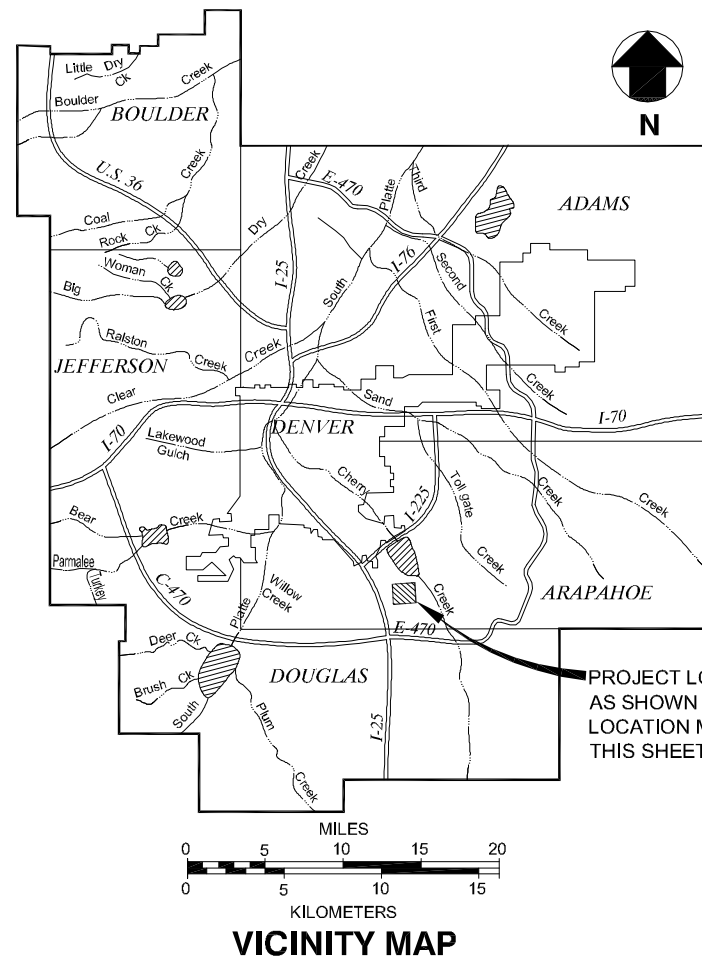
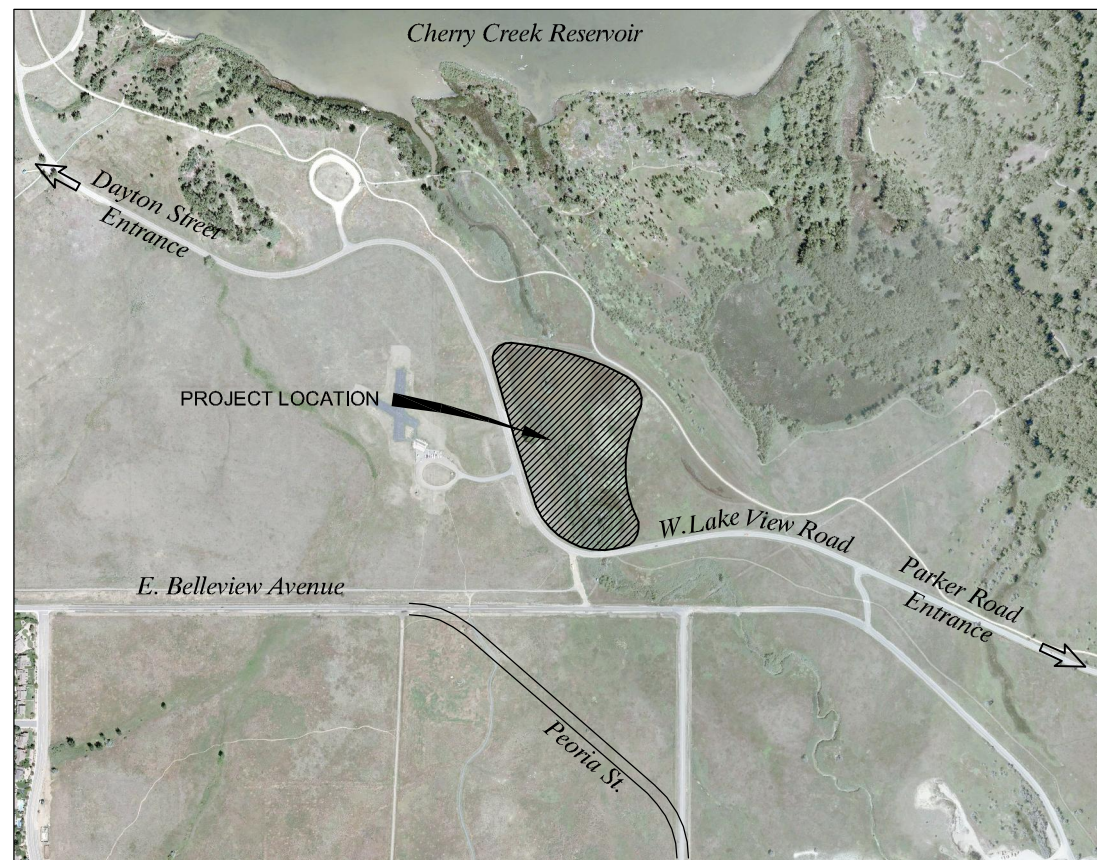


CONTRACT DRAWINGS FOR CONSTRUCTION OF COTTONWOOD CREEK WETLANDS REHABILITATION CHERRY CREEK BASIN WATER QUALITY AUTHORITY OCTOBER 2011



PROJECT LOCATION AS SHOWN ON THE LOCATION MAP, THIS SHEET.



INDEX OF DRAWINGS

SHEET	DRAWING NO.	TITLE
GENERAL		
1	G-1	TITLE SHEET
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3	G-3	SITE PLAN
CIVIL		
4	C-1	GRADING PLAN A
5	C-2	GRADING PLAN B
6	C-3	CHANNEL CENTERLINE PROFILE
7	C-4	TYPICAL CHANNEL SECTIONS
8	C-5	BANK PROTECTION DETAILS
STRUCTURAL		
9	S-1	STACKED BOULDER WALL AND GUARDRAIL DETAILS
10	S-2	POND OUTLET STRUCTURE MODIFICATION DETAILS

CHERRY CREEK BASIN WATER QUALITY AUTHORITY

BILL RUZZO; TECHNICAL MANAGER

DATE

COLORADO STATE PARKS

SHAWN KRIER; PROJECT MANAGER

DATE

MULLER ENGINEERING

I HEREBY AFFIRM THAT THESE FINAL CONSTRUCTION PLANS FOR COTTONWOOD CREEK WETLAND REHABILITATION WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE REQUIREMENTS OF THE INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS AND THE STORMWATER MANAGEMENT MANUAL.

JAMES T. WULLIMAN
PE # 20114
MULLER ENGINEERING CO.



REQUIRED NOTES:

1. THE COUNTY ENGINEER STAMP AND SIGNATURE AFFIXED TO THIS DOCUMENT INDICATES THE DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT HAS REVIEWED THE DOCUMENT AND FOUND IT IN GENERAL CONFORMANCE WITH THE ARAPAHOE COUNTY SUBMISSION REGULATIONS OR APPROVED VARIANCES TO THOSE REGULATIONS. THE COUNTY ENGINEER, THROUGH APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY, OTHER THAN STATED ABOVE, FOR THE COMPLETENESS AND/OR ACCURACY OF THESE DOCUMENTS. THE OWNER AND ENGINEER UNDERSTAND THAT IT IS THE POLICY AND PRACTICE OF ARAPAHOE COUNTY NOT TO ACCEPT LIABILITY FOR FACILITIES DESIGNED BY OTHERS. THE RESPONSIBILITY FOR THE ENGINEERING ADEQUACY OF THE FACILITIES DEPICTED IN THIS DOCUMENT LIES SOLELY WITH THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.
2. ALL ROADWAY CONSTRUCTION SHALL CONFORM TO THE ARAPAHOE COUNTY INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS.
3. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE ARAPAHOE COUNTY DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT. THE COUNTY RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
4. THE CONTRACTOR SHALL NOTIFY THE ARAPAHOE COUNTY DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT INSPECTION SECTION AT 720-874-6500, A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO STARTING CONSTRUCTION.
5. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO ACTUAL CONSTRUCTION. FOR INFORMATION CONTACT THE DENVER INTER-UTILITY GROUP AT 303-534-6700, OR AT 1-800-922-1987.
6. THE CONTRACTOR SHALL HAVE ONE (1) SIGNED COPY OF THE PLANS (APPROVED BY THE DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT) AND ONE (1) COPY OF THE INFRASTRUCTURE DESIGN AND CONSTRUCTION STANDARDS AT THE JOB SITE AT ALL TIMES.
7. A PLAN FOR TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE SUBMITTED TO ARAPAHOE COUNTY FOR APPROVAL WITH THE PERMIT APPLICATION. A STREET CUT AND RIGHT OF WAY USE PERMIT OR PUBLIC IMPROVEMENT CONSTRUCTION PERMIT WILL NOT BE ISSUED WITHOUT AN APPROVED TRAFFIC CONTROL PLAN FOR TRAFFIC CONTROL DURING CONSTRUCTION.
8. THESE CONSTRUCTION PLANS SHALL BE CONSIDERED VALID FOR A PERIOD OF TWO (2) YEARS FROM THE DATE OF COUNTY ACCEPTANCE, AFTER WHICH TIME THESE PLANS SHALL BE VOID AND WILL BE SUBJECT TO ADDITIONAL REVIEW AND ACCEPTANCE BY ARAPAHOE COUNTY.
9. CONTRACTOR SHALL NOTIFY THE ARAPAHOE COUNTY ENGINEERING INSPECTION SECTION WHEN WORKING OUTSIDE OF THE PUBLIC RIGHT-OF-WAY ON A FACILITY, WHICH WILL BE CONVEYED TO THE COUNTY, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, OR OTHER SPECIAL DISTRICT FOR MAINTENANCE (STORM SEWER, ENERGY DISSIPATORS, DETENTION POND OUTLET STRUCTURES, OR OTHER DRAINAGE INFRASTRUCTURE). FAILURE TO NOTIFY THE ENGINEERING INSPECTION SECTION TO ALLOW FOR INSPECTION OF THIS CONSTRUCTION MAY RESULT IN NON-ACCEPTANCE OF THE FACILITIES BY THE COUNTY.

BENCHMARK:
HORIZONTAL CONTROL FROM ARAPAHOE COUNTY CONTROL POINTS. VERTICAL CONTROL FROM BM 3" BRASS CAP @NW CORNER OF HEADWALL ON SOUTH END OF NEWARK WAY CUL-DE-SAC, NORTH OF COTTONWOOD CREEK STAMPED: "USGS, SEPT. 1992 ELEV. 5632.33", NGVD 1929 DATUM. NAVD88 = NGVD29 + 2.97

ALL VERTICAL INFORMATION ON THESE PLANS IS BASED ON NGVD 1929 DATUM.

