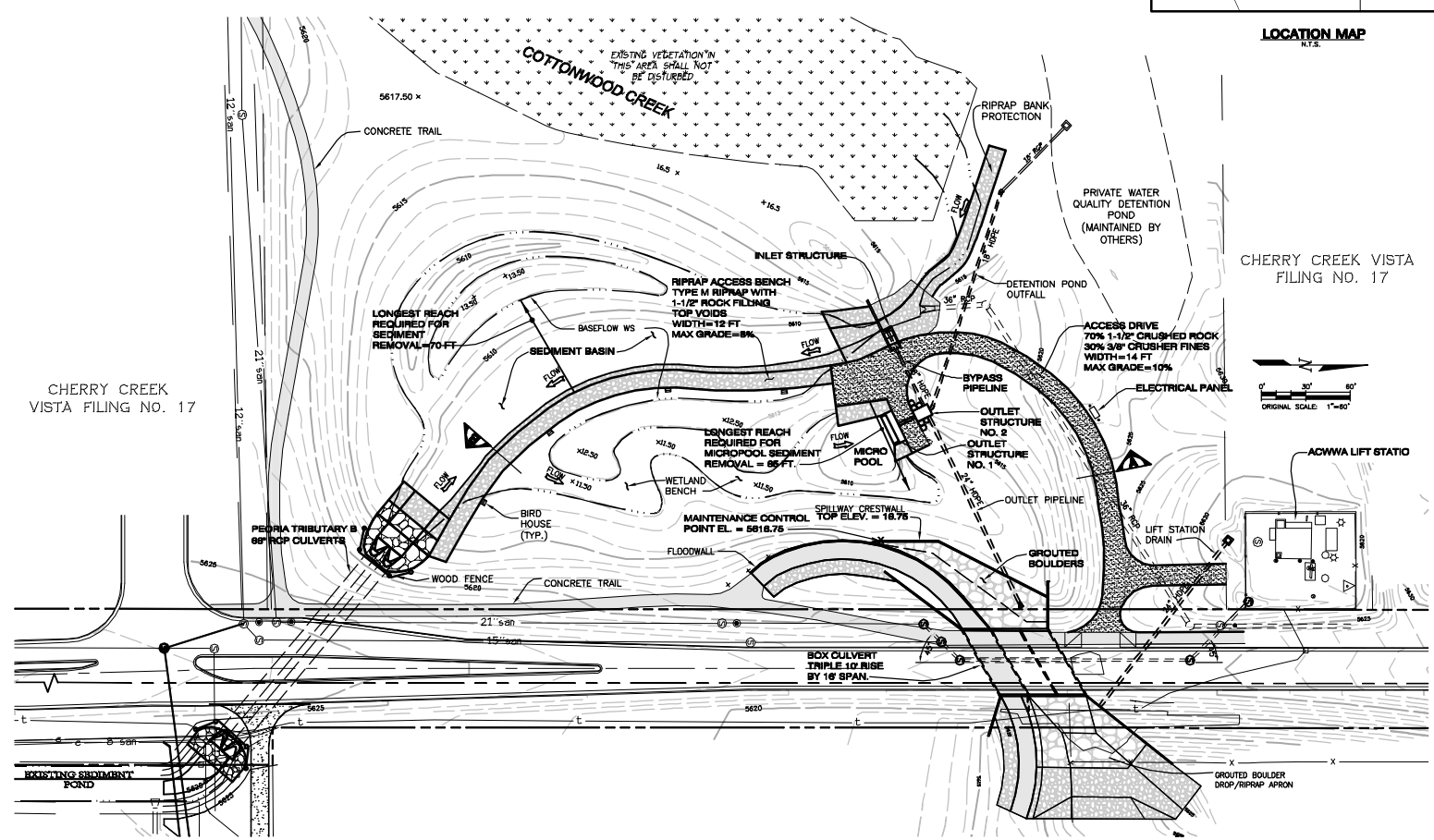
D. SITE INSPECTION

THE FOLLOWING ITEMS SHOULD BE INSPECTED A MINIMUM OF ONCE PER YEAR AND MAINTAINED AS NECESSARY:

