LEGEND

US-36 Berm on the US-36 Median Barrier

Main Roads

Drainage Feature

Stream or Ditch

SBC 2003 1' Contours

INDEX

INTERVAL

Notes:
1. Approximate flood plain based on High Water Marks Collected the Week of September 16, 2013 by DHI, and CH2M HILL

N

0 190 380 760 1,140 1,520 Feet

FIGURE I-1
US-36 Detention Berm Centered on the US-36 Median Barrier
South Boulder Creek Flood Mitiagtion Report

LEGEND

- CDOT US-36 Phase I ROW
- Parcels
- US-36 Detention Using CDOT Phase I ROW
- US-36 Phase I Improvements
- Main Roads

Drainage Feature

- Stream or Ditch

Notes:
1. Approximate flood plain based on High Water Marks Collected the Week of September 16, 2013 by DHI, and CH2M HILL

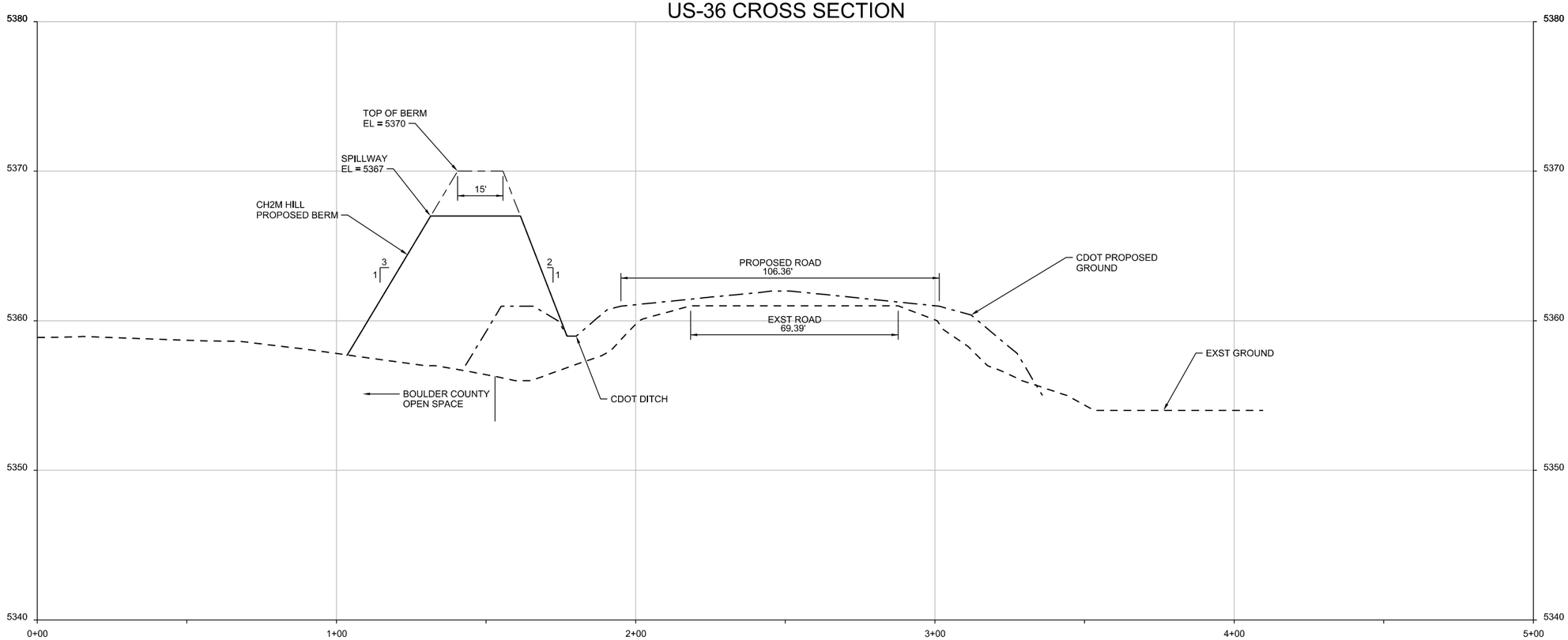
N

0 125 250 500 750 1,000 Feet

FIGURE I-2
US-36 Detention Berm Maximizing US-36 Phase I ROW
South Boulder Creek Flood Mitiagtion Report

CH2MHILL

US-36 CROSS SECTION



NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN							

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Figure I-3

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

BERM CROSS SECTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2013
PROJ	
DWG	
SHEET	of

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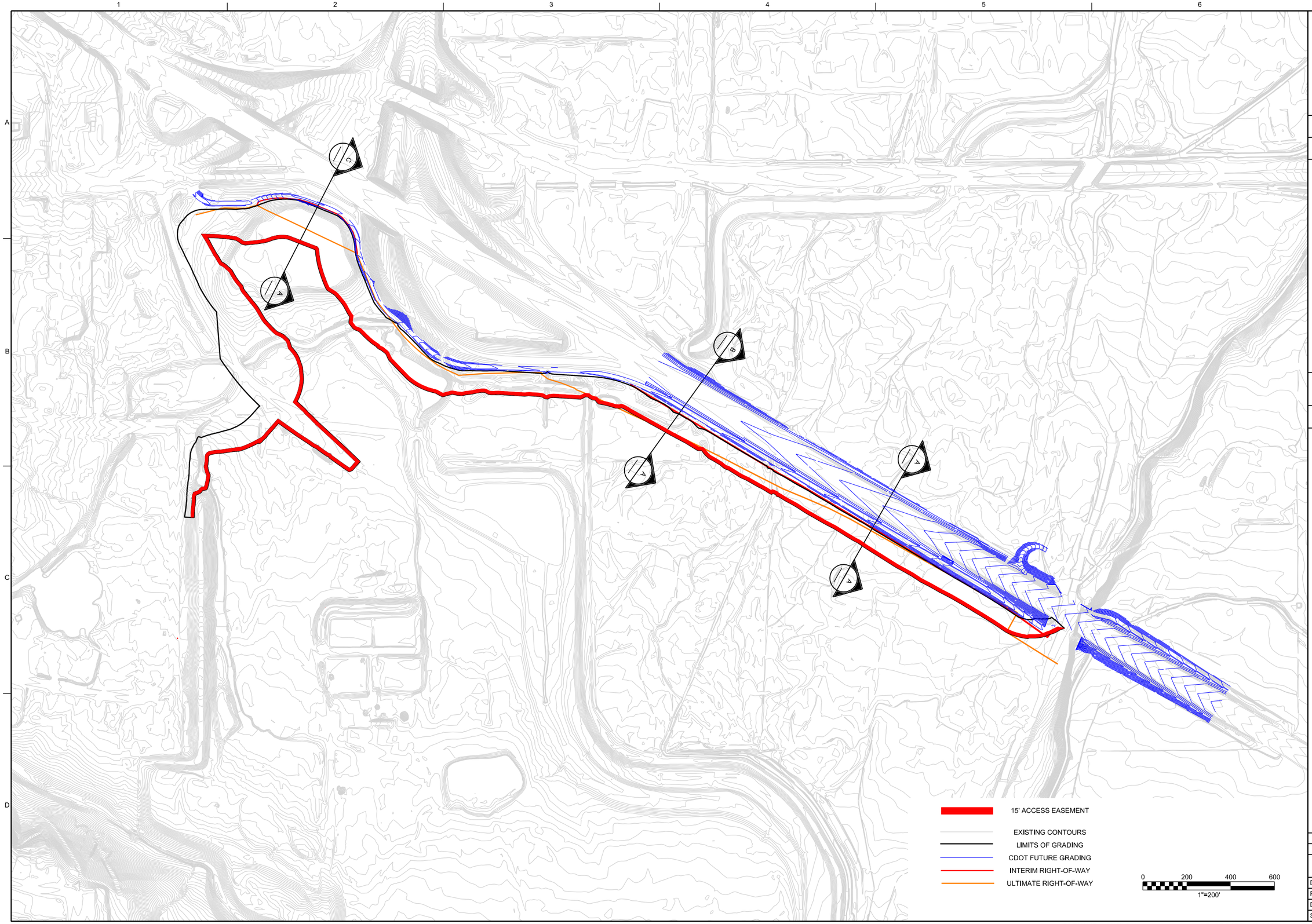