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK

CASE NO. E10-032

3/5 ADD AC NOTES AND STAMP



MULLER ENGINEERING CO., INC.
CONSULTING ENGINEERS
IRONGATE 4, SUITE 100
777 S. WADSWORTH BLVD.
LAKEWOOD, COLORADO 80226
(303) 988-4939

DESIGN
JRS
DRAWN
LLD
CHECK
JTW



PREPARED FOR:
CHERRY CREEK BASIN WATER QUALITY AUTHORITY
8390 E. CRESCENT PKWY., SUITE 500
GREENWOOD VILLAGE, CO. 80111
303-779-4525

**COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY**

GENERAL
TITLE SHEET

DATE
OCTOBER 2011
DRAWING NO.
G-1
SHEET NO.
1 OF 10

No. DATE REVISIONS APPR. MEC PROJECT No. 02-025.10

GENERAL NOTES

GENERAL LEGEND

	SOIL/SUBGRADE		PROPOSED FENCE
	CONCRETE		EXISTING FENCE
	BEDDING		EXISTING MAJOR CONTOUR
	EXISTING TREES EXISTING SHRUBS		EXISTING MINOR CONTOUR
	CONTROL POINT		PROPOSED MAJOR CONTOUR
	GEOTECHNICAL TEST PIT		PROPOSED MINOR CONTOUR
	NEW EMBANKMENT SLOPE AS INDICATED (HORIZ:VERT)		EASEMENT LINE
	SPOT ELEVATION		RIGHT-OF-WAY
	SECTION OR DETAIL DESIGNATION		EXISTING CULVERTS
	DRAWING NUMBER WHERE SECTION OR DETAIL IS SHOWN OR TAKEN		EXISTING SANITARY SEWER
	SILT FENCE		EXISTING WATER LINE
	CONSTRUCTION FENCE		EXISTING UNDERGROUND GAS
	CONSTRUCTION MARKER		EXISTING OVERHEAD ELECTRIC
	VEHICLE TRACKING CONTROL		PROPOSED UNDERGROUND ELECTRIC
	CHECK DAM		EXISTING UNDERGROUND TELEPHONE
	STABILIZED STAGING AREA		DITCH
			EDGE OF PAVEMENT/CONCRETE
			SECTION LINE
			CENTER LINE
			PARCEL LINE
			LIMITS OF CONSTRUCTION
			EXISTING RIPRAP
			PROPOSED RIPRAP

VOID-FILLED RIPRAP NOTES:

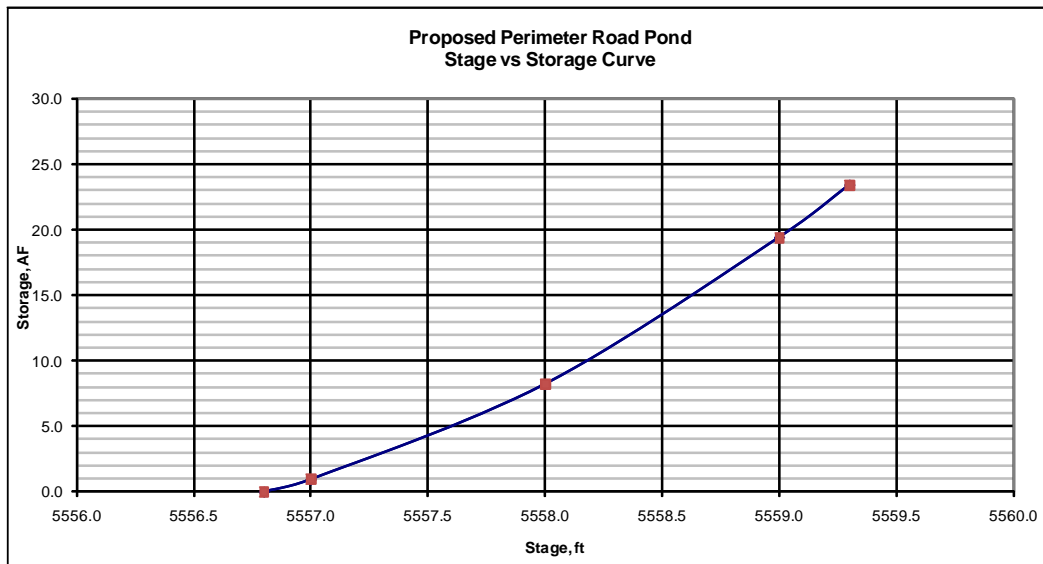
1. THE COLOR OF RIPRAP AND VOID-FILL MATERIALS USED TO FILL THE RIPRAP VOIDS SHALL BE LIGHT GRAY AND/OR TAN AND SHALL BE UNIFORM. SAMPLES OF RIPRAP AND VOID-FILL MATERIALS SHALL BE SUBMITTED FOR THE REVIEW AND APPROVAL OF THE ENGINEER AND OWNER PRIOR TO CONSTRUCTION.
2. ELEVATION TOLERANCE FOR THE VOID-FILLED RIPRAP SHALL BE 0.10 FEET. THICKNESS OF VOID-FILLED RIPRAP SHALL BE NO LESS THAN THICKNESS SHOWN AND NO MORE THAN 2-INCHES GREATER THAN THE THICKNESS SHOWN.
3. WHERE "VOID-FILLED RIPRAP (12-INCH)" IS DESIGNATED ON THE CONTRACT DRAWINGS, D50-12-INCH RIPRAP SHALL BE MIXED WITH THE MATERIALS AND ASSOCIATED PROPORTIONS LISTED IN THE TABLE BELOW TO FILL THE VOIDS OF THE RIPRAP.

APPROXIMATE PROPORTIONS (LOADER BUCKETS)	MATERIAL TYPE	MATERIAL DESCRIPTION
6	D50 = 12" RIPRAP, AS SHOWN ON DRWGS	D50 = 12" RIPRAP (70-100% SMALLER THAN 2 1/4-INCH EQUIV. SPHERICAL DIA., 50-70% SMALLER THAN 1 1/2-INCH, 35-50% SMALLER THAN 1 1/4-INCH, 2-10% SMALLER THAN 1/2-INCH)
2	VOID-FILL MATERIAL	7-INCH MINUS CRUSHED ROCK SURGE (100% PASSING 7-INCH SIEVE, 80-100% PASSING 6-INCH SIEVE, 35-50% PASSING 3-INCH SIEVE, 10-20% PASSING 1.5-INCH SIEVE)
1	VOID-FILL MATERIAL	VTC (VEHICLE TRACKING CONTROL) ROCK (100% PASSING 4-INCH SIEVE, 50-70% PASSING 3-INCH SIEVE 0-10% PASSING 2-INCH SIEVE) (FRACTURED FACE, ALL SIDES)
1	VOID-FILL MATERIAL	FILTER MATERIAL (CLASS A) (100% PASSING 3/8-INCH SIEVE, 20-80% PASSING 0.75-INCH SIEVE, 0-20% PASSING #4 SIEVE, AND 0-3% PASSING #200 SIEVE) (FRACTURED FACE ALL SIDES)
1/2	VOID-FILL MATERIAL	4-INCH MINUS PIT RUN SURGE (ROUND ROCK AND SAND, WELL GRADED), (90-100% PASSING 4-INCH SIEVE, 70-80% PASSING 1 1/2-INCH SIEVE, 40-60% PASSING 3/4-INCH SIEVE, 10-30% PASSING #16 SIEVE)
1/2 - 1	VOID-FILL MATERIAL	NATIVE TOPSOIL

NOTE: MIX PROPORTIONS AND MATERIAL GRADATIONS ARE APPROXIMATE AND ARE SUBJECT TO ADJUSTMENT BY THE ENGINEER. NO ADJUSTMENT IN UNIT PRICE FOR VOID-FILLED RIPRAP WILL BE ALLOWED BASED ON MODIFICATIONS TO THE MIX PROPORTIONS.

4. THE RIPRAP AND VOID-FILL MATERIALS SHALL BE THOROUGHLY MIXED PRIOR TO PLACEMENT AND SHALL BE INSTALLED AND COMPACTED SO THAT A DENSE, INTERLOCKED LAYER OF RIPRAP AND VOID-FILL MATERIAL IS PROVIDED WITH RIPRAP VOIDS COMPLETELY FILLED. THE LOOSE MATERIAL SHALL BE PLACED IN A SINGLE LIFT OF SUFFICIENT HEIGHT SUCH THAT FINAL GRADE WILL BE ACHIEVED UPON COMPACTION. IF THE COMPACTION MATERIAL IS BELOW FINAL GRADE, PLACEMENT OF ONLY THE SMALLER VOID-FILL MATERIALS TO ACHIEVE FINAL GRADE WILL NOT BE PERMITTED. SEGREGATION OF MATERIALS SHALL BE AVOIDED AND IN NO CASE SHALL THE COMBINED MATERIAL CONSIST PRIMARILY OF THE VOID-FILL MATERIALS. IF MATERIALS DO SEGREGATE PRIOR TO PLACEMENT, THE MIXTURE SHALL BE REMOVED, REPROCESSED, AND REPLACED. THE DENSITY AND INTERLOCKING NATURE OF RIPRAP IN THE MIXED MATERIAL SHALL ESSENTIALLY BE THE SAME AS IF THE RIPRAP WAS PLACED WITHOUT FILLING THE VOIDS.
5. AFTER REVIEW AND APPROVAL OF THE INITIAL VOID-FILLED RIPRAP INSTALLATION, A 50:50 MIXTURE OF 4-INCH MINUS PIT RUN AND FILTER MATERIAL (CLASS A) SHALL BE SPRINKLED ON THE SURFACE OF THE VOID-FILLED RIPRAP AT THE DIRECTION OF THE ENGINEER, AND WASHED-IN WITH WATER USING A HIGH PRESSURE HOSE TO FILL-IN SMALL VOIDS. THIS SHALL BE DONE JUST PRIOR TO COMPACTION OF THE VOID-FILLED RIPRAP.
6. COMPACTION OF THE VOID-FILLED RIPRAP SHALL BE PERFORMED BY WHEEL ROLLING WITH HEAVY RUBBER-TIRED EQUIPMENT (E.G., FRONT END LOADER), THE MOISTURE CONTENT OF THE MIXTURE SHALL BE AT OPTIMUM CONDITIONS PRIOR TO COMPACTION AND WATER SHALL BE ADDED, AS NECESSARY, AT THE DIRECTION OF THE ENGINEER.
7. THE CONTRACTOR SHALL INSTALL A TEST SECTION OF AT LEAST 300 SQUARE FEET OF VOID-FILLED RIPRAP FOR THE REVIEW AND APPROVAL OF THE ENGINEER AND OWNER PRIOR TO INSTALLATION OF THE REMAINING VOID FILLED-RIPRAP.
8. THE CONTRACTOR SHALL PREPARE SUBGRADE FOR VOID-FILLED RIPRAP FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO RIPRAP PLACEMENT.