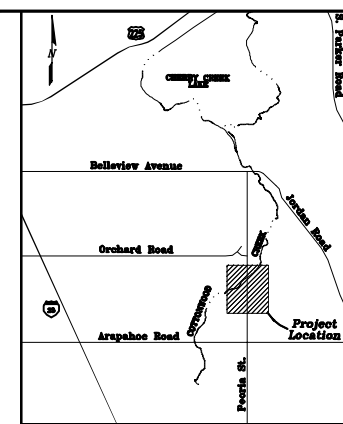
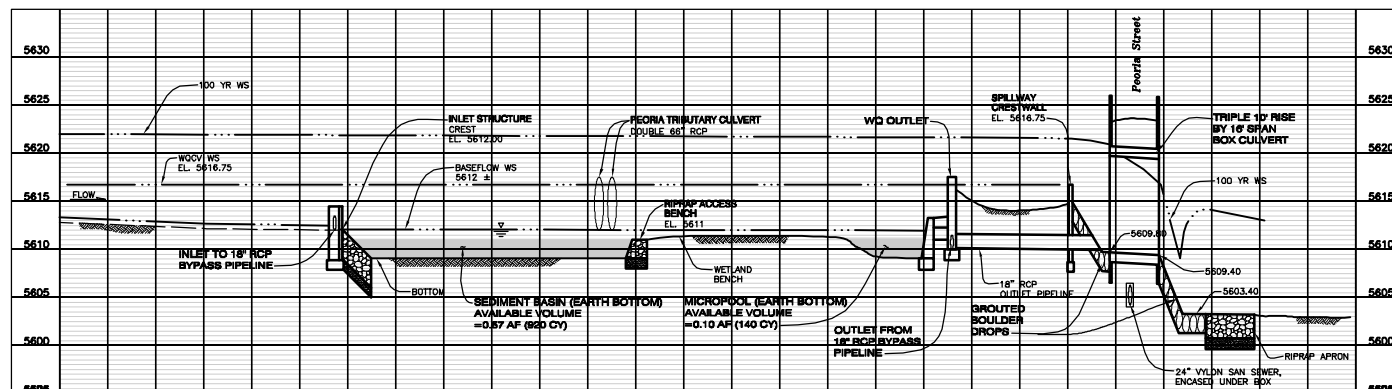
- GENERAL**
- RIPRAP ACCESS BENCH
 - ACCESS DRIVE
 - EROSION
 - VEGETATION
 - NATIVE WETLAND AND UPLAND GRASSES
 - WILLOWS, SEDGES, BULRUSH, AND OTHER RIPARIAN PLANTS AROUND EDGE OF POND
 - WILD FLIKES, CURLENT SHIRUBS, COTTONWOOD TREES IN MIDDLE ELEVATIONS
 - SNOWBERRY AND RABBITBRUSH IN UPPER AREAS
- EQUIPMENT AND STRUCTURES**
- INLET STRUCTURE
 - CONCRETE STRUCTURE
 - STOPLOGS
 - GRATE
 - BYPASS PIPE
 - RIPRAP
 - OUTLET STRUCTURE NO. 1
 - CONCRETE STRUCTURE
 - GRATE
 - PIPE
 - OUTLET STRUCTURE NO. 2
 - CONCRETE STRUCTURE
 - GRATE
 - STOPLOGS
 - ORIFICE PLATES
 - SLIDE GATE
 - PIPES
 - BOULDERS AROUND STRUCTURE
- CRESTWALL**
- PAINTED CONCRETE WALL (YOSEMITE BROWN, FLAT, MEDIUM TEXTURE)
 - 24" HDPE PIPE OUTLET
 - GROUTED BOULDERS AROUND OUTLET
- ELECTRICAL SERVICE**
- PANEL
 - RECEPTACLES
 - BOULIARDS
 - METER
 - FLEXIBLE MARKERS FOR CONDUIT
 - PEORIA STREET TRIBUTARY B CULVERTS
 - 66" REINFORCED CONCRETE PIPES / JOINTS
 - GROUTED BOULDERS
 - CONCRETE DRIVEWAY
- MISCELLANEOUS**
- BIRDHOUSES AND POSTS

E. POST-MAINTENANCE CONSIDERATIONS
 FOLLOWING COMPLETION OF MAINTENANCE ACTIVITIES, ALL STOPLOGS SHOULD BE RESTORED TO THEIR ORIGINAL POSITIONS, ALLOWING THE POND TO REFILL. ALL DEBRIS, TRASH, AND EXCAVATED SEDIMENT MUST BE REMOVED OFFSITE. IF NECESSARY, PEORIA STREET MUST BE SWEEP CLEAN.

