303-757 9275

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Region 6 Utilities Unit
2000 South Holly Street
Denver, Colorado 80222
(303) 757-9910

ATTN: DONNA HAIGHT

DOT
DEPARTMENT OF TRANSPORTATION

Utility Information Sheet (UIS)

PE Project No.: STA 1281-011; WBS #: 15782
CN Project No.: STA C800-001; WBS #: 16501

Project Description: 120th Avenue Connection- Phase I
Construct new 120th Avenue Connection alignment from Wadsworth Pkwy (SH 121) to Old Wadsworth Blvd. Construct new Commerce Street from Park Street to 118th Avenue. Also, minor realignment of Old Wadsworth Blvd.

UIS #: 05-001
Utility Company: Dry Creek Valley Ditch (Public)

Work Performed by: Contractor

Location: 120th Sta. 41+80

Existing Utility: 48" RCP- Class IV

Expected Impact: None-Contractor shall avoid impacts to this facility.

Attached: Plan Sheet and Broomfield Urban Transit Village (Artista) (Dry Creek Valley Ditch) as-builts.

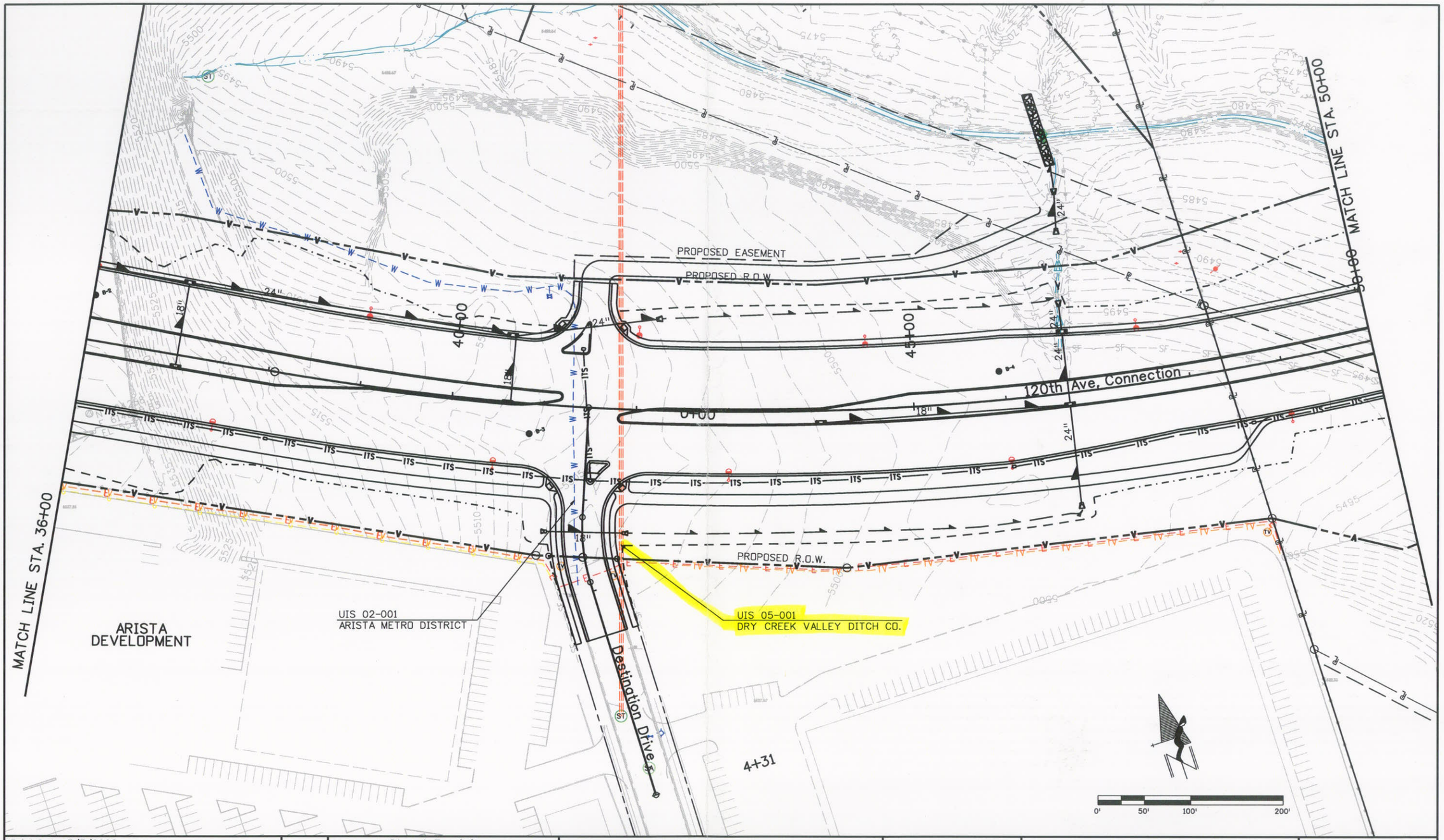
CDOT Representative: Ron Dickey — Ron Dickey – Region 6 Utility Manager — 7-9-08 Date

Utility Representative: Daniel Ray Mayo — 7/9/08 Date

(Print name): DANIEL RAY MAYO

THERE SHOULD BE NO DIRECT IMPACTS TO THE DRY CREEK VALLEY DITCH PIPELINE RESULTING FROM THE CONSTRUCTION OF CDOT'S 120TH AVENUE CONNECTION PROJECT. HOWEVER, THERE ARE IMPACTS RESULTING FROM THIS CONSTRUCTION IN AREAS SUCH AS ACCESS FOR PIPELINE REPAIRS OR REPLACEMENT. THESE IMPACTS WILL NEED TO BE ADDRESSED IN THE LICENSE AGREEMENTS AS DISCUSSED.

Dan



Print Date: 5/5/2008		Sheet Revisions	
File Name: 15782Utilities02.dgn		Date:	Comments	Init.
Horiz. Scale: 1:100	Vert. Scale: As Noted	R-X		
Unit Information	Unit Leader Initials			

Colorado Department of Transportation
DOT
4670 Holly Street
Denver, CO 80216-6408
Phone: 303-398-6765 FAX: 303-398-6781
Region 6 IDM

As Constructed
No Revisions:
Revised:
Void:

120TH AVE. CONNECTION UTILITIES

Designer:	XXXXXXXX	Structure Numbers	X-XX-XX
Detailer:	XXXXXXXX		X-XX-XX
Sheet Subset:	UT	Subset Sheets:	02 of 10

Project No./Code
STA 1281-011
16501
Sheet Number 27

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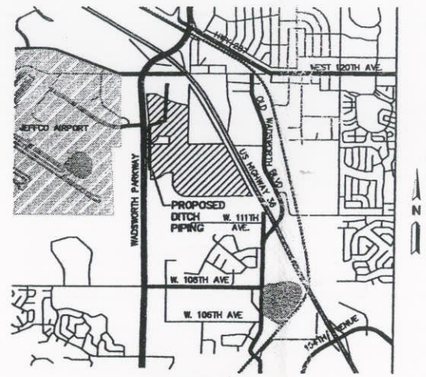
BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA
DRY CREEK VALLEY DITCH

LOCATED IN THE EAST ONE-HALF OF SECTION 3,
TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY AND COUNTY OF BROOMFIELD, STATE OF COLORADO.

RECEIVED
JUN 02 2006
ENGINEERING



VICINITY MAP
SCALE: 1"=2500'

SHEET INDEX

IRR-1	COVER SHEET AND NOTES
IRR-2	DRY CREEK VALLEY DITCH PLAN & PROFILE
IRR-3	DRY CREEK VALLEY DITCH PLAN & PROFILE
IRR-4	DRY CREEK VALLEY DITCH PLAN & PROFILE
IRR-5	DETAIL SHEET
IRR-6	DETAIL SHEET
IRR-7	DETAIL SHEET

GENERAL NOTES:

1.) ALL MATERIALS AND CONSTRUCTION SHALL BE TO CURRENT CITY AND COUNTY OF BROOMFIELD STANDARD SPECIFICATIONS UNLESS OTHERWISE SPECIFIED HEREIN.

2.) THE CONTRACTOR SHALL HAVE A SET OF APPROVED DRAWINGS AND CURRENT CITY AND COUNTY OF BROOMFIELD STANDARD SPECIFICATIONS ON-SITE AT ALL TIMES.

3.) ALL CONTRACTORS AND SUBCONTRACTORS SHALL BE LICENSED WITH THE CITY AND COUNTY OF BROOMFIELD.

4.) THE ENGINEERING DIVISION SHALL BE NOTIFIED (438-6386) A MINIMUM OF 24 HOURS PRIOR TO ANY CONSTRUCTION.

5.) THE ENGINEER ASSUMES NO RESPONSIBILITY FOR BURIED UTILITIES. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION. THE CONTRACTOR SHALL FIELD VERIFY SIZE AND HORIZONTAL AND VERTICAL LOCATIONS OF EXISTING FACILITIES PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER AND CITY OF ANY DISCREPANCIES.

6.) THE CONTRACTOR IS RESPONSIBLE FOR ALL PROJECT SAFETY INCLUDING, BUT NOT LIMITED TO, TRENCH EXCAVATION AND SHORING, TRAFFIC CONTROL AND SECURITY.

7.) BENCHMARK: ELEVATIONS ARE BASED ON THE CITY AND COUNTY OF BROOMFIELD BENCHMARK DESIGNATED "JEFFCO AZ MK" A 3" BRASS CAP IN CONCRETE STAMPED JEFFCO 1977 LOCATED AT MILEPOST 24.95 ON ST HWY 121 0.9 MI SOUTH OF US 36.
ELEVATION = 5512.65' NGS (NAVD88) DATUM.

