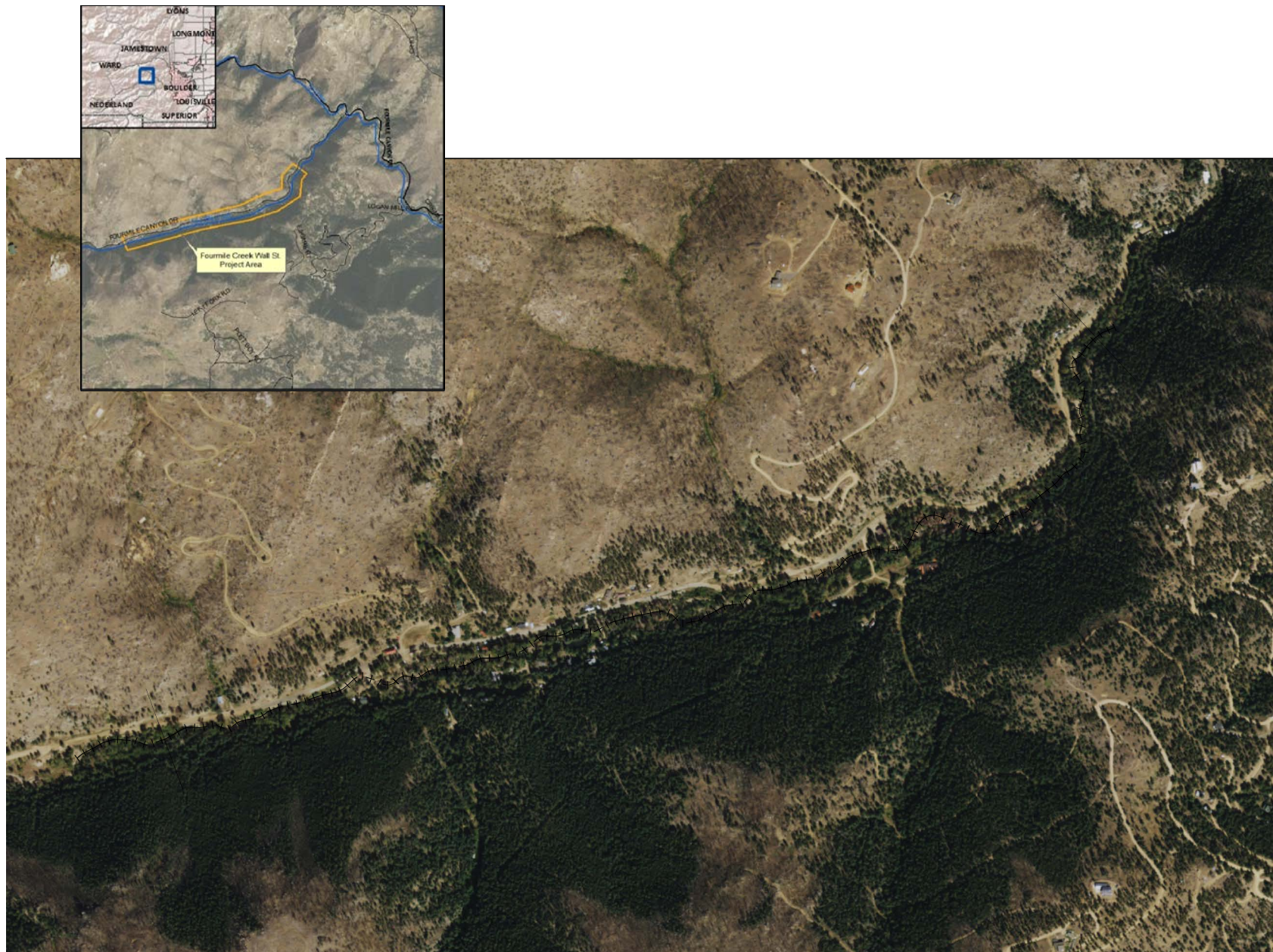


FOURMILE WATERSHED COALITION FOURMILE CREEK WALL STREET RESTORATION PROJECT

DESIGN PLANSET BOULDER COUNTY, CO



PROJECT EXTENTS

Sheet List Table	
Sheet Number	Sheet Title
C0.0	COVER SHEET
C0.1	NOTES
C0.2	LEGEND
P1.0	Plan & Profile Overview
P1.1	PLAN & PROFILE 1
P1.2	PLAN & PROFILE 2
P1.3	PLAN & PROFILE 3
P1.4	PLAN & PROFILE 4
P1.5	PLAN & PROFILE 5
P1.6	PLAN & PROFILE 6
P1.7	PLAN & PROFILE 7
P1.8	PLAN & PROFILE 8
P1.9	REACH A OVERFLOW PLAN & PROFILE
P1.10	MELVINA GULCH PLAN & PROFILE
P1.11	UNNAMED TRIBUTARY PLAN & PROFILE
S2.1	SECTION VIEWS 1
S2.2	SECTION VIEWS 2
S2.3	SECTION VIEWS 3
S2.4	SECTION VIEWS 4
S2.5	SECTION VIEWS 5
S2.6	SECTION VIEWS 6
S2.7	SECTION VIEWS 7
S2.8	SECTION VIEWS 8
S2.9	SECTION VIEWS 9
S2.10	SECTION VIEWS 10
S2.11	SECTION VIEWS 11
S2.12	SECTION VIEWS 12
S2.13	SECTION VIEWS 13
D3.1	TYPICAL CROSS SECTIONS
D3.2	BANKFULL CHANNEL SHAPING
D3.3	LOW FLOW CHANNEL SHAPING
D3.4	RIFFLE-POOL & HARDENED RIFFLE CREST
D3.5	POOL
D3.6	BOULDER CASCADE 1
D3.7	BOULDER CASCADE 2
D3.8	ROCK CROSS VANE
D3.9	ROCK J-HOOK
D3.10	BOULDER COBBLE TOE
D3.11	STACKED BOULDER TOE WITH WILLOWS
D3.12	ROOTWAD
D3.13	FLOODPLAIN WOOD