1. LOCATIONS OF UTILITIES REPRESENT THE BEST-KNOWN LOCATIONS AT THE TIME OF PREPARATION OF DRAWINGS. THE CONTRACTOR SHALL FIELD-LOCATE ALL UTILITIES IN ADVANCE OF EXCAVATION. RELOCATION OF UTILITIES MAY OR MAY NOT BE NEEDED AFTER THEY ARE EXPOSED. ACTUAL RELOCATION OF LINES WILL NOT BE THE RESPONSIBILITY OF THE CONTRACTOR, UNLESS OTHERWISE SHOWN, BUT THE CONTRACTOR SHALL COOPERATE WITH UTILITY COMPANIES TO COORDINATE THE RELOCATION EFFORT. LINES NOT RELOCATED SHALL BE PROTECTED BY THE CONTRACTOR IN PLACE OR REMOVED AND REPLACED, IN KIND, AS APPROVED BY THE ENGINEER. NO ADDITIONAL PAYMENT WILL BE ALLOWED FOR THE MINOR ADJUSTMENT OF STRUCTURES OR PIPES IN ORDER TO CLEAR A CONFLICTING UTILITY. CONTACT UTILITY COMPANIES 48 HOURS IN ADVANCE WHEN WORKING ADJACENT TO THE UTILITY.
2. THE CONTRACTOR SHALL COMPLY WITH ANY APPLICABLE TRAFFIC CONTROL REQUIREMENTS OF CHERRY CREEK STATE PARK IN ACCESSING THE CONSTRUCTION SITE.
3. PROJECT FACILITIES ARE TO BE LOCATED BASED ON THE SURVEY COORDINATES, ELEVATIONS, DIMENSIONS, AND/OR GEOMETRIC DESIGN DATA PROVIDED ON THE DRAWINGS. WHERE SUCH INFORMATION IS NOT INDICATED ON THE DRAWINGS, FINISHED GRADES AND FACILITY LOCATIONS ARE TO BE DERIVED FROM PLAN VIEW LAYOUT LINES AND CONTOURS.
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING STABLE EXCAVATIONS AND TEMPORARY SLOPES AND FOR SATISFYING ALL APPLICABLE OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS. TEMPORARY EXCAVATIONS SHALL PROVIDE, AT MINIMUM, THE TRENCH DIMENSIONS AND CLEARANCES SHOWN OR SPECIFIED. TEMPORARY CONSTRUCTION SLOPES SHALL BE SLOPED, SHORED, SHEETED, AND/OR BRACED IN ACCORDANCE WITH STABILITY REQUIREMENTS AND APPLICABLE REGULATIONS, AND SHALL BE NO STEEPER THAN THE SLOPES SHOWN OR SPECIFIED WITHOUT THE APPROVAL OF THE ENGINEER. ANY SUCH APPROVALS BY THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR FROM SOLE RESPONSIBILITY FOR PROVIDING STABLE EXCAVATIONS AND TEMPORARY SLOPES.
5. THE WORK WILL TAKE PLACE IN AND AROUND A FLOWING STREAM, SUBJECT TO PERIODIC FLOODING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF SURFACE AND SUBSURFACE WATER DURING THE COURSE OF THE WORK. ANY DAMAGE TO THE WORK RESULTING FROM SUBSURFACE, BASE FLOWS OR FLOOD FLOWS, INCLUDING BOUJANCY FORCES ON PIPELINES AND OTHER FACILITIES, SHALL BE CORRECTED BY THE CONTRACTOR AT THE CONTRACTOR'S SOLE COST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND SATISFYING THE REQUIREMENTS OF ANY APPLICABLE PERMITS PERTAINING TO WATER AND EROSION CONTROL.
6. THE CONSTRUCTION WORK IS LIMITED TO THE PUBLIC RIGHT OF WAY AND THE CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS.
7. EXISTING FACILITIES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED IN PLACE OR REMOVED AND REPLACED IN KIND, AS APPROVED BY THE ENGINEER.
8. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS (HORIZONTAL AND VERTICAL) AT CONNECTIONS TO ALL EXISTING INFRASTRUCTURE INCLUDING EXISTING SANITARY SEWERS, STORM DRAINS AND EXISTING CONCRETE STRUCTURES. THIS INFORMATION SHALL BE COLLECTED AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION AND/OR PRIOR TO INSTALLATION OF ANY NEW FACILITIES SHOWN ON THESE CONTRACT DRAWINGS. THE ENGINEER WILL DETERMINE IF ANY MINOR MODIFICATIONS TO THE NEW FACILITIES SHOWN ON THE CONTRACT DRAWINGS ARE NECESSARY SUCH AS HORIZONTAL AND VERTICAL ADJUSTMENTS.
9. SCALES SHOWN ARE FOR FULL SIZE (22"x34") SHEETS AND REQUIRE ADJUSTMENT FOR HALF SIZE (11"x17") SHEETS.
10. TOPOGRAPHIC MAPPING ON THE DRAWINGS SOUTH OF WEST LAKE VIEW ROAD WAS PREPARED BY CARROLL AND LANGE, INC. BASED ON AN AERIAL SURVEY CONDUCTED IN 2003. TOPOGRAPHIC MAPPING ON THE DRAWINGS NORTH OF WEST LAKE VIEW ROAD WAS PREPARED BY CARROLL AND LANGE, INC. BASED ON A FIELD SURVEY COMPLETED IN 2008. HORIZONTAL CONTROL FROM ARAPAHOE COUNTY CONTROL POINTS. VERTICAL CONTROL FROM BM 3" BRASS CAP @ NW CORNER OF HEADWALL ON SOUTH END OF NEWARK WAY CUL-DE-SAC, NORTH OF COTTONWOOD CREEK STAMPED: "USGS, SEPT. 1992 ELEV. 5632.33", NGVD 1929 DATUM. HORIZONTAL AND VERTICAL CONTROL POINTS ARE SHOWN ON DWG. G-3.
11. THE PROJECT IS ORGANIZED INTO A BASE BID AND AN ALTERNATE SCHEDULE OF WORK TASKS. THE OWNER MAY ELECT TO AWARD JUST THE BASE BID, OR THE BASE BID PLUS SELECTED WORK TASKS FROM THE ALTERNATE SCHEDULE.
12. THE FIRST INSTALLATIONS OF STACKED BOULDER WALL, GRADING, BANK PROTECTION, AND OTHER WORK ELEMENTS IDENTIFIED BY THE OWNER SHALL BE CONSIDERED TEST INSTALLATIONS. CONTRACTOR SHALL NOTIFY ENGINEER AT LEAST 48 HOURS IN ADVANCE OF THE INSTALLATIONS SO THAT THE WORK CAN BE OBSERVED BY THE ENGINEER AND OWNER. THE OWNER, ENGINEER AND CONTRACTOR WILL DISCUSS THE WORK, CONFIRM THAT IT IS IN CONFORMANCE WITH THE DRAWINGS AND SPECIFICATIONS, AND CONSIDER ANY MODIFICATIONS THAT MAY ENABLE THE PROJECT TO BETTER EMULATE A NATURAL, FUNCTIONAL STREAM ENVIRONMENT. SEE SPECIFICATIONS FOR PAYMENT INFORMATION REGARDING MODIFICATIONS TO THE WORK.
13. THE CONTRACTOR SHALL HANDLE THE SITE EXCAVATION AND DISPOSAL AS OUTLINED IN THE SPECIFICATIONS BASED ON THE THREE ZONE DELINEATIONS PROVIDED ON SHEETS C-1 AND C-2. CHERRY CREEK STATE PARK SHALL DRAIN THE POND TO FACILITATE ACCESS. THE THREE ZONES ARE OUTLINED AS FOLLOWS:
EXCAVATION ZONES:
 ZONE 1 - MATERIAL STOCKPILED ON SITE TO DRY PRIOR TO DISPOSAL AT THE LANDFILL.
 ZONE 2 - MATERIAL UTILIZED AS ON SITE FILL WITH EXCESS TRANSPORTED TO THE HAUL SITE IN PARK SHOWN ON SHEET EC-3.
 ZONE 3 - TO BE STOCKPILED ON SITE FOR OBSERVATION AND DETERMINATION WHETHER MATERIAL GOES TO LANDFILL OR HAUL SITE IN PARK SHOWN ON SHEET EC-3. IF MATERIAL IS DETERMINED TO BE CONTAMINATED, CONTRACTOR TO DRY MATERIAL PRIOR TO DISPOSAL AT THE LANDFILL.



NAME: F:\02-025_10 Cottonwood Perimeter Road Pond - CCBWQA\CAD\02-025_10_GEN.dwg DATE: OCT 26, 2011 TIME: 03:04 AM

No.	DATE	REVISIONS	APPR.

MULLER ENGINEERING CO., INC.
 CONSULTING ENGINEERS
 IRONGATE 4, SUITE 100
 777 S. WADSWORTH BLVD.
 LAKEWOOD, COLORADO 80226
 (303) 988-4939

DESIGN JRS
DRAWN SAR
CHECK JTW

PREPARED FOR:

 CHERRY CREEK BASIN WATER QUALITY AUTHORITY
 8390 E. CRESCENT PKWY., SUITE 500
 GREENWOOD VILLAGE, CO. 80111
 303-779-4525

COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
 APPROVAL BLOCK

GENERAL
GENERAL NOTES

DATE	OCTOBER 2011
DRAWING NO.	G-2
SHEET NO.	2 OF 10

GRADING PLAN A

GRADING PLAN B



CONTROL POINT #2
CHISELED "X"
ON CONTROL
STRUCTURE

CONTROL POINT #3
CHISELED "X" ON TOP
OF HEADWALL

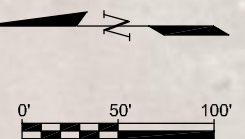
Existing 24" RCP
Existing Outlet
Structure

Existing 10' X 6'
Culvert

W. Lake View Road

CONTROL POINT #1

CONTROL INFORMATION			
CONTROL POINT	NORTHING	EASTING	ELEV. (NGVD 29)
1	1653828.54	3183738.54	5579.33
2	1654695.74	3183937.62	5560.90
3	1653651.28	3184210.82	5561.37



NOTES:

1. TOPOGRAPHIC MAPPING ON THE DRAWINGS SOUTH OF WEST LAKE VIEW ROAD WAS PREPARED BY CARROLL AND LANGE, INC. BASED ON AN AERIAL SURVEY CONDUCTED IN 2003. TOPOGRAPHIC MAPPING ON THE DRAWINGS NORTH OF WEST LAKE VIEW ROAD WAS PREPARED BY CARROLL AND LANGE, INC. BASED ON A FIELD SURVEY COMPLETED IN 2008.
2. BENCHMARK:
HORIZONTAL CONTROL FROM ARAPAHOE COUNTY CONTROL POINTS. VERTICAL CONTROL FROM BM 3" BRASS CAP @NW CORNER OF HEADWALL ON SOUTH END OF NEWARK WAY CUL-DE-SAC, NORTH OF COTTONWOOD CREEK STAMPED: "USGS, SEPT. 1992 ELEV. 5632.33". NGVD 1929 DATUM.
3. THE EXISTING CONTOURS SHOWN ON THE DRAWINGS BELOW ELEVATION 5556.6 (BELOW THE EXISTING POND PERMANENT WATER SURFACE) ARE ASSUMED. PRIOR TO ANY CONSTRUCTION DISTURBANCE IN THE POND AREA, THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER A SURVEY OF THE WORK AREA BELOW ELEVATION 5556.6 (CONSISTING OF A FILE OF 3D POINTS, BREAKLINES, AND CONTOURS IN AUTOCAD FORMAT). THE ENGINEER WILL USE THE SURVEY INFORMATION TO CREATE AN UPDATED EXISTING GROUND SURFACE FOR THE DETERMINATION OF TOTAL PAY QUANTITIES FOR EARTHWORK.


DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK

NAME: F:\02-05-10 Cottonwood Perimeter Road Pond - CCBWQA\CA0\02-05-10_S11E-PL1.dwg DATE: OCT 26, 2011 TIME: 10:48 AM

No.	DATE	REVISIONS	APPR.