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DSGN | DR | CHK | APVD

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

INTERIM GRADING PLAN WALL ALTERNATIVE

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE
PROJ
DWG
SHEET of

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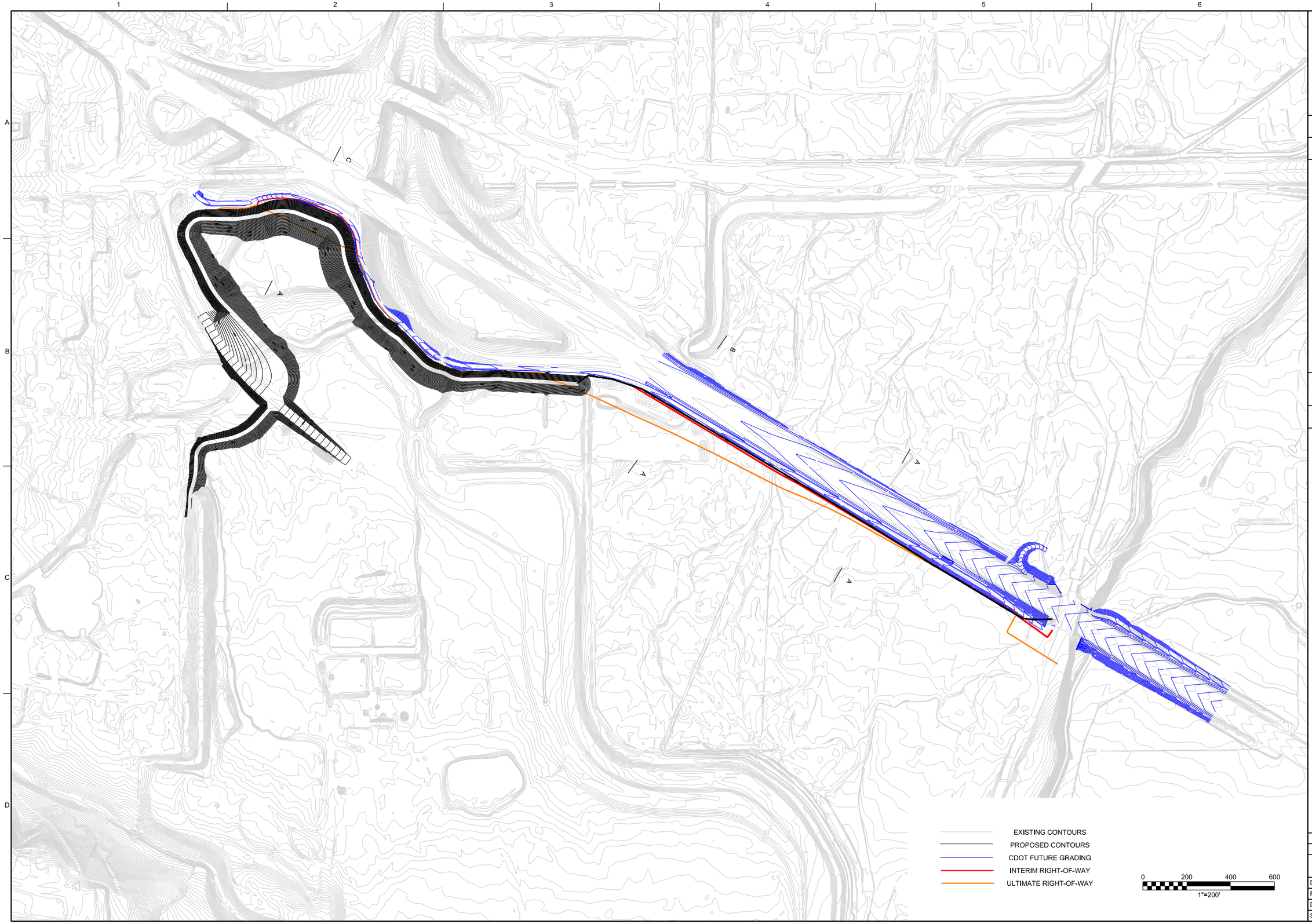

NO.	DATE	REVISION	BY	APVD

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

INTERIM GRADING PLAN WALL ALTERNATIVE

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE
PROJ
DWG
SHEET of

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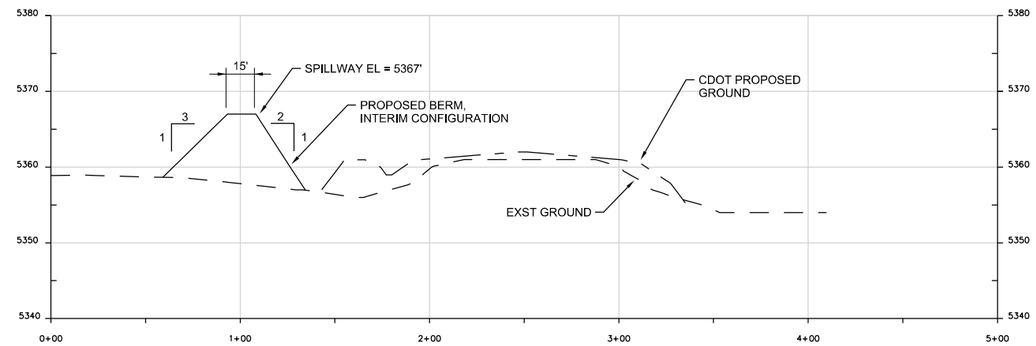
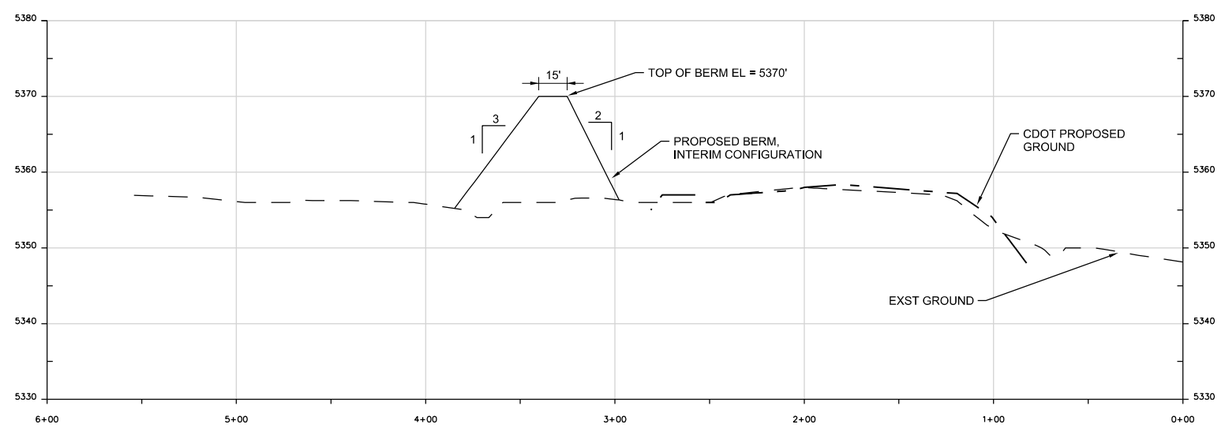


SECTION A

H: 1" = 40'
V: 1" = 10'



SECTION B

H: 1" = 40'
V: 1" = 10'

NO.	DATE	REVISION	BY	APVD
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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

INTERIM CONFIGURATION
TYPICAL SECTIONS (1 OF 2)

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE
PROJ
DWG
SHEET of

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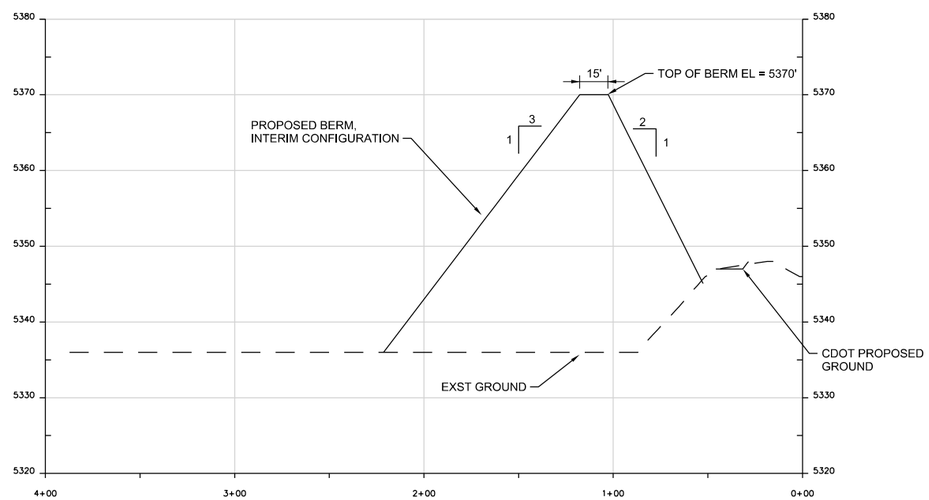