8.) BASIS OF BEARING: BEARINGS ARE BASED ON THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 2, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO, BEARING NORTH 89°37'38" EAST, WITH ALL BEARINGS CONTAINED HEREIN AND RELATIVE THERETO. SAID LINE BEING MONUMENTED ON THE WEST TERMINUS BY 2 1/2" ALUMINUM CAP ON A 2" ALUMINUM PIPE AND AS MONUMENTED ON THE EAST TERMINUS BY 3 1/4" ALUMINUM CAP LOCATED IN A RANGE BOX.

9.) OWNER/DEVELOPER/CONTRACTOR SHALL OBTAIN A PERMIT FROM THE COLORADO DEPARTMENT OF HEALTH, WATER QUALITY CONTROL DIVISION PERMIT ENFORCEMENT SECTION PRIOR TO CLEARING, GRADING, OR EXCAVATING A SITE OF ONE ACRE OR MORE. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.

10.) THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. CONTRACTOR SHALL OBTAIN ALL PERMITS FOR STREET CUTS, UTILITY INTERFERENCE'S AND TRAFFIC CONTROL.

11.) EXISTING TOPOGRAPHY SHOWN (UNLESS NOTED OTHERWISE) WAS TAKEN FROM AN AERIAL SURVEY PERFORMED BY OTHERS. THE EXISTING CONTOUR INTERVAL WITHIN THE LIMITS OF THE PROJECT IS 2'.

12.) REPAIR OF ANY DAMAGE TO EXISTING IMPROVEMENTS OR LANDSCAPING IS THE RESPONSIBILITY OF THE CONTRACTOR.

13.) IF DEWATERING IS REQUIRED, A STATE CONSTRUCTION DEWATERING DISCHARGE PERMIT IS REQUIRED FOR DISCHARGES TO A STORM SEWER, CHANNEL, IRRIGATION DITCH, ANY STREET THAT IS TRIBUTARY TO THE AFOREMENTIONED FACILITIES, OR ANY WATERS OF THE UNITED STATES.

14.) PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION, THE CONTRACTOR SHALL CONTACT ALL UTILITIES TO COORDINATE SCHEDULES.

15.) REFER TO THE EARTHEN CUT/FILL RECOMMENDATIONS, PARK 36 DEVELOPMENT, BROOMFIELD, CO DATED JANUARY 19, 2005 PREPARED BY GROUND ENGINEERING CONSULTANTS FOR RECOMMENDATIONS REGARDING EXCAVATION, DISPOSAL, PLACEMENT, AND COMPACTION OF MATERIALS WITHIN THE LIMITS OF THE PROJECT SITE.

16.) REFER TO BROOMFIELD URBAN TRANSIT VILLAGE – ARISTA CIVIL SITE PLANS FOR ROADWAY AND STORM SEWER CONSTRUCTION PLANS.

17.) CONTRACTOR TO PROTECT EXISTING NGS 1ST ORDER CONTROL POINT LOCATED ON JOHN E. JOHNS PROPERTY. CONTROL POINT IS A BRASS CAP LOCATED ON A CONCRETE PIER.

EROSION CONTROL CONSTRUCTION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION TO PREVENT DAMAGING FLOWS ON THE SITE AND IN THE WATERSHED BELOW THE SITE. CONTROL SYSTEMS SHALL BE INSTALLED PRIOR TO STRIPPING OF NATIVE VEGETATIVE COVER AND AS GRADING PROGRESSES. CONTROL SYSTEMS SHALL INCLUDE, AS SHOWN, STRAW BALE SEDIMENT TRAPS ALONG DRAINAGEWAYS, SILT FENCES, INLET PROTECTION DEVICES AND SEDIMENT TRAPS.
2. EROSION/SEDIMENT CONTROL DEVICES SHALL BE PLACED AS CONSTRUCTION SEQUENCING AND ACCESS DICTATES.
3. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME.
4. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY.
5. TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED TO DISTURBED AREAS (OTHER THAN JOHNS PROPERTY) WITHIN 30 DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION MEASURES (STRAW MULCH AT A RATE OF 2 TON/ACRE) SHALL BE APPLIED WITHIN 30 DAYS ON ANY DISTURBED AREAS WHICH WILL BE LEFT DORMANT FOR LONGER THAN 60 DAYS.
6. PERMANENT SOIL STABILIZATION MEASURES SHALL BE APPLIED TO DISTURBED AREAS OF JOHNS PROPERTY WITHIN 30 DAYS AFTER FINAL GRADE IS REACHED ON THIS PORTION OF THE SITE.
7. THE STANDARD EROSION CONTROL DETAILS FROM UD & FCD URBAN STORM DRAINAGE CRITERIA MANUAL VOLUME 3 – BEST MANAGEMENT PRACTICES, SEPTEMBER 1999 INDICATED HEREON SHALL BE USED AS A MINIMUM TO CONSTRUCT THIS PROJECT.

DRY CREEK VALLEY DITCH RELOCATION NOTES

1. ALL IRRIGATION PIPE SHALL BE CLASS III (EXCEPT AS NOTED OTHERWISE) REINFORCED CONCRETE PIPE IN ACCORDANCE WITH ASTM C76-73 AND SHALL HAVE WATERTIGHT JOINTS IN ACCORDANCE WITH ASTM C361 AND ASTM C443, THE MORE STRINGENT STANDARD APPLYING WHERE OVERLAPS OCCUR.
2. BEDDING MATERIAL SHALL BE COMPACTED TO 90% AASHTO T-99 DENSITY, AND SHALL CONFORM TO CDOT STANDARDS AND ASTM C-33 OR D-448, SQUEEGEE. BACKFILL ABOVE SPRINGLINE SHALL BE COMPACTED TO 95% AASHTO T-99 DENSITY.
3. CONTRACTOR SHALL NOTIFY THE DRY CREEK VALLEY DITCH COMPANY 48 HOURS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL CONTACT, DAN MAYO (C.O.B) PHONE NO. (303) 455-9587 TO SCHEDULE CONSTRUCTION AND TO COORDINATE ANY SHUTDOWN OF THE DITCH REQUIRED.
4. THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH A SET OF PLANS MARKED WITH "AS-BUILT". THE PLANS SHALL SHOW MANHOLE LOCATIONS, PIPE SIZES AND ANY VARIATIONS FROM THE APPROVED PLAN.
5. MANHOLES, BARRELS AND CONES SHALL BE CONSTRUCTED OF PRECAST CONCRETE, UNLESS OTHERWISE NOTED.
6. PRECAST MANHOLES AND RISERS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478. ALL CONES SHALL BE ECCENTRIC.
7. THE FLEXIBLE PLASTIC JOINT SEALING COMPOUND FOR MANHOLES SHALL BE " RAMNEK", RUBBERNECK OR APPROVED EQUAL.
8. NO BACKFILL MATERIAL SHALL BE PLACED ABOVE THE SPRINGLINE OF THE PIPE UNTIL A DRY CREEK VALLEY DITCH REPRESENTATIVE HAS AUTHORIZED BACKFILLING. IT SHALL BE THE DUTY OF THE CONTRACTOR TO NOTIFY THE DRY CREEK VALLEY DITCH COMPANY 48 HOURS IN ADVANCED OF PROPOSED BACKFILL OPERATIONS SO A REPRESENTATIVE MAY INSPECT THE PIPE AND THE BEDDING PRIOR TO BACKFILL.

RECORD DRAWING

MARTIN/MARTIN BY: PFH DATE: 05/11/06

This "drawing" is a record document prepared from and based upon, in part, information provided by others. Neither MARTIN/MARTIN nor the Engineer of Record has verified the accuracy of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.

COLORADO REGISTERED PROFESSIONAL ENGINEER PATRICK HORN NO. 31.584 MAY 11, 2006

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
OR 232-1991 IN METRO DENVER
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR MARKING OF UNDERGROUND MEMBER UTILITIES

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.

ACCEPTED BY: _____
CITY ENGINEER DATE JOB NO.

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	RIGHT-OF-WAY LINE	
	SECTION LINE	
	EASEMENT	
	RETAINING WALL	
	CURB & GUTTER	
	HANDICAP RAMPS	
5750	CONTOURS	5750
	DITCH PIPING	
ST	STORM MANHOLE	
ST	STORM PIPE	ST
	STORM INLET	
<	FLARED END SECTION	<
SS	SANITARY SEWER	SS
SS	SANITARY MANHOLE	
	CLEAN OUT	
W	WATER LINE	W
RW	REUSE WATER	RW
	WATER VALVE	
	FIRE HYDRANT	
	WATER METER	
IRR	IRRIGATION CONTROL	
OHE	OVERHEAD ELECTRIC	
E	ELECTRIC LINE	E
	LIGHT POLE	
	POWER POLE	
ELEC	ELECTRIC METER	
T	TELEPHONE LINE	T
TEL	TELEPHONE PEDESTAL	T
CT	CABLE TV	CT
G	GAS LINE	G
	SIGN	
	DECIDUOUS TREE	
	EVERGREEN TREE	
	BUSH/SHRUB	
G.W.	MONITOR WELL	
DRIVE	DESCRIPTIONS	DRIVE

MARTIN / MARTIN
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12499 WEST DOLFAX AVE.
P.O. BOX 151500
LAKEWOOD, CO 80215
303.431.6100
FAX 303.431.4028

RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA
DRY CREEK VALLEY DITCH
COVER SHEET & NOTES

No.	Description of Revisions	Date	Name
1	INITIAL SUBMITTAL	02/01/05	BCD
2	REV. PER OWNER	04/01/05	BCD
3	ISSUE FOR BID	5/2/05	PFH
4	REVISED FOR REALIGNMENT	6/02/05	BCD
5	REV. PER DITCH CO. ENGINEER COMMENTS	7/13/05	BCD
6	RESUBMITTED FOR CITY APPROVAL	10/31/05	BCD
7	RECORD DRAWING	05/11/06	BCD

Date: FEBRUARY 02, 2005
Job Number: 17034.C.44
Design By: B. DUMMER
Drawn By: M. WINGERTER
Checked By: P. HORN