MULLER ENGINEERING CO., INC.
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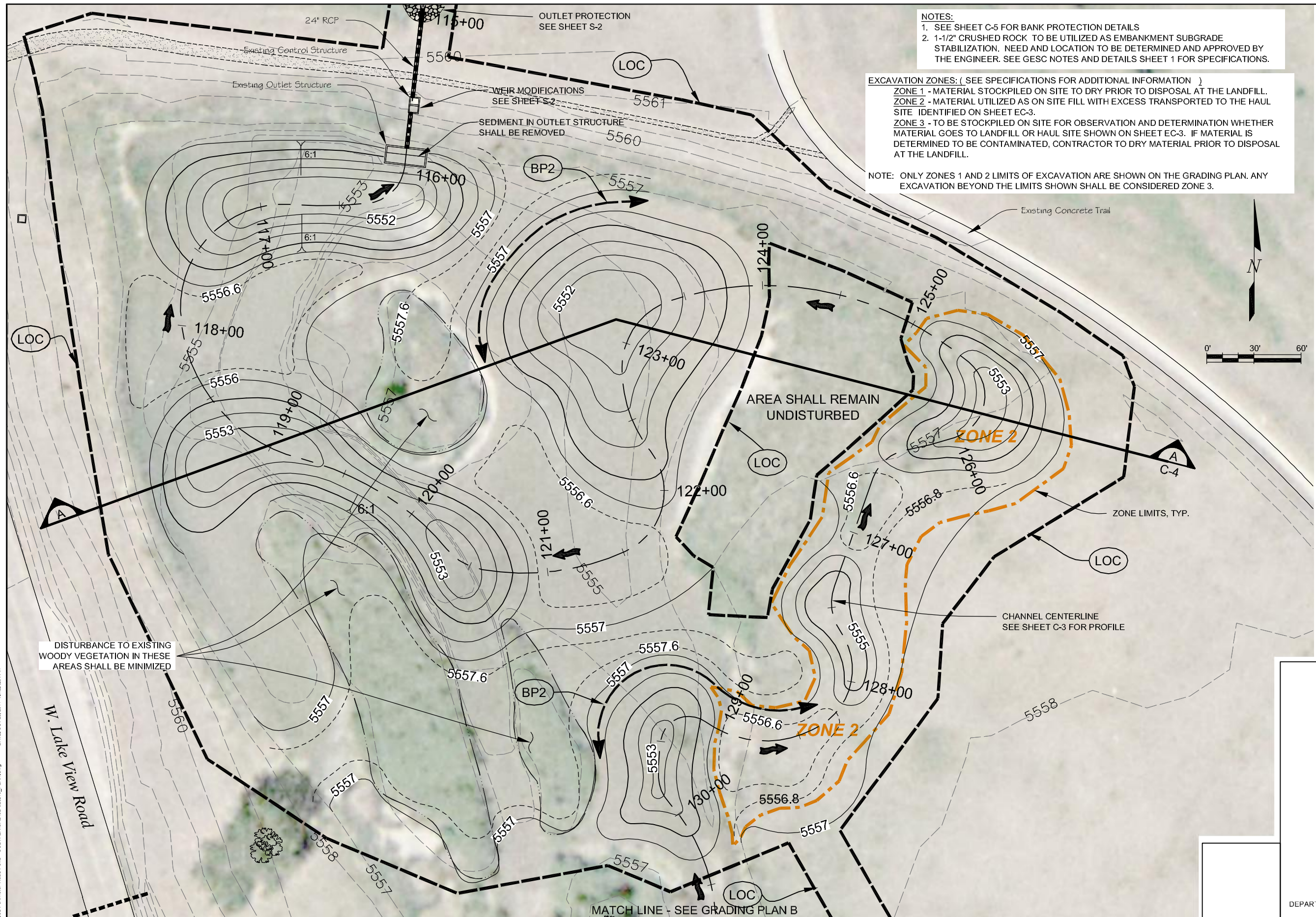
DESIGN
JRS
DRAWN
SAR
CHECK
JTW

PREPARED FOR:
 CHERRY CREEK BASIN WATER QUALITY AUTHORITY
8390 E. CRESCENT PKWY., SUITE 500
GREENWOOD VILLAGE, CO. 80111
303-779-4525

COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

GENERAL
SITE PLAN

DATE	OCTOBER 2011
DRAWING NO.	G-3
SHEET NO.	3 OF 10



NOTES:
 1. SEE SHEET C-5 FOR BANK PROTECTION DETAILS
 2. 1-1/2" CRUSHED ROCK TO BE UTILIZED AS EMBANKMENT SUBGRADE STABILIZATION. NEED AND LOCATION TO BE DETERMINED AND APPROVED BY THE ENGINEER. SEE GESC NOTES AND DETAILS SHEET 1 FOR SPECIFICATIONS.

EXCAVATION ZONES: (SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION)
 ZONE 1 - MATERIAL STOCKPILED ON SITE TO DRY PRIOR TO DISPOSAL AT THE LANDFILL.
 ZONE 2 - MATERIAL UTILIZED AS ON SITE FILL WITH EXCESS TRANSPORTED TO THE HAUL SITE IDENTIFIED ON SHEET EC-3.
 ZONE 3 - TO BE STOCKPILED ON SITE FOR OBSERVATION AND DETERMINATION WHETHER MATERIAL GOES TO LANDFILL OR HAUL SITE SHOWN ON SHEET EC-3. IF MATERIAL IS DETERMINED TO BE CONTAMINATED, CONTRACTOR TO DRY MATERIAL PRIOR TO DISPOSAL AT THE LANDFILL.

NOTE: ONLY ZONES 1 AND 2 LIMITS OF EXCAVATION ARE SHOWN ON THE GRADING PLAN. ANY EXCAVATION BEYOND THE LIMITS SHOWN SHALL BE CONSIDERED ZONE 3.

DISTURBANCE TO EXISTING WOODY VEGETATION IN THESE AREAS SHALL BE MINIMIZED

AREA SHALL REMAIN UNDISTURBED

ZONE LIMITS, TYP.

CHANNEL CENTERLINE
SEE SHEET C-3 FOR PROFILE

MATCH LINE - SEE GRADING PLAN B

NAME: P:\02-025_10 Cottonwood Perimeter Road Pond - CCBWQA\CA\02-025_10_PLAN.dwg DATE: OCT 26, 2011 TIME: 5:54 PM

No.	DATE	REVISIONS	APPR.

MULLER ENGINEERING CO., INC.
 CONSULTING ENGINEERS
 IRONGATE 4, SUITE 100
 777 S. WADSWORTH BLVD.
 LAKEWOOD, COLORADO 80226
 (303) 988-4939

DESIGN: JRS
 DRAWN: SAR
 CHECK: JTW

PREPARED FOR:
 CHERRY CREEK BASIN WATER QUALITY AUTHORITY
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**COTTONWOOD CREEK WETLANDS REHABILITATION
 CHERRY CREEK BASIN WATER QUALITY AUTHORITY**

CIVIL
GRADING PLAN A

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
 APPROVAL BLOCK

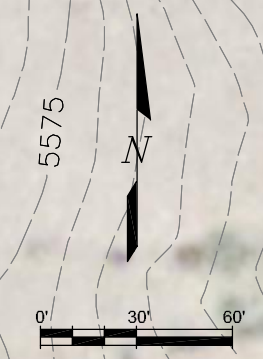
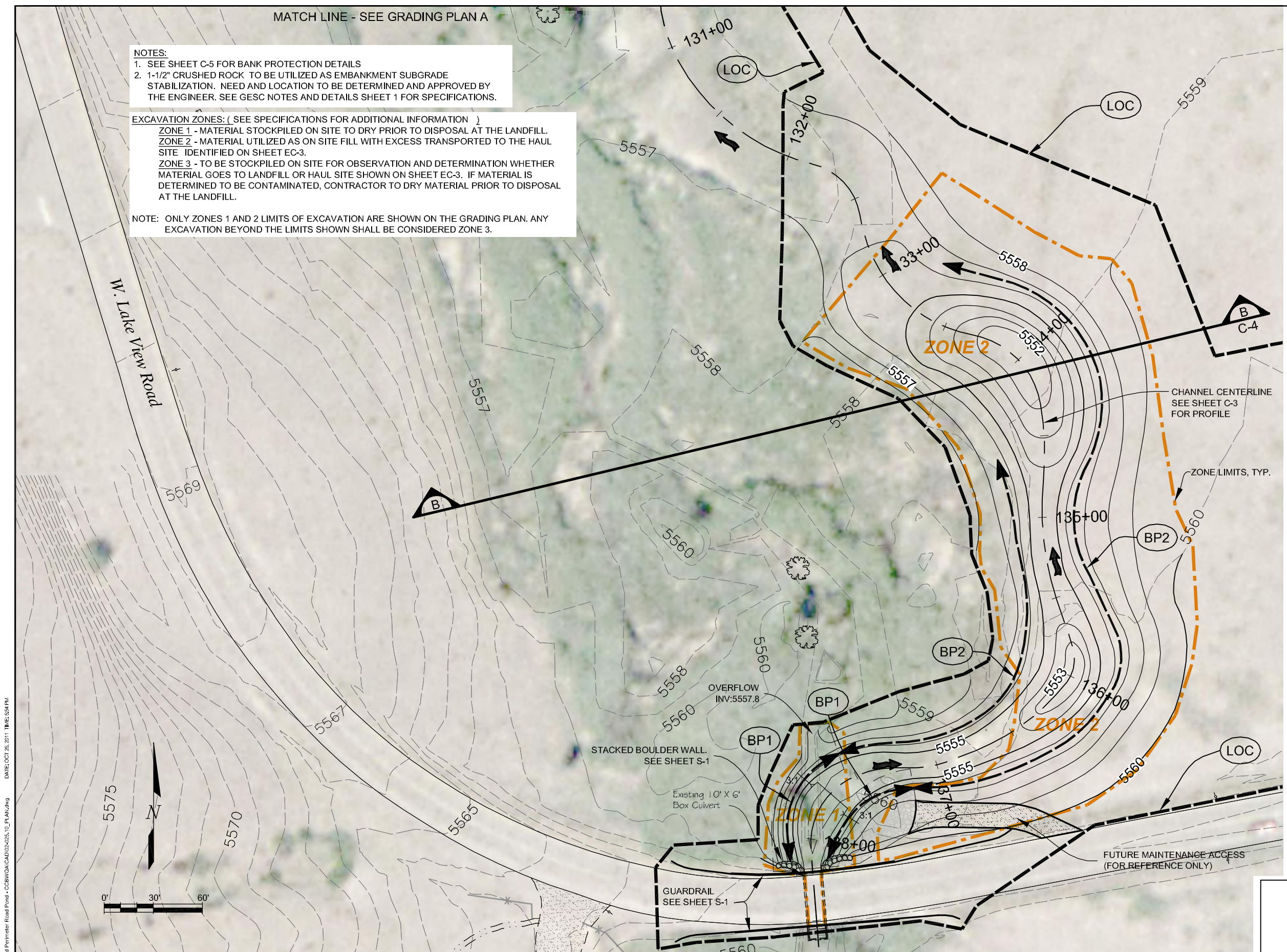
DATE	OCTOBER 2011
DRAWING NO.	C-1
SHEET NO.	4 OF 10

MATCH LINE - SEE GRADING PLAN A

NOTES:
 1. SEE SHEET C-5 FOR BANK PROTECTION DETAILS
 2. 1-1/2" CRUSHED ROCK TO BE UTILIZED AS EMBANKMENT SUBGRADE STABILIZATION. NEED AND LOCATION TO BE DETERMINED AND APPROVED BY THE ENGINEER. SEE GESC NOTES AND DETAILS SHEET 1 FOR SPECIFICATIONS.

EXCAVATION ZONES: (SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION)
ZONE 1 - MATERIAL STOCKPILED ON SITE TO DRY PRIOR TO DISPOSAL AT THE LANDFILL.
ZONE 2 - MATERIAL UTILIZED AS ON SITE FILL WITH EXCESS TRANSPORTED TO THE HAUL SITE IDENTIFIED ON SHEET EC-3.
ZONE 3 - TO BE STOCKPILED ON SITE FOR OBSERVATION AND DETERMINATION WHETHER MATERIAL GOES TO LANDFILL OR HAUL SITE SHOWN ON SHEET EC-3. IF MATERIAL IS DETERMINED TO BE CONTAMINATED, CONTRACTOR TO DRY MATERIAL PRIOR TO DISPOSAL AT THE LANDFILL.

