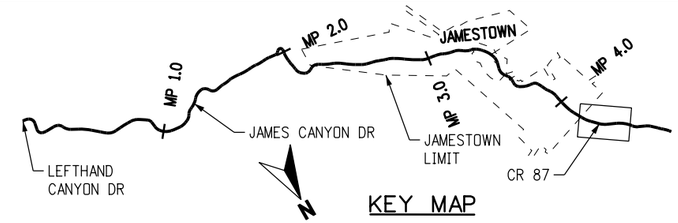
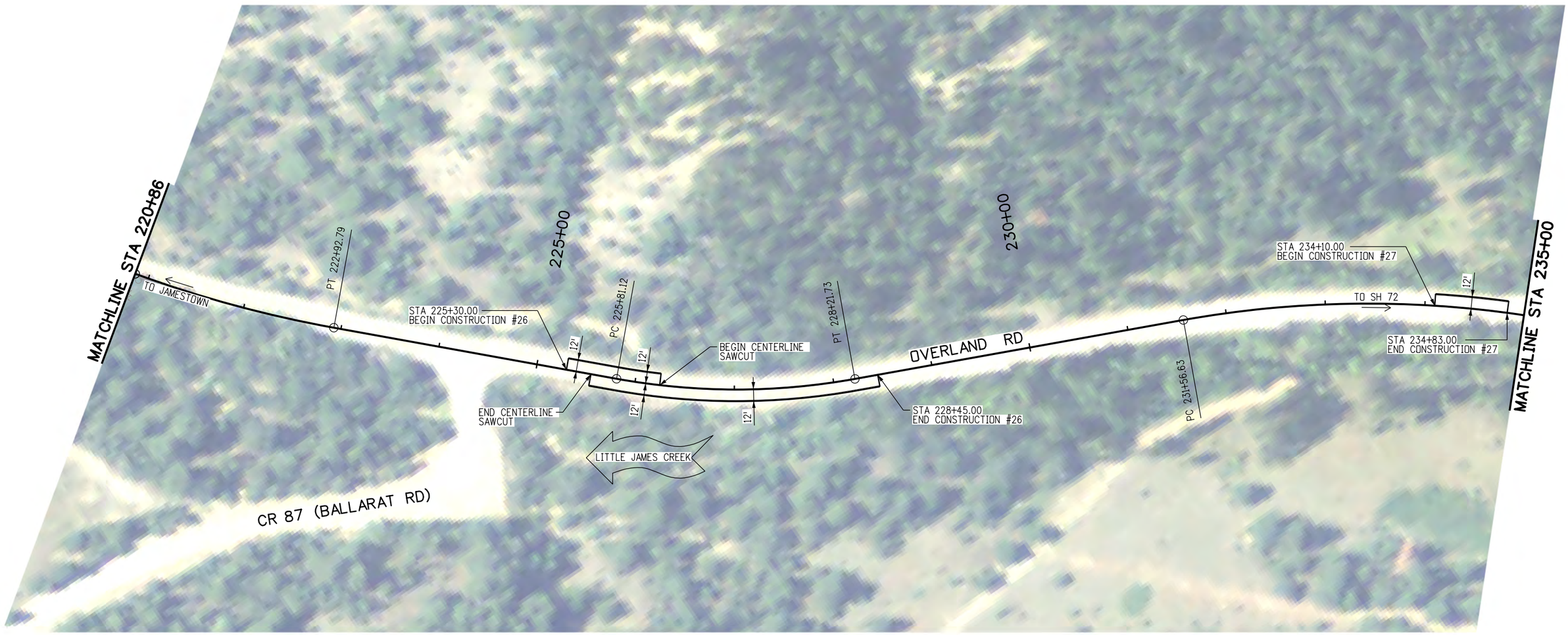
NOTE: CURVE AND ALIGNMENT DATA NOT PROVIDED BEYOND 220+86. STATIONING FOR REMAINDER OF JAMES CANYON TO BE BASED ON THE ROAD CENTERLINE DISTANCE FROM STA 220+86.



KEY MAP



F.I.R. SUBMITTAL

0' 50' 100' 200'

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

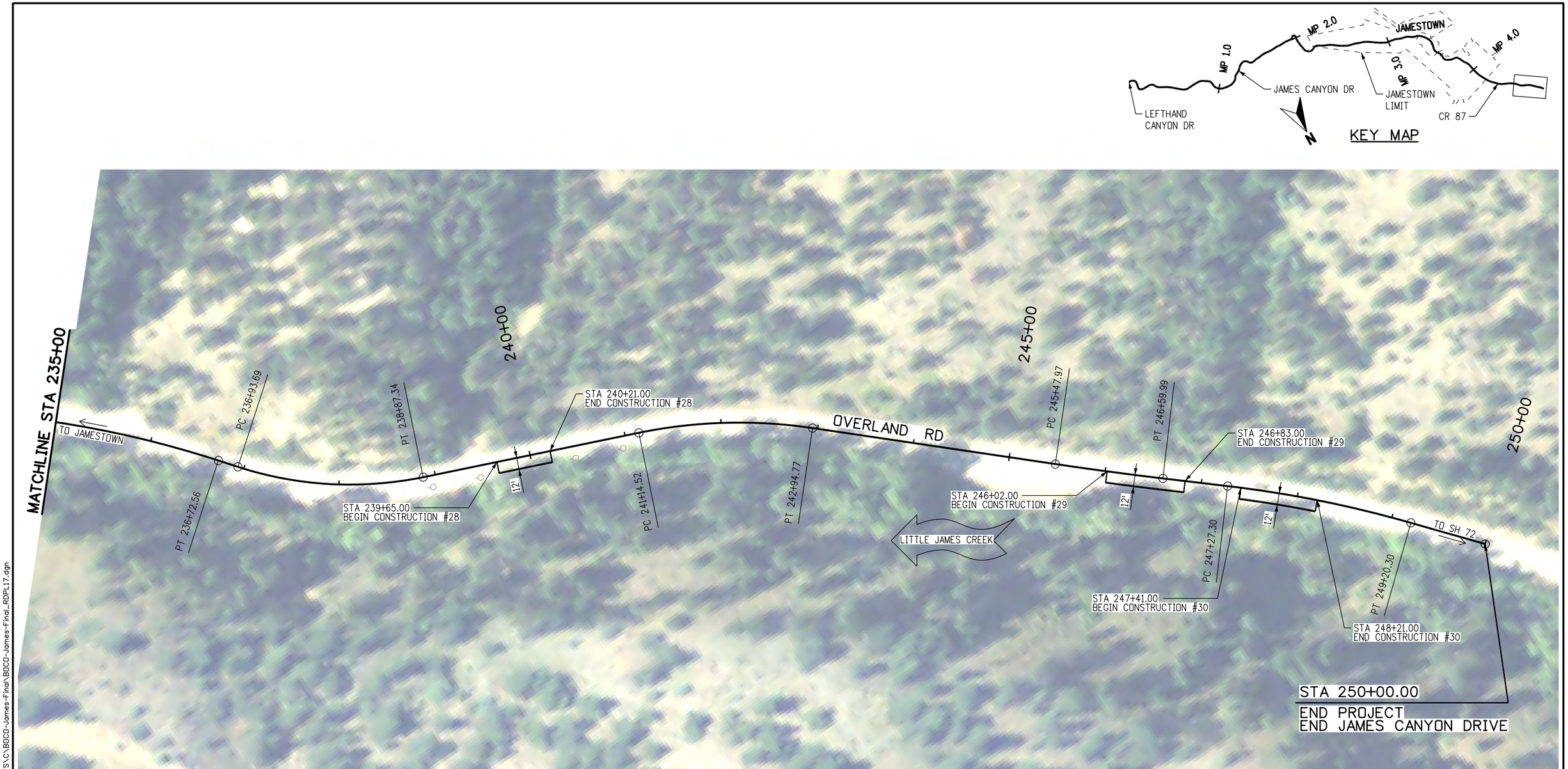
DESIGNED:	CAD:	CHECKED:	DATE:
JTS	JTS	MES	06/24/2015

JAMES CANYON
PLAN AND PROFILE

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 22

stahrj 6/22/2015 5:19:55 PM L:\0048\900-CAD\02-SHEETS\C\BOCO-James-Final\BOCO-James-Final_RDPL16.dgn



F.I.R. SUBMITTAL

0' 50' 100' 200'

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
JTS	JTS	MES	06/24/2015

JAMES CANYON
PLAN AND PROFILE

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 23

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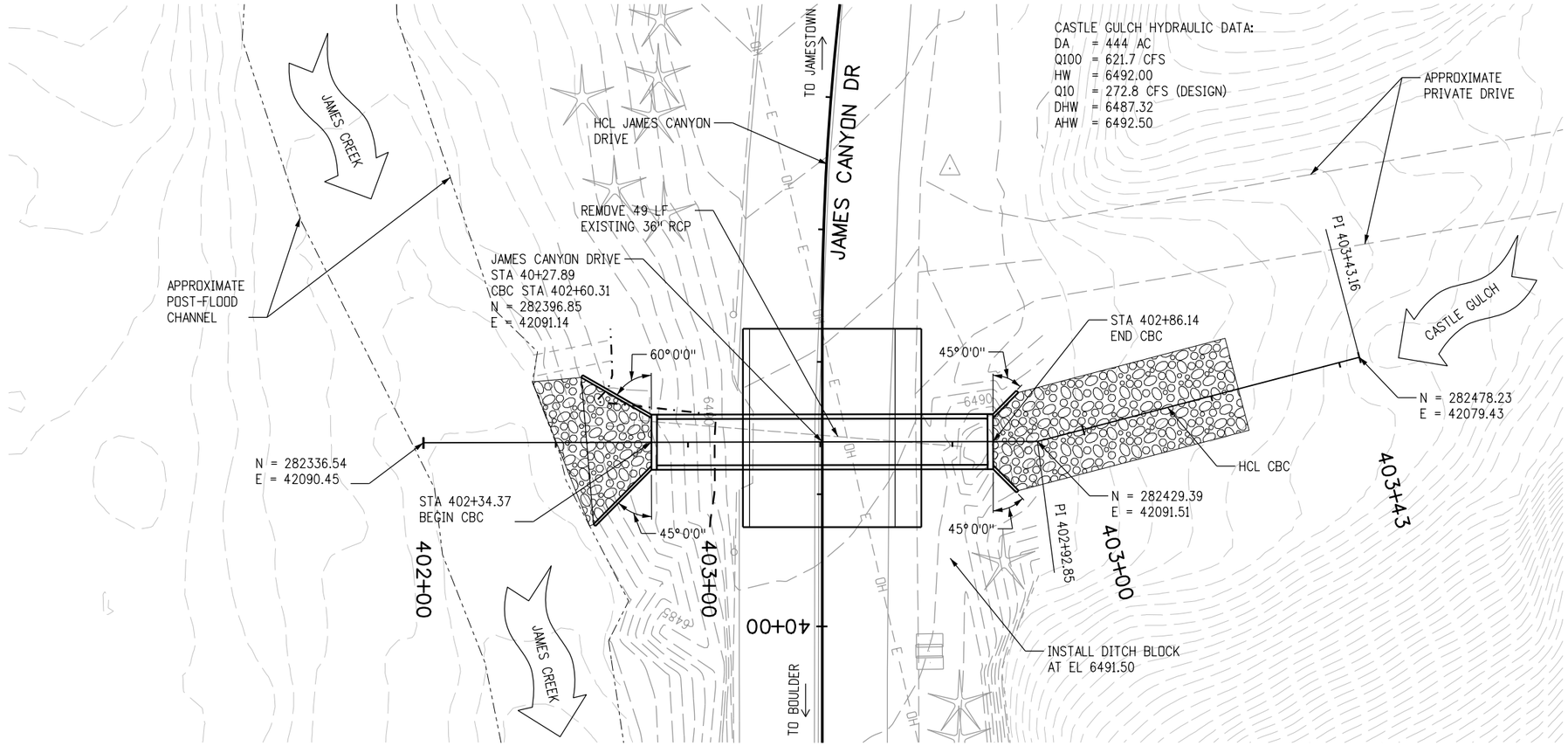
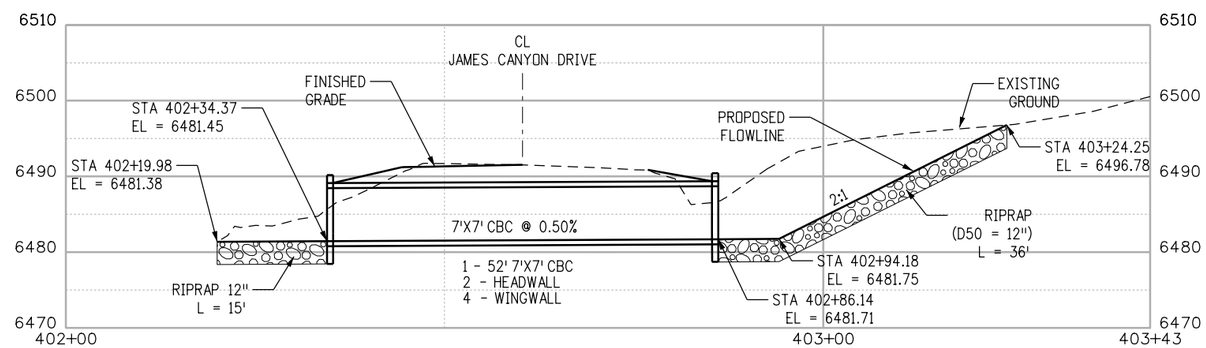




F.I.R. SUBMITTAL

0' 10' 20' 40'