(EXAMPLE PLAN)
**COTTONWOOD CREEK -
 PEORIA STREET WATER QUALITY POND
 MAINTENANCE SITE PLAN**
 MARCH, 2005
 (PROJECT COMPLETED SPRING 2002)



HYDRAULIC PROFILE

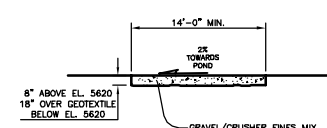


LOCATION MAP

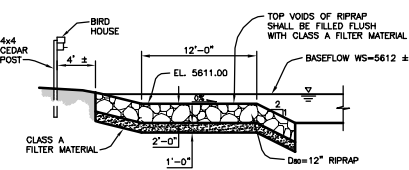
PROJECT DETAILS

(NOT APPLICABLE)

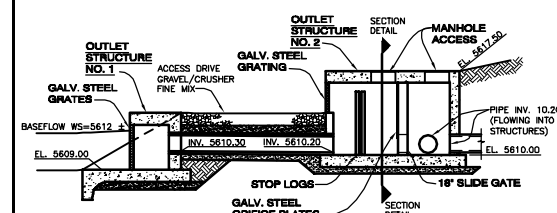
TRICKLE CHANNEL SECTION



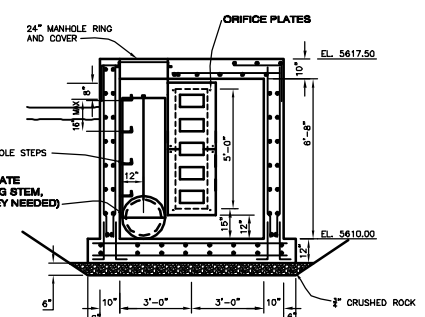
ACCESS DRIVE - SECTION A



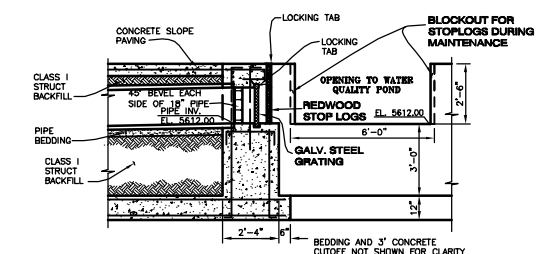
RIPRAP ACCESS BENCH - SECTION B



OUTLET STRUCTURES SECTION



OUTLET STRUCTURE NO. 2 - SECTION DETAIL



INLET STRUCTURE SECTION

PROJECT INFORMATION

1.0 GENERAL INFORMATION

- A. UDFCD DRAINAGEWAY #5402, WILLOW CREEK (EAST TRIBUTARY)
- B. PROPERTY OWNER: PANORAMA CORPORATE CENTER
C/O SPECIAL DISTRICT MANAGEMENT SERVICES, INC.
303-987-0835
- C. DESIGN ENGINEER: MULLER ENGINEERING COMPANY
303-988-4939

1.1 HYDRAULIC INFORMATION

- A. ONLINE OR OFFLINE FACILITY? ONLINE
- B. FLOW RATES

	INFLOW	OUTFLOW
10-YEAR	408 CFS	53 CFS
100-YEAR	758 CFS	177 CFS
- C. POND DESCRIPTION

	VOLUME	WSEL	DEPTH	INVERT	SURFACE TYPE
MICROPOOL	0.26 AF (420 CY)	5739.5	3.5 FT.	5736.0	EARTH
FOREBAY	0.28 AF (450 CY)	5742.0	1.5 FT.	5740.5	CONCRETE
WQCV	4.8 AF	5745.0			
10-YEAR	12.2 AF	5749.5			
TOTAL CAPACITY	22.0 AF	5754.0	(100-YR WSE)		

- D. OUTLET TYPES
 - 10-YR - DROP BOX OUTLET STRUCTURE
 - 100-YR - OFFLINE RECTANGULAR OUTLET STRUCTURE
- E. WQCV DRAIN TIME: 40 HOURS