D3.14	LARGE WOOD COMPLEX
D3.15	WILLOW TOE & EROSION CONTROL BLANKET
L4.1	ZONE B PLANTING PLAN
L4.2	STANDARD VEGETATION ZONES
L4.3	PLANTING NOTES
L4.4	PLANTING TABLES

NO.	DATE	BY	REVISION	COMMENTS

PREPARED FOR:

COVER SHEET
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO



























5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3304
Fax: 303-296-3699

DRAFT

32610K
Project No. Drawing No.
C0.0
Sheet No.
© Otak, Inc. 2015

Plotted: May 24, 2017 - 5:49pm
 User: rachelw
 C:\Dropbox (otak co wnt)\otak co wnt\beam folder\Projects\32610_wrp_phase_2\000_well_street\00\PlanSet\0-HGIS-Cover.dwg
 Layout Name: COVER SHEET

LEGEND	
BOULDER COUNTY PARCEL	
ASSET TO BE PROTECTED	
EXISTING ROAD	
HEC-RAS CROSS SECTION	
EXISTING STREAM CENTERLINE	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	
PROPOSED TOP OF BANK	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
RIPRAP PAD	
SILL	
ROOTWAD	
J-HOOK	
CROSS VANE	
LARGE WOOD COMPLEX	

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:



Design	Drawn	Checked	Date	Initial	Issue Date
K.J.	REN, ALN		5/24/17		5/24/17

LEGEND
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3904
 Fax: 303-296-3699