SECTION C

H: 1" = 40'
V: 1" = 10'

NO.	DATE	REVISION	BY	APVD
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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

INTERIM CONFIGURATION
TYPICAL SECTIONS (2 OF 2)

VERIFY SCALE
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0 1"

DATE
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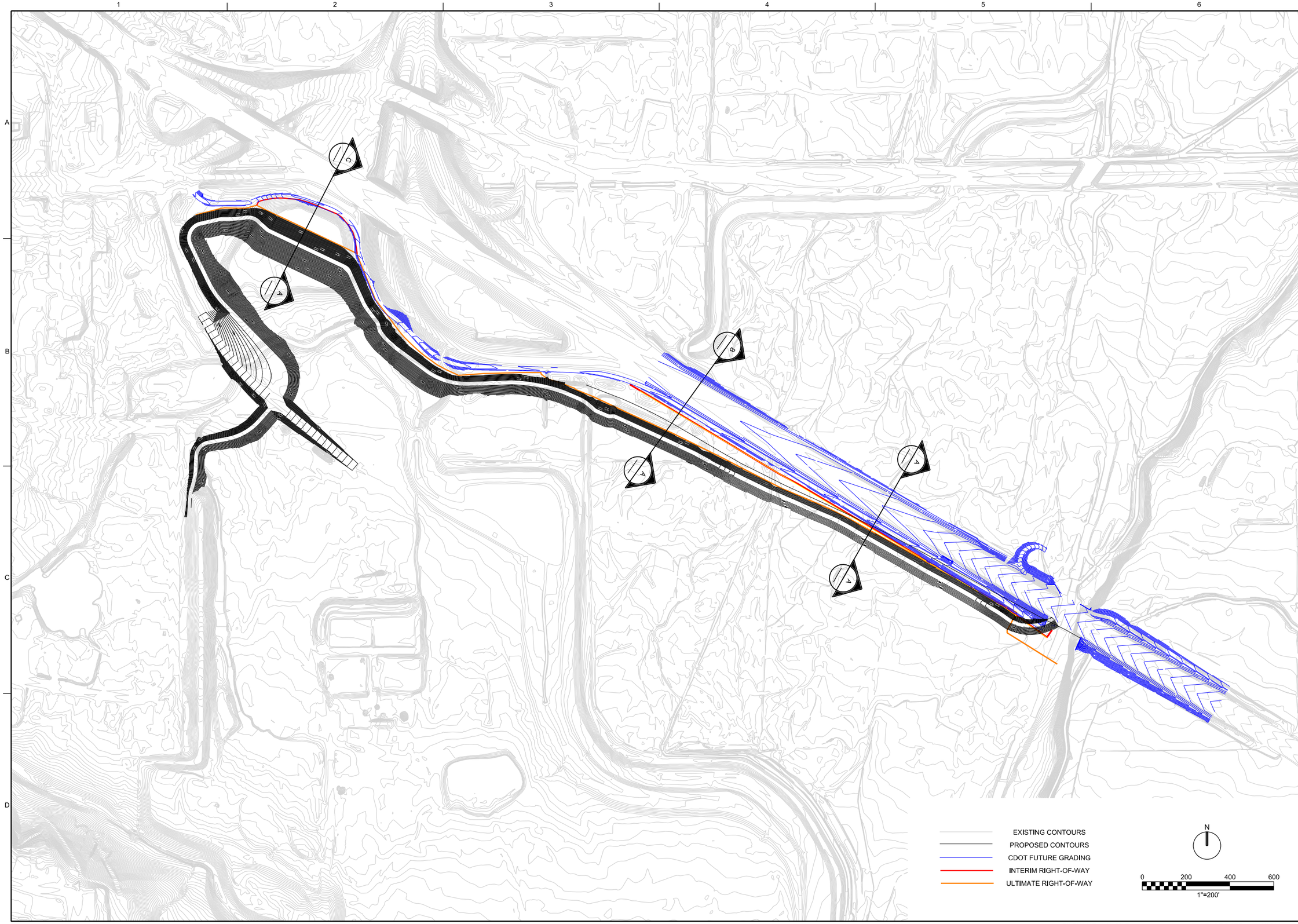

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

ULTIMATE GRADING PLAN

VERIFY SCALE
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DATE
PROJ
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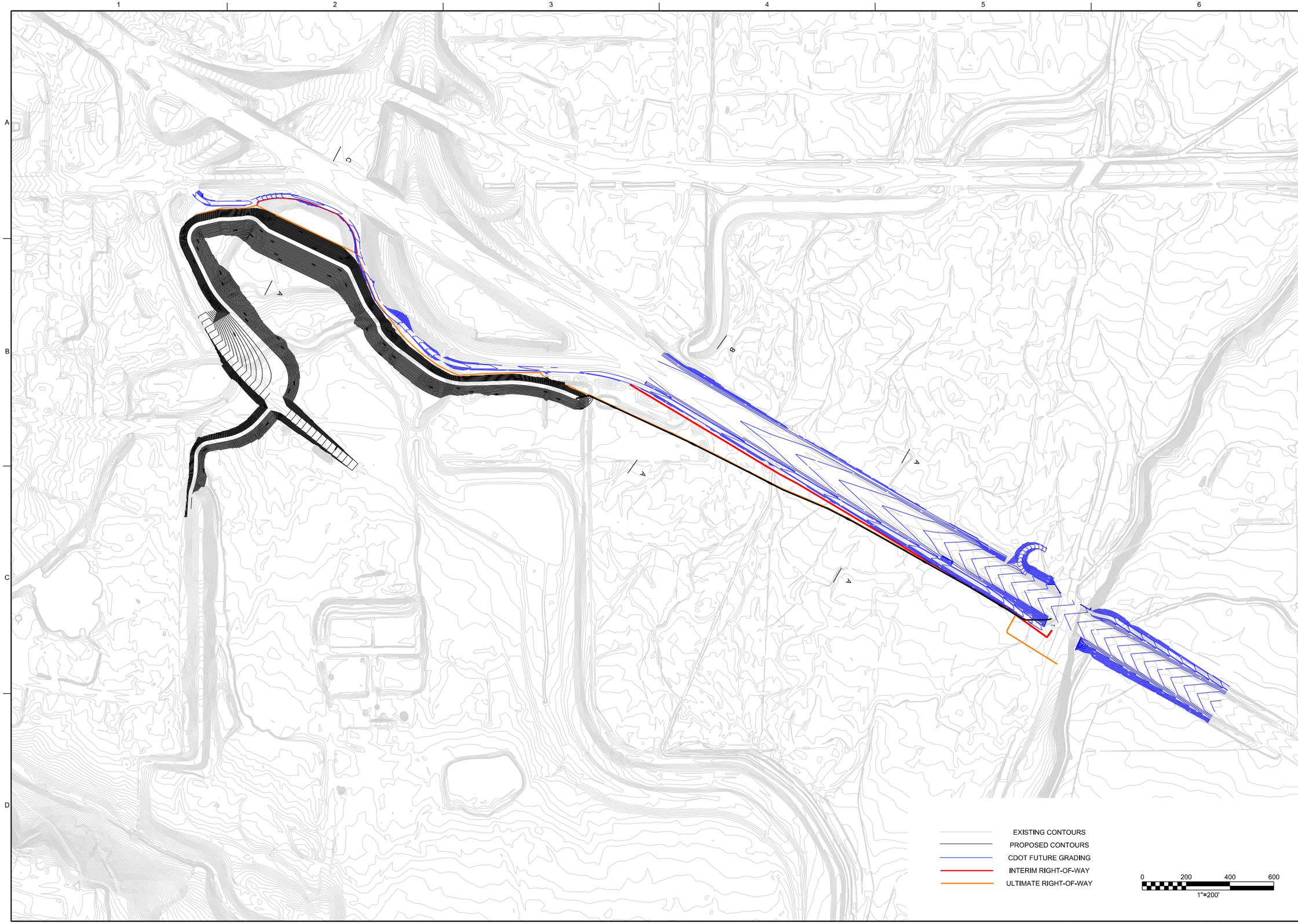