N

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

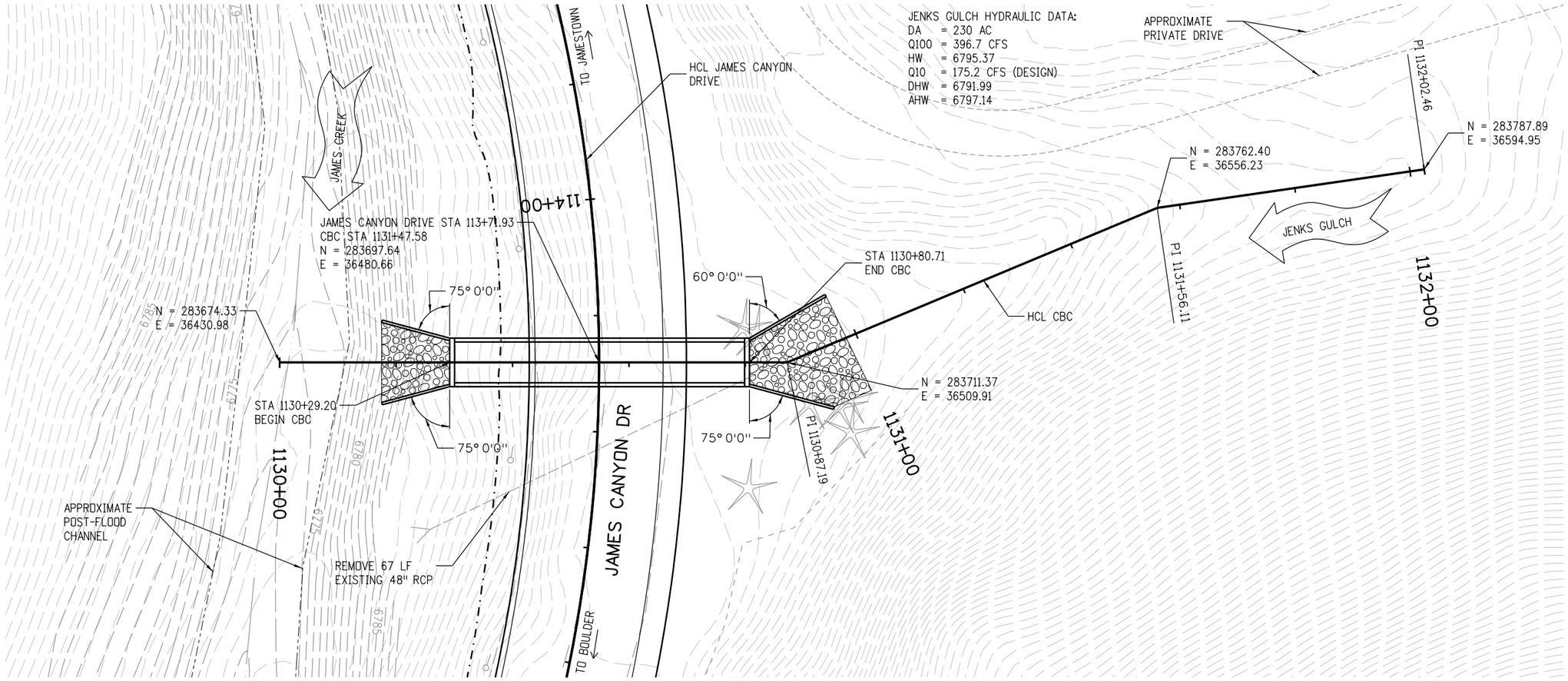
DESIGNED:	CAD:	CHECKED:	DATE:
CLK	CLK	SKL	06/24/2015

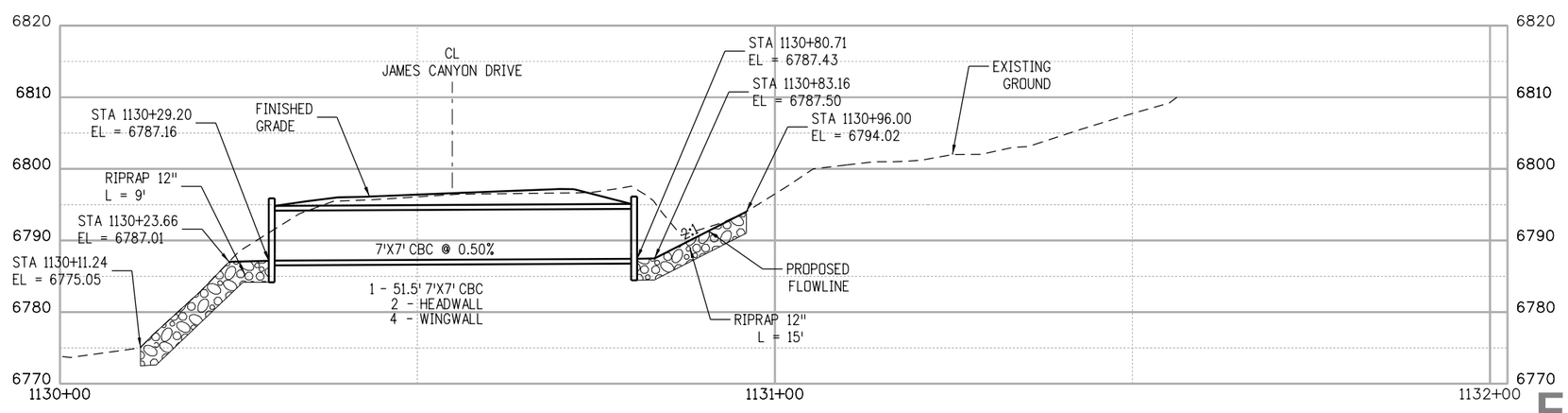
JAMES CANYON
CASTLE GULCH
CBC PLAN & PROFILE

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 24

cloudm1 6/22/2015 6:12:29 PM L:\0048\900-CAD\02-SHEETS\H\BOCD-James-Final\BOCD-James-Final_CBC-PnP01.dgn





F.I.R. SUBMITTAL

0' 10' 20' 40'

N

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

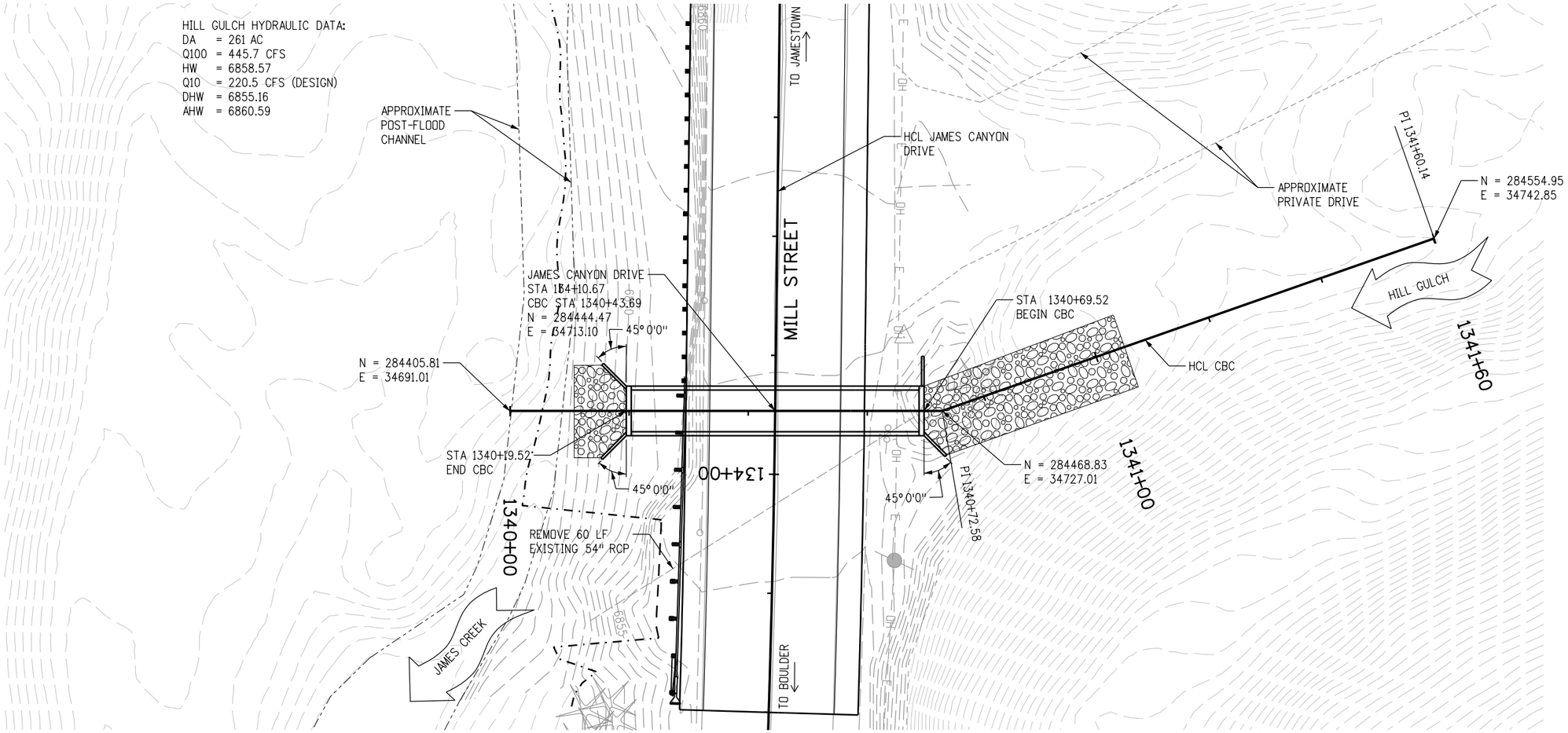
DESIGNED:	CAD:	CHECKED:	DATE:
CLK	CLK	SKL	06/24/2015

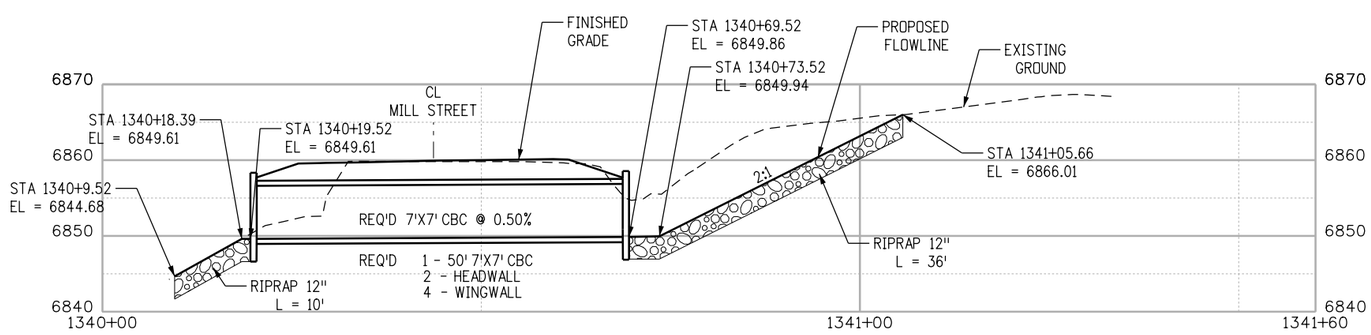
JAMES CANYON
JENKS GULCH
CBC PLAN & PROFILE

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 25

cloudml 6/22/2015 6:13:37 PM L:\0048\900-CAD\02-SHEETS\H\BDCO-James-Final\BDCO-James-Final_CBC-PnP02.dgn

HILL GULCH HYDRAULIC DATA:
DA = 261 AC
Q100 = 445.7 CFS
HW = 6858.57
Q10 = 220.5 CFS (DESIGN)
DHW = 6855.16
AHW = 6860.59





F.I.R. SUBMITTAL

0' 10' 20' 40'

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
CLK	CLK	SKL	06/22/2015

JAMES CANYON
HILL GULCH
CBC PLAN & PROFILE

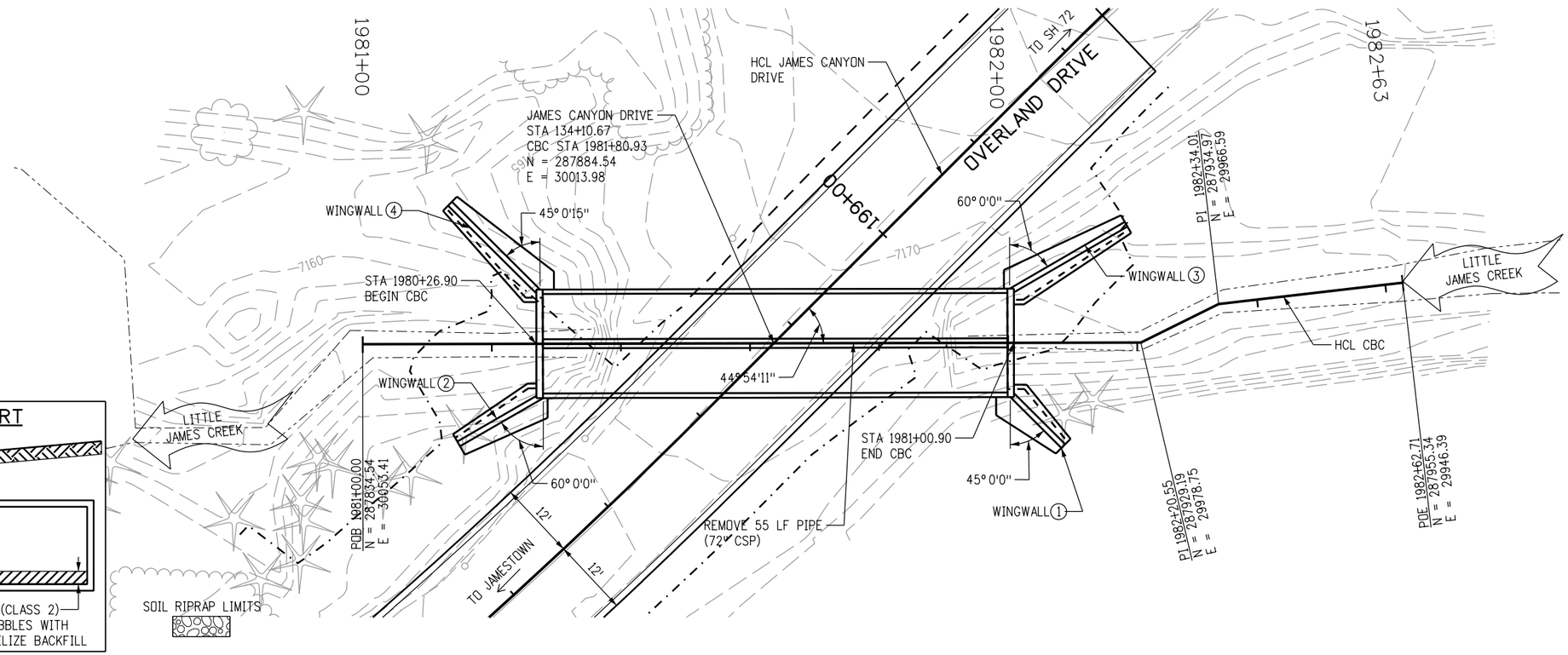
PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 26

cloudml 6/22/2015 6:13:50 PM L:\0048\900-CAD\02-SHEETS\H\BOCO-James-Final\BOCO-James-Final_CBC-PnP03.dgn