NOTE: ONLY ZONES 1 AND 2 LIMITS OF EXCAVATION ARE SHOWN ON THE GRADING PLAN. ANY EXCAVATION BEYOND THE LIMITS SHOWN SHALL BE CONSIDERED ZONE 3.




DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
 APPROVAL BLOCK

NAME: P:\02-05-10 Cottonwood Perimeter Road Pond - CCBWQA\CAO\02-05-10_PLAN.dwg DATE: OCT 26, 2011 TIME: 5:54 PM

No.	DATE	REVISIONS	APPR.

MULLER ENGINEERING CO., INC.
 CONSULTING ENGINEERS
 IRONGATE 4, SUITE 100
 777 S. WADSWORTH BLVD.
 LAKEWOOD, COLORADO 80226
 (303) 988-4939

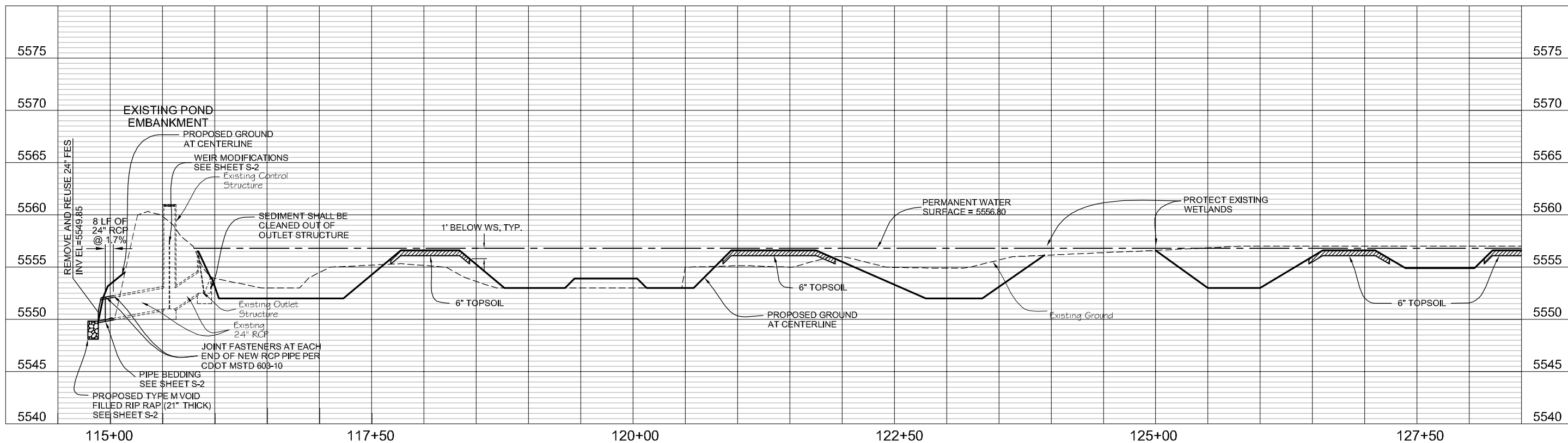
DESIGN: JRS
 DRAWN: SAR
 CHECK: JTW

PREPARED FOR:

 CHERRY CREEK BASIN WATER QUALITY AUTHORITY
 8390 E. CRESCENT PKWY., SUITE 500
 GREENWOOD VILLAGE, CO. 80111
 303-779-4525

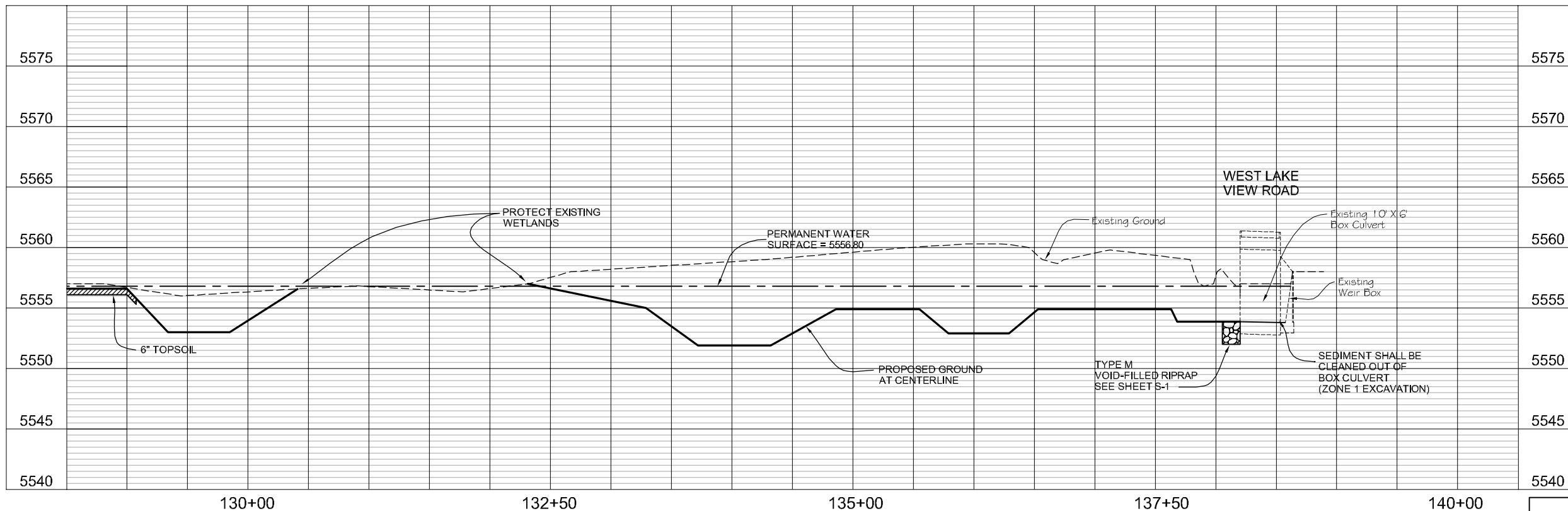
COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

CIVIL
GRADING PLAN B

DATE	OCTOBER 2011
DRAWING NO.	C-2
SHEET NO.	5 OF 10



SCALE
H: 1"=100'
V: 1"=10'



SCALE
H: 1"=100'
V: 1"=10'

NOTE:
PROFILE IS FOR REFERENCE ONLY. CONTRACTOR TO
UTILIZE GRADING PLANS FOR GRADING OPERATIONS.

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK

NAME: P:\02-05-10 Cottonwood Perimeter Road Pond - CCBWA\CA\02-05-10_PRR.dwg DATE: OCT 26, 2011 TIME: 12:48 PM

No.	DATE	REVISIONS	APPR.

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DESIGN JRS
DRAWN SAR
CHECK JTW

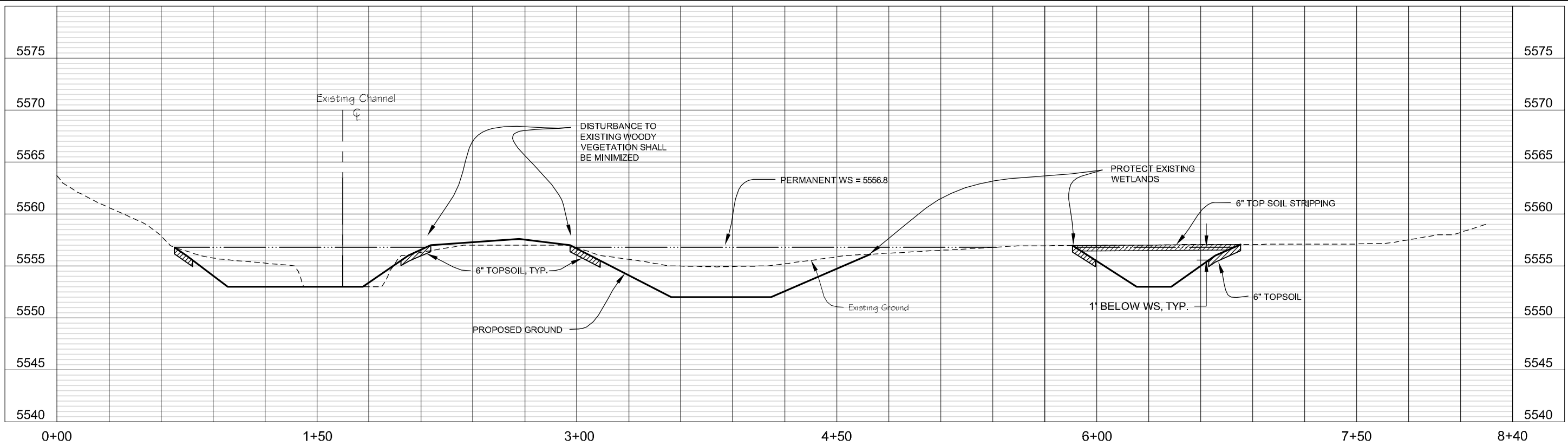
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COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

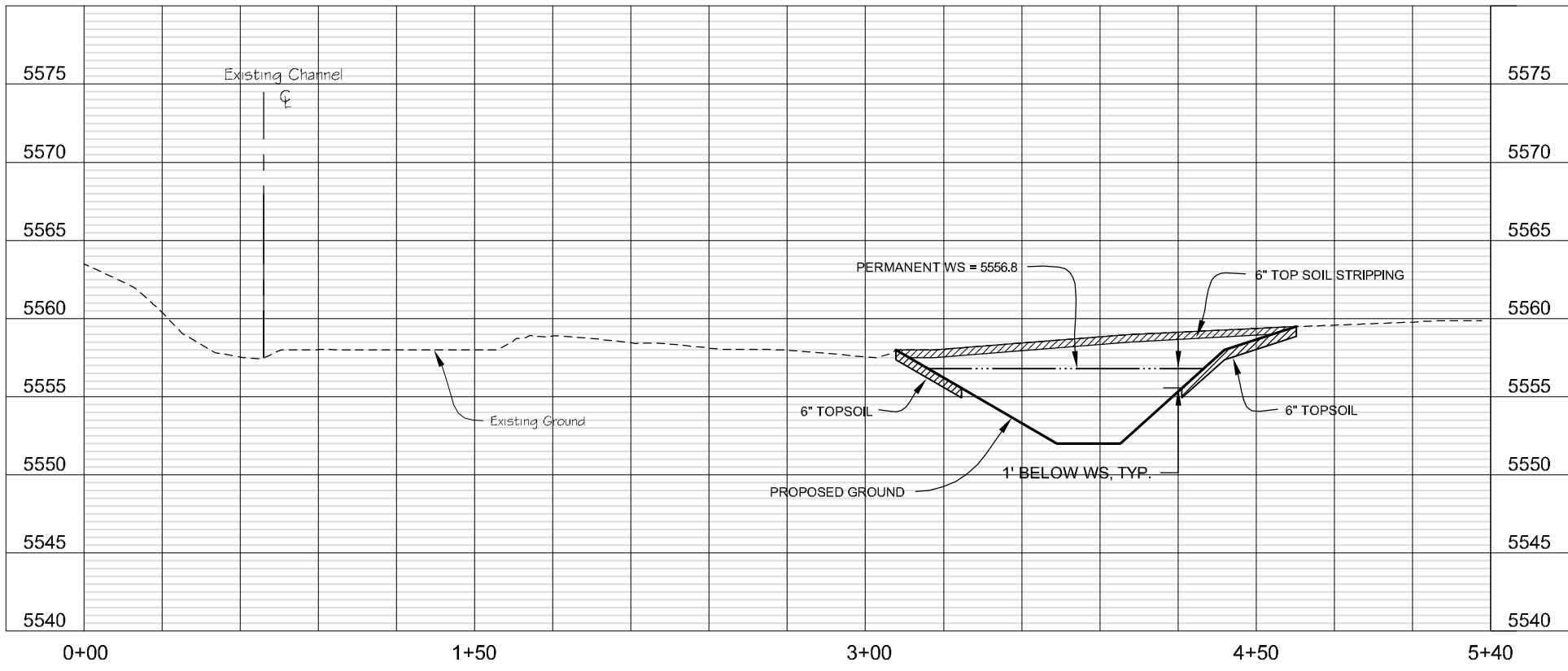
CIVIL
CHANNEL CENTERLINE PROFILE

DATE OCTOBER 2011
DRAWING NO. C-3
SHEET NO. 6 OF 10

MEC PROJECT No. 02-025.10



CROSS SECTION A
 SCALE C-1
 H: 1"=60' V: 1"=10'



CROSS SECTION B
 SCALE C-1
 H: 1"=60' V: 1"=10'

NOTE:
 PROFILE IS FOR REFERENCE ONLY. CONTRACTOR TO
 UTILIZE GRADING PLANS FOR GRADING OPERATIONS.