Sheet Number:
IRR-1
1 OF 7

RECORD DRAWING
Job Number: 17034.C.44 Sheet Number: IRR-1 1 OF 7
Project Manager: PFH
Designed By: BCD
Location: G:\HORN\Park 36\PLANS\AS-BUILTS\Irrigation\
Drawn By: MRW
X References:
Plot Date: 3/31/05 winganter
Tab Name: AB-IRR-1
Model Space
Plan view(s): PLAN
Profile View(s):
Other View:
CAD INFORMATION
Paper Space
Plot view:
PLOT
Dwg. Name: AB-IRR-1.dwg

Project Manager: PFH
Designed By: BCD
Location: G:\HORN\Park_36\PLANS\AS-BUILTS\irrigation\
Drawn By: MRW
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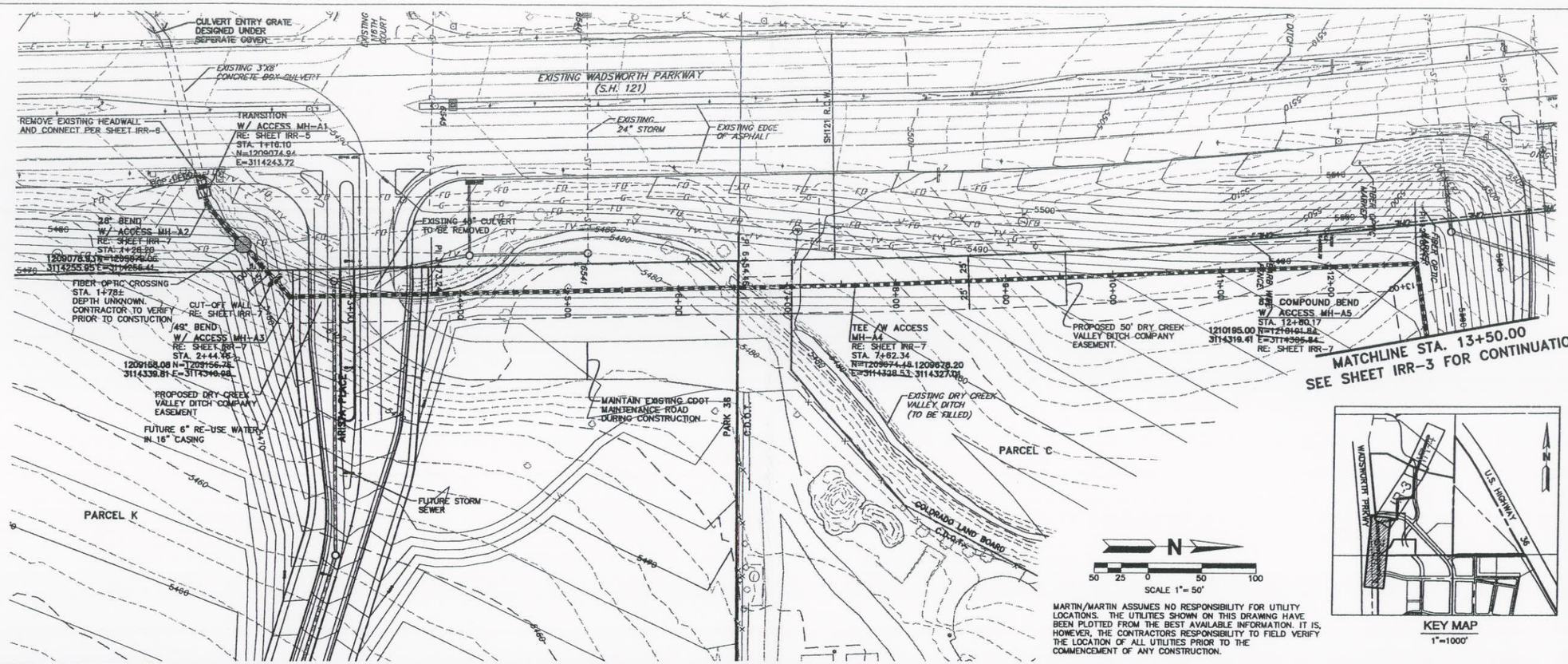
Job Number: 17034.C.44
Sheet Number: IRR-2 2 OF 7



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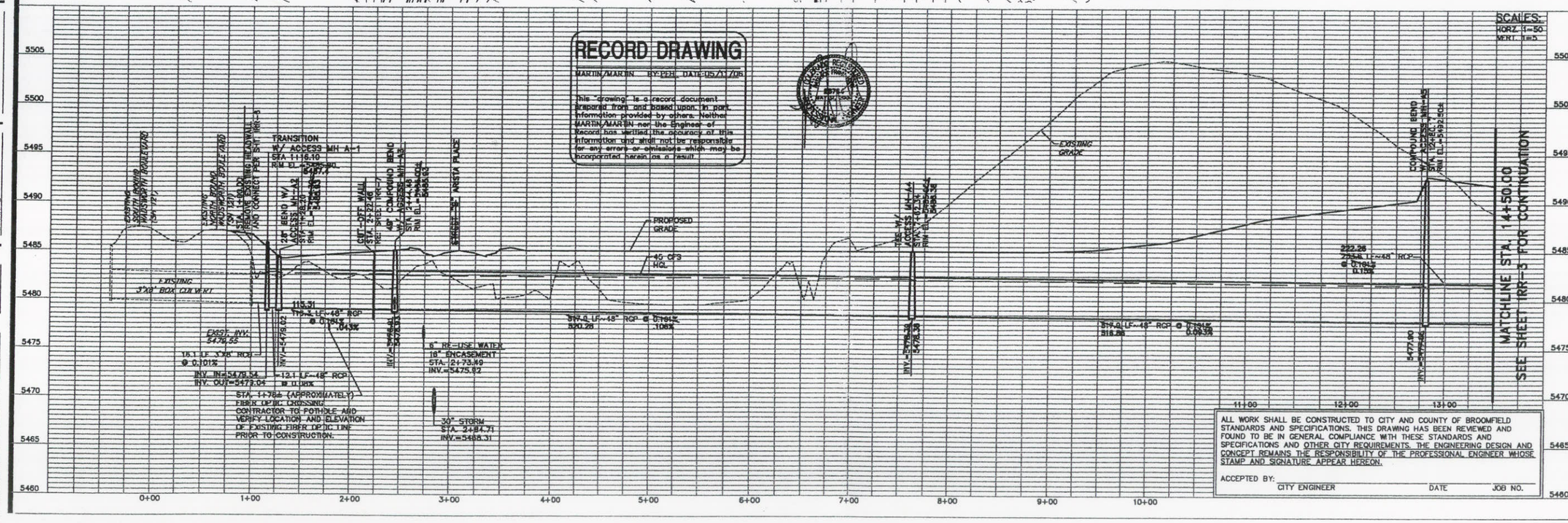

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ACCEPTED BY:
CITY ENGINEER DATE JOB NO.

MARTIN / MARTIN CONSULTING ENGINEERS
12499 WEST COLFAX AVE.
P.O. BOX 151500
LAKEWOOD, CO 80215
303.431.6100
FAX 303.431.4028

RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA
DRY CREEK VALLEY DITCH PLAN & PROFILE

No.	Description of Revisions	Date	Name
1	INITIAL SUBMITTAL	02/01/05	BCD
2	REV. PER OWNER	04/01/05	BCD
3	ISSUE FOR BID	5/2/05	PRH
4	REVISED TO REQUIREMENT	6/2/05	BCD
5	REV. PER DTCI CO. ENGINEER COMMENTS	7/13/05	BCD
6	SUBMITTED FOR CITY APPROVAL	10/31/05	BCD
7	RECORD DRAWING	05/1/06	BCD

Date: JANUARY 04, 2005
Job Number: 17034.C.44
Design By: B. DUMMER
Drawn By: M. WINGERTER
Checked By: P. HORN