JAMES CREEK HYDRAULIC DATA:
DA = X.XX MI²
Q100 = XXXX CFS
HW = XXXX.X
Q10 = XXX CFS (DESIGN)
DHW = XXXX.X
AHW = XXXX.X

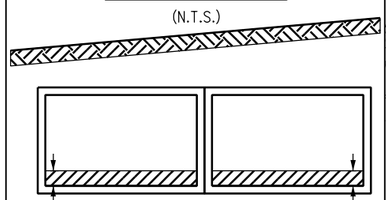
WINGWALL DIMENSIONS

①	L = XX.XX'		③	L = XX.XX'	
	M = XX.XX'			M = XX.XX'	
	K = XX.XX'			K = XX.XX'	
②	L = XX.XX'		④	L = XX.XX'	
	M = XX.XX'			M = XX.XX'	
	K = XX.XX'			K = XX.XX'	

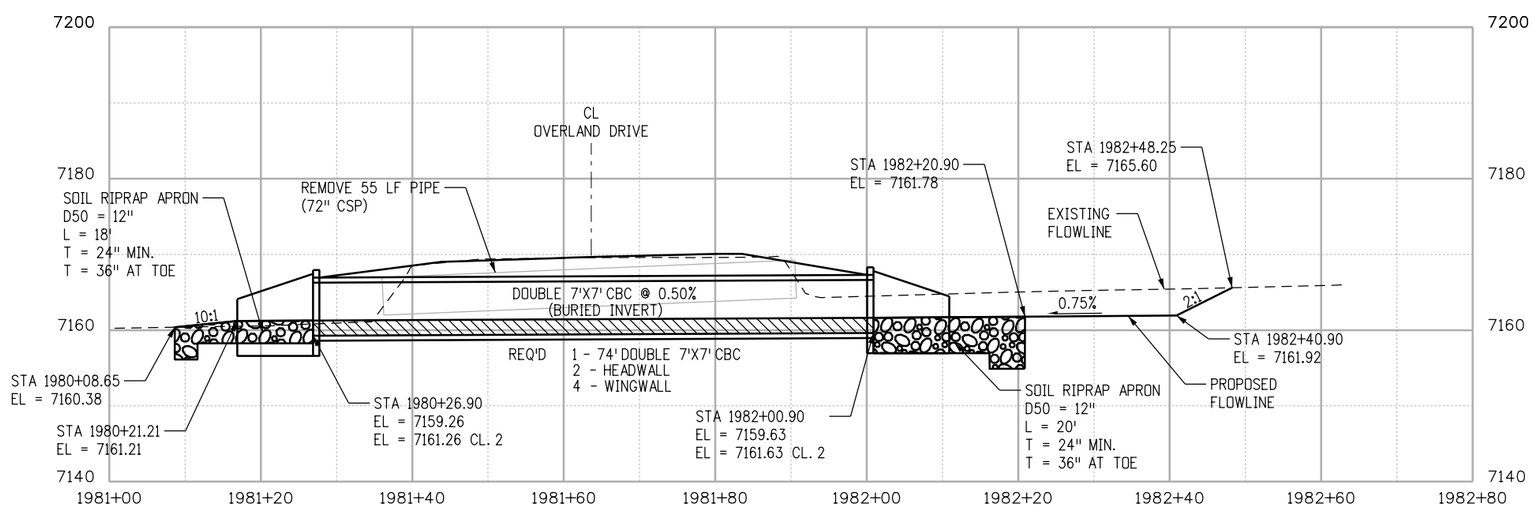


BURIED INVERT

(N.T.S.)



24" STRUCTURE BACKFILL (CLASS 2) TO INCLUDE ROCK AND COBBLES WITH RIPRAP AT ENDS TO STABILIZE BACKFILL



F.I.R. SUBMITTAL

0' 50' 100' 200'

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

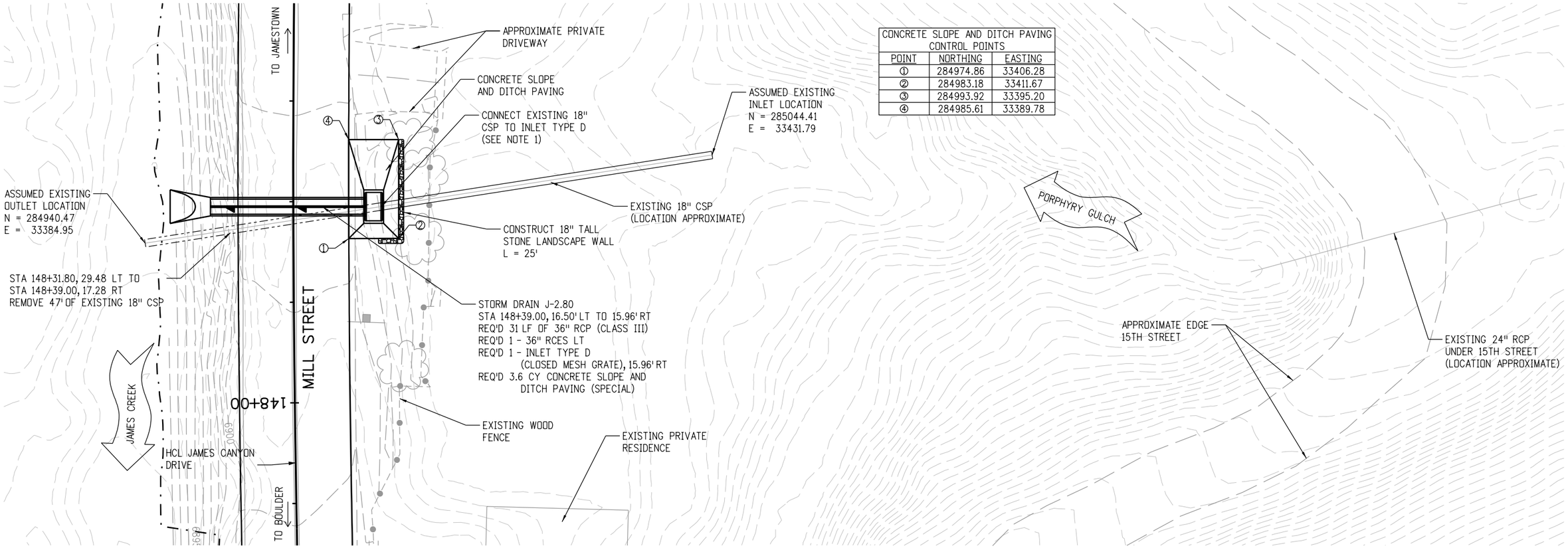
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

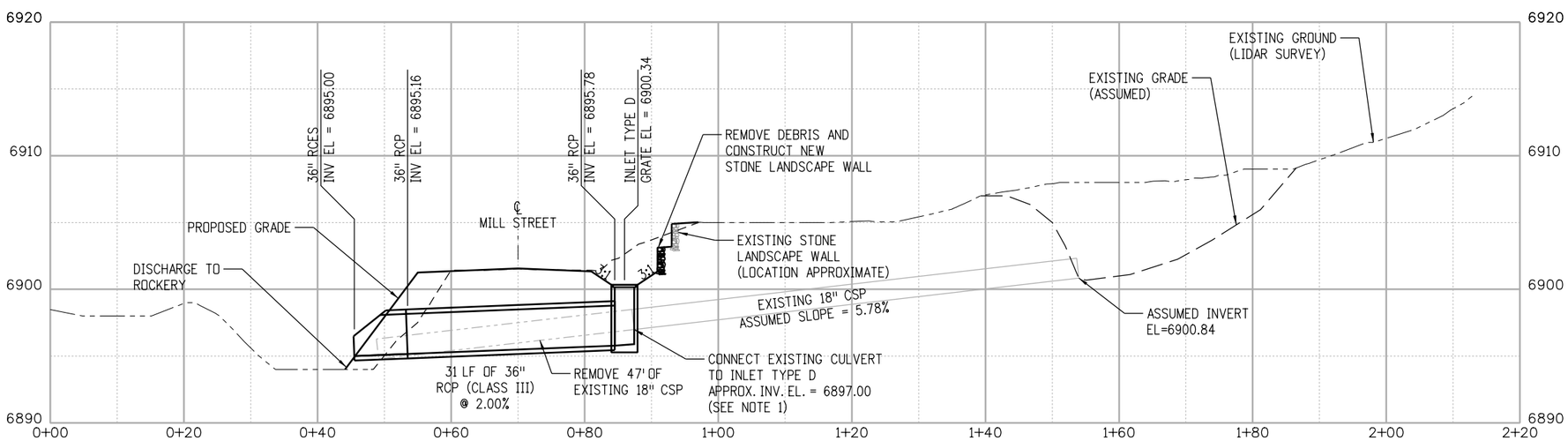
JAMES CANYON
CBC PLAN & PROFILE

PROJECT NO: SEPT12C24 SEPT12C91 SHEET NO: 27

cloudm1 6/22/2015 6:13:52 PM L:\0048\900-CAD\02-SHEETS\H\BOCO-James-Final\BOCO-James-Final_CBC-PnP04.dgn



CONCRETE SLOPE AND DITCH PAVING CONTROL POINTS		
POINT	NORTHING	EASTING
①	284974.86	33406.28
②	284983.18	33411.67
③	284993.92	33395.20
④	284985.61	33389.78



STORM DRAIN J-2.80

CROSSING STA 148+39.00

NOTES:

1. EXISTING CULVERT LOCATION IS ASSUMED BASED ON PRELIMINARY FIELD MEASUREMENTS. FIELD VERIFY LOCATION AND INVERT OF EXISTING CULVERT AND ADJUST LOCATION OF INLET TYPE D AND PROPOSED CULVERT AS REQUIRED FOR CONNECTION. MAINTAIN GRATE ELEVATION AND CULVERT SLOPE AS SHOWN.

F.I.R. SUBMITTAL

0' 10' 20' 40'

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
STORM DRAIN J-2.80
PLAN & PROFILE

PROJECT NO: SEPT12C24 SEPT12C91 SHEET NO: 28

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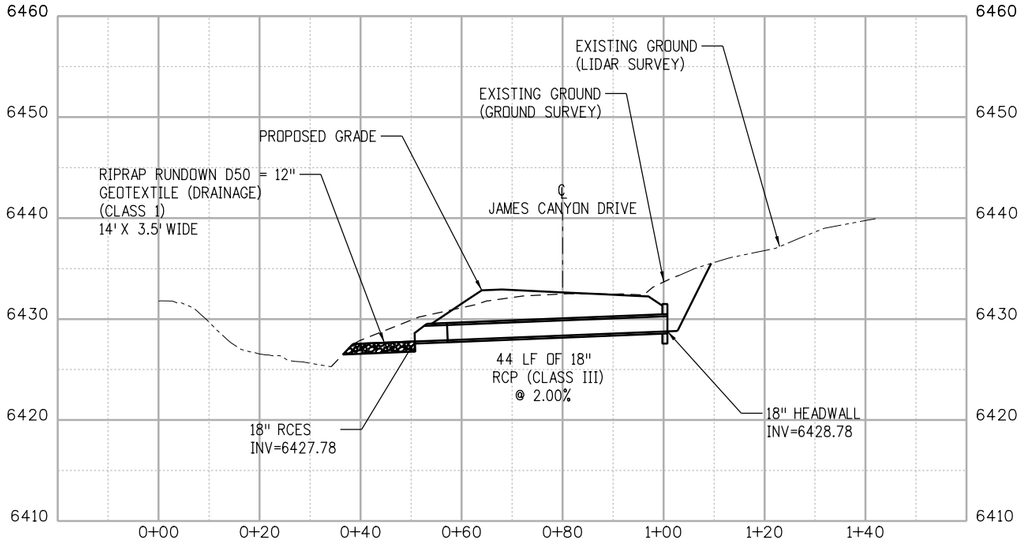
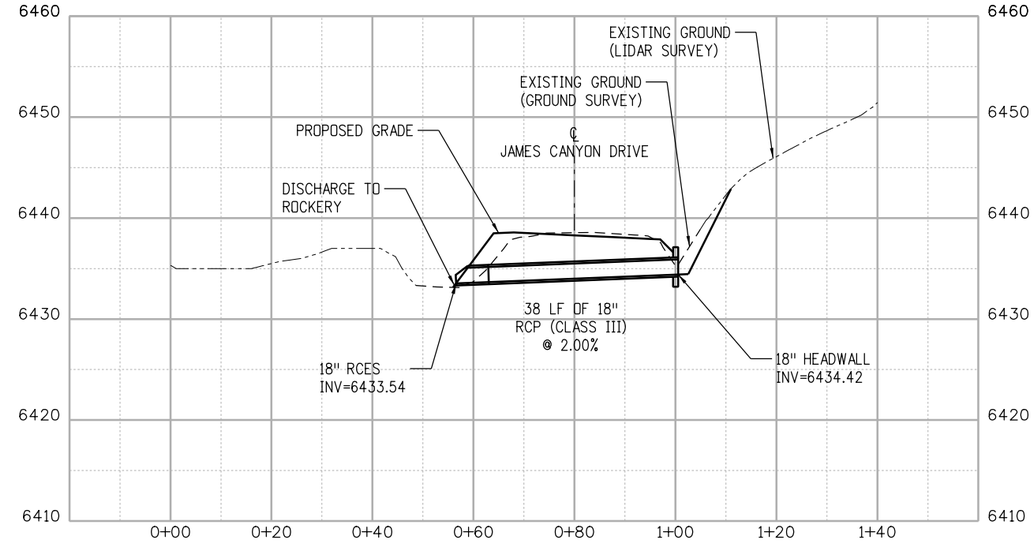