DRAFT

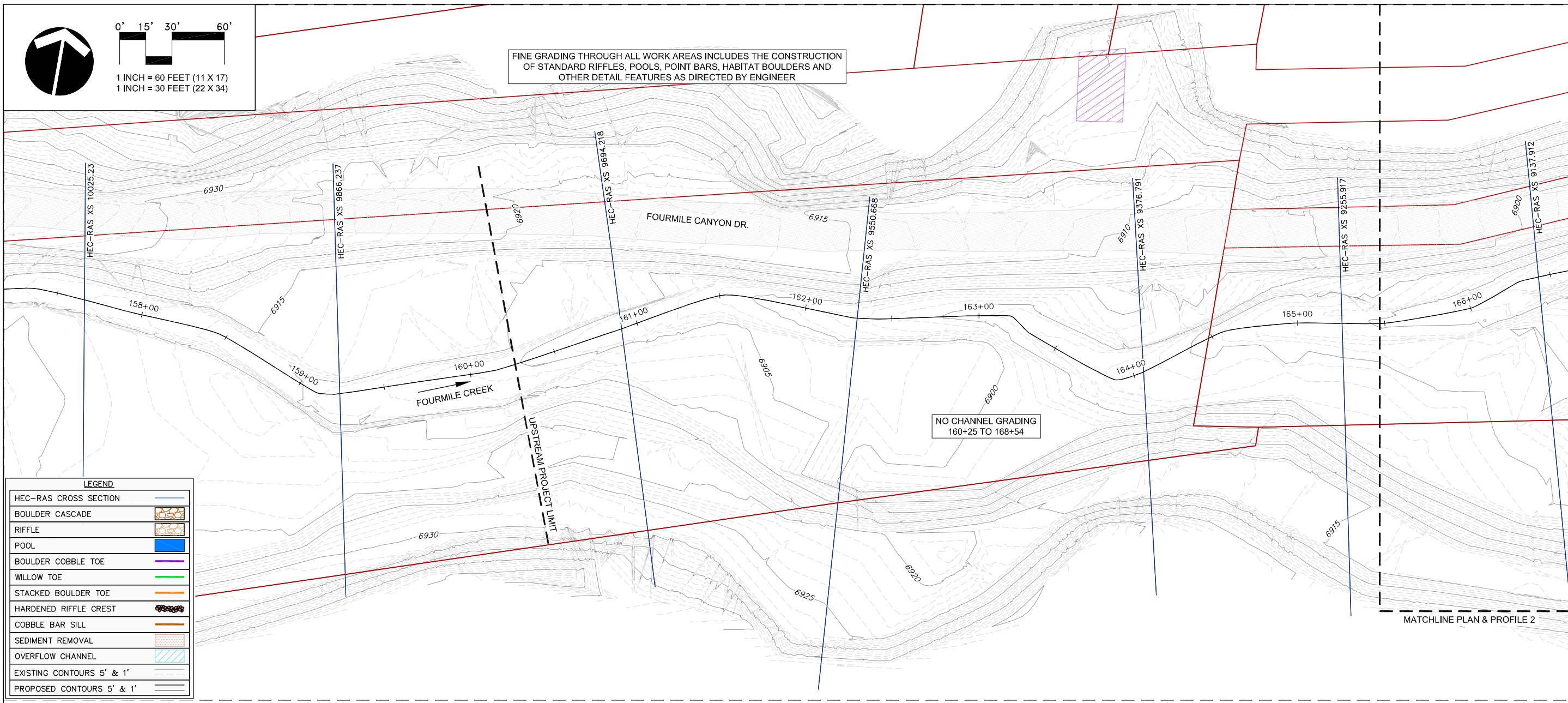
32610K
 Project No. Drawing No.
CO.2
 Sheet No.
 © Otak, Inc. 2015



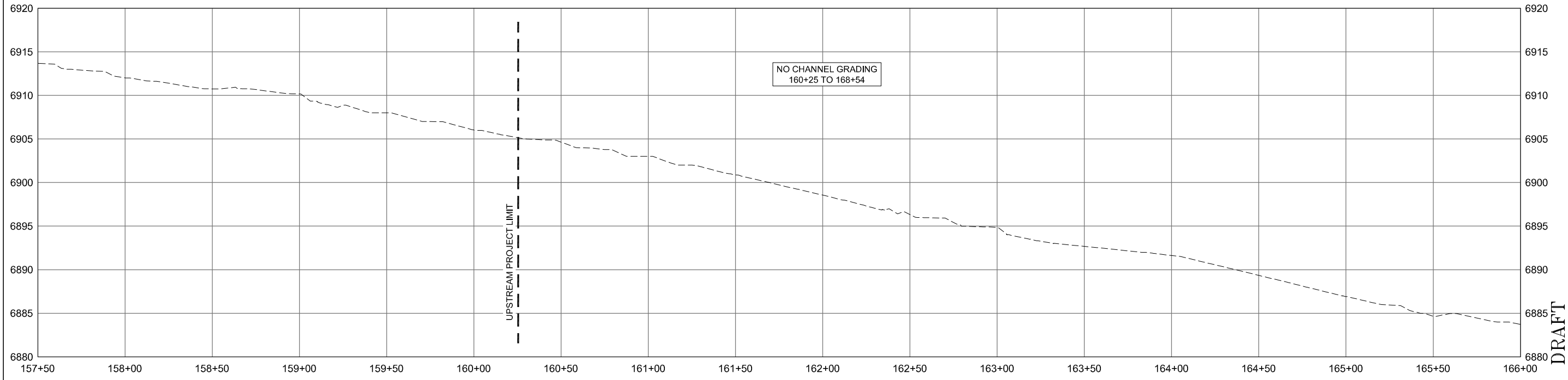
0' 15' 30' 60'