Sheet Number:
IRR-2
2 OF 7

CAD INFORMATION
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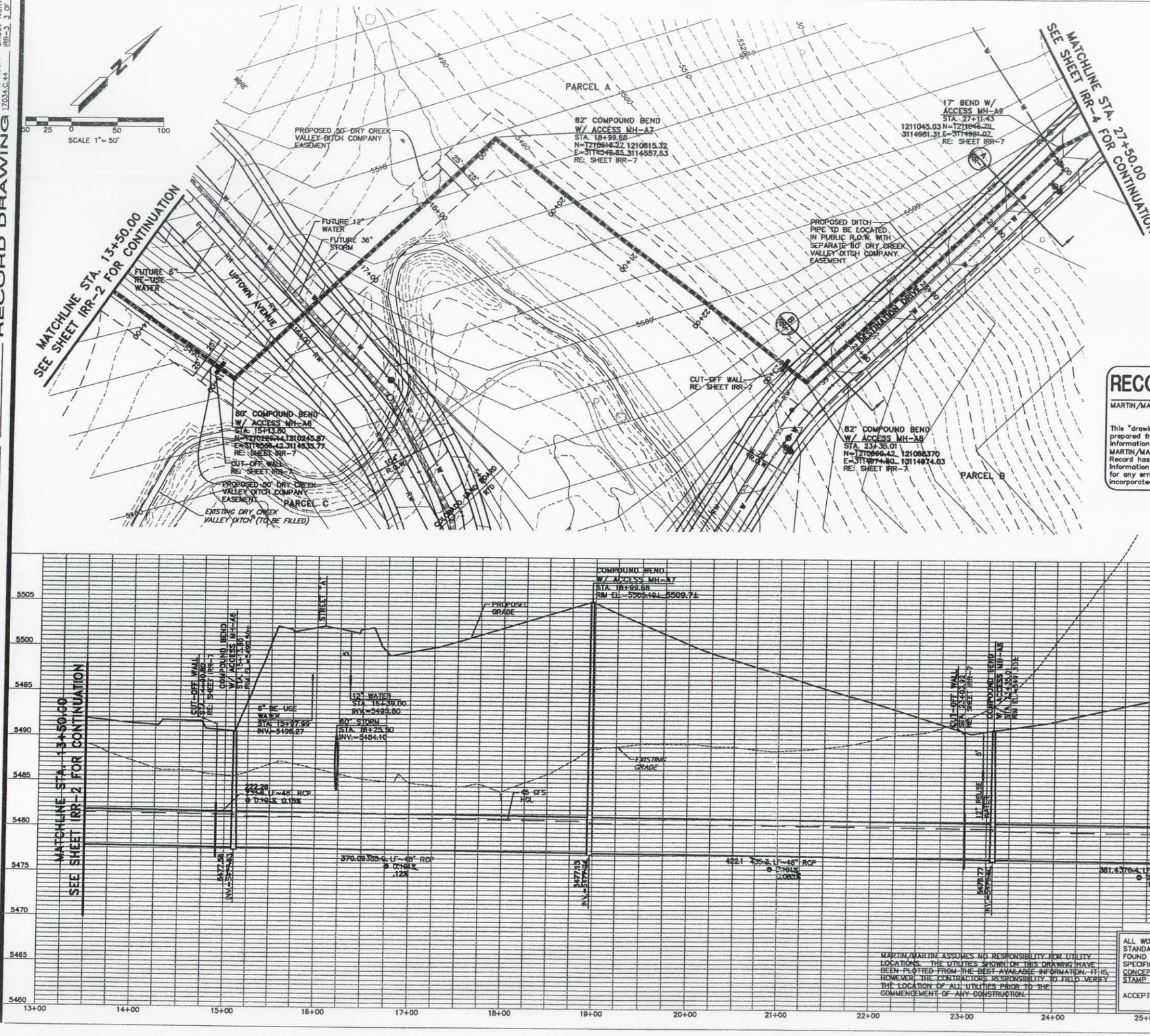
Dwg. Name: AB-IRR-2.dwg
Other View:
Model Space Plan view(s): PLAN
Profile View(s):
Plot Date: 3/31/05 wingerter
Tab Name: AB-IRR-2
X References:

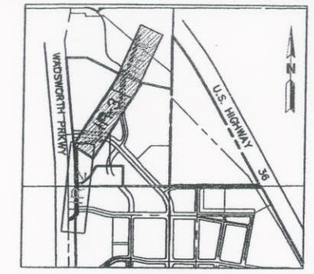
Job Number: 17034.C.44
Sheet Number: IRR-3 3 OF 7

RECORD DRAWING

Location: G:\HORN\Park 36\PLANS\AS-BUILTS\Irrigation\
Drawn By: MRW
Project Manager: PFH
Designed By: BCD

SCALE 1"= 50'





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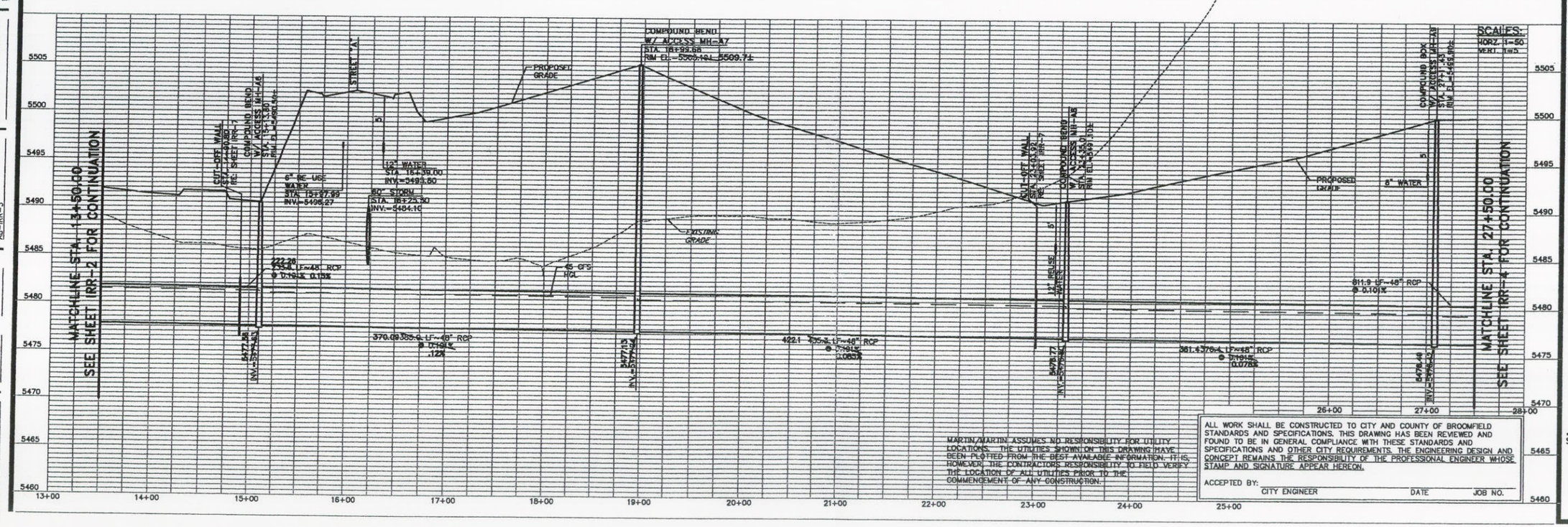

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COLORADO REGISTERED PROFESSIONAL ENGINEER 38744 PAUL HORN

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CONSULTING ENGINEERS
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LAKEWOOD, CO 80219
303.431.6100
FAX 303.431.4028

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Drawn By: M. WINGERTER
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IRR-3
3 OF 7

CAD INFORMATION
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Profile View(s):
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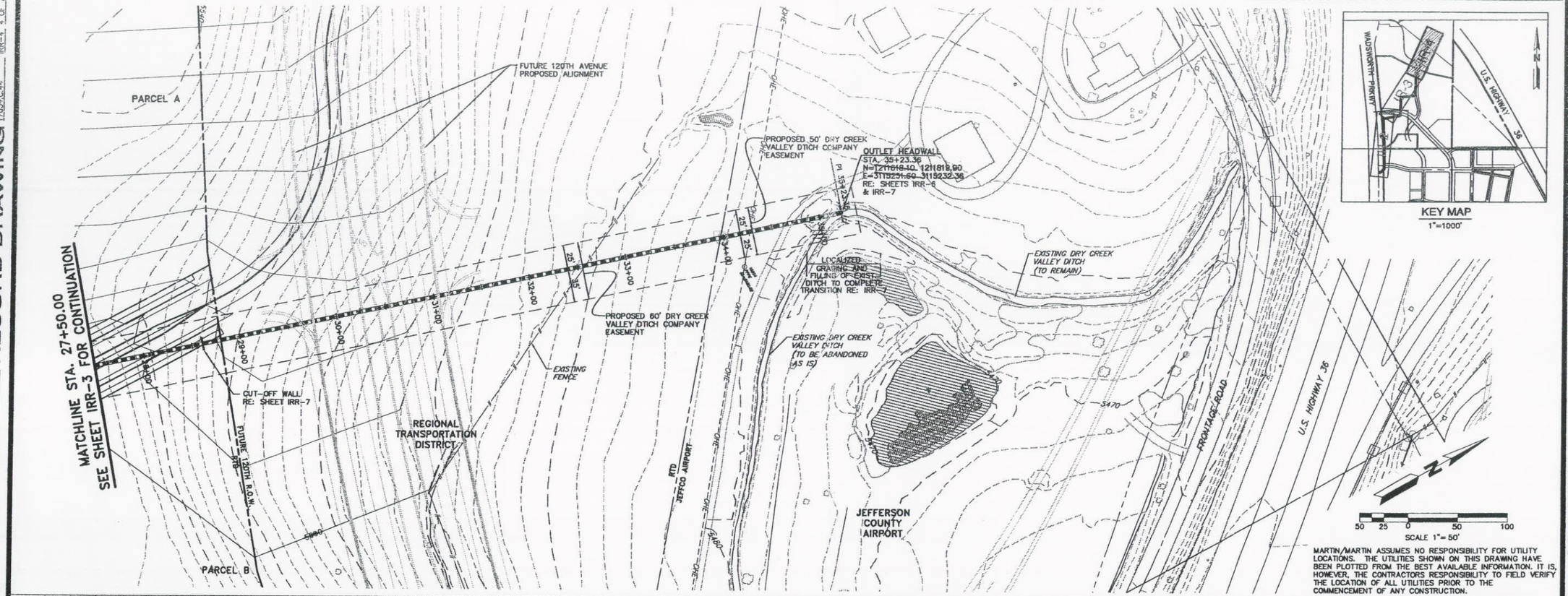
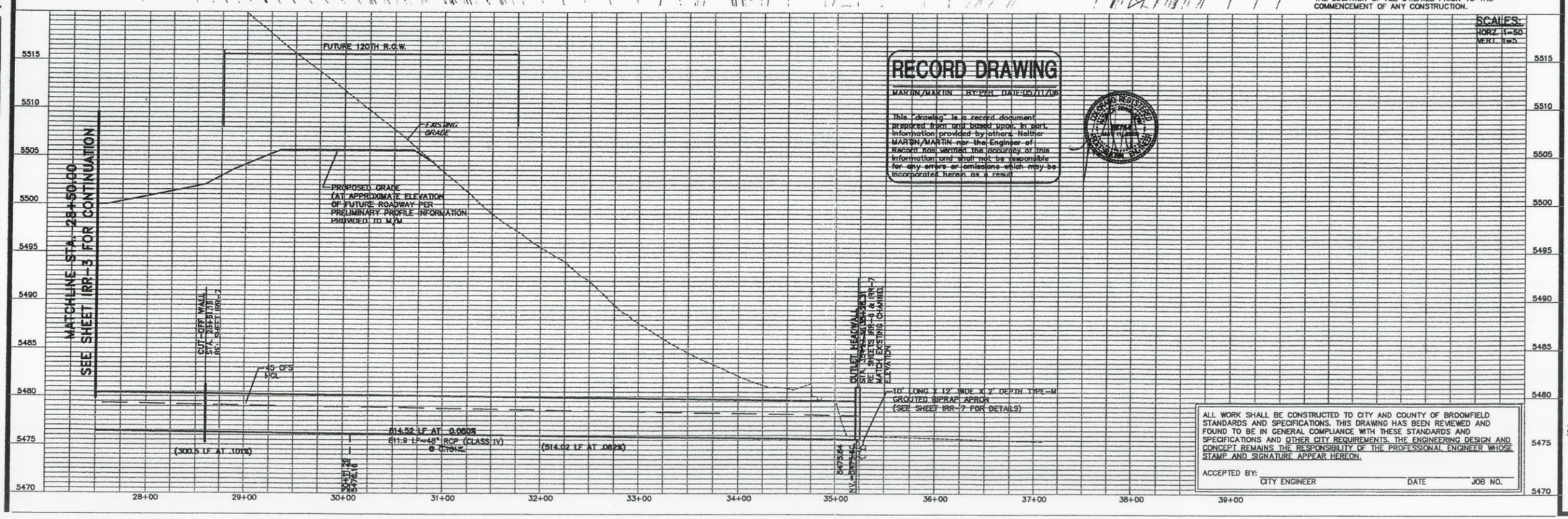
X References:

Project Manager: PFH
Designed By: BCD
Location: G:\HORN\Park_36\PLANS\AS-BUILTS\Irrigation\
Drawn By: MRW
RECORD DRAWING
Job Number: 17034.C.44
Sheet Number: IRR-4 4 OF 7





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CITY ENGINEER DATE JOB NO.

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12499 West Colfax Ave.
P.O. Box 181800
Lakewood, CO 80215
303.431.6100
FAX 303.431.4028

RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA
DRY CREEK VALLEY DITCH PLAN & PROFILE

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Drawn By: M. WINGERTER
Checked By: BCD

Sheet Number:
IRR-4
4 OF 7

CAD INFORMATION
Paper Space
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Dwg. Name: AB-IRR-4.dwg
Other View:
Model Space
Plan view(s): PLAN
Profile View(s):
X References:
Plot Date: 3/31/05 wincerter
Tab Name: AB-IRR-4

STRUCTURAL NOTES

All construction shall be in conformance with Colorado Department of Highways "Standard Specifications for Road and Bridge Construction", 1999 edition as modified by Project Special Provisions, Supplemental Specifications, and these drawings.

A representative of the Geotechnical Engineer shall be present to confirm the foundation excavation prior to the construction of the structure.

All concrete shall be Class D unless noted otherwise.

Reinforcing steel shall be Grade 60.

All reinforcing shall have 2" clear unless otherwise noted.

The following table gives the minimum Class C splice length for reinforcing bars:

BAR SIZE							
#4	#5	#6	#7	#8	#9	#10	#11
1'-5"	1'-9"	2'-1"	2'-6"	3'-3"	4'-1"	5'-2"	6'-4"

The Contractor shall submit the location of all construction joints to the Engineer for approval.

Construction means, methods, techniques, sequences and procedures as related to the stability of the structure during construction shall be the responsibility of the Contractor unless otherwise noted.

The Contractor shall field verify the location and dimensions of the existing box culvert prior to the start of construction. Any discrepancies shall be reported to the Engineer.

DESIGN DATA

CURRENT AASHTO SPECIFICATIONS, 17th Edition

DESIGN METHODS
Storm Water Vault – Working Stress Design

LIVE LOAD: 2.0' Surcharge

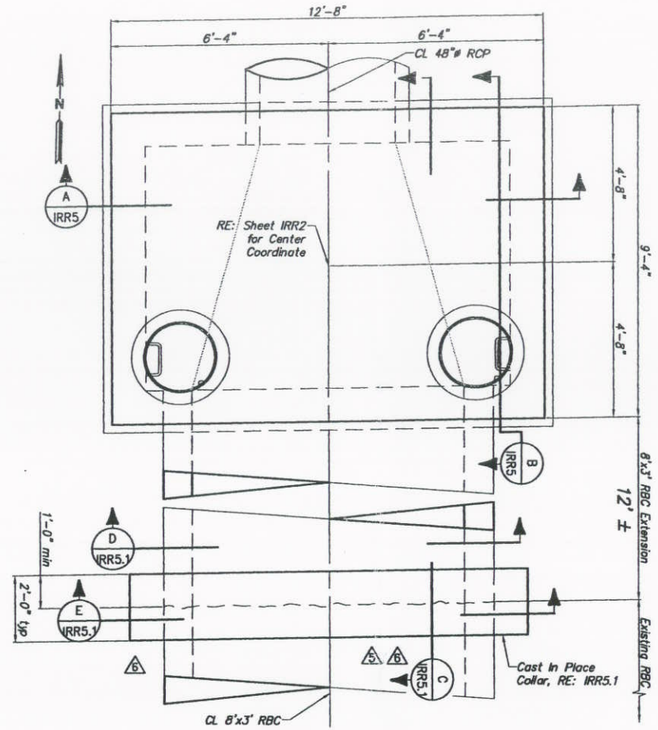
DEAD LOAD: Lateral Pressure
45 PCF Unsaturated
90 PCF Saturated

Vertical Pressure
120 PCF

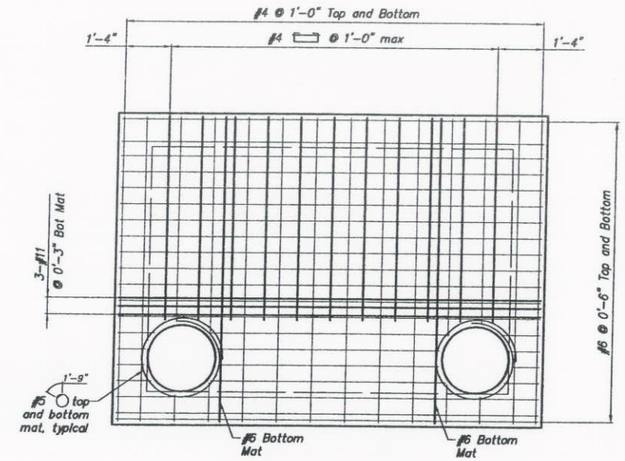
Allowable Bearing Pressure = 2,000 psf

UTILITY NOTE

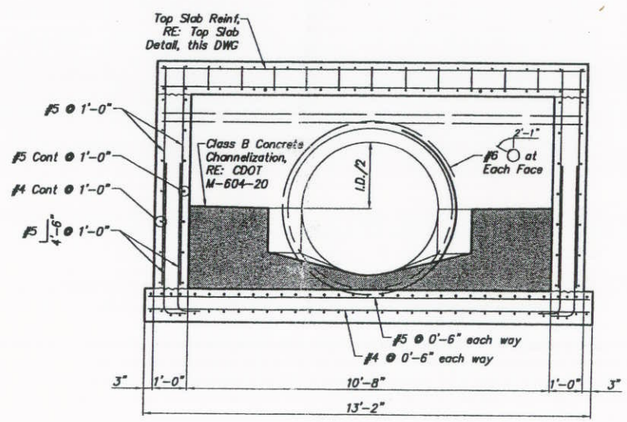
The information shown on these plans concerning the type and location of underground utilities is not guaranteed to be accurate or all inclusive. The contractor is responsible for making his own determination as to the type and location of underground utilities as may be necessary to avoid damage thereto. The contractor shall contact The Utility Notification Center of Colorado at 1-800-922-1987 (534-6700 in metro Denver) at least two days (not including the day of notification) prior to any excavation or other earthwork.



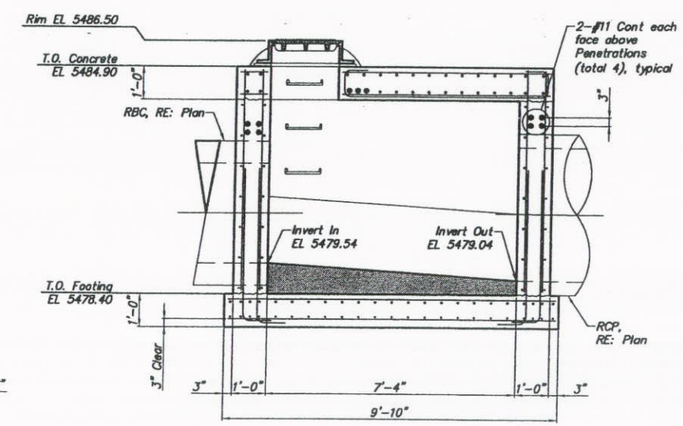
PLAN



TOP SLAB DETAIL



SECTION A IRR5



SECTION B IRR5

STA 2+16.10 TRANSITION BOX WITH ACCESS MH-A1

Project Manager:
Designed By:
Location: G:\HAYNES\15303_C_11 Broomfield Urban Transit Village\
Drawn By:
RECORD DRAWING
Job Number:
Sheet Number:
X References:
Plot Date:
Tab Name: PDF
Profile View(s):
Model Space Plan view(s):
Other View:
CAD INFORMATION
Paper Space Plot view:
Dwg. Name: IRR5.0.dwg

MARTIN / MARTIN
CONSULTING ENGINEERS
12499 West Colfax Ave.
P.O. Box 151500
Lakewood, CO 80215
303.431.6100
FAX 303.431.4028