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DSGN | DR | CHK | APVD

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

INTERIM GRADING PLAN WALL ALTERNATIVE

VERIFY SCALE
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0 1"

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PROJ
DWG
SHEET of

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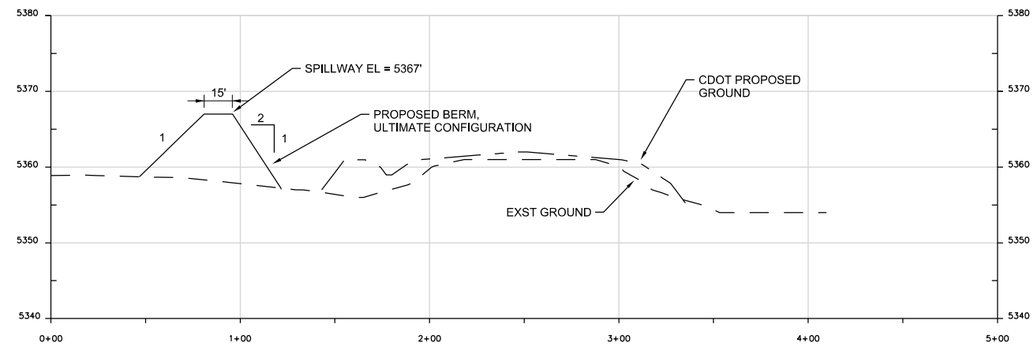
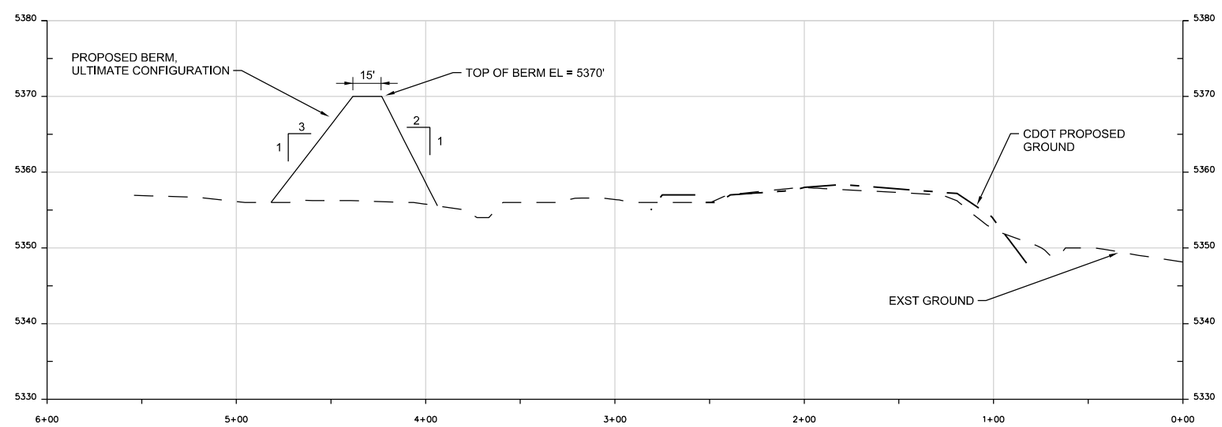


SECTION A

H: 1" = 40'
V: 1" = 10'



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H: 1" = 40'
V: 1" = 10'

NO.	DATE	REVISION	BY	APVD
DSGN	DR	CHK	APVD	

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

ULTIMATE CONFIGURATION
TYPICAL SECTIONS (1 OF 2)

VERIFY SCALE
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0 1"

DATE
PROJ
DWG
SHEET of

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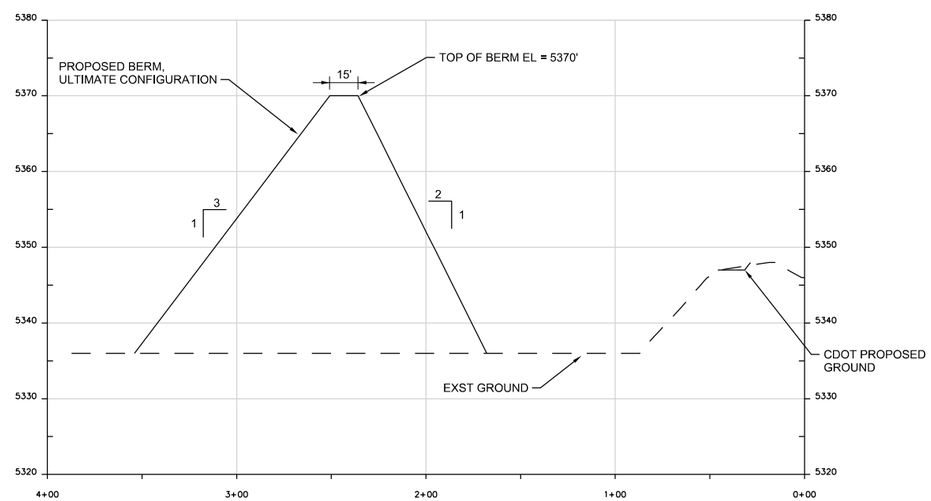

SECTION C

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NO.	DATE	REVISION	BY	APVD

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SOUTH BOULDER CREEK FLOOD MITIGATION STUDY

ULTIMATE CONFIGURATION
TYPICAL SECTIONS (2 OF 2)

VERIFY SCALE
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0 1"

DATE
PROJ
DWG
SHEET of

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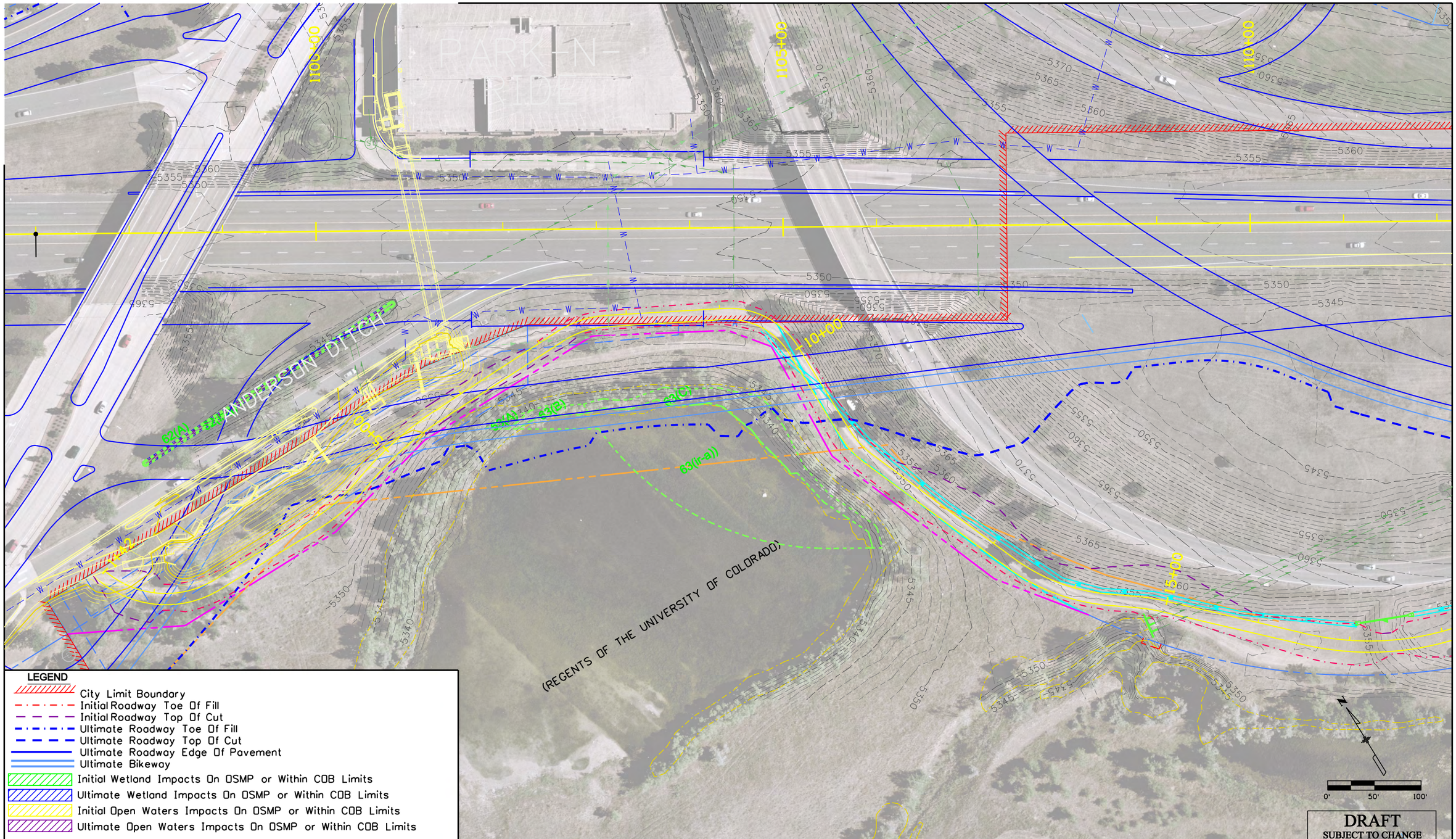