1 INCH = 60 FEET (11 X 17)
1 INCH = 30 FEET (22 X 34)

FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER



LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 1
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

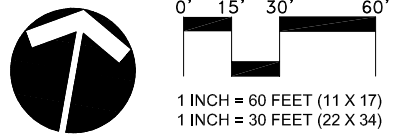
5777 Central Avenue
Suite 220
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

32610K
Project No. Drawing No.
P1.1

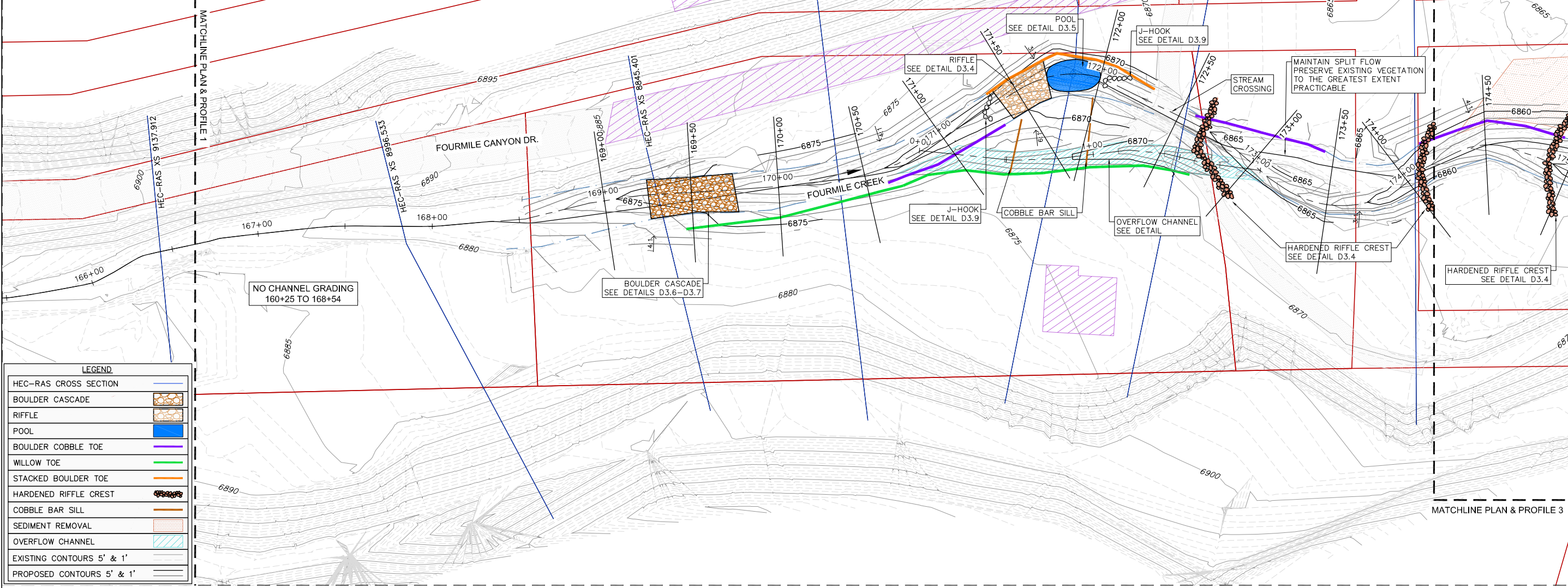
Sheet No.
© Otak, Inc. 2015

Plotfile: May 24, 2017 - 5:32pm
 C:\v\pbox (otak co wrr)\otak co wrr team folder\Project\32610\emp_phase_2\w00_will_street\1-HEC-RAS-Plan&Profiles.dwg
 Layout Name: P1