RECORD DRAWING

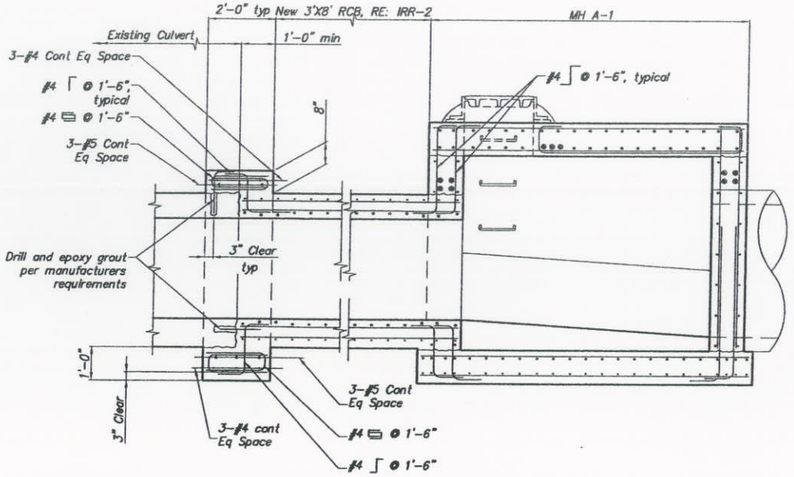
BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA

DRY CREEK VALLEY DITCH
TRANSITION BOX - MH-A1

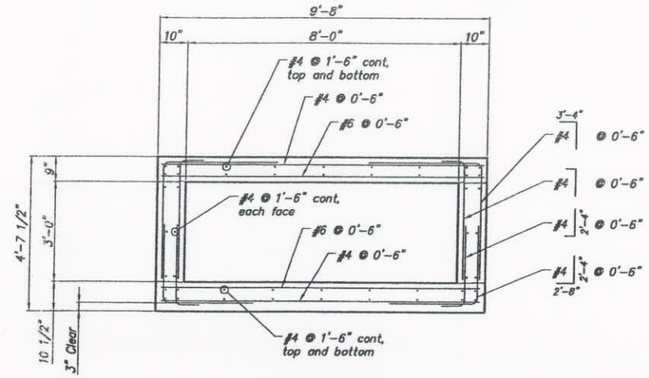
No.	Description of Revisions	Date	Name
1	INITIAL SUBMITTAL	02/01/05	BCD
2	REVISED PER OWNER	04/01/05	BCD
3	REVISED FOR REALIGNMENT	6/02/05	BCD
4	SUBMITTAL FOR CITY REVIEW	10/20/05	BCD
5	RBC CONNECTION DETAILS	1/20/06	JRL
6	EXISTING RBC CONNECTION DETAILS	1/31/06	JRL
7	RECORD DRAWING	5/11/06	BCD

Date: January 4, 2005
Job Number: 17034.C.44
Design By: TNS
Drawn By: MNG
Checked By: BWH

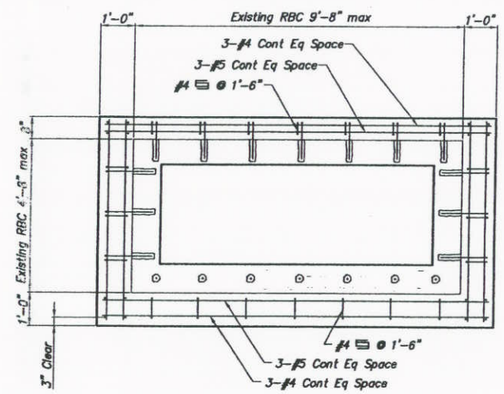
Sheet Number:
IRR5
5 OF 8



5 6 SECTION C IRR5



6 SECTION D IRR5



6 SECTION E IRR5

CAD INFORMATION
Paper Space
Plot View:
Other View:
Model Space
Plan View(s):
Profile View(s):
Plot Date:
Tab Name: PDF
X References:
Project Manager:
Designed By:
Location: G:\HAYNES\15303_C_11 Broomfield Urban Transit Village\
Drawn By:
Job Number:
Sheet Number:
Dwg. Name: IRR5.1.dwg

RECORD DRAWING

MARTIN / MARTIN
CONSULTING ENGINEERS
12499 West Colfax Ave.
P.O. Box 151500
Lakewood, CO 80215
303.431.6100
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RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
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TRANSITION BOX - MH-A1

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6	EXISTING RBC CONNECTION DETAILS	2/2/06	JRL
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Date: January 4, 2005
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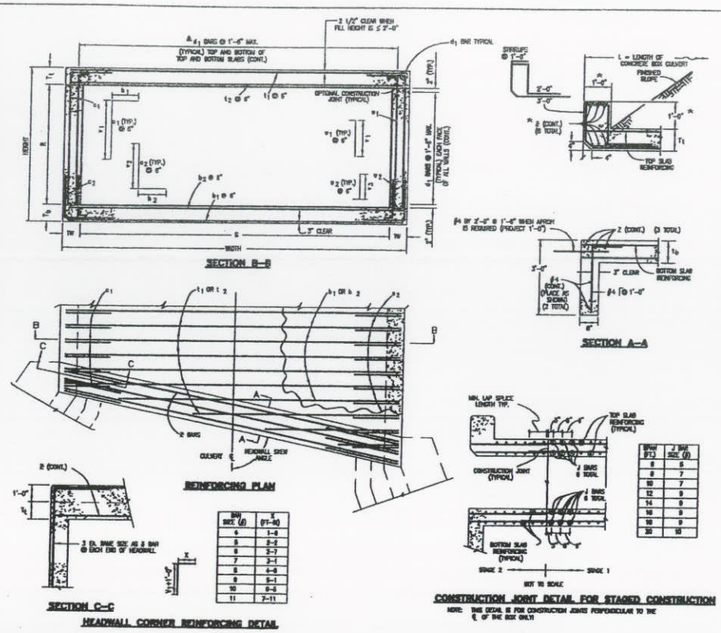
Sheet Number:
IRR5.1
6 OF 8



GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS D (BOX CULVERT).
2. ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS POURED.
3. ALL CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
5. STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH SEC. 19-230-1.
6. FOR ANY CLEAR SPAN 20 FT. OR GREATER, A FOUNDATION INVESTIGATION AND REPORT ARE REQUIRED.
7. DO NOT BACKFILL UNTIL TOP SLAB HAS REACHED DESIGN STRENGTH, f'_c.
8. SPLICE LENGTHS FOR LONGITUDINAL AND TRANSVERSE BARS ARE NOT INCLUDED.
9. GRADE 60 REINFORCING STEEL IS REQUIRED.
10. THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-3"	1'-4"	1'-5"	1'-10"	2'-2"	2'-6"	2'-11"	3'-3"

THE MINIMUM LAP SPLICE LENGTH FOR BLACK REINFORCING BARS SHALL BE:

BAR SIZE:	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH:	1'-0"	1'-1"	1'-3"	1'-10"	2'-5"	3'-1"	3'-11"	4'-10"

11. ALL DIMENSIONS ARE PERPENDICULAR TO THE CENTERLINE OF THE BOX.
12. WINGWALLS SHALL BE TIED TO CONCRETE BOX CULVERT PER STD. M-601-20.
13. ALL TRANSVERSE REINFORCING SHALL BE NORMAL TO THE CENTERLINE OF THE BOX.
14. FILL HEIGHT IS THE DISTANCE MEASURED FROM TOP OF TOP SLAB TO TOP OF PAVEMENT.
15. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.

A WHEN THE FILL HEIGHT IS LESS THAN OR EQUAL TO 2 FT., THE SPACING OF THE #4 BARS IN THE BOTTOM OF THE TOP SLAB SHALL BE 9 INCHES MAXIMUM. USE THE FOLLOWING EQUATION TO CALCULATE THE ADDITIONAL REINFORCING QUANTITY, WHERE S IS IN FEET:

ADDED REINFORCING, LBS/LIN FT. = $\left(\frac{1}{0.75} - \frac{1}{1.5}\right) \times 0.668 = 0.891\ S$

DESIGN DATA: 16TH EDITION OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES

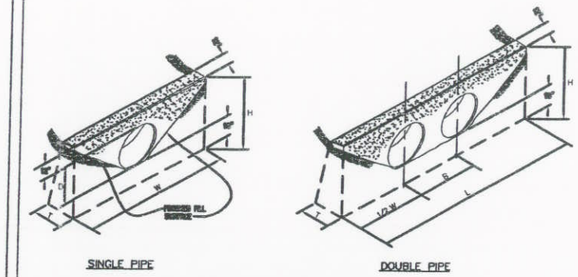
SERVICE LOAD DESIGN METHOD

UNIT STRESSES: $f_s = 24{,}000$ psi, $f_y = 60{,}000$ psi, $f_b = 1{,}800$ psi, $f'_c = 4{,}000$ psi, $n = 8$

LOADING DATA:
LIVE LOAD = AASHTO, HS 20-44 AND ALTERNATE MILITARY LOADING
ROAD LOAD CASE 1: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 30 LBS./CU.FT.
ROAD LOAD CASE 2: VERTICAL EARTH LOAD = 120 LBS./CU. FT.
HORIZONTAL EARTH LOAD = 60 LBS./CU. FT.
FUTURE ASPHALT OVERLAY = 40 LBS./SQ. FT.
LIVE LOAD SURCHARGE ON EXTERIOR WALLS = 2 FT. OF EARTH

* IF HEADWALL MOUNT CHANGES, BE USED (SEE M-601-1, SHEET 1S):
- ALL REINFORCING STEEL SHALL BE ACCORDING TO THIS BOX CULVERT PLAN.
- ANY ADDITIONAL STIRRUP LENGTH WILL NOT BE REQUIRED AND THIS FOR SEPARATELY BUT SHALL BE INCLUDED IN THE BOXC.
- HEADWALL DIMENSION AND CONCRETE QUANTITY SHALL BE ACCORDING TO M-601-1 SHEET 1S.
- POST ANCHORS SHALL BE PROVIDED ACCORDING TO M-601-1 SHEET 1S.
- POST ANCHORS AND CONCRETE FOR HEADWALL MOUNT OF HANDRAIL WILL NOT BE REQUIRED AND THIS FOR SEPARATELY BUT SHALL BE INCLUDED IN THE BOXC.
- POST ANCHORS WHEN REQUIRED AND ENCASED IN HEADWALL CONCRETE, SHALL BE ASTM A36 OR ASTM F-1554 GRADE 36.