LEGEND

- City Limit Boundary
- Initial Roadway Toe Of Fill
- Initial Roadway Top Of Cut
- Ultimate Roadway Toe Of Fill
- Ultimate Roadway Top Of Cut
- Ultimate Roadway Edge Of Pavement
- Ultimate Bikeway
- Initial Wetland Impacts On OSMP or Within COB Limits
- Ultimate Wetland Impacts On OSMP or Within COB Limits
- Initial Open Waters Impacts On OSMP or Within COB Limits
- Ultimate Open Waters Impacts On OSMP or Within COB Limits

Print Date: 3/14/2013
File Name: 18907_100scale_PLan_02F.dgn
Horiz. Scale: 1:100 Vert. Scale: As Noted

Sheet Revisions		
Date:	Comments	Init.

Colorado Department of Transportation
DOT
DEPARTMENT OF TRANSPORTATION
1050 Lee Hill Road
Boulder, CO 80302
Phone: 303-546-5660 FAX: 303-444-0751

As Constructed
No Revisions:
Revised:
Void:

US-36 INITIAL AND ULTIMATE PROJECT WETLANDS AND WATERS OF US IMPACTS TO OSMP PROPERTY OR WITHIN CITY OF BOULDER LIMITS

Designer:
Detailer:
Sheet Subset:
Structure Numbers
Subset Sheets:

Project No./Code
NH 0361-103
18907
Sheet Number 02F

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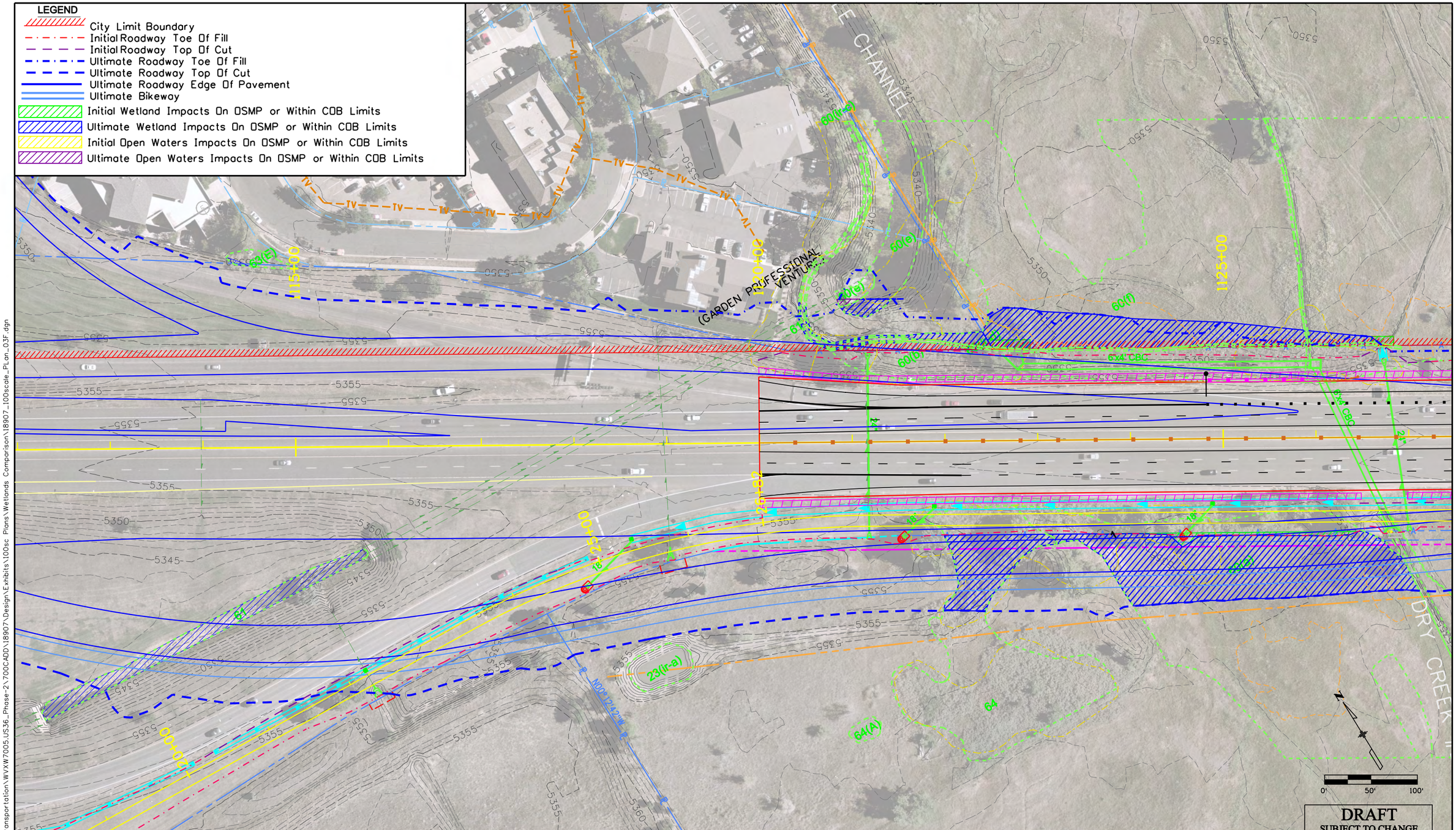