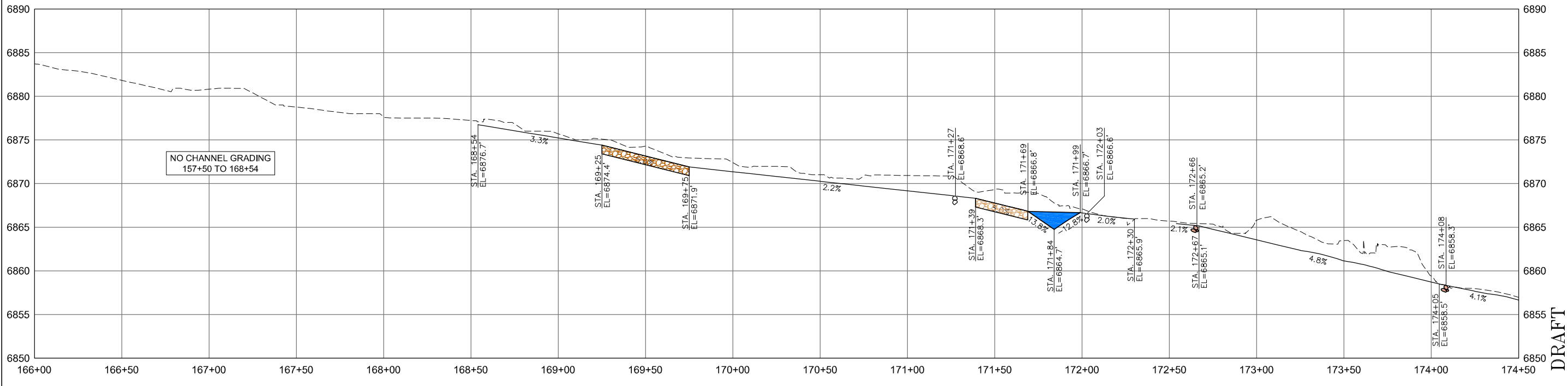
DRAFT



FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER



LEGEND	
HEC-RAS CROSS SECTION	—
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 2

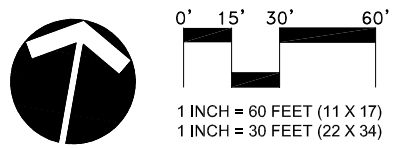
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

32610K
Project No. Drawing No.
P1.2
Sheet No.
© Otak, Inc. 2015

Plotfile: May 24, 2017 - 5:33pm; c:\v\pbox (otak co wnt)\otak co wnt team folder\Projects\32610\emp_phase_2\w00_well_atrest\LCD\Profile1-1\w00_ras\Plan&Profile.dwg; Layout: Name: P2

DRAFT



WORK WITHIN 100-FT OF STRUCTURE REQUIRES AN ARCHEOLOGIST ON-SITE (COORDINATE BY ENGINEER) AND 72 HR. NOTICE TO ENGINEER BEFORE PROCEEDING