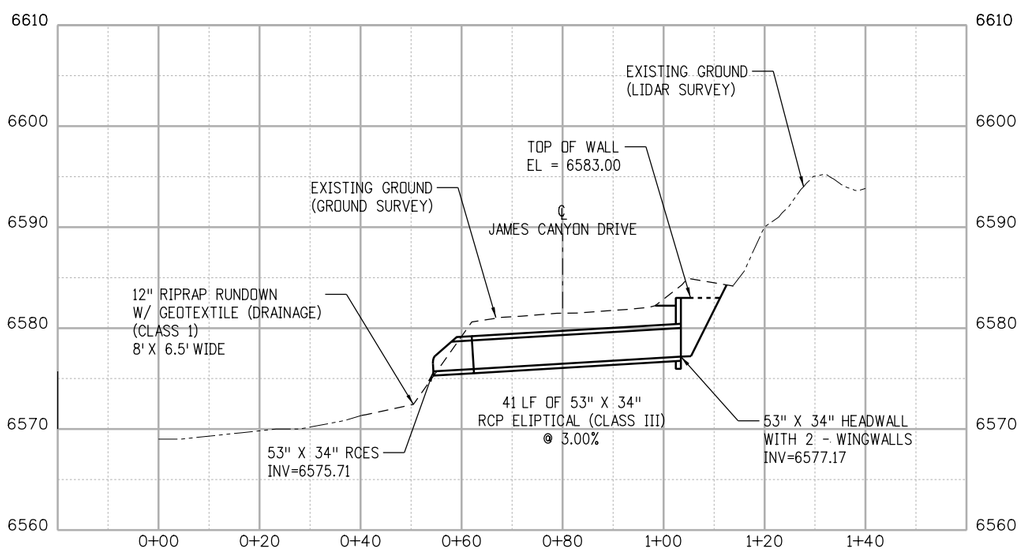
CULVERT J-0.44

CROSSING STA 23+45.00



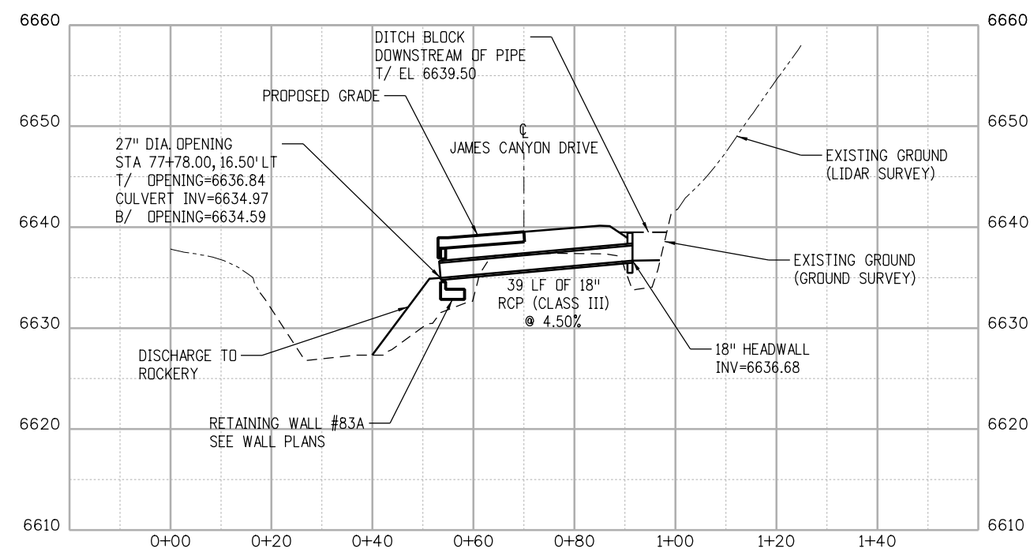
CULVERT J-0.47

CROSSING STA 25+05.00



CULVERT J-1.13

CROSSING STA 60+00.00



CULVERT J-1.46

CROSSING STA 77+78.00

F.I.R. SUBMITTAL

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
CROSS CULVERT PROFILES

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 29

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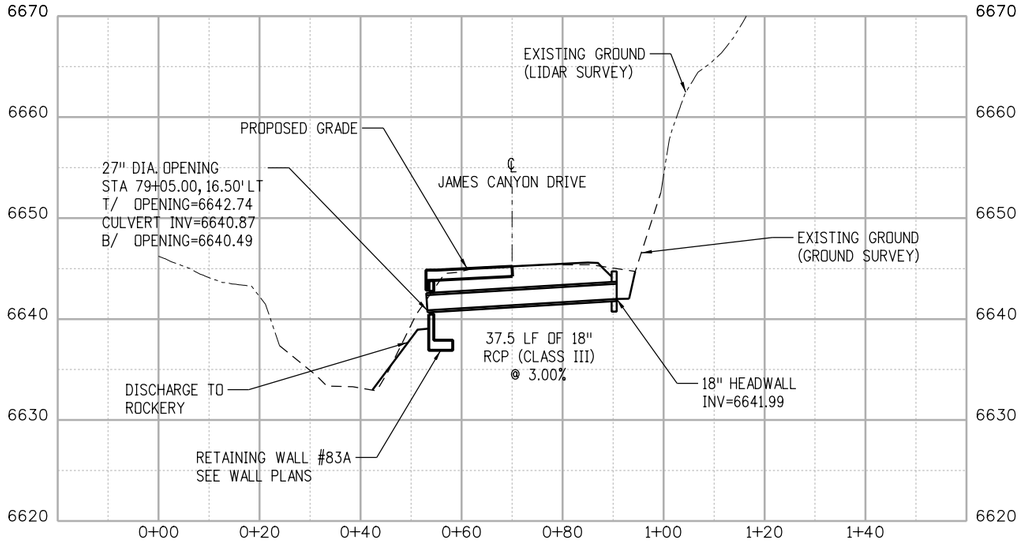

CULVERT J-1.47

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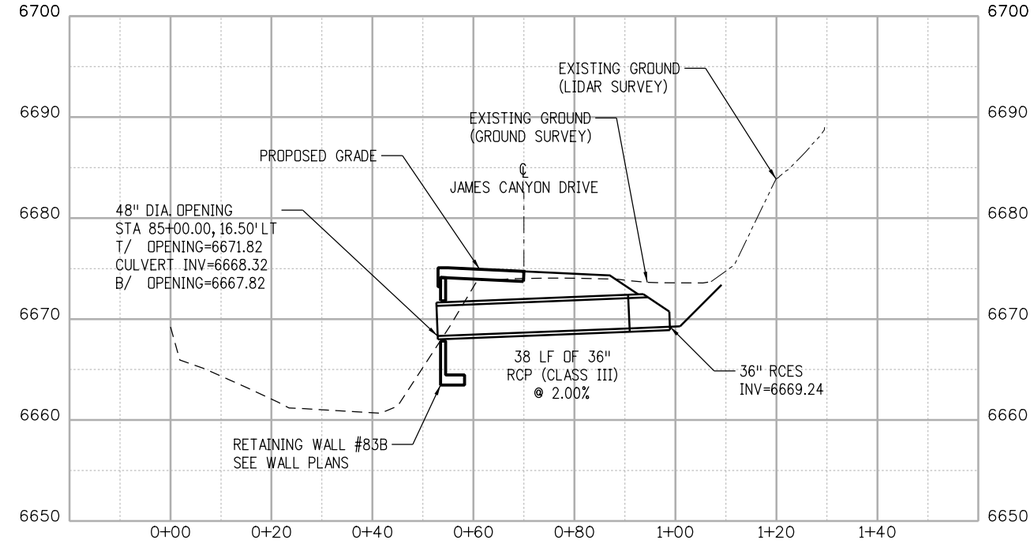

CULVERT J-1.63

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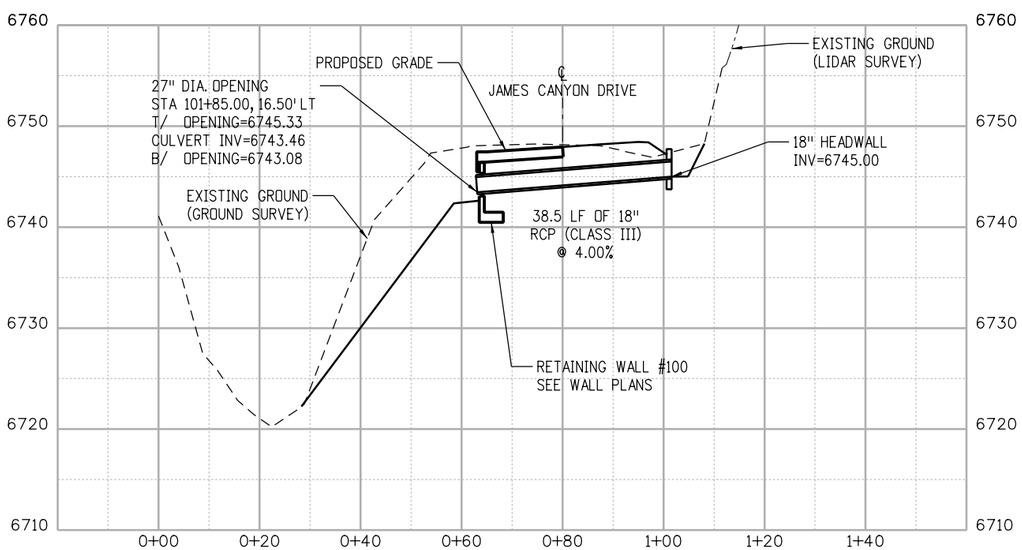
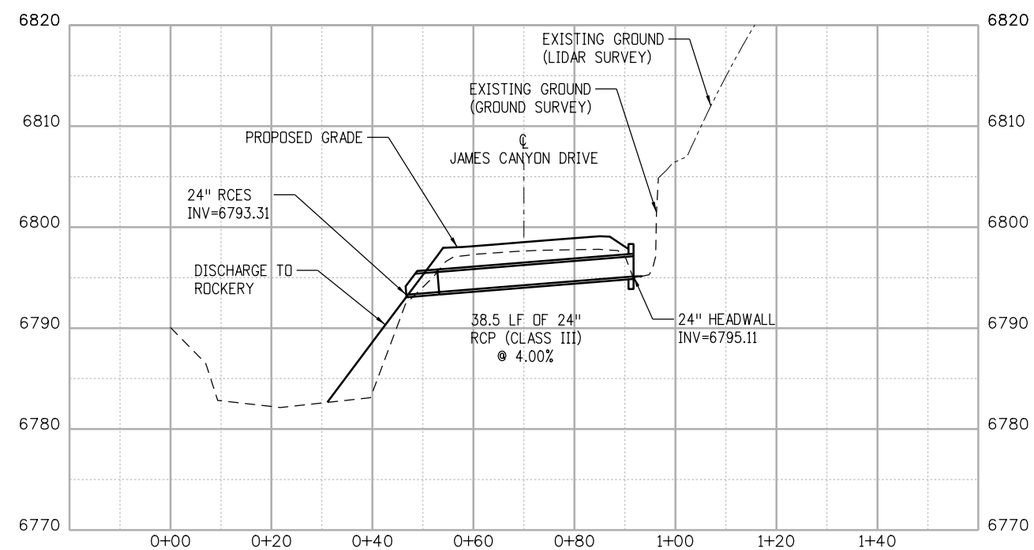