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Print Date: 3/14/2013	Sheet Revisions	Colorado Department of Transportation	As Constructed
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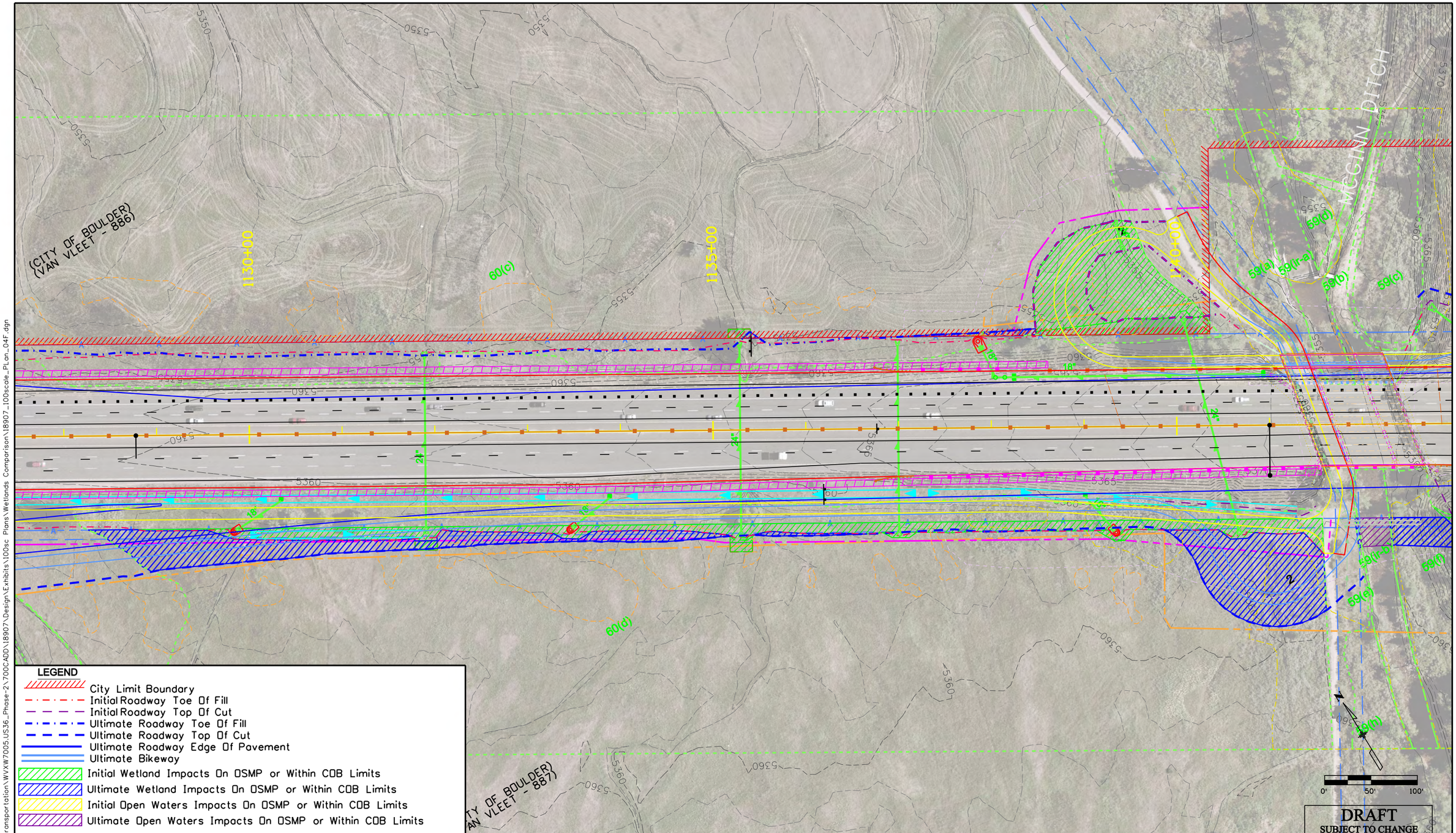
Horiz. Scale: 1:100 Vert. Scale: As Noted			Revised:
			Void:

US-36 INITIAL AND ULTIMATE PROJECT WETLANDS AND WATERS OF US IMPACTS TO OSMP PROPERTY OR WITHIN CITY OF BOULDER LIMITS

Designer:		Structure Numbers	
Detailer:			
Sheet Subset:		Subset Sheets:	

Project No./Code
NH 0361-103
18907
Sheet Number 03F



LEGEND

- City Limit Boundary
- Initial Roadway Toe Of Fill
- Initial Roadway Top Of Cut
- Ultimate Roadway Toe Of Fill
- Ultimate Roadway Top Of Cut
- Ultimate Roadway Edge Of Pavement
- Ultimate Bikeway
- Initial Wetland Impacts On OSMP or Within COB Limits
- Ultimate Wetland Impacts On OSMP or Within COB Limits
- Initial Open Waters Impacts On OSMP or Within COB Limits
- Ultimate Open Waters Impacts On OSMP or Within COB Limits

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1050 Lee Hill Road
Boulder, CO 80302
Phone: 303-546-5660 FAX: 303-444-0751

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Void:		

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Designer:		Structure Numbers	
Detailer:			
Sheet Subset:		Subset Sheets:	

Project No./Code	
NH 0361-103	
18907	
Sheet Number	04F

June 25, 2012

TO: Bruce Messinger, Superintendent

FROM: Glen Segrue, Senior Planner

RE: Manhattan Floodplain improvements

In 2008, the City of Boulder completed an update of the City's floodplain maps in response to inconsistencies found between the previous floodplain delineation and individual property surveys. During this process, the City found that a substantial number of residential properties in east Boulder were within the new floodplain delineation. This included much of the homes surrounding Manhattan Middle School, although the school itself is on a raised pad and remains out of the floodplain. Because of the large numbers of residential structure impacted by the new findings, the City has commissioned a study on how potential flooding could be mitigated in the future.

This study is currently underway and expected to be presented to City Council later this year. Council can choose to pursue the recommendations in the study, which are likely to cost tens of millions of dollars (but qualify for some federal funds), or could choose not to enact any of the recommendations at all.

The goal of the new study is to shift much of the floodplain from residential areas to uninhabited lands on City Open Space along South Boulder Creek. This would be accomplished through a combination of detention ponds and drainage way improvements to rechannel potential floodwaters. The Manhattan Middle school property was identified early on for drainage improvements because the Dry Creek No. 2 Ditch runs along the east side of the property and feeds into an undersized pipe at the northeast corner. During a large flood event, this pipe is likely to be a "choke point" where heavy flows would back up onto the Manhattan playfields and the surrounding neighborhood.

One solution to correct this choke point would be to enlarge the pipe, however it runs north underneath numerous residential lots and the cost to resize the pipe has been determined to be cost prohibitive. The only other solution is to create more water detention before water enters the pipe. With that, the Manhattan playfields are ideally located and detention could be created by lowering the grade several feet. The City estimates approximately 31 acre feet of water retention would be needed at this site.

City representatives approached District staff in the summer of 2010 to discuss the detention approach at Manhattan. At that time, the study was at a conceptual level and District staff had no objection to further exploration of this option. But more recent discussions have lead the City to request a more formal acceptance on the part of the District.

At a meeting held on June 18, 2012, City staff indicated that, if the overall plan is approved by City Council, the Manhattan project would be in the last of three phases and construction would not occur for 5 to 10 years. Prior to construction, the City and School District would negotiate a drainage easement that would outline compensation to BVSD as well as maintenance responsibilities of the detention area. District staff felt that there could be potential benefits for BVSD should the detention be created, include greater safety for accessing the school during a flood event and greater protection for the surrounding neighborhood, which is served by Manhattan.

District staff did have concern, however, that the flood improvements would interfere with school use of the property, which includes extensive rental of the fields to outside athletic groups. Another concern was that the detention area would retain water for an extensive amount of time after an event and not be available for District use. The City representatives were confident, however, that the detention area could be designed to accommodate the current number of athletic fields and would only hold water for a matter of hours should flooding occur. Furthermore, the District would have the option to negotiate greater improvements to the fields as part of the compensation package for the drainage easement.

In response to the City's request for support of the plan to construct a detention area on the Manhattan Middle School property, BVSD staff has determined that the plan is beneficial to the District and, therefore, does support the project. This support comes because of the potential safety benefits to the school and surrounding neighborhood and assumption that the detention can be designed so that Manhattan has no net loss of athletic fields. BVSD would also benefit from compensation as part the drainage easements needed to pursue the project on District property. Staff support for this project in its current form is likely to be maintained unless otherwise directed by the Board of Education.

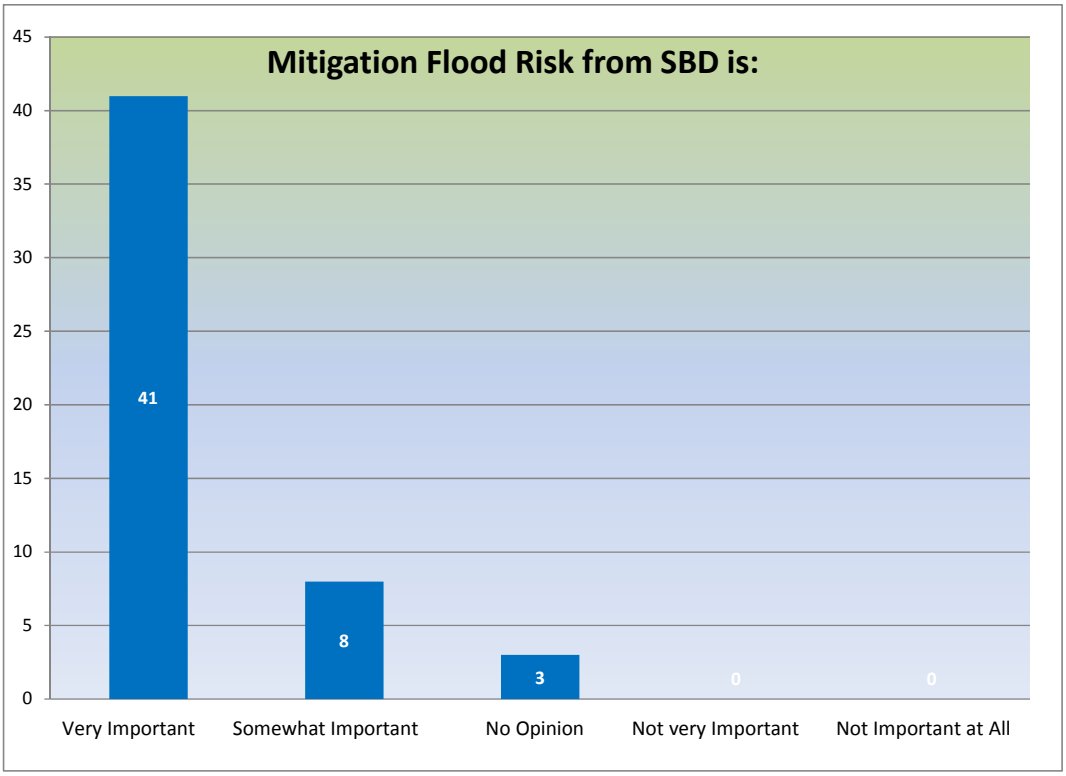
Further commitments by the District are not being requested at this time. Should the plan be pursued by the City, the Board of Education in existence at the time of construction would be requested to commit to the terms of the drainage easement(s).