SEDIMENT REMOVAL AS THE BUDGET ALLOWS; PRESERVE MATURE VEGETATION

BOULDER CASCADE SEE DETAILS D3.6-D3.7

BOULDER CASCADE SEE DETAILS D3.6-D3.7

RIFFLE SEE DETAIL D3.4

POOL SEE DETAIL D3.5

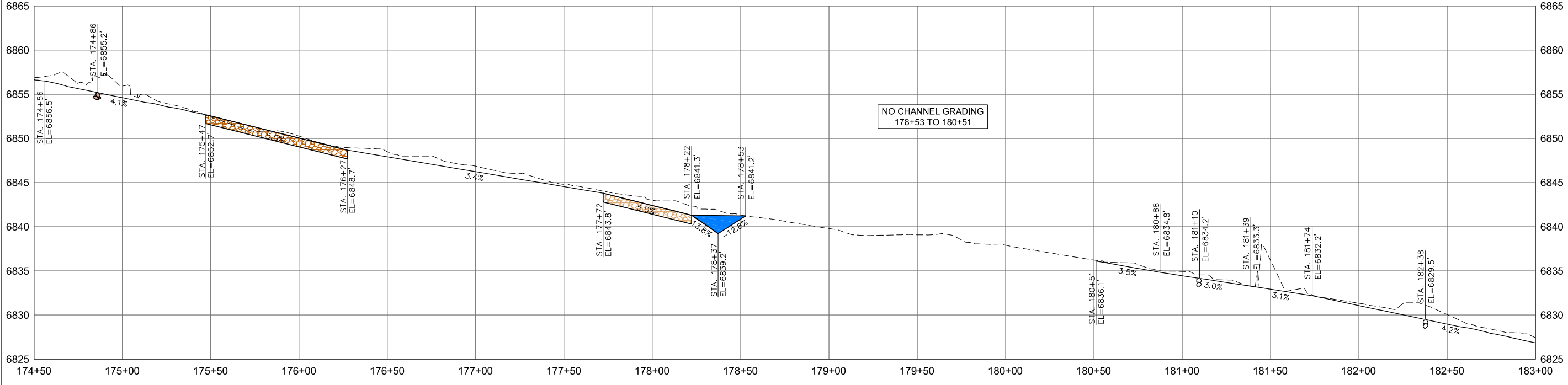
NO CHANNEL GRADING 178+53 TO 180+51

CROSS-VANE FOR DIVERSION SEE DETAIL D3.8

J-HOOK SEE DETAIL D3.9

FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER

LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



Plotfile: May 24, 2017 - 5:33pm
 C:\temp\box (otak co wrr)\otak co wrr team folder\Projects\32610_omp_phase_2\w00_well_street\CAD\Profile\1-WellSt-Plan&Profile.dwg
 Layout Name: P3

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

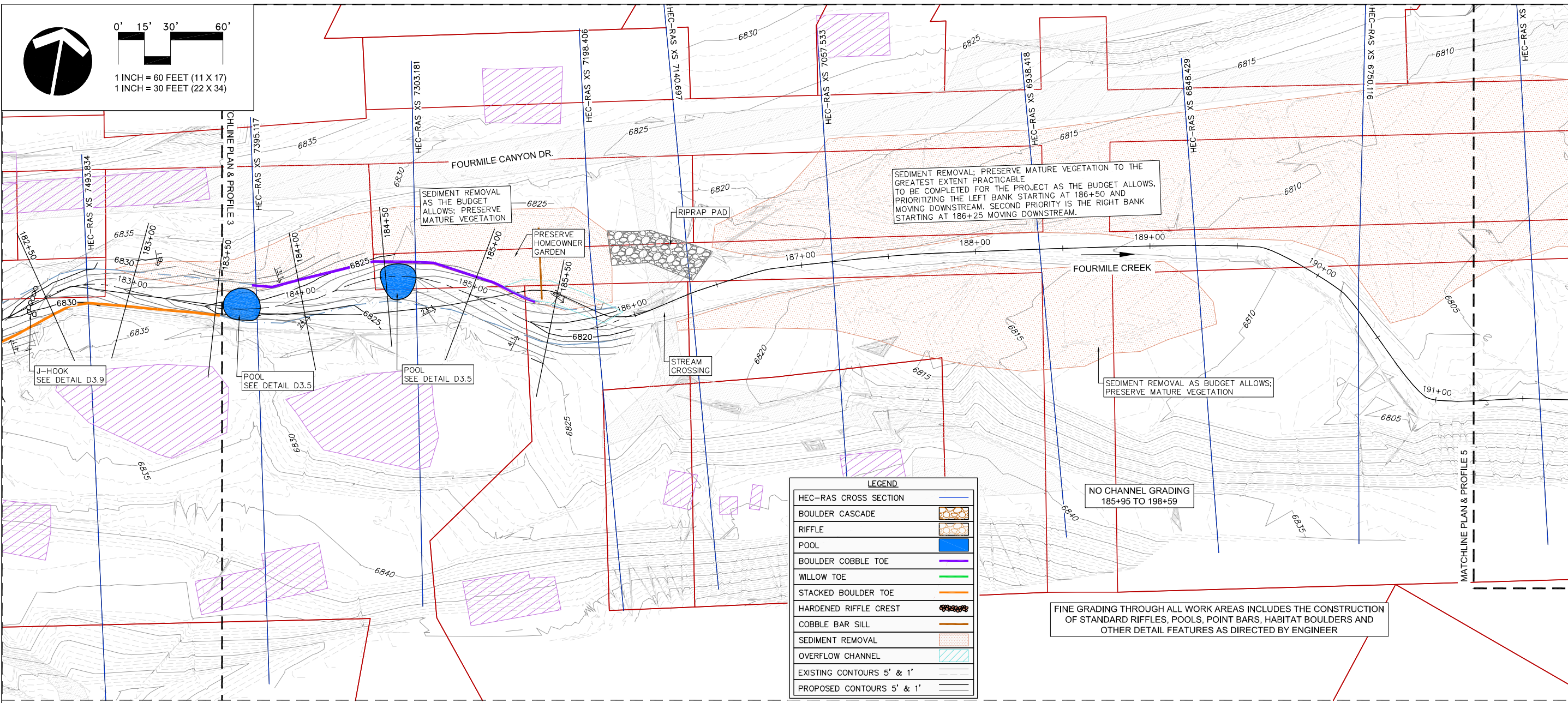
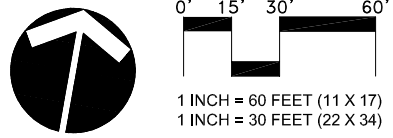
PLAN & PROFILE 3

WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

5777 Central Avenue
 Suite 220
 Boulder, Colorado 80301
 Phone: 303-296-3904
 Fax: 303-296-3699

32610K
 Project No. Drawing No.
P1.3
 Sheet No.
 © Otak, Inc. 2015

DRAFT



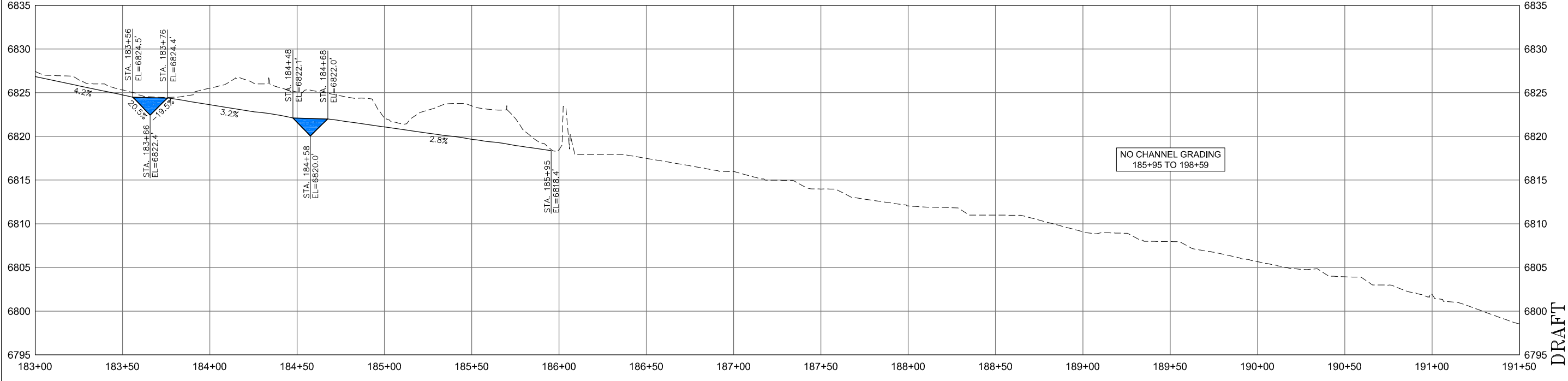
SEDIMENT REMOVAL; PRESERVE MATURE VEGETATION TO THE GREATEST EXTENT PRACTICABLE TO BE COMPLETED FOR THE PROJECT AS THE BUDGET ALLOWS, PRIORITIZING THE LEFT BANK STARTING AT 186+50 AND MOVING DOWNSTREAM. SECOND PRIORITY IS THE RIGHT BANK STARTING AT 186+25 MOVING DOWNSTREAM.