1.2 MISCELLANEOUS INFORMATION

- A. PROJECT SURVEY:
 - HORIZONTAL CONTROL IS BASED ON NORTHING AND EASTING FROM SURVEY PROVIDED BY ARROW CIVIL ENGINEERS, INC.
 - SURVEY BENCHMARK: NE CORNER NW 1/4, SECTION 34, T5S, R67W, 3" BRASS CAP "PUBLIC SERVICE OF COLORADO, PLS 19607", ELEV. = 5869.90, ARAPAHOE COUNTY DATUM.
 - MAINTENANCE CONTROL POINT: TOP OF FOREBAY WALL ALONG WEST SIDE (SEE SITE PLAN VIEW FOR LOCATION). MARKED BY "X" CHISELED INTO TOP OF WALL. ELEV. = 5743.00
- B. SEED MIX:

SEED SPECIES AND VARIETY	PERCENTAGE OF MIX BY WEIGHT
WESTERN WHEATGRASS "ARRIBA"	25%
SIDEGRASS GRAMA "NAUGHN"	10%
BLUE GRAMA "LOVINGTON"	20%
NEEDLE AND THREAD	10%
STREAMBANK WHEATGRASS "SODAR"	15%
INDIAN RICEGRASS "PALOMA"	5%
BUFFALOGRASS (NATIVE)	15%
	100%
- C. MOW AREA: 1.5 AC
 - THE MOW AREA IS GENERALLY DESCRIBED AS THE INTERIOR SIDES AND BOTTOM OF THE ENTIRE POND UP TO THE APPROXIMATE ELEVATION OF 5750. GRASSES SHOULD BE MAINTAINED AT A HEIGHT OF 4-6 INCHES.