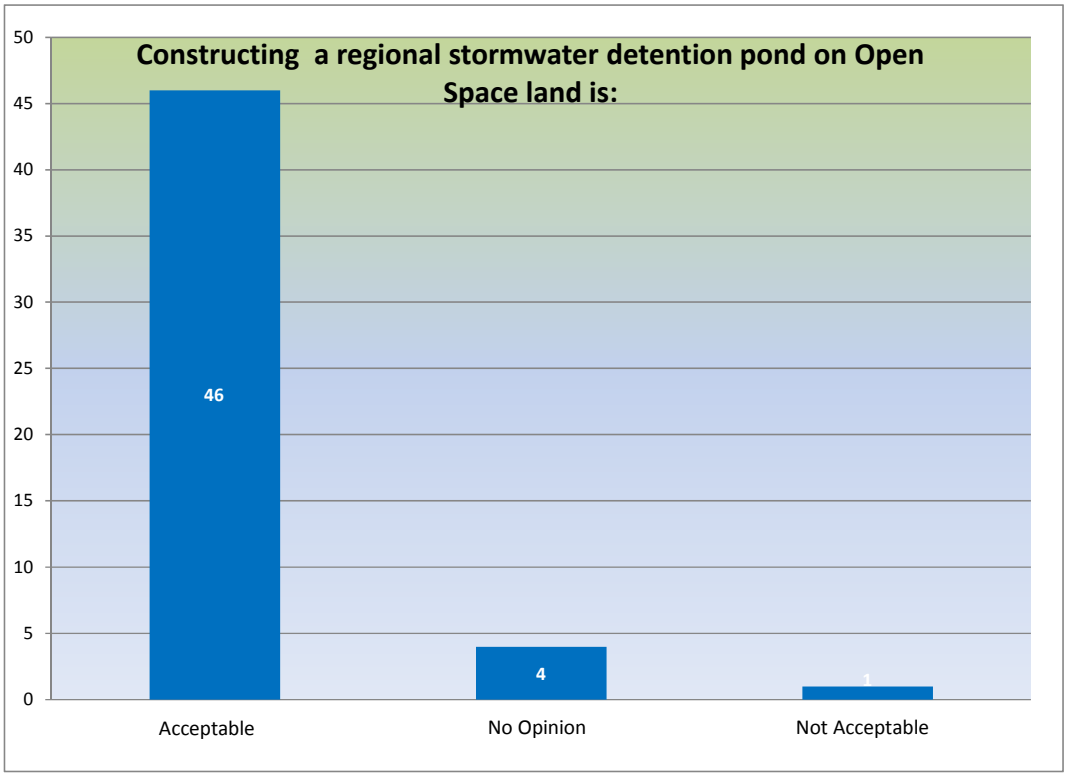
Thank you.

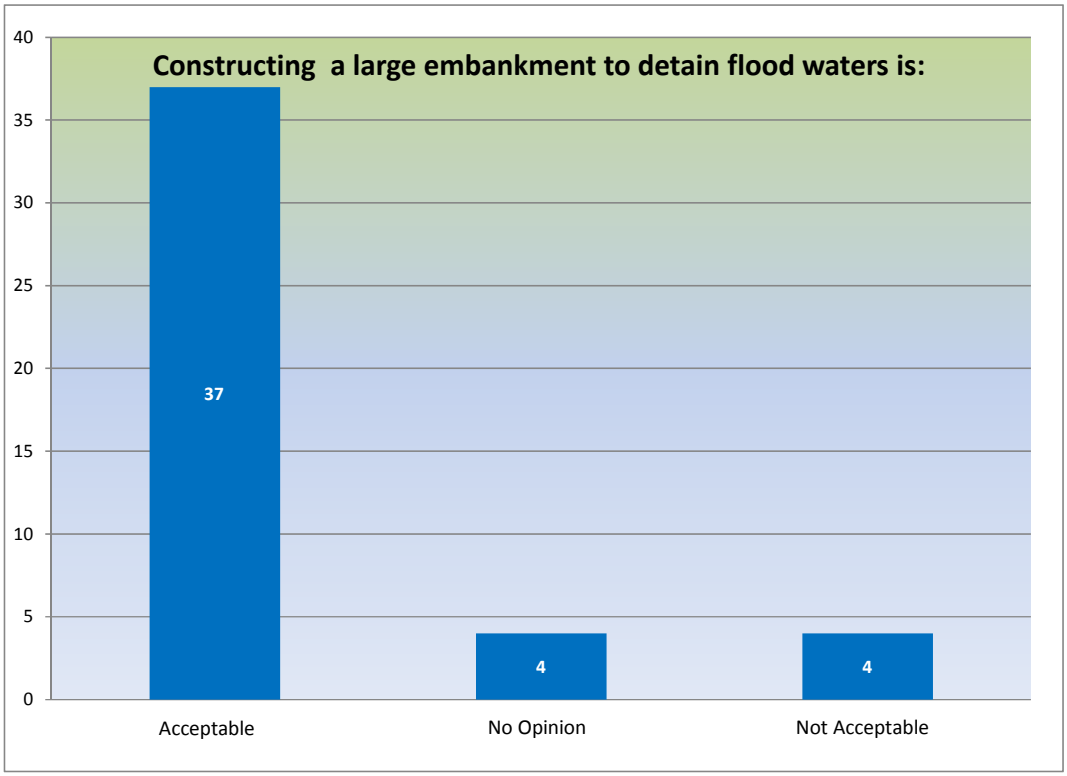
GS

c: Don Orr

Attachment


Mitigation Flood Risk from SBD is:
45
40
35
30
25
20
15
10
5
0
41
8
3
0
0
Very Important
Somewhat Important
No Opinion
Not very Important
Not Important at All


Constructing a regional stormwater detention pond on Open Space land is:
50
45
40
35
30
25
20
15
10
5
0
46
4
1
Acceptable
No Opinion
Not Acceptable