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT APPROVAL BLOCK	

NAME: P:\0205\10 Cottonwood Perimeter Road Pond - CCBWQA\CAD\02-025\11_SEC.dwg DATE: OCT 26, 2011 TIME: 12:28 PM

No.	DATE	REVISIONS	APPR.

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DESIGN
 JRS
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 SAR
 CHECK
 JTW

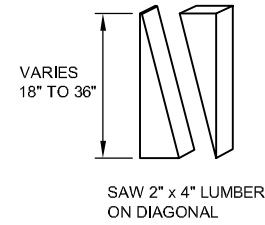
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COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

CIVIL
TYPICAL CHANNEL SECTIONS

DATE
 OCTOBER 2011
 DRAWING NO.
 C-4
 SHEET NO.
 7 OF 10

MEC PROJECT No. 02-025.10

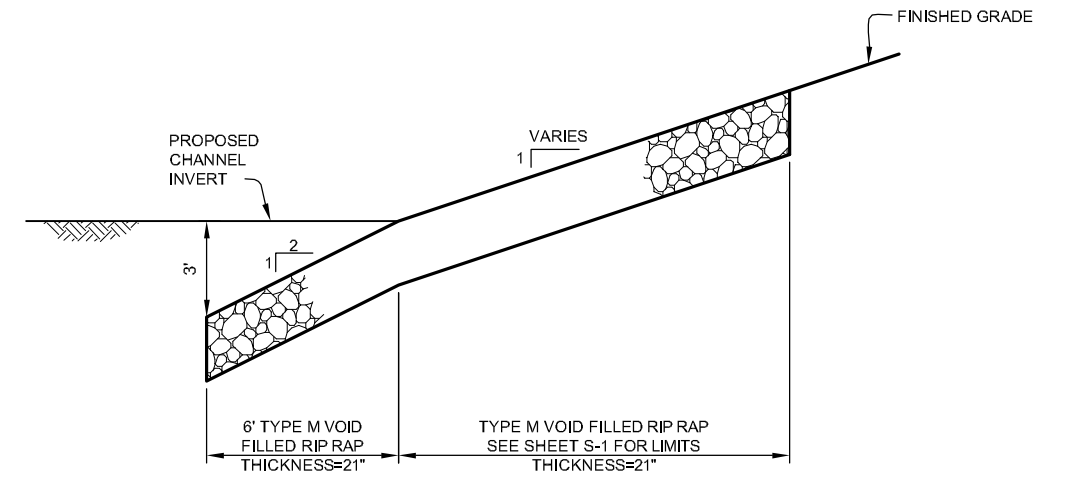


WOOD STAKE DETAIL

N.T.S.

BANK PROTECTION NOTES:

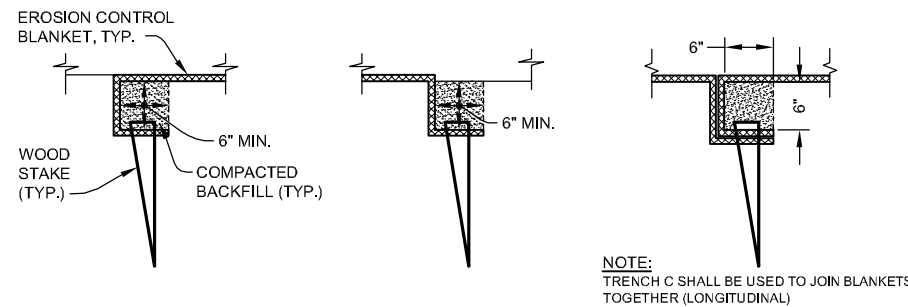
1. SEED AND MULCH PRIOR TO INSTALLING COIR MAT. COIR MAT TOTAL WIDTH SHALL BE 13', BUT ONLY 10'-6" TO 11' OF WIDTH WILL BE EXPOSED ON SLOPE. STAKE COIR MAT BETWEEN ANCHORED ENDS WITH 3 ROWS OF 18" LONG WOOD STAKES @ 36" O.C. (SEE STAKING PATTERN 1 AND 2).
2. POSITION ROW STAKES IN AN ALTERNATING STAGGER PATTERN SO THAT STAKES FOR THE ROW ARE POSITIONED IN BETWEEN STAKES FOR ADJACENT ROWS.
3. CONTRACTOR SHALL USE STEEL PENETRATION RODS OR OTHER MEANS AS NECESSARY TO PENETRATE RIPRAP LAYER WITH WOOD STAKES.



BANK PROTECTION NO. 1

BP1

SCALE: 1" = 3' - 0"



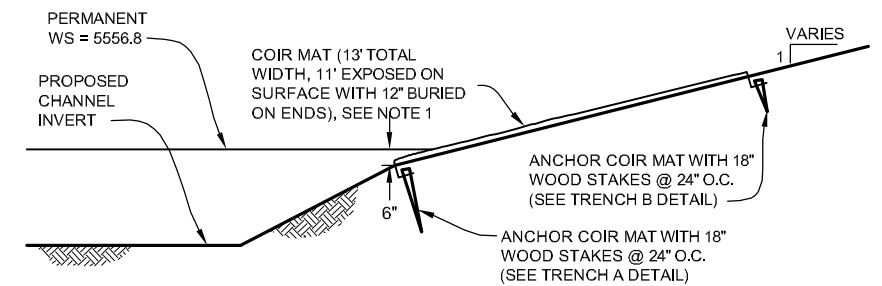
TRENCH A
SCALE = 1" = 1' - 0"

TRENCH B
SCALE = 1" = 1' - 0"

TRENCH C
SCALE = 1" = 1' - 0"

NOTE:
TRENCH C SHALL BE USED TO JOIN BLANKETS TOGETHER (LONGITUDINAL)

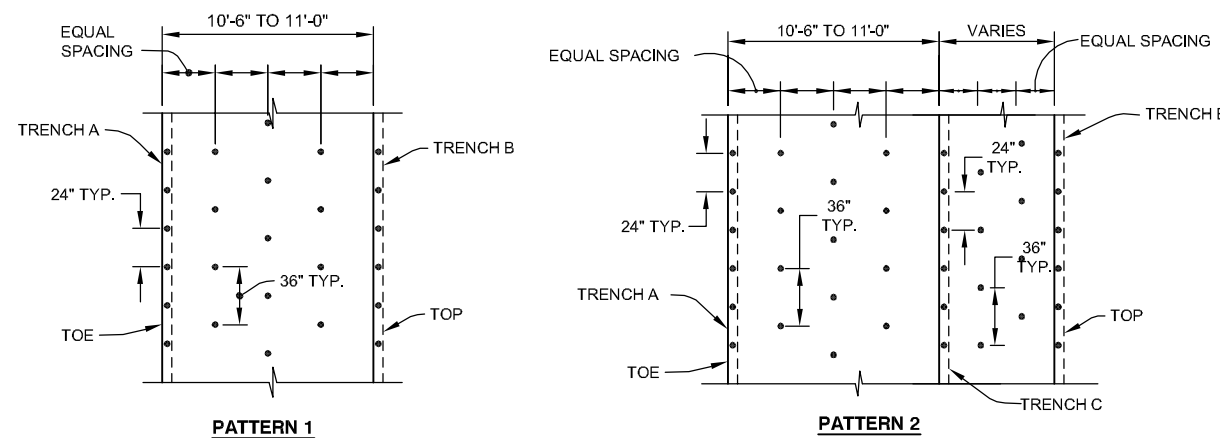
ANCHOR TRENCH DETAILS FOR EROSION CONTROL BLANKETS



BANK PROTECTION NO. 2

BP2

SCALE: 1" = 3' - 0"



STAKING PATTERNS FOR EROSION CONTROL BLANKET

SCALE: 1" = 5'

NOTE:
INSTALL WOOD STAKES SUCH THAT ONLY 1" IS EXPOSED ABOVE GROUND.

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK

NAME: P:\02-025_10 Cottonwood Perimeter Road Pond - CCBWQA\CA0102-025_10_DET-BANK.dwg DATE: OCT 25, 2011 TIME: 1:01 PM

No.	DATE	REVISIONS	APPR.

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DESIGN	JRS
DRAWN	SAR
CHECK	JTW