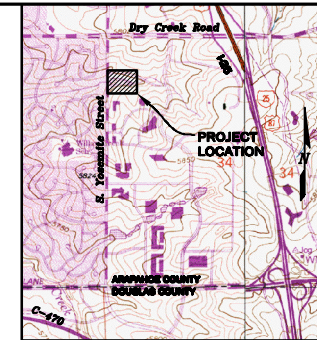
PROJECT NOTES

- 2.0 GENERAL FACILITY DESCRIPTION**

THIS FACILITY IS A REGIONAL DETENTION POND THAT HAS BEEN IMPROVED TO PROVIDE WQCV, REDUCE THE 100-YR DISCHARGE, AND PREVENT SMALL EVENTS FROM BYPASSING THE POND. INFLOWS ARE GENERATED THROUGH SURFACE RUNOFF FROM THE BUSINESS PARK AND ENTER THE POND FROM THE NORTHEAST. THE POND RELEASES INTO AN EAST TRIBUTARY OF WILLOW CREEK.
- 2.1 MAINTENANCE NOTES**
 - A. MAINTENANCE FREQUENCY
 - ROUTINE MAINTENANCE TASKS, INCLUDING MOWING AND DEBRIS REMOVAL, SHOULD BE PERFORMED ON AN AS-NEEDED BASIS. DEBRIS REMOVAL SHOULD BE DONE PRIOR TO THE SUMMER STORM SEASON AND FOLLOWING SIGNIFICANT RAINFALL EVENTS. IN ADDITION, THE PROPERTY OWNER SHOULD PERFORM A SITE INSPECTION ON AN ANNUAL BASIS TO EVALUATE THE NEED FOR ADDITIONAL MAINTENANCE, INCLUDING SEDIMENT REMOVAL, EROSION CONTROL, REVEGETATION, AND STRUCTURAL REPAIRS. IF ADDITIONAL MAINTENANCE IS REQUIRED, THE PROPERTY OWNER MAY REQUEST ASSISTANCE FROM UDFCD.
 - B. EQUIPMENT AND SPECIAL TOOLS REQUIRED
 - SUBMERSIBLE PUMP / GENERATOR
 - LONG-REACH RAKE OR BROOM (7 FT)
 - LONG-REACH TRACK EXCAVATOR
 - SKID STEER
 - DUMP TRUCK
- 2.2 MAINTENANCE PROCEDURE**
 - A. DEWATERING
 - THIS POND HAS NO NATURAL BASEFLOW BUT WILL RECEIVE STORM AND IRRIGATION RUNOFF ON A FREQUENT BASIS. BASEFLOW IS NOT EXPECTED FOLLOWING ELIMINATION OF BYPASS PIPE. PERMANENT POOLS FORM IN THE MICROPOOL AND FOREBAY. THESE TWO AREAS MUST BE PUMPED TO DEWATER. IF PUMP DOES NOT HAVE FINE SCREENING AT THE INTAKE, ALTERNATELY PUMP FROM ONE POOL TO THE OTHER TO PREVENT SEDIMENT-LADEN DISCHARGE.
 - B. SEDIMENT REMOVAL
 - SEDIMENT MUST BE REMOVED FROM THE FOREBAY AND MICROPOOL WHEN THEY HAVE REACHED 3/4 CAPACITY. THE CONCRETE-LINED FOREBAY IS ACCESSED FROM A MAINTENANCE RAMP OFF THE MAINTENANCE ROAD, AND CAN BE CLEANED WITH A SKID-STEER OR LOADER. HAND REMOVAL MAY BE NECESSARY ADJACENT TO THE VERTICAL WALLS. THE MICROPOOL CAN BE CLEANED WITH A LONG-REACH EXCAVATOR OR BACKHOE FROM THE MAINTENANCE ROAD.
 - C. DEBRIS REMOVAL
 - DEBRIS BUILDUP IS EXPECTED AT THE 10-YR OUTLET STRUCTURE TRASH RACK AND WATER QUALITY SCREEN, AT THE 100-YR OUTLET STRUCTURE TRASH RACK, AND AT THE ENERGY DISSIPATOR UPSTREAM OF THE FOREBAY ENTRANCE STRUCTURE. ALL DEBRIS SHOULD BE COLLECTED AND DISPOSED OFFSITE. ACCESS TO THE WATER QUALITY SCREEN IN THE 10-YR STRUCTURE IS PROVIDED BY A TRAP DOOR ABOVE THE TRASH RACK. A LONG-REACH BROOM OR RAKE WILL BE NECESSARY TO CLEAN THE SCREEN.
 - D. SITE INSPECTION
 - THE FOLLOWING ITEMS SHOULD BE INSPECTED A MINIMUM OF ONCE PER YEAR AND MAINTAINED AS NEEDED:
 - GENERAL:
 - RIPRAP TRICKLE CHANNEL
 - MAINTENANCE ROAD
 - EROSION
 - VEGETATION
 - EQUIPMENT AND STRUCTURES:
 - FOREBAY ENTRANCE STRUCTURE AND CONCRETE-LINED FOREBAY
 - CONCRETE ENTRANCE STRUCTURE
 - ENERGY DISSIPATOR
 - 24" REINFORCED CONCRETE PIPE
 - CONCRETE SLAB AND VERTICAL WALLS
 - 10-YR OUTLET STRUCTURE:
 - CONCRETE STRUCTURE
 - OVERFLOW GRATE
 - TRASH RACK
 - WATER QUALITY SCREEN
 - FLOW CONTROL PLATE
 - 24" REINFORCED CONCRETE PIPE
 - 100-YR OUTLET STRUCTURE:
 - CONCRETE STRUCTURE
 - INTERCEPTOR GRATE
 - 42" REINFORCED CONCRETE PIPE
 - HANDRAIL
 - SLOPING GROUTED BOULDERS AT MICROPOOL
 - E. POST-MAINTENANCE CONSIDERATIONS
 - FOLLOWING COMPLETION OF MAINTENANCE ACTIVITIES, ALL DEBRIS, TRASH, AND EXCAVATED SEDIMENT MUST BE REMOVED OFFSITE. IF NECESSARY, PANORAMA DRIVE MUST BE SWEEP CLEAN.