Constructing a large embankment to detain flood waters is:
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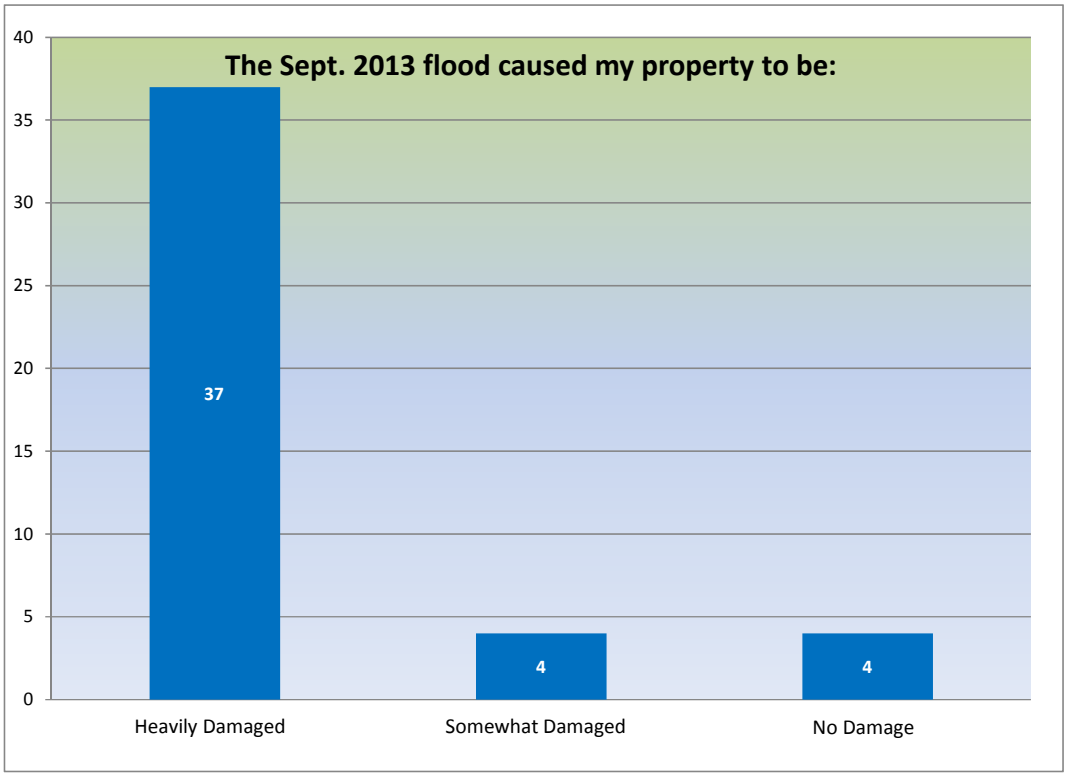
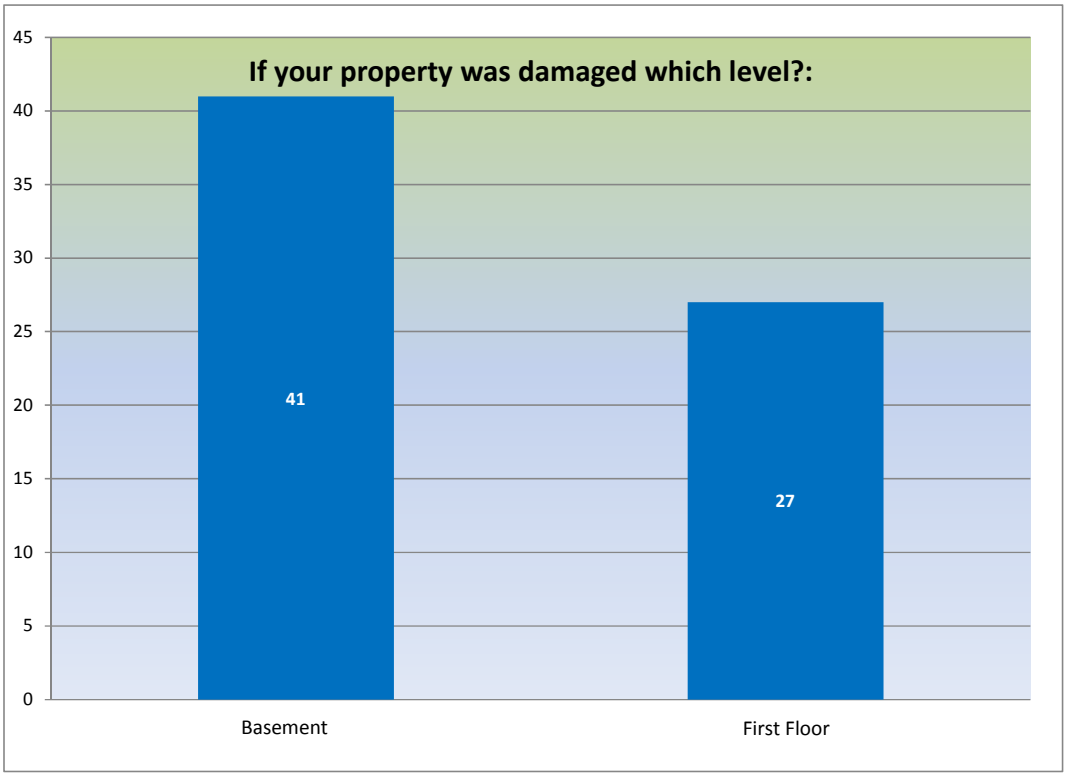
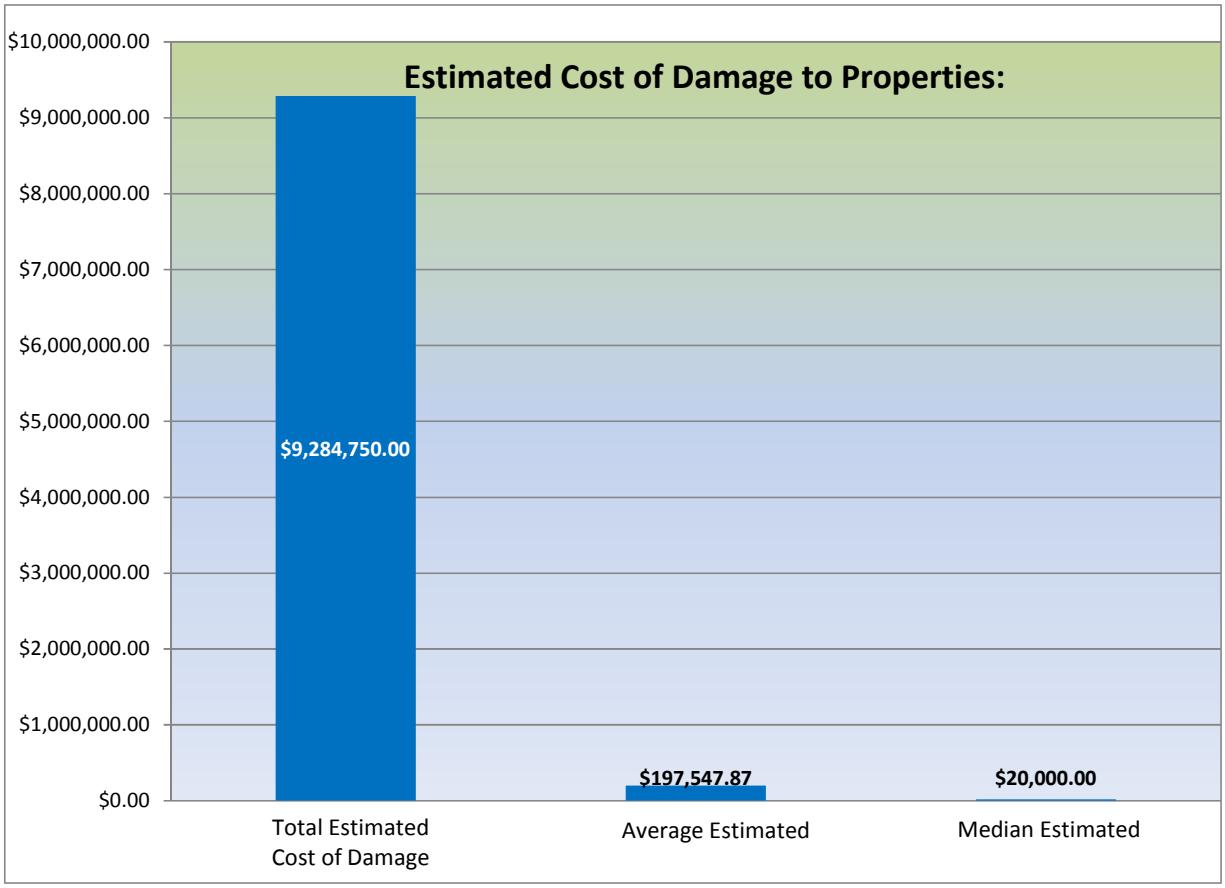
35
30
25
20
15
10
5
0
37
4
4
Acceptable
No Opinion
Not Acceptable


The Sept. 2013 flood caused my property to be:
40
35
30
25
20
15
10
5
0
37
4
4
Heavily Damaged
Somewhat Damaged
No Damage


If your property was damaged which level?:
45
40
35
30
25
20
15
10
5
0
41
27
Basement
First Floor


Estimated Cost of Damage to Properties:
$10,000,000.00
$9,000,000.00
$8,000,000.00
$7,000,000.00
$6,000,000.00
$5,000,000.00
$4,000,000.00
$3,000,000.00
$2,000,000.00
$1,000,000.00
$0.00
$9,284,750.00
$197,547.87
$20,000.00
Total Estimated Cost of Damage
Average Estimated
Median Estimated