CULVERT J-1.89

CROSSING STA 101+85.00



CULVERT J-2.20

CROSSING STA 116+23.00

F.I.R. SUBMITTAL

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
CROSS CULVERT PROFILES

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 30

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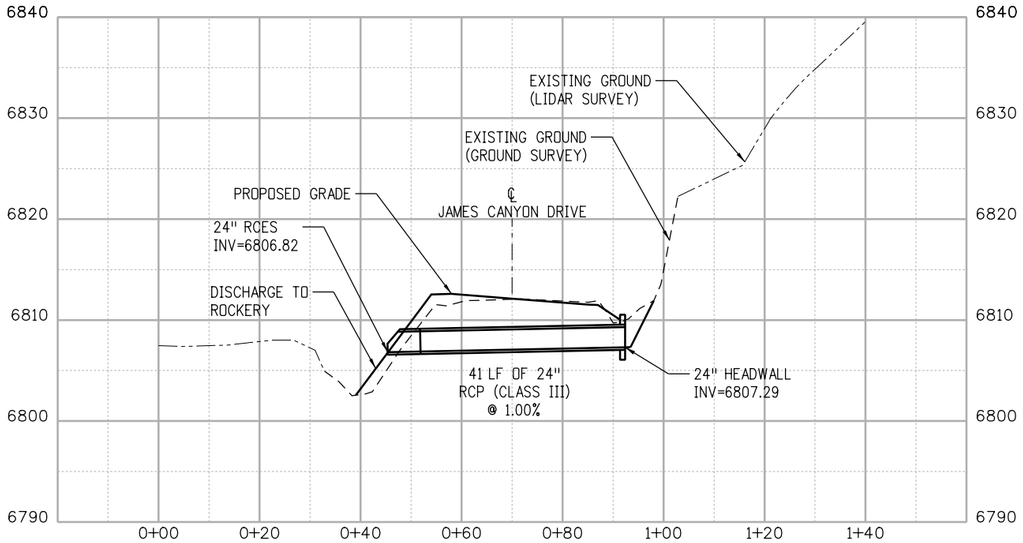
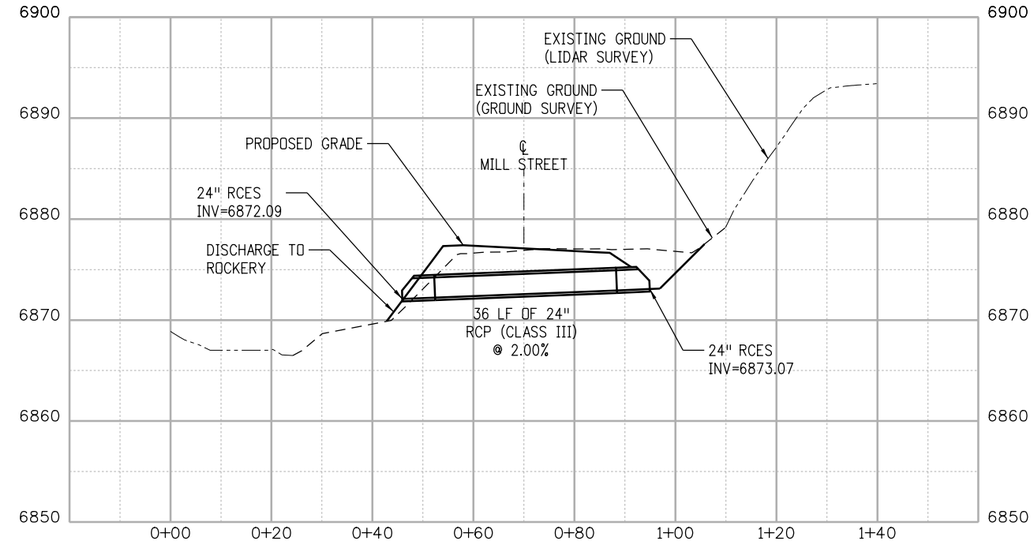


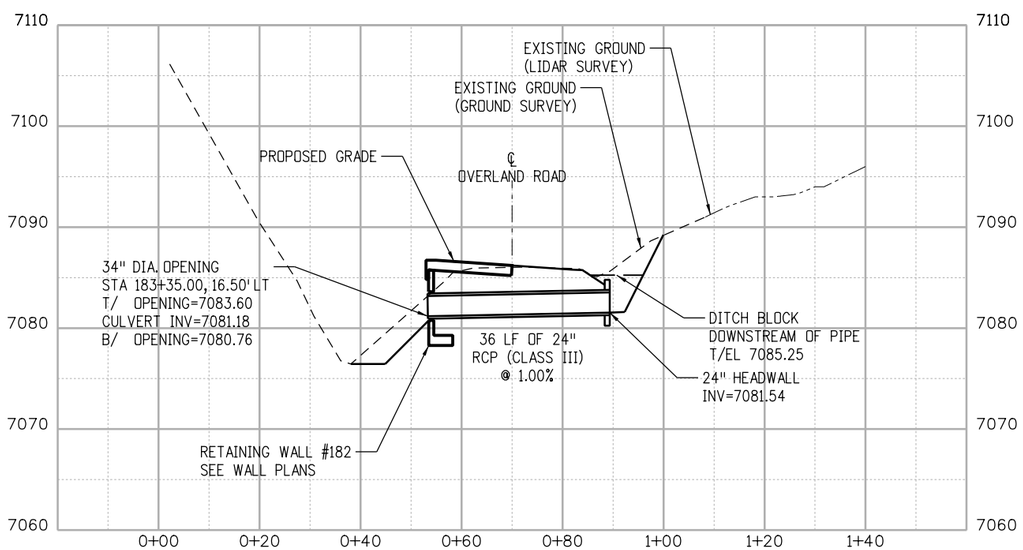
CULVERT J-2.29

CROSSING STA 121+26.00



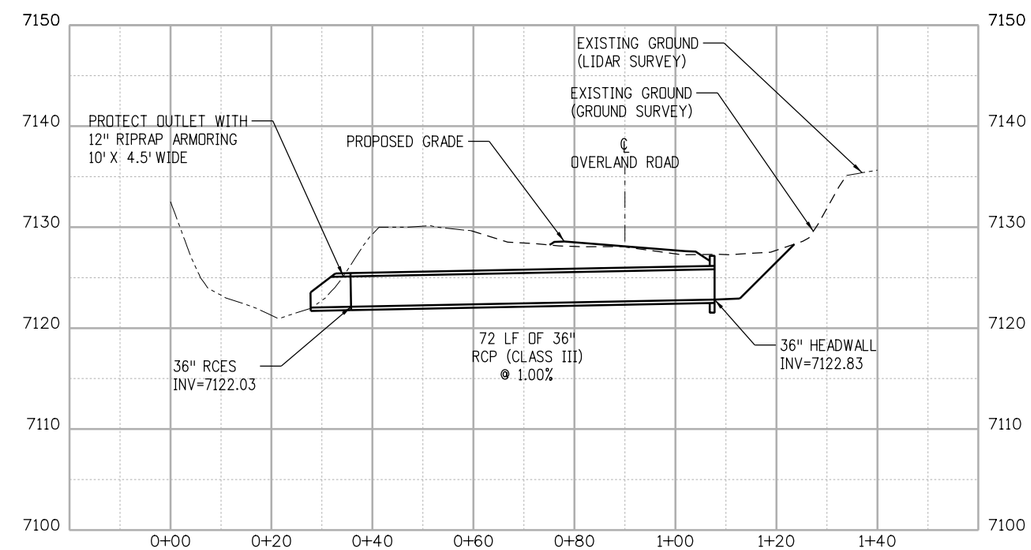
CULVERT J-2.68

CROSSING STA 140+68.00



CULVERT J-3.48

CROSSING STA 183+35.00



CULVERT J-3.62

CROSSING STA 190+88.00

F.I.R. SUBMITTAL

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
CROSS CULVERT PROFILES

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 31

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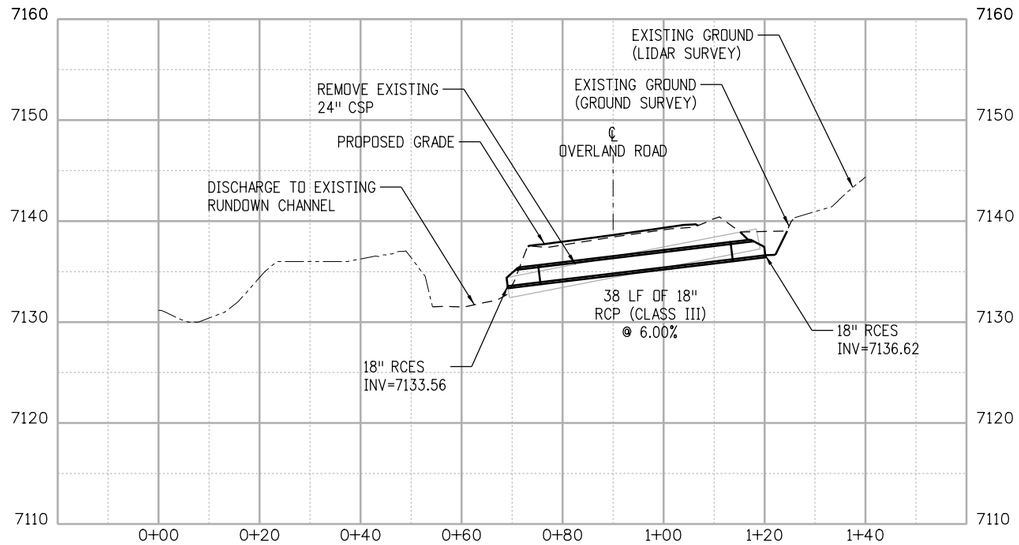
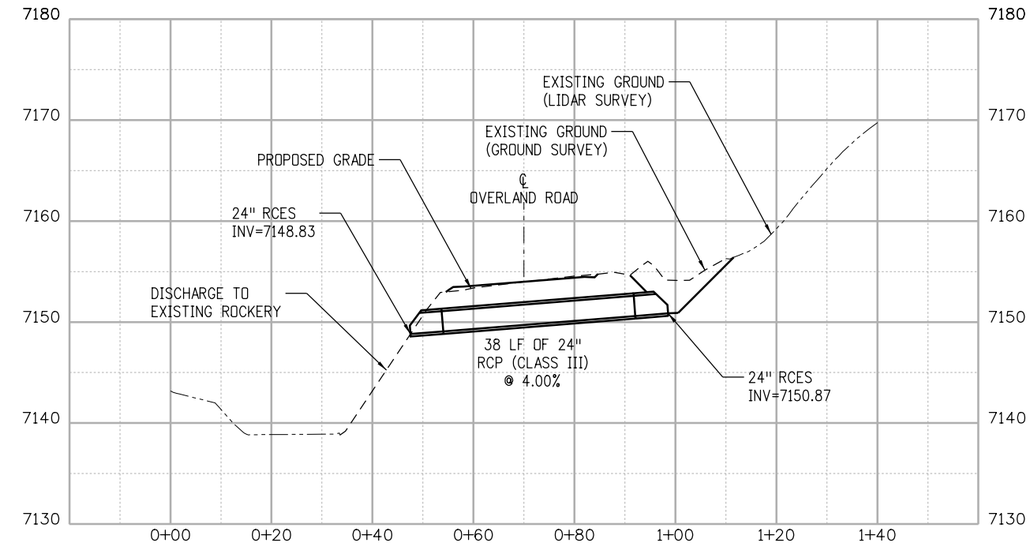


CULVERT J-3.64

CROSSING STA 192+46.00



CULVERT J-3.68

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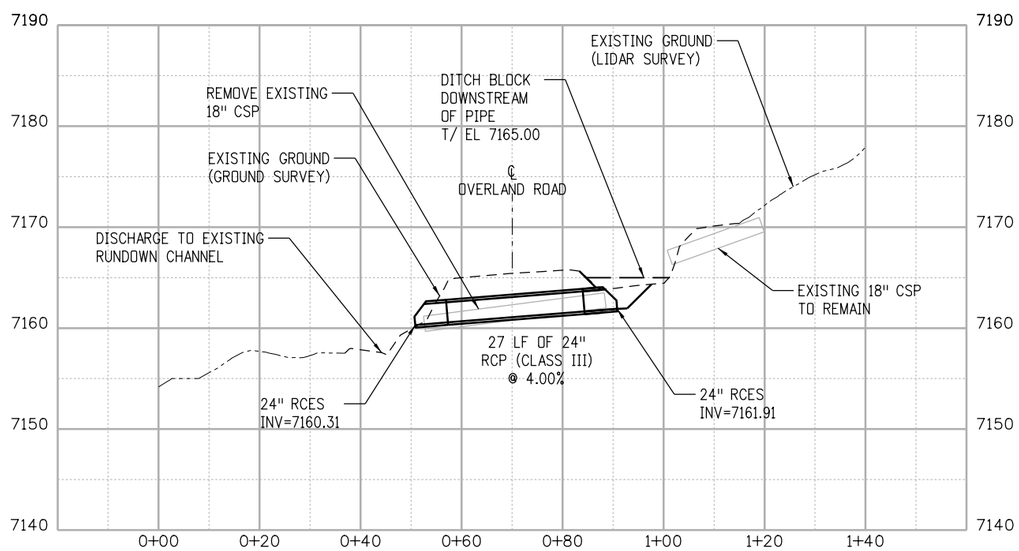
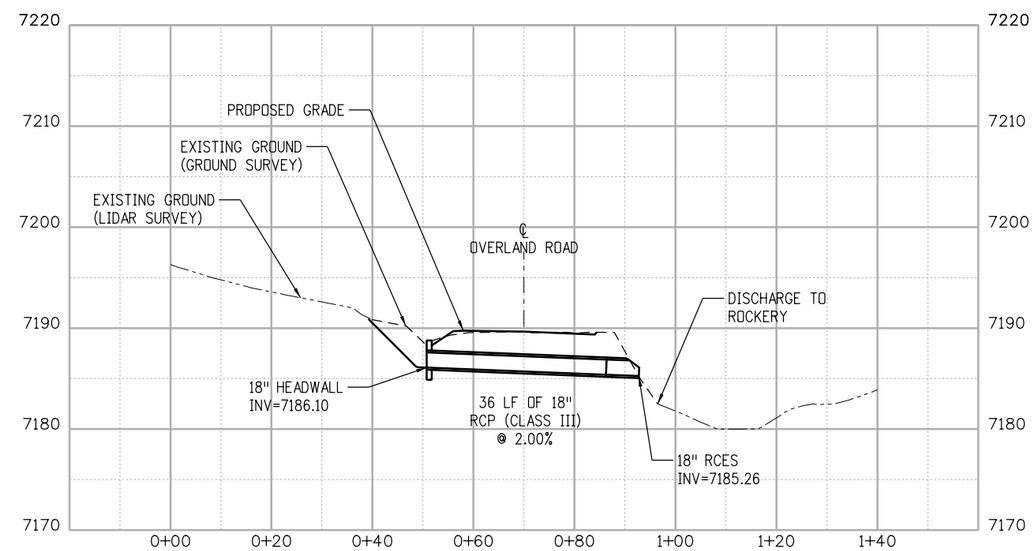