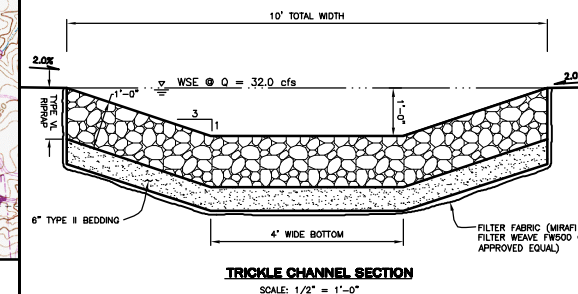
(EXAMPLE PLAN)

**PANORAMA PARK REGIONAL
WATER QUALITY DETENTION POND
MAINTENANCE SITE PLAN**
MARCH, 2005
(PROJECT COMPLETED APRIL, 2005)

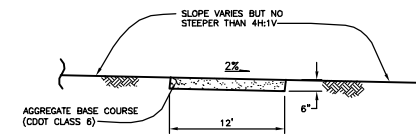


LOCATION MAP
SCALE: 1" = 200'

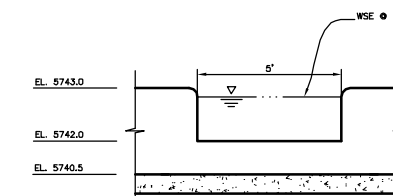
PROJECT DETAILS



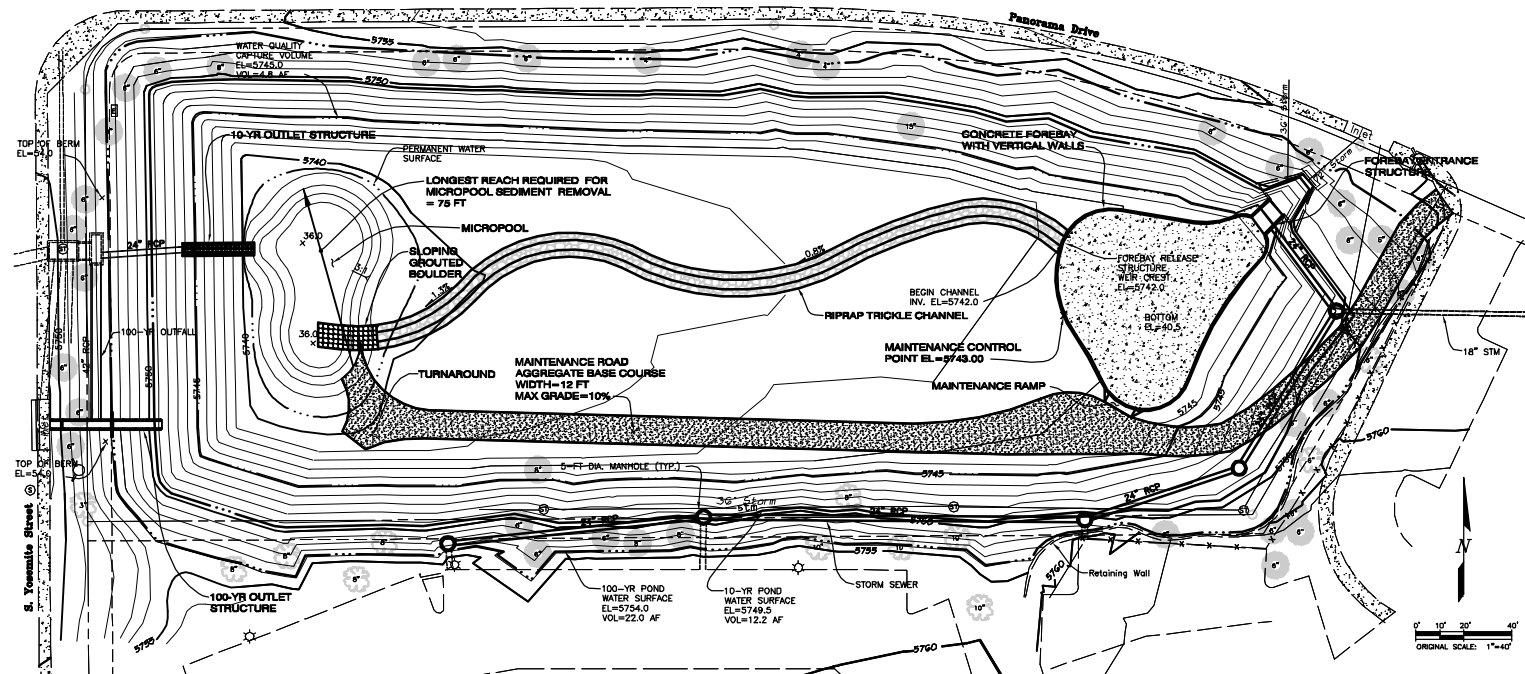
TRICKLE CHANNEL SECTION
SCALE: 1/2" = 1'-0"