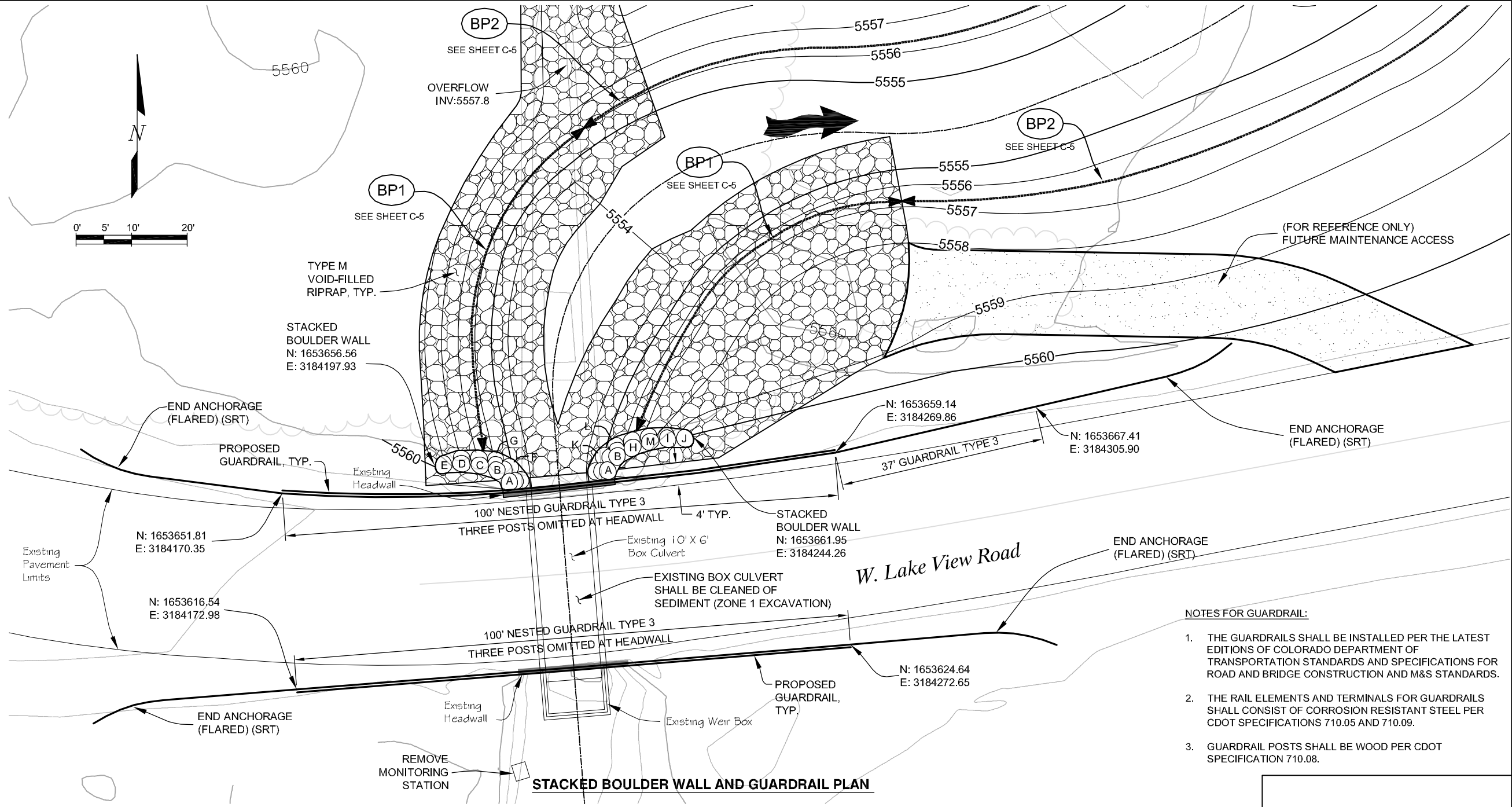
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CHERRY CREEK BASIN WATER QUALITY AUTHORITY
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303-779-4525

COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

CIVIL
BANK PROTECTION DETAILS

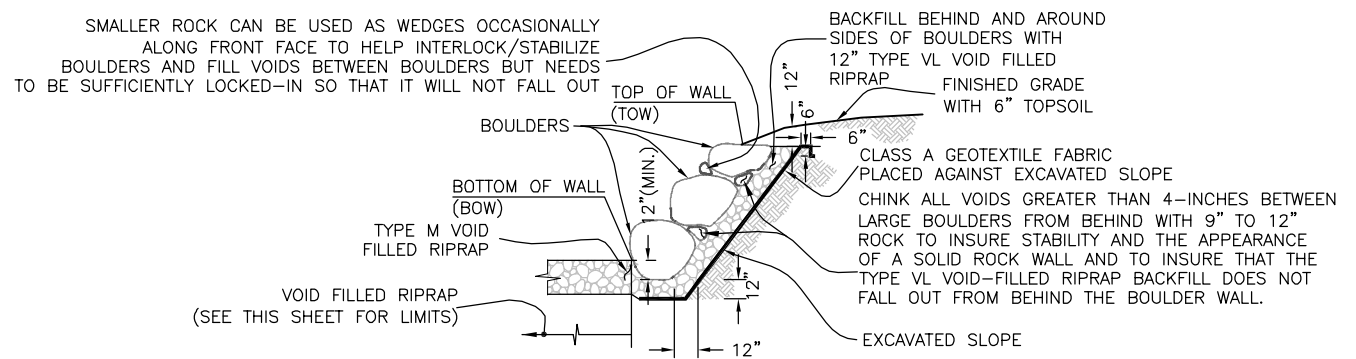
DATE	OCTOBER 2011
DRAWING NO.	C-5
SHEET NO.	8 OF 10

BOULDER	TOW	BOW
A	5561.0	5554.0
B	5560.9	-
C	5560.8	5556.5
D	5560.7	5557.5
E	5560.7	5558.7
F	-	5554.5
G	-	5555.5
H	5560.8	5556.0
I	5560.7	5558.0
J	5560.7	5558.7
K	-	5554.5
L	-	5555.0
M	5560.7	5557.0



- NOTES FOR GUARDRAIL:**
1. THE GUARDRAILS SHALL BE INSTALLED PER THE LATEST EDITIONS OF COLORADO DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND M&S STANDARDS.
 2. THE RAIL ELEMENTS AND TERMINALS FOR GUARDRAILS SHALL CONSIST OF CORROSION RESISTANT STEEL PER CDOT SPECIFICATIONS 710.05 AND 710.09.
 3. GUARDRAIL POSTS SHALL BE WOOD PER CDOT SPECIFICATION 710.08.

- NOTES FOR STACKED BOULDER WALL:**
1. BOULDERS SHALL BE 18"-36" (MIN. DIMENSION) WITH LARGER BOULDERS AT BOTTOM OF WALL. STACK HEIGHT 1-3 BOULDERS HIGH AS REQUIRED TO ACHIEVE TOP OF WALL BOULDER ELEVATIONS SHOWN ON PLAN AND MINIMUM REQUIRED KEY-IN DEPTH INTO CHANNEL BOTTOM.
 2. FACE SLOPE MAY VARY FROM 0.75-1.5H:1.0V AS LONG AS BOULDERS ARE ADEQUATELY INTERLOCKED TO INSURE A STABLE CONFIGURATION.
 3. BOULDERS SHALL BE SELECTED AND PLACED SO THEY FIT AS TIGHTLY AS POSSIBLE WITH ADJACENT BOULDERS AND SO THAT MAXIMUM FLAT SURFACES TOUCH ADJACENT BOULDERS. GAPS/VOIDS BETWEEN BOULDERS SHALL BE MINIMIZED AND SHALL NOT EXCEED 4-INCHES WITHOUT CHINKING WITH SMALLER ROCK FROM BEHIND AS SHOWN IN THE DETAIL.
 4. THE FRONT OF THE BOULDERS SHALL SECURELY REST ON THE LOWER BOULDER AND THE BACK REST ON THE VOID-FILLED RIPRAP BACKFILL SUCH THAT THE TOP SURFACE OF THE BOULDER SLOPES SLIGHTLY TOWARD THE EXCAVATED SLOPE.
 5. LONG DIMENSION OF BOULDERS SHALL EXTEND BACK TOWARDS THE EXCAVATED SLOPE TO PROVIDE MAXIMUM STABILITY.
 6. STACKING OF BOULDERS SHALL BE DONE SUCH THAT THE JOINTS BETWEEN BOULDERS ARE STAGGERED ON SUCCEEDING LEVELS TO AVOID CONTINUOUS JOINT PLANES IN VERTICAL OR LATERAL DIRECTIONS.



TYPICAL STACKED BOULDER WALL SECTION
SCALE: 1"=5'-0"

DEPARTMENT OF PUBLIC WORKS AND DEVELOPMENT
APPROVAL BLOCK

DATE: OCT 31, 2011 TIME: 9:38 AM
NAME: P:\02-05-10 Cottonwood Perimeter Road Pond - CCBWQA\CA02-02-05-10_CULVERT-DET.dwg

No.	DATE	REVISIONS	APPR.

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IRONGATE 4, SUITE 100
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(303) 988-4939

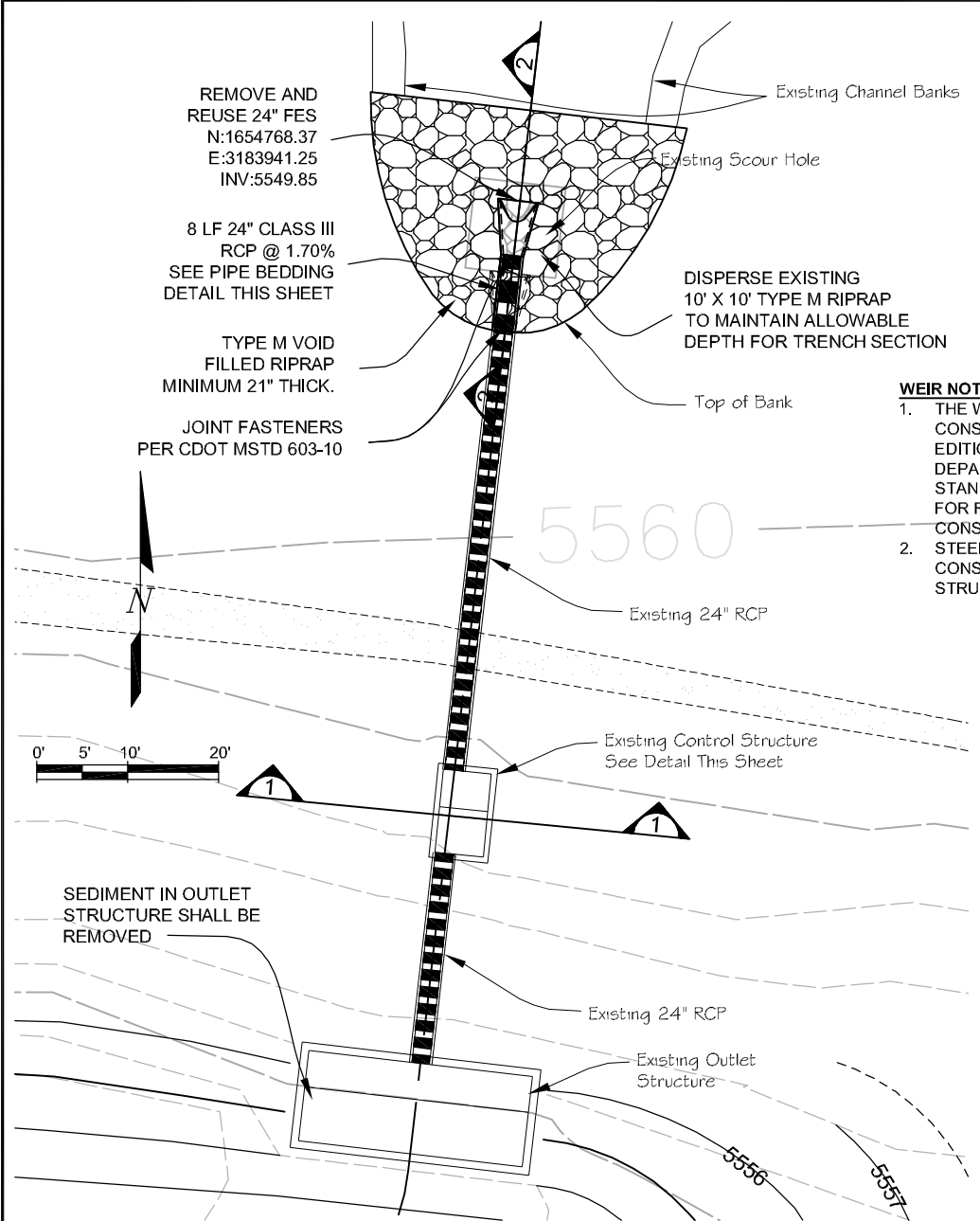
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8390 E. CRESCENT PKWY., SUITE 500
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303-779-4525

COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

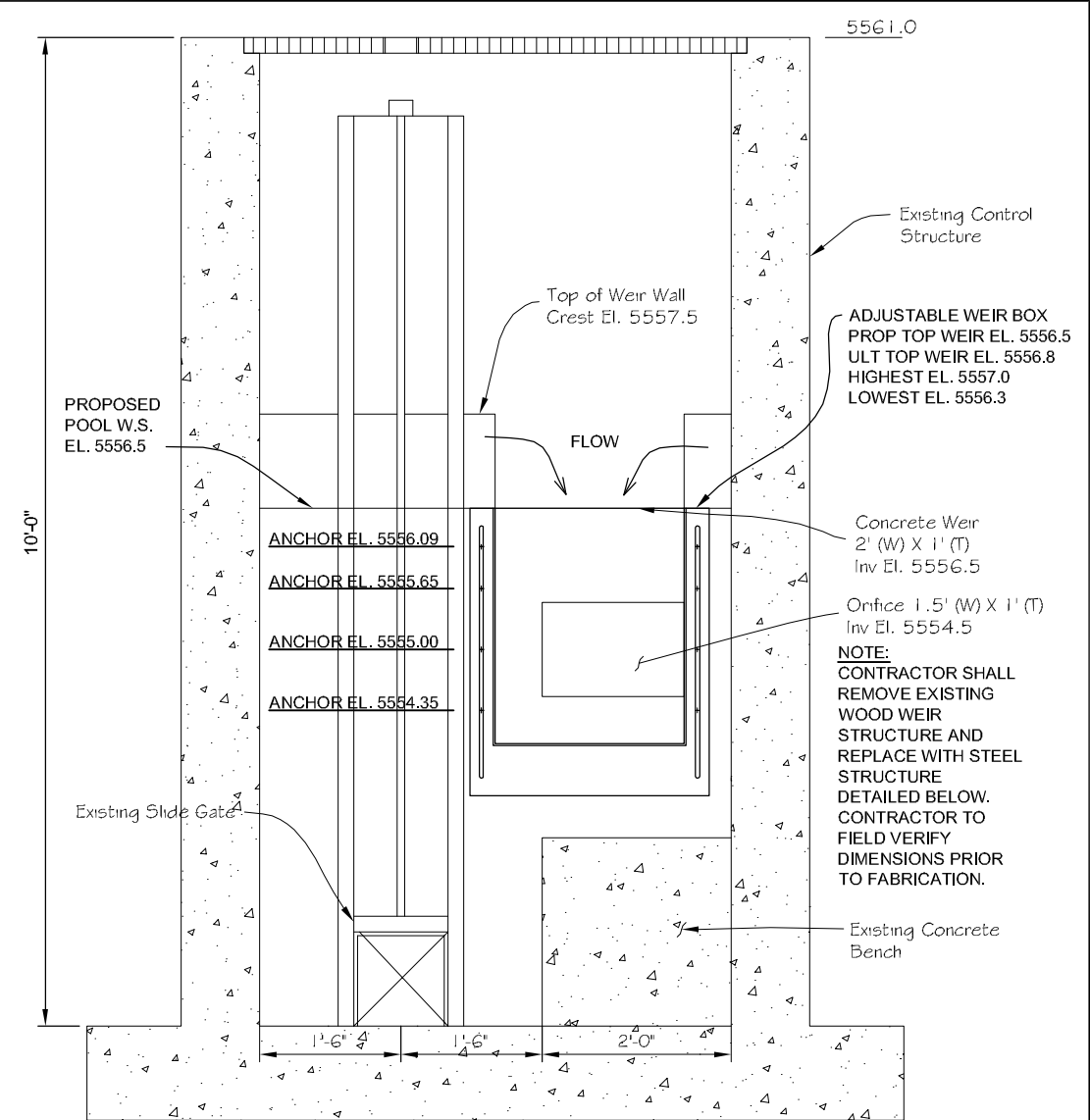
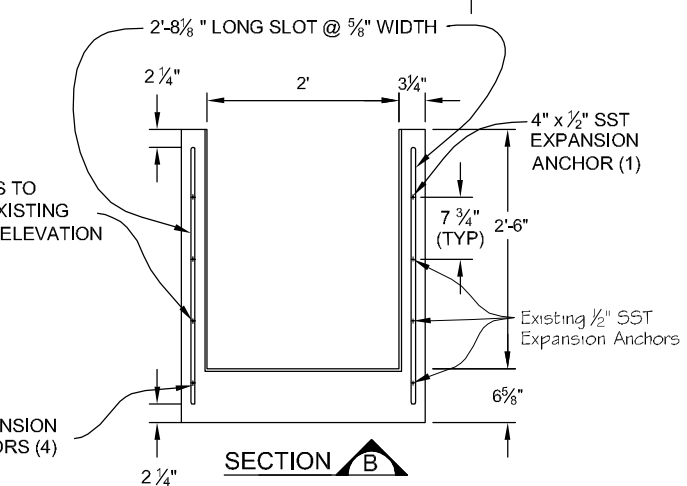
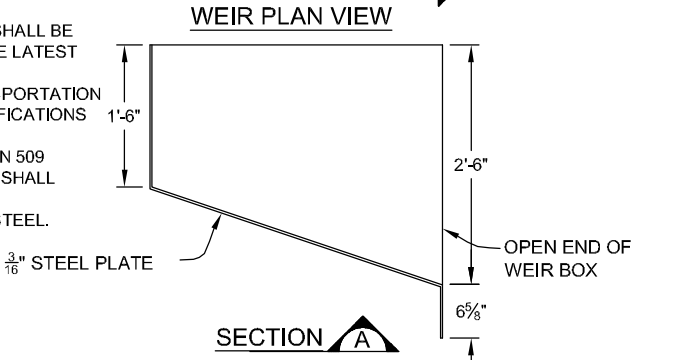
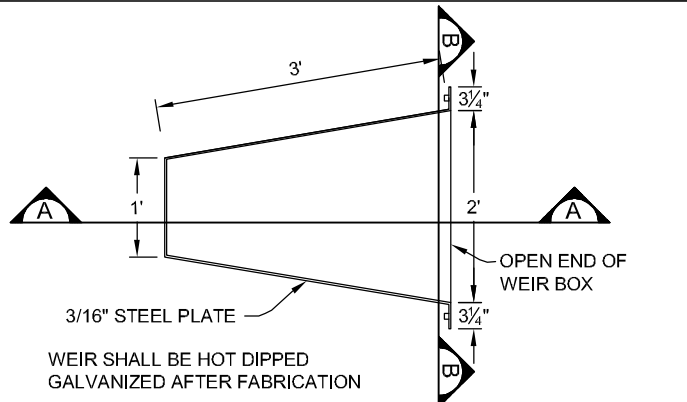
STRUCTURAL
STACKED BOULDER WALL AND GUARDRAIL DETAILS

DATE
OCTOBER 2011
DRAWING NO.
S-1
SHEET NO.
9 OF 10

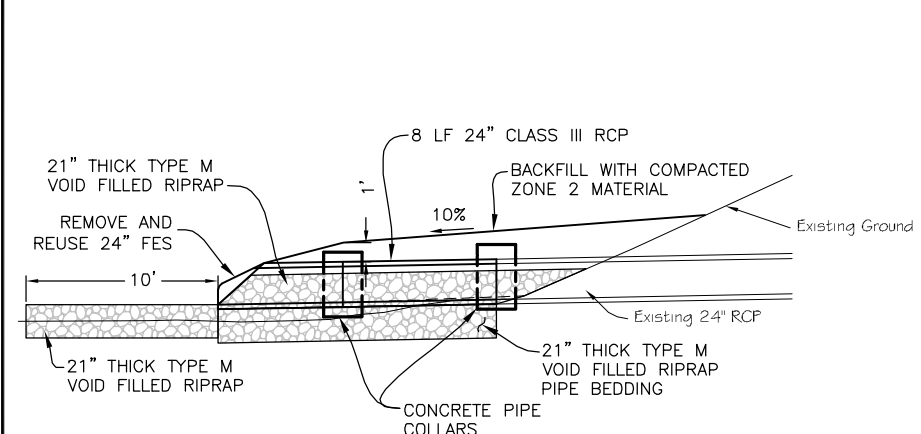


WEIR NOTES:

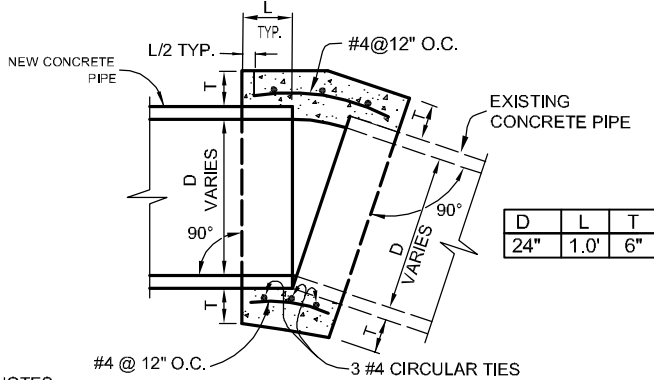
1. THE WEIR STRUCTURE SHALL BE CONSTRUCTED PER THE LATEST EDITION OF COLORADO DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 509
2. STEEL PLATE FOR WEIR SHALL CONSIST OF GRADE 36 STRUCTURAL CARBON STEEL.



EXISTING CONTROL STRUCTURE WEIR REPLACEMENT DETAIL 1
SCALE 1"=2'



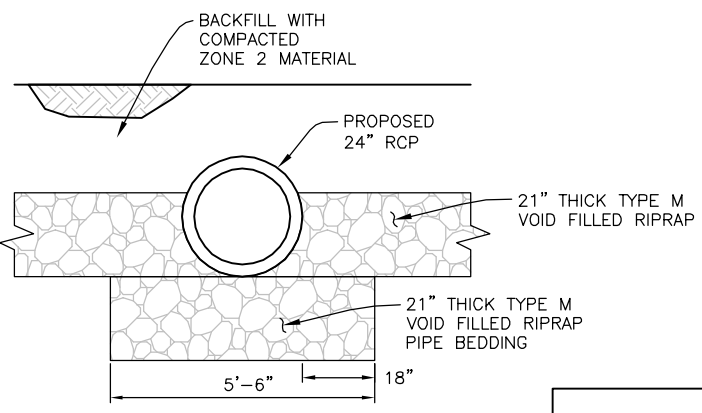
PIPE EXTENSION PROFILE 2
SCALE 1"=5'



CONCRETE PIPE COLLAR NOTES:

1. OMIT REINFORCING ON ALL PIPES LESS THAN 24" IN DIAMETER WITH MINIMUM 2' COVER, AND SUBSTITUTE WITH WIRE MESH.
2. CONCRETE SHALL BE CDOT CLASS B.
3. CONCRETE PIPE COLLARS WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE WORK.
4. THE INTERIOR SURFACE OF THE CONCRETE COLLAR SHALL BE FINISHED SMOOTH TO MATCH THE ADJOINING PIPE SURFACES. IF THE PROPOSED PIPE DEFLECTION CREATES A GAP WHICH PROHIBITS A SMOOTH INTERIOR FINISH, A METERED CUT TO EACH PIPE SHALL BE REQUIRED.

CONCRETE PIPE COLLAR
N.T.S.



PIPE TRENCH DETAIL

DESIGN	JRS
DRAWN	SAR
CHECK	JTW

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303-779-4525

COTTONWOOD CREEK WETLANDS REHABILITATION
CHERRY CREEK BASIN WATER QUALITY AUTHORITY

STRUCTURAL	DATE	OCTOBER 2011
POND OUTLET STRUCTURE MODIFICATION DETAILS	DRAWING NO.	S-2
	SHEET NO.	10 OF 10

DATE: OCT 31, 2011 TIME: 9:38 AM
NAME: P:\02-05-10 Cottonwood Perimeter Road Pond - CCBWQA\02-05-10_CULVERT-DET.dwg