CULVERT J-3.74

CROSSING STA 197+24.00



CULVERT J-3.81

CROSSING STA 202+85.00

F.I.R. SUBMITTAL

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
CROSS CULVERT PROFILES

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 32

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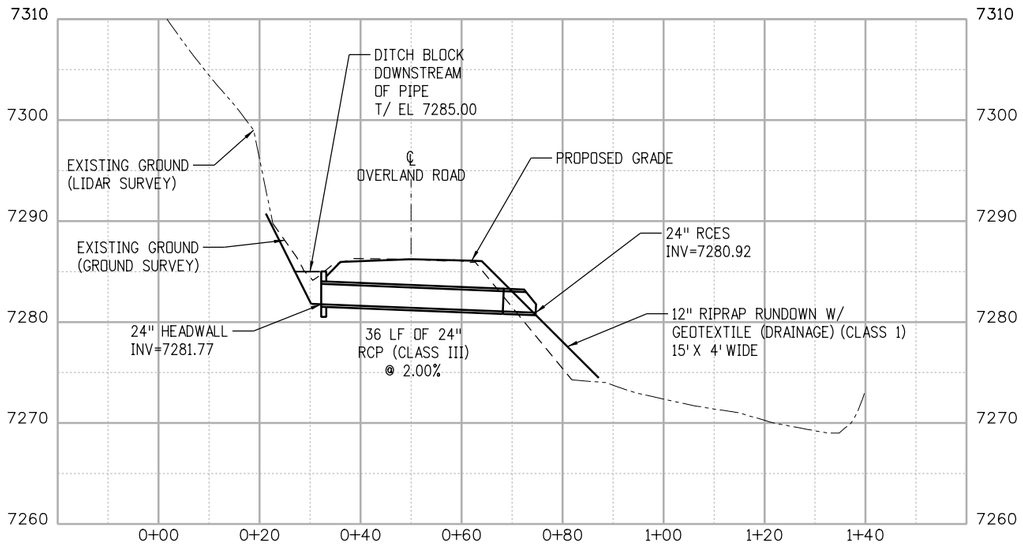

CULVERT J-4.16

CROSSING STA 219+00.00

F.I.R. SUBMITTAL

F.I.R.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	SKL	06/24/2015

JAMES CANYON
CROSS CULVERT PROFILES

PROJECT NO: SEPT12C24 SEPT12C91

SHEET NO: 33

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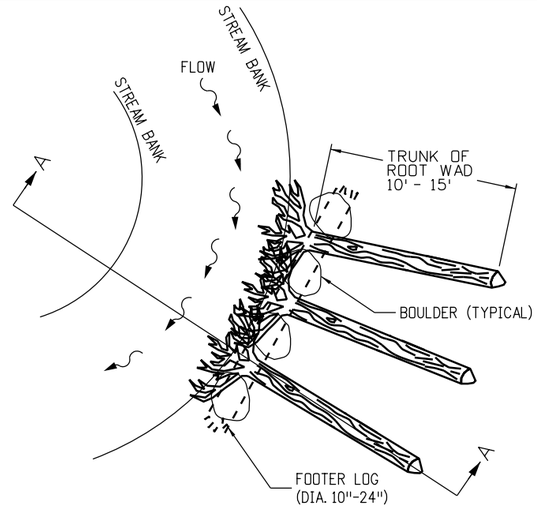
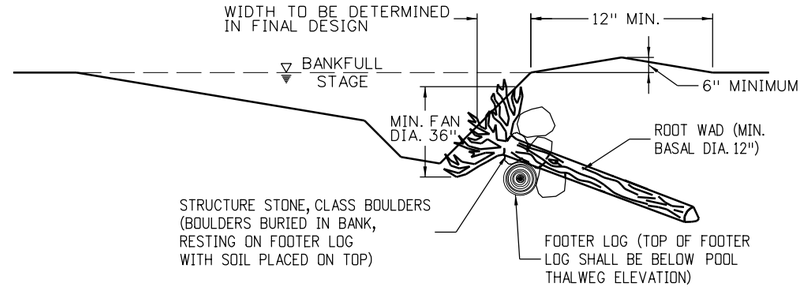
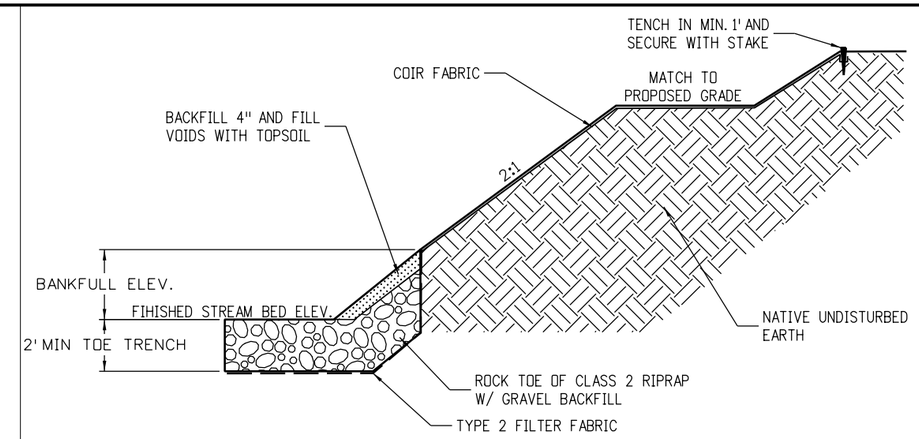


PLAN VIEW



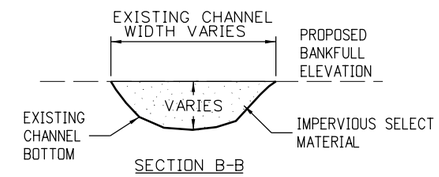
CROSS-SECTION A-A

ROOT WAD
SCALE: NTS

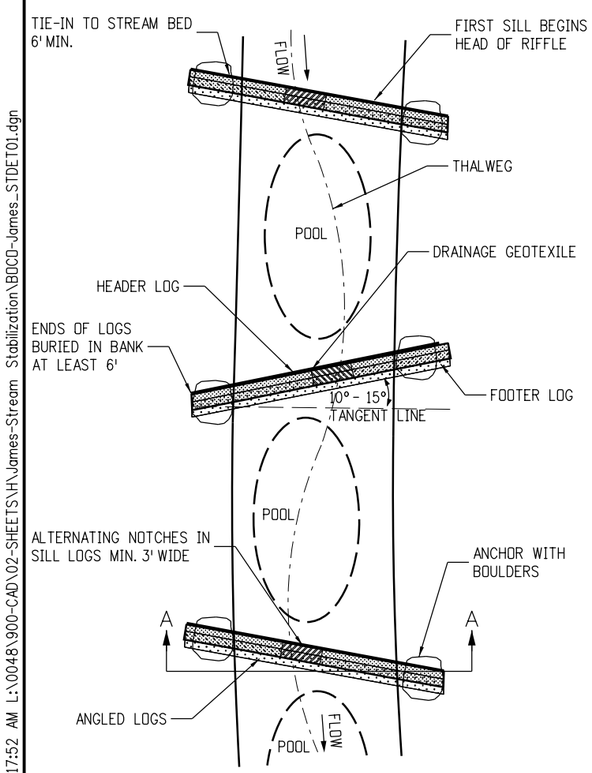


ROCK TOE
SCALE: NTS

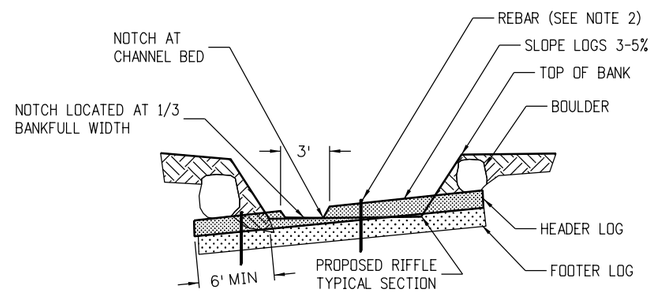
NOTES:
1. 90% COMPACTION RATE IS REQUIRED ON CHANNEL PLUG OR AS APPROVED BY THE ENGINEER.
2. SIDE SLOPE THAT IS ADJACENT TO PROPOSED STREAM NEEDS TO MATCH PROPOSED CROSS SECTION IN THAT REGION.
3. THIS STRUCTURE SHALL BE PLACED AS DIRECTED BY THE ENGINEER.



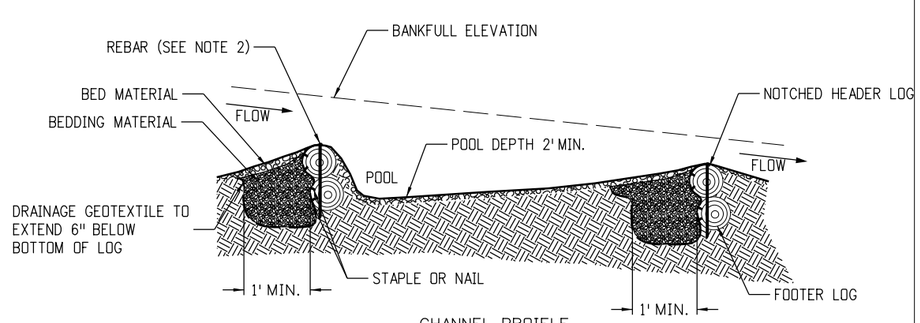
SECTION B-B



PLAN VIEW



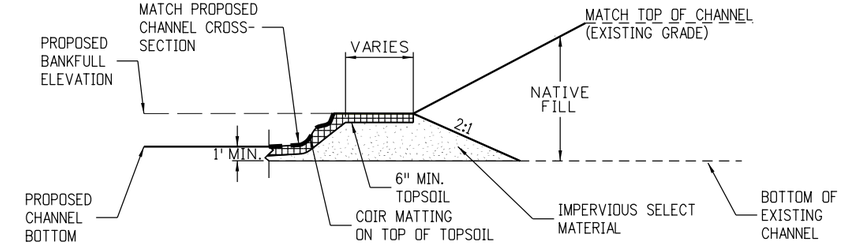
LOG SECTION A-A LOOKING UPSTREAM



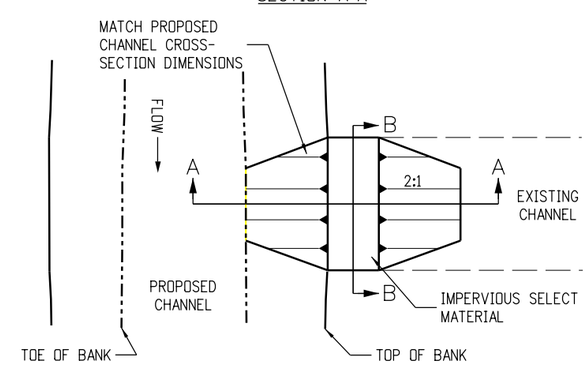
CHANNEL PROIFLE

NOTES:
1. ALTERNATE SILL DIRECTION AND SLOPE IN ACCORDANCE WITH PLANS.
2. DRILL 1-1/8" DIAMETER HOLE IN LOGS AND DRIVE #8 REBAR THROUGH. BEND AT TOP.
3. NOTCH LOCATED AT 1/3 BANKFULL, ALTERNATING IN RIFFLE, OR LOCATED AT MIDDLE FOR THE HEAD OF POOL.
4. LOG SHALL BE EMBEDDED IN BANK A MINIMUM OF 6'.

ANGLED LOG STEP POOL
SCALE: NTS



SECTION A-A



PLAN VIEW OF EXISTING CHANNEL WITH CHANNEL PLUG

CHANNEL PLUG
SCALE: NTS

F.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS: NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

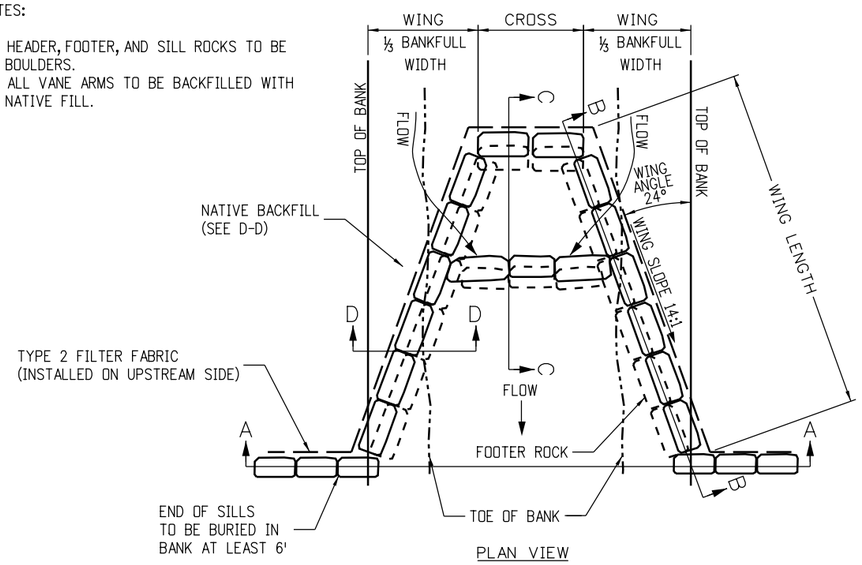
JAMES CANYON STREAM DETAILS (1 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 34

SalekM 6/23/2015 8:17:52 AM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_STDET01.dgn

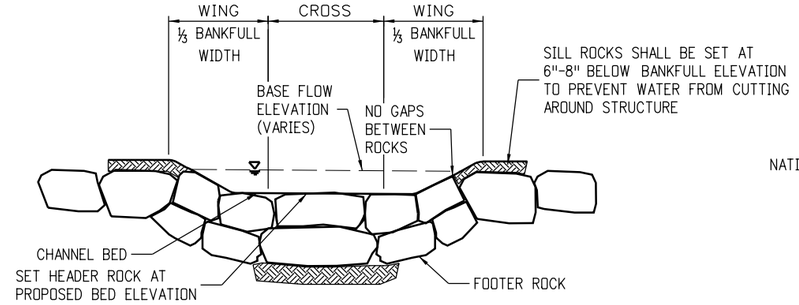
NOTES:

1. HEADER, FOOTER, AND SILL ROCKS TO BE BOULDERS.
2. ALL VANE ARMS TO BE BACKFILLED WITH NATIVE FILL.

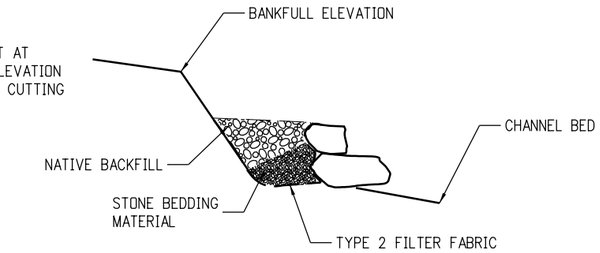


PLAN VIEW

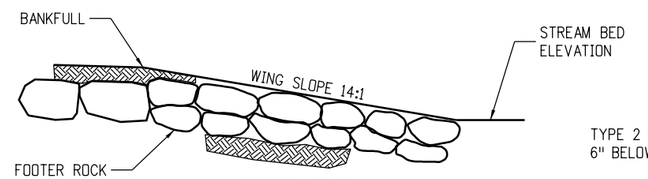
FOOTER AND HEADER BOULDER DIMENSIONS		
MINIMUM	MIDRANGE	MAXIMUM
24"	30"	36"



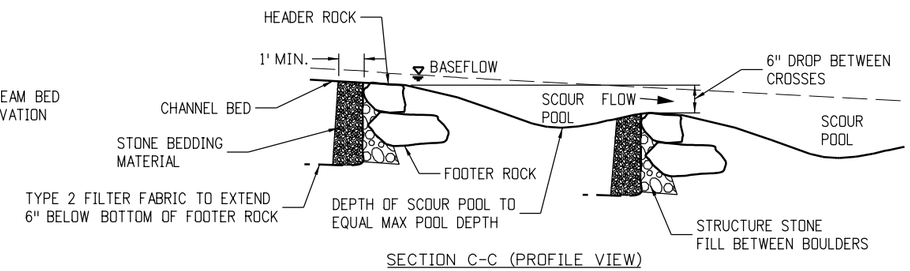
SECTION A-A (UPSTREAM VIEW)



SECTION D-D



SECTION B-B



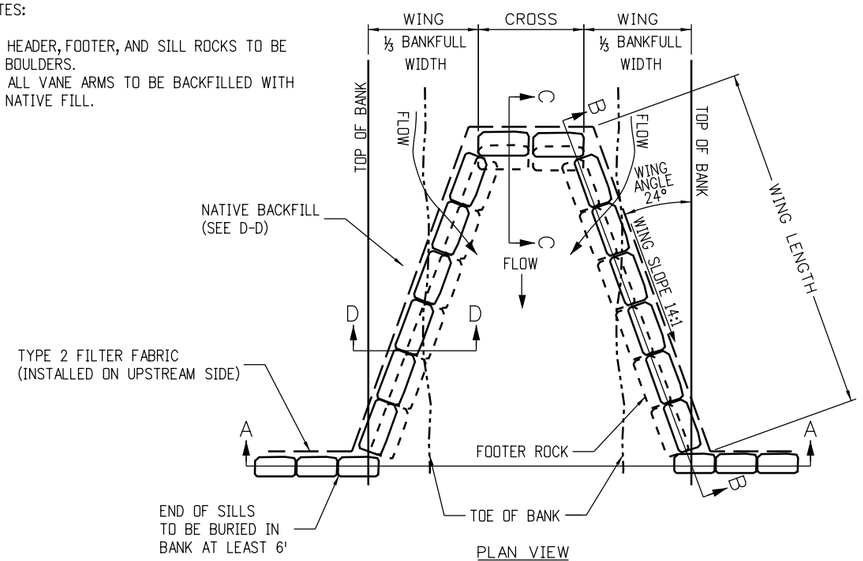
SECTION C-C (PROFILE VIEW)

DOUBLE DROP ROCK CROSS-VANE

SCALE: NTS

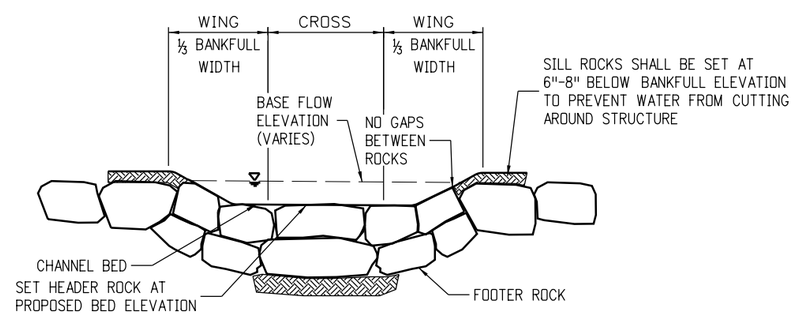
NOTES:

1. HEADER, FOOTER, AND SILL ROCKS TO BE BOULDERS.
2. ALL VANE ARMS TO BE BACKFILLED WITH NATIVE FILL.

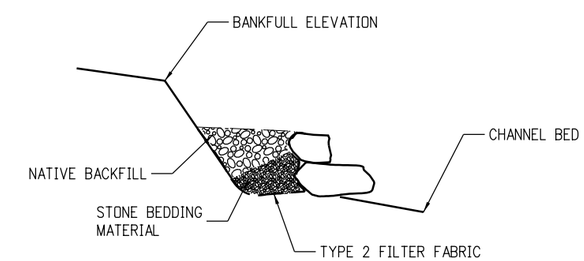


PLAN VIEW

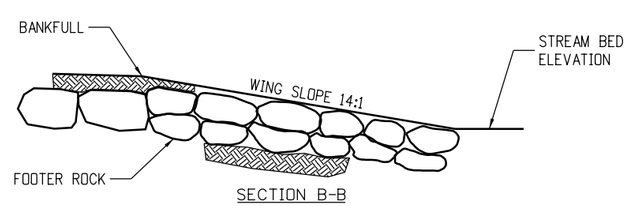
FOOTER AND HEADER BOULDER DIMENSIONS		
MINIMUM	MIDRANGE	MAXIMUM
24"	30"	36"



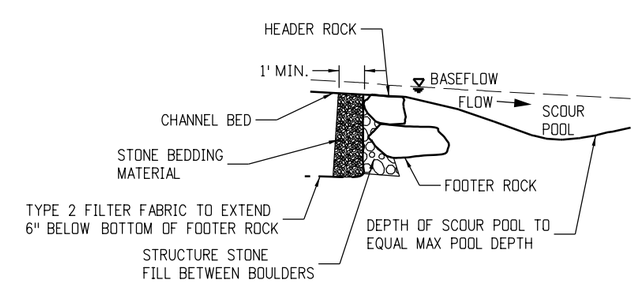
SECTION A-A (UPSTREAM VIEW)



SECTION D-D



SECTION B-B



SECTION C-C (PROFILE VIEW)

ROCK CROSS-VANE

SCALE: NTS

F.I.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS: NO.	DATE	REVISION DESCRIPTION:

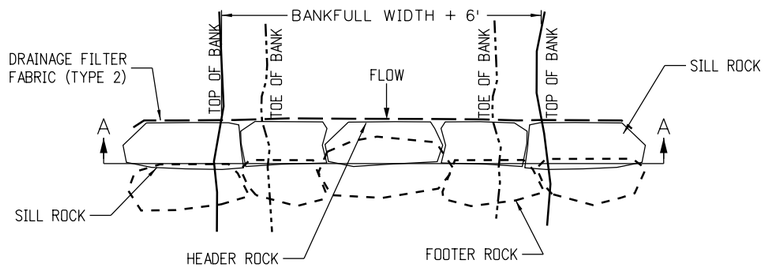
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

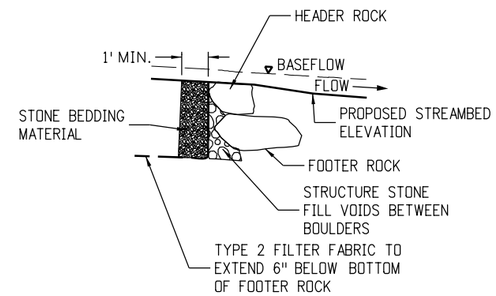
JAMES CANYON STREAM DETAILS (2 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 35

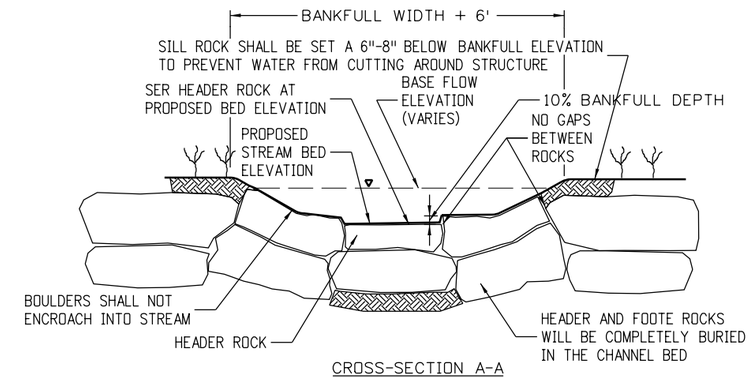
SaleKM 6/23/2015 8:17:53 AM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STDET02.dgn



PLAN VIEW



PROFILE VIEW



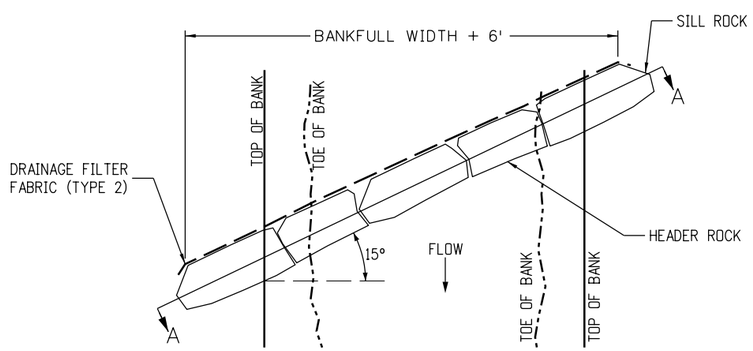
CROSS-SECTION A-A

NOTES:

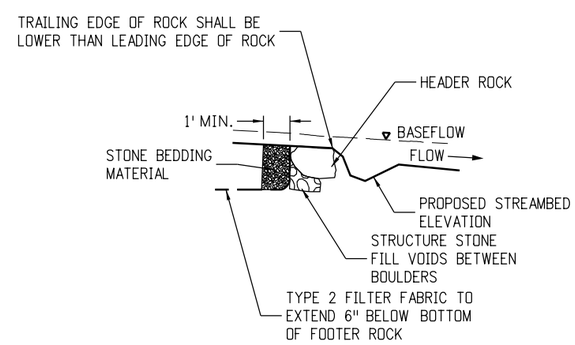
1. HEADER, FOOTER, AND SILL ROCKS TO BE STRUCTURE STONE, CLASS BOULDER.
2. HEADER ROCK IS PLACED LOWER THAN TOE ROCKS.

ROCK SILL

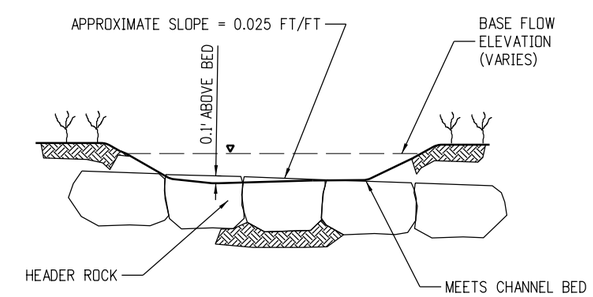
SCALE: NTS



PLAN VIEW



PROFILE VIEW



CROSS-SECTION A-A

NOTES:

3. ALTERNATE SILL DIRECTION IN ACCORDANCE WITH PLANS. HEADER, AND SILL ROCKS TO BE STRUCTURE STONE, CLASS BOULDER, 30"-36".
4. AT THE DISCRETION OF THE DESIGNER, SURGE STONE MAY BE USED IN LIEU OF #57 STONE AND CLASS 'A' USED TO FILL VOIDS.

ANGLED ROCK SILL (PLACED AT 15° ANGLE)

SCALE: NTS

F.I.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
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BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

JAMES CANYON STREAM DETAILS (3 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 36