MAINTENANCE ROAD
NOT TO SCALE

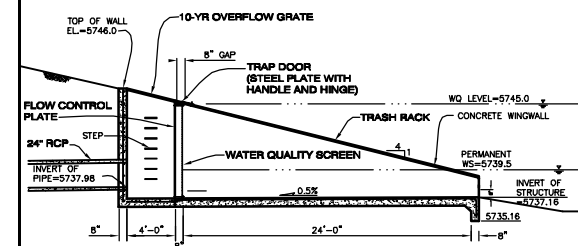
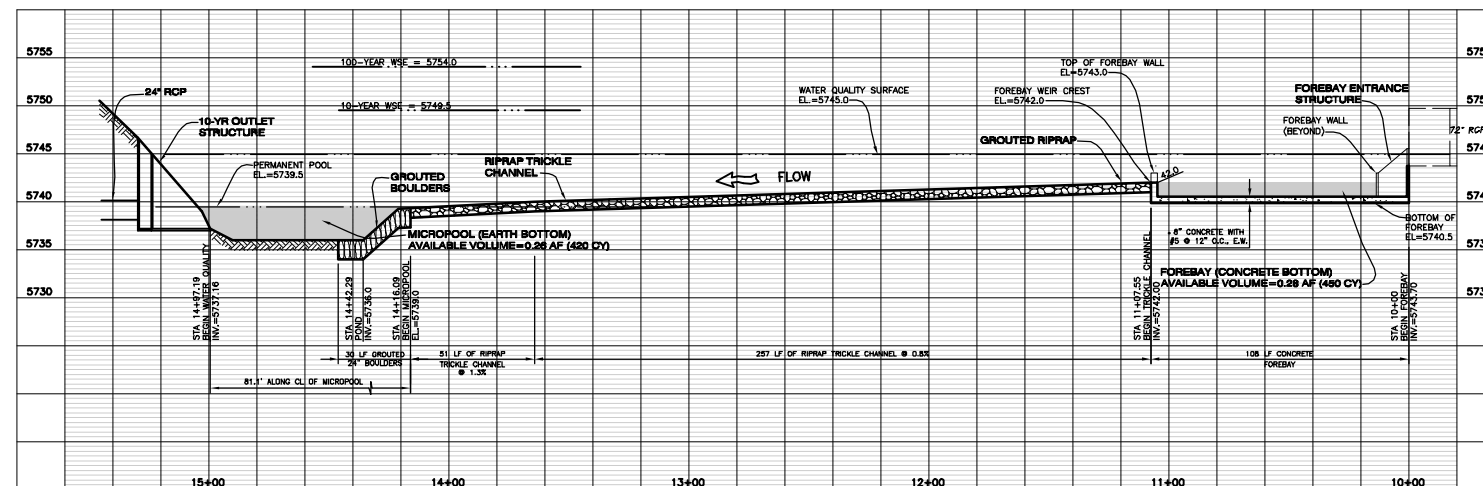


FOREBAY RELEASE STRUCTURE
NOT TO SCALE



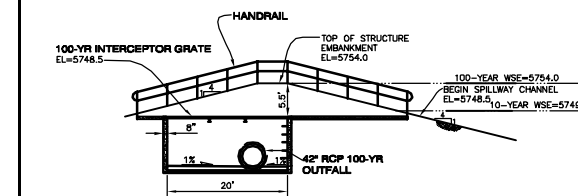
HYDRAULIC PROFILE

SCALE: 1" = 40' HORIZ.
1" = 10' VERT.



10-YR OVERFLOW GRATE

10-YR OUTLET STRUCTURE
SCALE: 1/8" = 1'-0"



100-YR INTERCEPTOR GRATE

100-YR OUTLET STRUCTURE
SCALE: 1/16" = 1'-0"

DATE: MAR 28, 2005 TIME: 8:12 PM NAME: P:\01-010\21_C&M_Manual\01010-21-PANORAMA-esp.dwg