Colorado Department of Transportation	Computer File Information	Standard Plan Revised	SINGLE CONCRETE BOX CULVERT	STANDARD PLAN NO.
4201 East Arkansas Avenue, Denver, Colorado 80222; Phone: (303) 757-9083; FAX: (303) 757-9820	Path: www.dot.state.co.us/DesignProjects/DesignSupport/AllStandards/	Date: / Comments:	Issued By: Project Development Branch October 1, 2000	M-601-1
Project Development Branch SD	Drawing File Name: 8010101 02.dwg; Acad Version: R14; Scale: NA; Units: English			Sheet No. 1 of 2



CONCRETE HEADWALL INSTALLATIONS

USE M-601-10 FOR REINFORCED PIPES.

QUANTITIES FOR ONE CONCRETE HEADWALL (CUBIC YARDS)

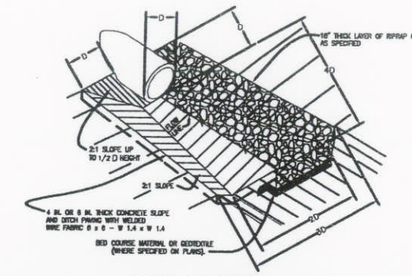
PIPE		DIAMETER (AND EQUIVALENT DIAMETER) (INCHES)											
		18		24		30		36		42		48	
TYPE	MATERIAL	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE
CIRCULAR	RCP	1.0	1.3	1.5	2.0	2.0	3.7	2.8	3.8	3.8	4.8	4.8	6.0
	CMP OR PLASTIC	1.1	1.4	1.8	2.1	2.2	3.0	3.0	4.0	3.8	5.3	5.0	6.8
ELLIPTICAL	RCP	23 x 14		30 x 19		38 x 24		45 x 29		53 x 34		60 x 38	
		0.9	1.2	1.3	1.8	1.7	2.2	2.3	2.8	2.9	3.7	3.5	4.4
ARCH	CMP	22 x 13		28 x 18		36 x 22		43 x 27		50 x 31		58 x 36	
		0.8	1.3	1.4	1.9	1.8	2.4	2.4	3.4	3.2	4.4	3.4	5.0

CULVERT OUTLET PAVING (CUBIC YARDS)

THICKNESS	MATERIAL	DIAMETER (INCHES)					
		18	24	30	36	42	48
4"	CONCRETE	0.4	0.8	1.2			
6"	CONCRETE				2.8	3.8	4.7
18"	RIPRAP	2.0	3.5	5.4	7.8	10.7	13.9

GENERAL NOTES

1. FOR SIZE AND LOCATION OF CULVERTS, SEE PLANS.
2. ALL CONCRETE SHALL BE CLASS B.
3. FOOTINGS IN ROCK SHALL BE POURED OUT TO ROCK AND NOT FORMED.
4. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 IN.



CULVERT OUTLET PAVING

TYPE OF PIPE	HEADWALL DIMENSIONS
CIRCULAR	D = PIPE DIAMETER (INSIDE) H = D + 30" W = 3D + 18" T = 0.4 H (NEAREST INCH) B = 1.5 D (30" MINIMUM) L = W + B

TYPE OF PIPE	HEADWALL DIMENSIONS
ARCH OR ELLIPTICAL	D = EQUIVALENT CIRCULAR DIAMETER (INSIDE) H = RISE + 30" W = 3D + 18" T = 0.4 H (NEAREST INCH) B = 1.5 D (30" MINIMUM) L = W + B

NOTE: VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED.

Colorado Department of Transportation	Computer File Information	Standard Plan Revised	HEADWALLS AND CULVERT OUTLET PAVING	STANDARD PLAN NO.
4201 East Arkansas Avenue, Denver, Colorado 80222; Phone: (303) 757-9083; FAX: (303) 757-9820	Path: www.dot.state.co.us/DesignProjects/DesignSupport/AllStandards/	Date: / Comments:	Issued By: Project Development Branch October 1, 2000	M-601-12
Project Development Branch SD	Drawing File Name: 8010120101.dwg; Acad Version: R14; Scale: NA; Units: English			Sheet No. 1 of 1

SINGLE CONCRETE BOX CULVERT DIMENSIONS & QUANTITIES (EXCLUDING HEADWALLS & TOEWALLS)

BOX SIZE S	B	HT.	WIDTH	FILL HEIGHT ALLOWED	SLAB & WALL THICKNESS (INCHES)	BAR SIZES t_1 & b_1	t_2 & b_2	t_3 & b_3	v_1 & v_2	v_3	θ_1	θ_2	θ_3	θ_4	DIMENSIONS NO.	H_1	H_2	V_1	V_2	V_3	QUANTITIES CONCRETE	REBAR EPL
FT.	FT.	FT.-IN.	FT.-IN.	FT.-FT.	T_1	T_2	T_3	TW							NO.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	CU.YDS./LIN.FT.	LBS./LIN.FT.
6	7	6-0	7-0	0-10 to 5-0	8	5	5	8	4	4	4	4	4	4	42	1-11	2-3	1-11	2-3	1-11	1.924	143
		7-11	7-0	5-10 to 10-10	10	6	6	10	4	4	4	4	4	4		2-3	2-7	2-3	2-7	2-3	2.250	167
		8-10	7-0	10-10 to 15-10	12	7	7	12	4	4	4	4	4	4		2-7	2-11	2-7	2-11	2-7	2.583	184
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		7-11	15-0	5-10 to 10-10	10	6	6	10	4	4	4	4	4	4		2-3	2-7	2-3	2-7	2-3	8.417	581
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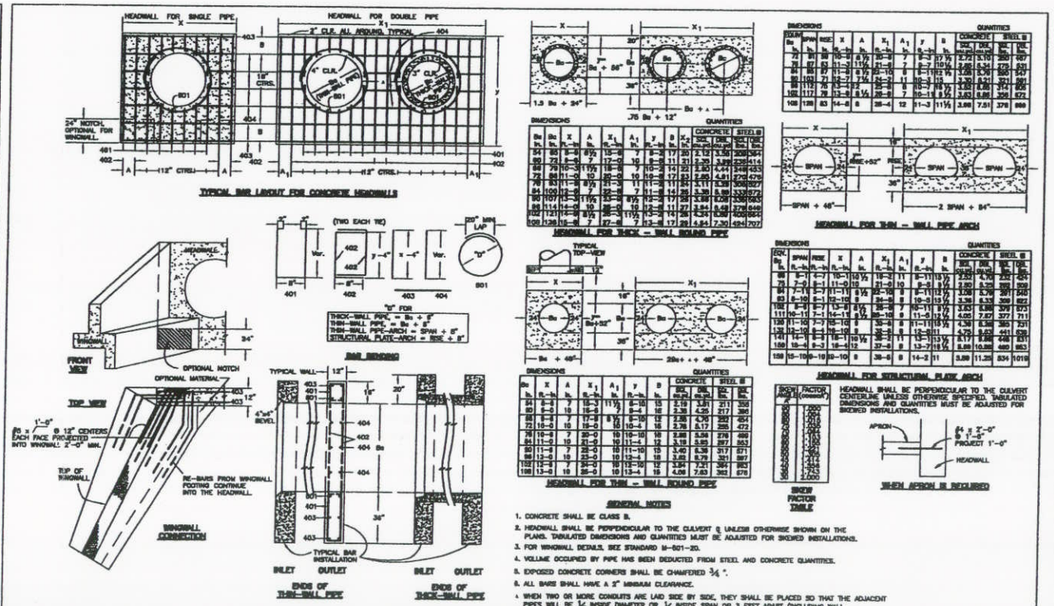
Colorado Department of Transportation	Computer File Information	Standard Plan Revised	SINGLE CONCRETE BOX CULVERT	STANDARD PLAN NO.
4201 East Arkansas Avenue, Denver, Colorado 80222; Phone: (303) 757-9083; FAX: (303) 757-9820	Path: www.dot.state.co.us/DesignProjects/DesignSupport/AllStandards/	Date: / Comments:	Issued By: Project Development Branch October 1, 2000	M-601-1
Project Development Branch SD	Drawing File Name: 8010101 02.dwg; Acad Version: R14; Scale: NA; Units: English			Sheet No. 2 of 2



GENERAL NOTES

1. CONCRETE SHALL BE CLASS B.
2. HEADWALL SHALL BE PERPENDICULAR TO THE CULVERT ℄ UNLESS OTHERWISE SHOWN ON THE PLANS. TABULATED DIMENSIONS AND QUANTITIES MUST BE ADJUSTED FOR SKEWED INSTALLATIONS.
3. FOR WINGWALL DETAILS, SEE STANDARD M-601-20.
4. VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED FROM STEEL AND CONCRETE QUANTITIES.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ ".
6. ALL BARS SHALL HAVE A 2" MINIMUM CLEARANCE.
7. WHEN TWO OR MORE CONDUITS ARE LAID SIDE BY SIDE, THEY SHALL BE PLACED SO THAT THE ADJACENT PIPES WILL BE ½ INSIDE DIAMETER OR ½ INSIDE SPAN OR 3 FEET APART (INCLUDING WALL THICKNESS) WHICHEVER IS LESS.

⊞ ADD 0.80 × (X OR X_1) (LB.) WHEN APRON IS REQUIRED.