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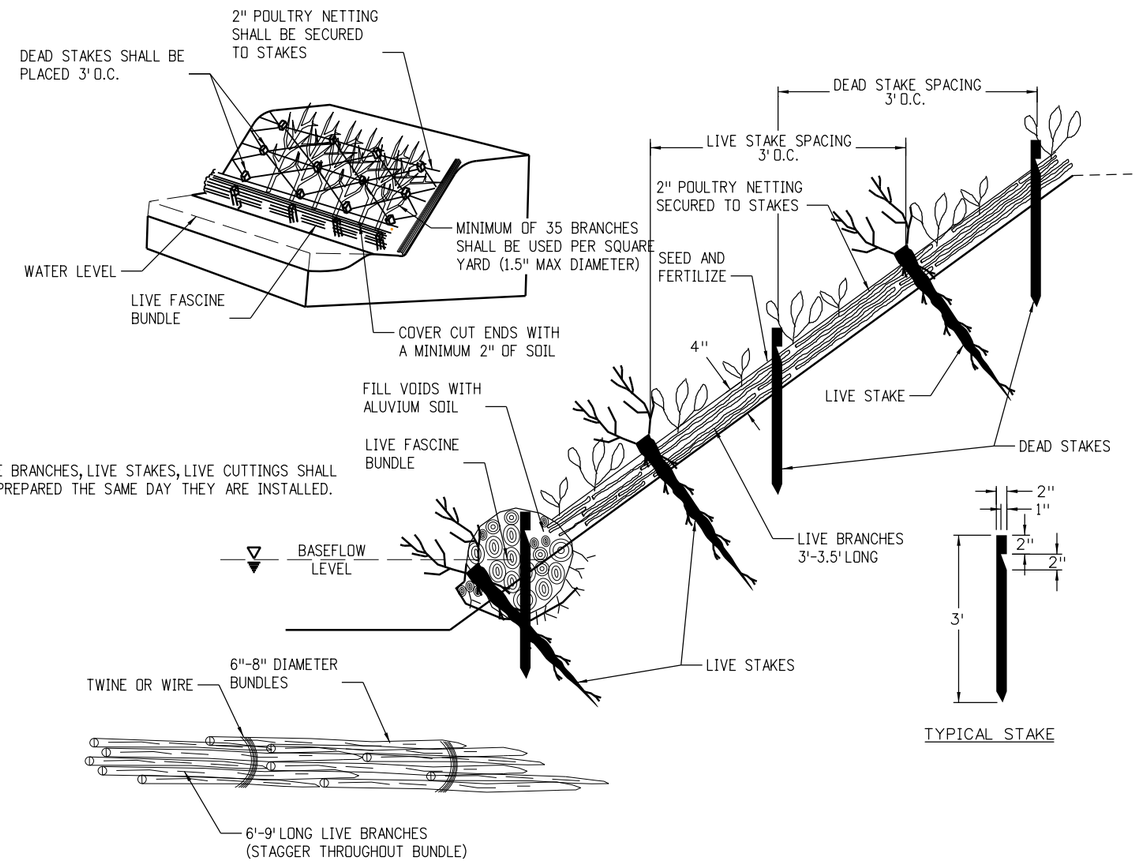
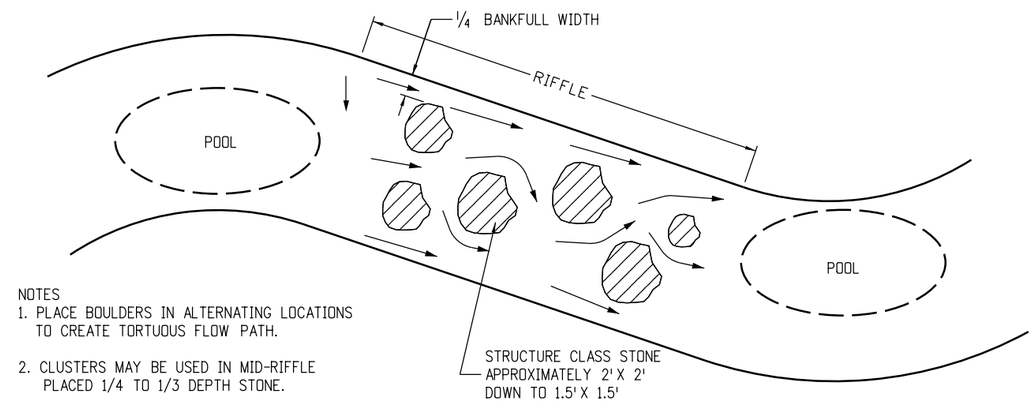


NOTE:

1. LIVE BRANCHES, LIVE STAKES, LIVE CUTTINGS SHALL BE PREPARED THE SAME DAY THEY ARE INSTALLED.

BRUSH MATTRESS
SCALE: NTS



NOTES
1. PLACE BOULDERS IN ALTERNATING LOCATIONS TO CREATE TORTUOUS FLOW PATH.

2. CLUSTERS MAY BE USED IN MID-RIFFLE PLACED 1/4 TO 1/3 DEPTH STONE.

TURBULENT RIFFLE
SCALE: NTS

F.I.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
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BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

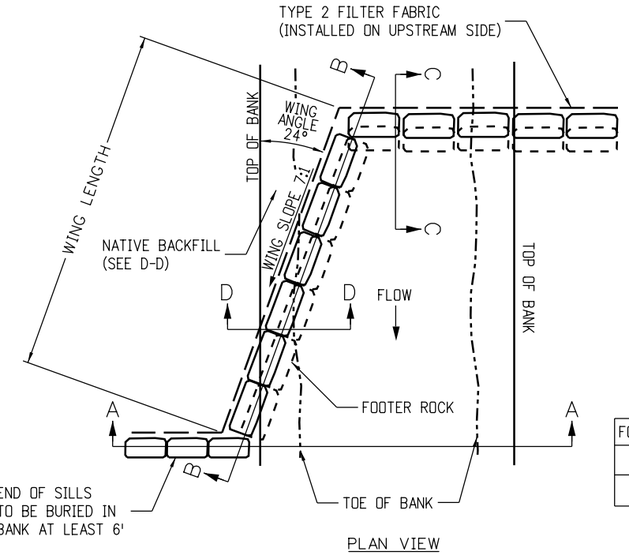
JAMES CANYON STREAM DETAILS (4 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 37

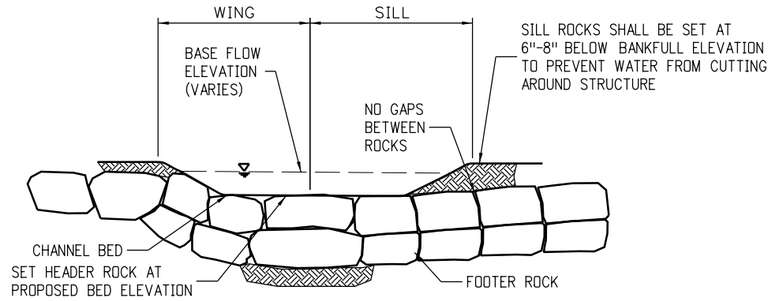
SolekM 6/23/2015 8:17:56 AM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STDET04.dgn

NOTES:

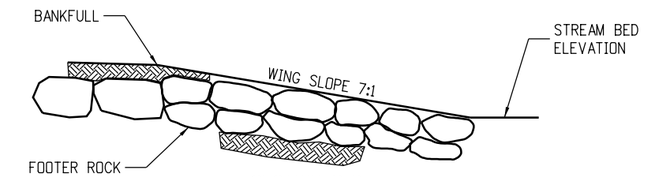
1. HEADER, FOOTER, AND SILL ROCKS TO BE BOULDERS.
2. ALL VANE ARMS TO BE BACKFILLED WITH NATIVE FILL.



PLAN VIEW

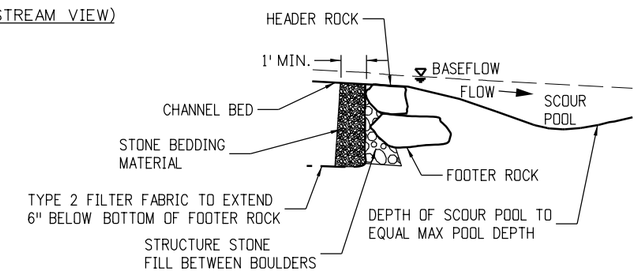


SECTION A-A (UPSTREAM VIEW)

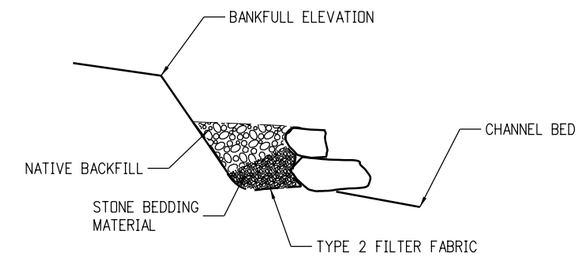


SECTION B-B

FOOTER AND HEADER BOULDER DIMENSIONS		
MINIMUM	MIDRANGE	MAXIMUM
24"	30"	36"



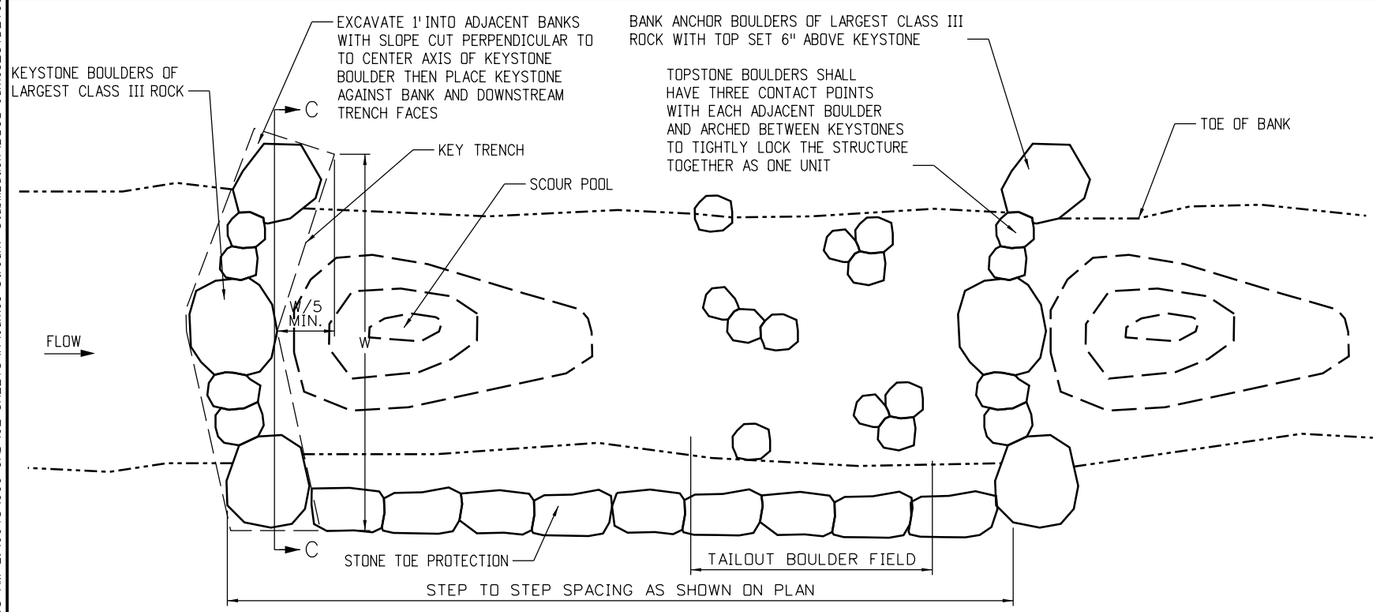
SECTION C-C (PROFILE VIEW)



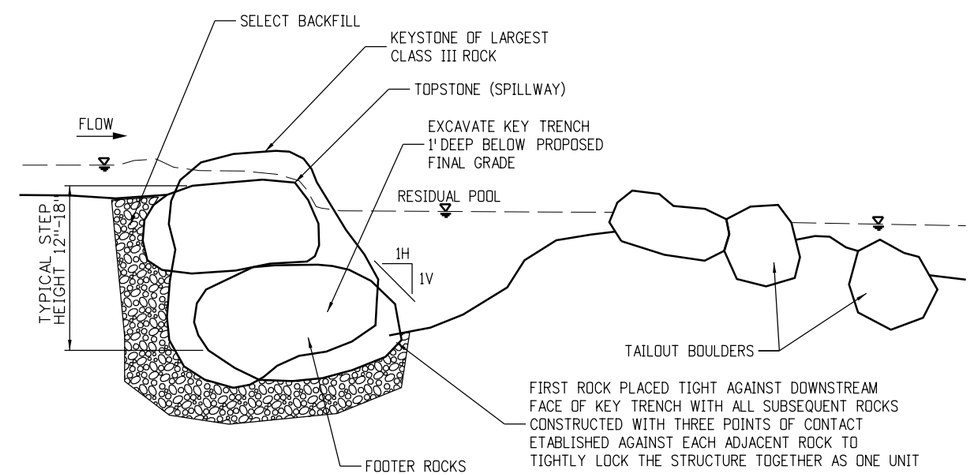
SECTION D-D

ROCK GRADE CONTROL VANE

SCALE: NTS



PLAN VIEW



PROFILE VIEW

NOTE
TOPSTONE AND FOOTER ROCKS SHALL BE PLACED
SO THAT THEY SHINGLE IN A DOWNSTREAM DIRECTION.
KEYSTONE ROCKS SHALL NTO HAVE FOOTERS.

ROCK STEP POOL

SCALE: NTS

F.I.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

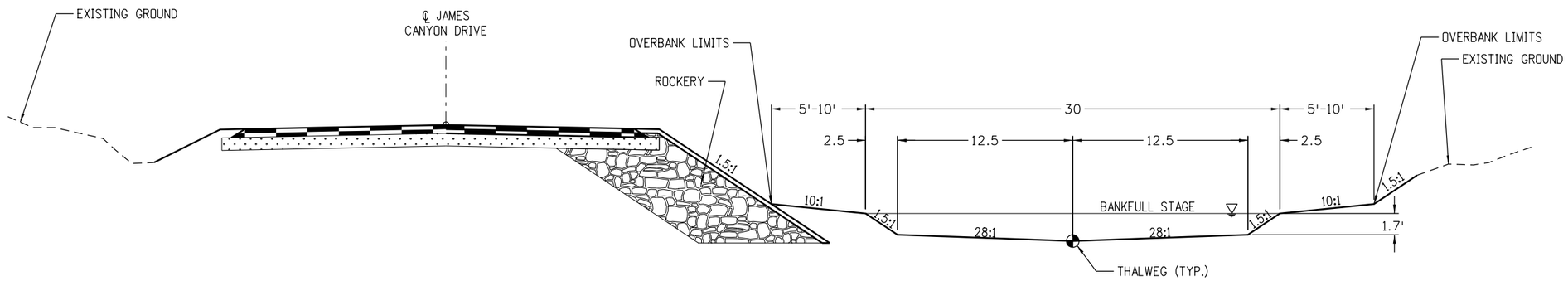
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

JAMES CANYON
STREAM DETAILS
(5 OF 5)

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 38

SalekM 6/23/2015 8:17:58 AM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCO-James_STDET05.dgn



TYPICAL RIFFLE CROSS-SECTION 1

SCALE 1" = 10'

F.I.R. SUBMITTAL

15%

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

AECOM

DESIGNED:	CAD:	CHECKED:	DATE:
MTC	MTC	TPF	04/15/2015

JAMES CREEK STABILIZATION
TYPICAL SECTIONS

PROJECT NO: SEPT12C24 SEPT12C91 | SHEET NO: 39

SalekM 6/23/2015 8:17:59 AM L:\0048\900-CAD\02-SHEETS\H\James-Stream Stabilization\BOCD-James_TYPXS01.dgn