Colorado Department of Transportation	Computer File Information	Standard Plan Revised	HEADWALLS FOR PIPE CULVERTS	STANDARD PLAN NO.
4201 East Arkansas Avenue, Denver, Colorado 80222; Phone: (303) 757-9083; FAX: (303) 757-9820	Path: www.dot.state.co.us/DesignProjects/DesignSupport/AllStandards/	Date: / Comments:	Issued By: Project Development Branch October 1, 2000	M-601-10
Project Development Branch SD	Drawing File Name: 8010100101.dwg; Acad Version: R14; Scale: NA; Units: English			Sheet No. 1 of 1

MARTIN / MARTIN
CONSULTING ENGINEERS
12499 WEST COLFAX AVE.
P.O. BOX 151500
LAKEWOOD, CO 80215
303.431.4170
FAX 303.431.4028

RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA

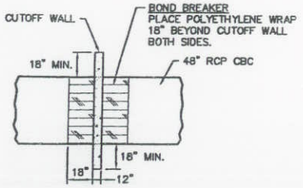
DRY CREEK VALLEY DITCH DETAIL SHEET

No.	Description of Revisions	Date	Name
1	INITIAL SUBMITTAL	02/01/05	BCD
2	REV. PER OWNER	04/01/05	BCD
3	ISSUE FOR BID	5/2/05	PRH
4	REVISED FOR REALIGNMENT	6/2/05	BCD
5	REV. PER DITCH CO. ENGINEER COMMENTS	7/13/05	BCD
6	SUBMITTED FOR CITY APPROVAL	10/31/05	BCD
7	RECORD DRAWING	05/11/06	BCD

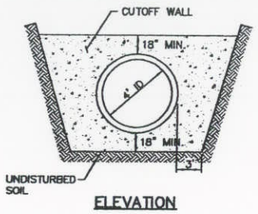
Date: JANUARY 04, 2005
Job Number: 17034.C.44
Design By: B. DUMMER
Drawn By: M. WINGERTER
Checked By: P. HORN

Sheet Number:
IRR-6
6 OF 7

RECORD DRAWING
Job Number: 17034.C.44
Sheet Number: IRR-6 6 OF 7
Location: G:\WORK\Park 36\PLANS\AS-BUILTS\Irrigation
Project Manager: PH
Designed By: BCD
Drawn By: MWW
X References:
Plot Date: 3/31/05 winserter
Tab Name: AB-IRR-6
Profile View(s):
Model Space Plan view(s): PLAN
Other View:
CAD INFORMATION
Paper Space Plot view: PLOT
Dwg. Name: AB-IRR-6.dwg



PLAN



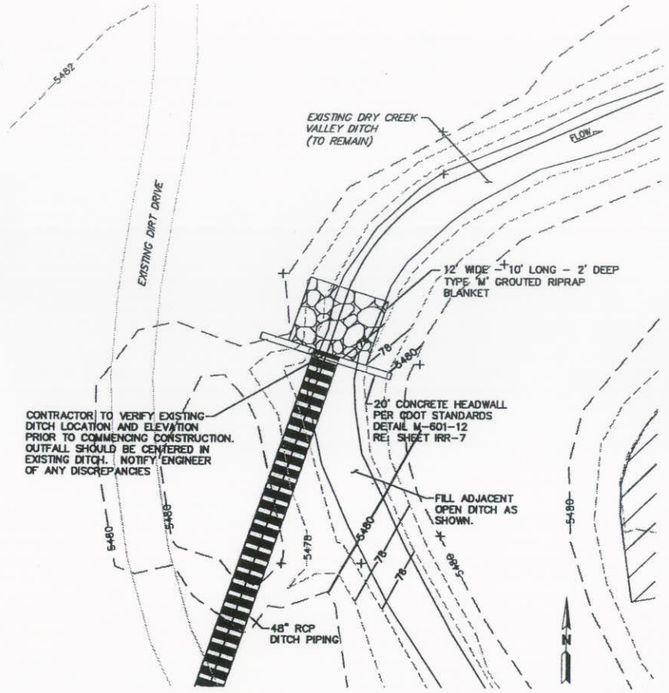
ELEVATION

NOTES:

1. CUTOFF WALL TO BE CDOT FLOW FILL MATERIAL

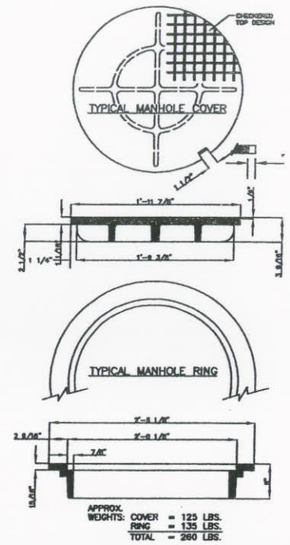
CUTOFF WALL DETAIL

N.T.S.



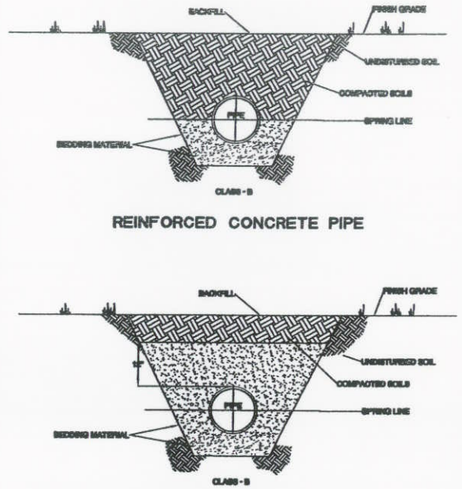
OUTFALL PLAN DETAIL

SCALE: 1" = 10'



City of Broomfield
ENGINEERING DEPARTMENT

TITLE: MANHOLE COVER AND RINGS
DETAIL DRAWING NUMBER: 400-3
APPROVED BY: DATE:



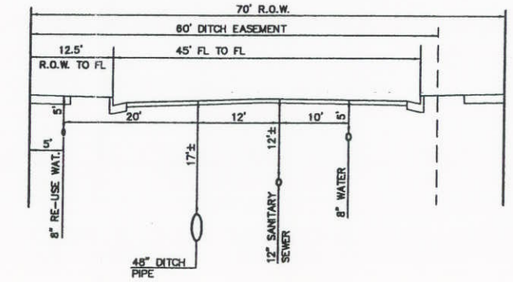
REINFORCED CONCRETE PIPE

P.V.C. PIPE DUCTILE IRON PIPE

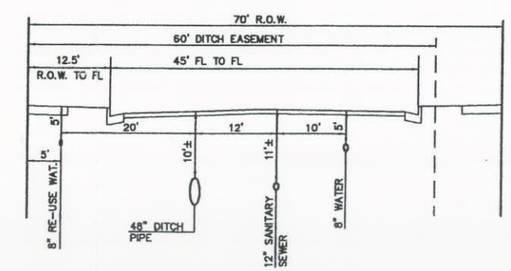
NOTE:
FOR ROCK STABILIZATION IN HIGHLY MOIST AND/OR UNSTABLE SOILS, REFER TO SECTION 938.04 OF CITY STANDARDS.

City of Broomfield
ENGINEERING DEPARTMENT

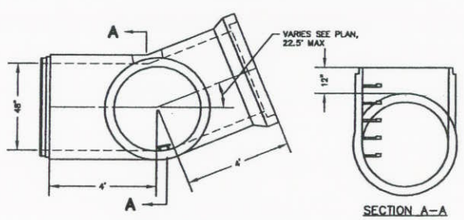
TITLE: PIPE STABILIZATION SEC. W/O UNDERDRAIN
DETAIL DRAWING NUMBER: 300-4
APPROVED BY: DATE:



A STREET D SECTION
1"=10' HORIZ
1"=10' VERT

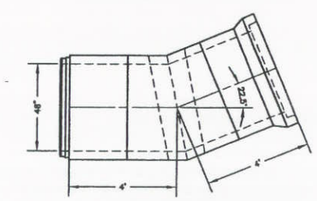


B STREET D SECTION
1"=10' HORIZ
1"=10' VERT



PRECAST ELBOW W/MANHOLE TEE

N.T.S.



PRECAST 22.5° BEND

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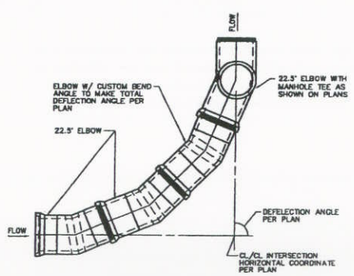
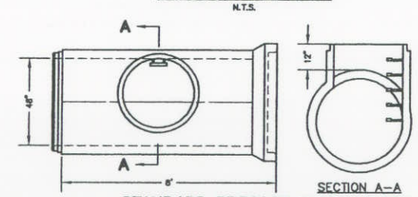


COMPOUND BEND

N.T.S.



STANDARD PRECAST MANHOLE TEE

N.T.S.

MARTIN / MARTIN
CONSULTING ENGINEERS
12499 WEST DELAWARE AVE.
P.O. BOX 151500
LAKEWOOD, CO 80215
303.431.6100
FAX 303.431.4028

RECORD DRAWING

BROOMFIELD URBAN TRANSIT VILLAGE
ARISTA

DRY CREEK VALLEY DITCH DETAIL SHEET

No.	Description of Revisions	Date	Name
1	INITIAL SUBMITTAL	02/01/05	BGD
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6	SUBMITTED FOR CITY APPROVAL	10/31/05	BGD
7	RECORD DRAWING	06/01/06	BGD

Date: JANUARY 04, 2005
Job Number: 17034.C.44
Design By: B. DUMMER
Drawn By: M. WINGERTER
Checked By: P. HORN

Sheet Number:

IRR-7
7 OF 7

RECORD DRAWING
Job Number: 17034.C.44
Sheet Number: IRR-8 7 OF 7

Project Manager: PFH
Designed By: BGD
Location: G:\HORN\Park 36\PLANS\AS-BUILTS\irrigation\
Drawn By: MRW

X References:
Plot Date: 7/21/05 wingerter
Tab Name: AB-IRR-7
Profile View(s):
Model Space Plan View(s): PLAN
Other View:

CAD INFORMATION
Paper Space Plot view: PLOT
Dwg. Name: AB-IRR-7.dwg