SEDIMENT REMOVAL AS THE BUDGET ALLOWS; PRESERVE MATURE VEGETATION

SEDIMENT REMOVAL AS BUDGET ALLOWS; PRESERVE MATURE VEGETATION

FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER

LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 4

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

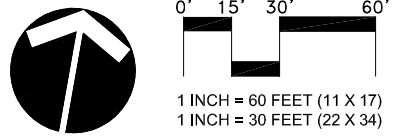


5777 Central Avenue
Suite 220
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

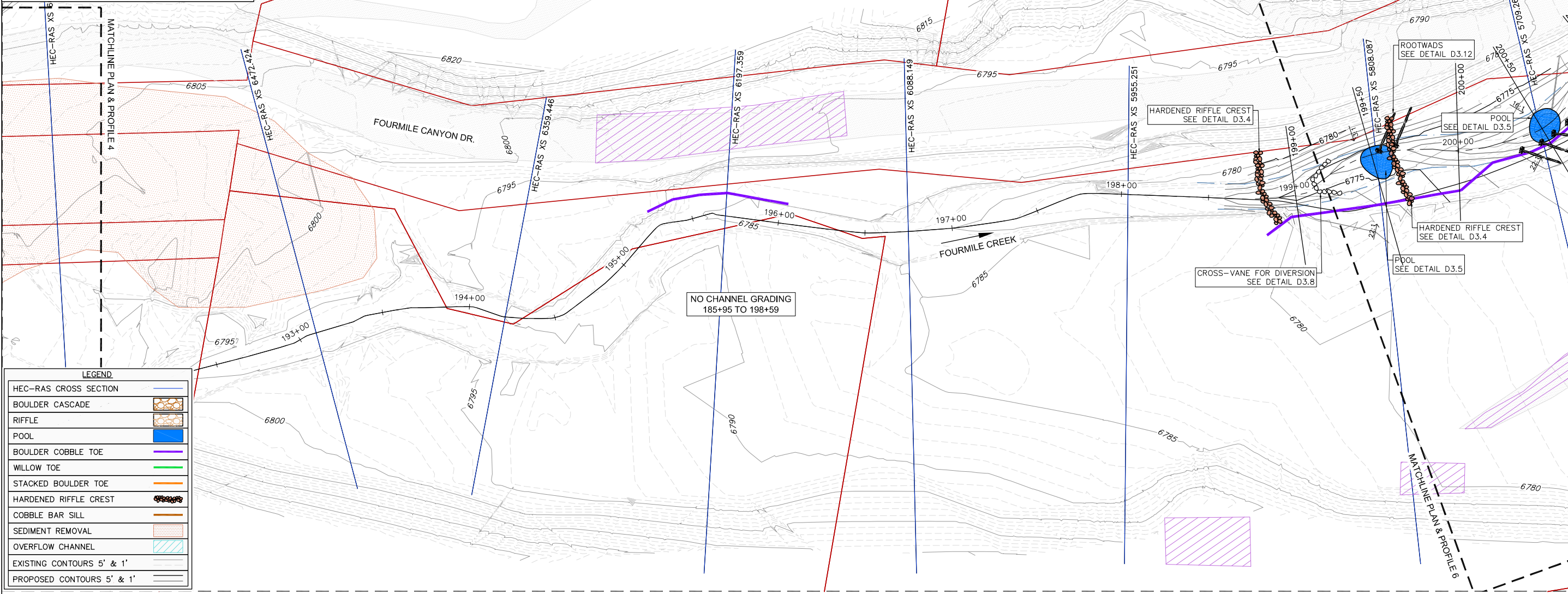
32610K
Project No. Drawing No.
P1.4
Sheet No.
© Otak, Inc. 2015

Plotfile: May 24, 2017 - 5:33pm
 path: C:\vtpbox (otak co wrr)\otak co wrr team folder\Projects\32610K_emp_phase_2\w00_well_street\1-WellSt-Plan&Profile.dwg
 Layout Name: P4

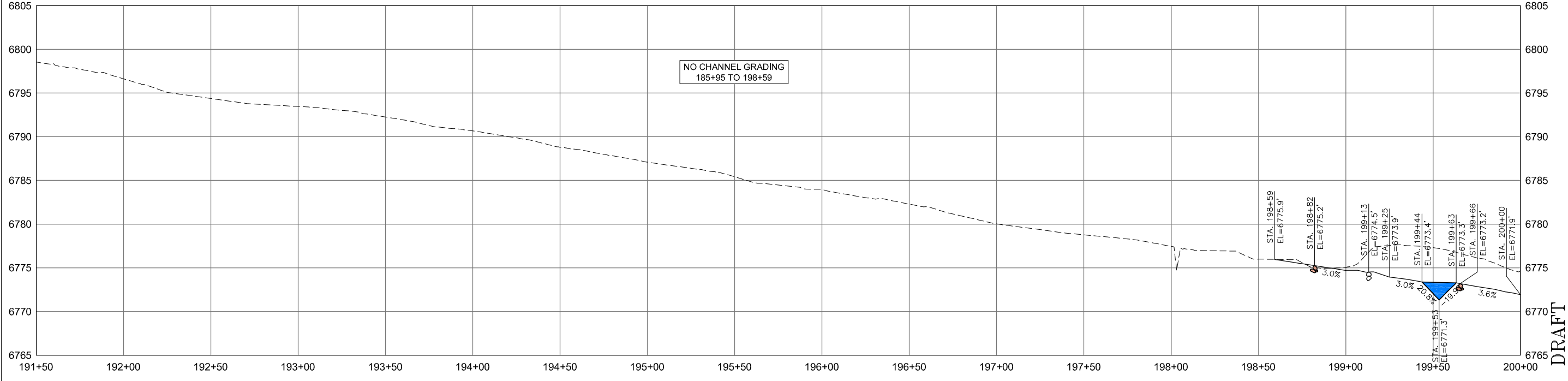
DRAFT



FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER



LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 5

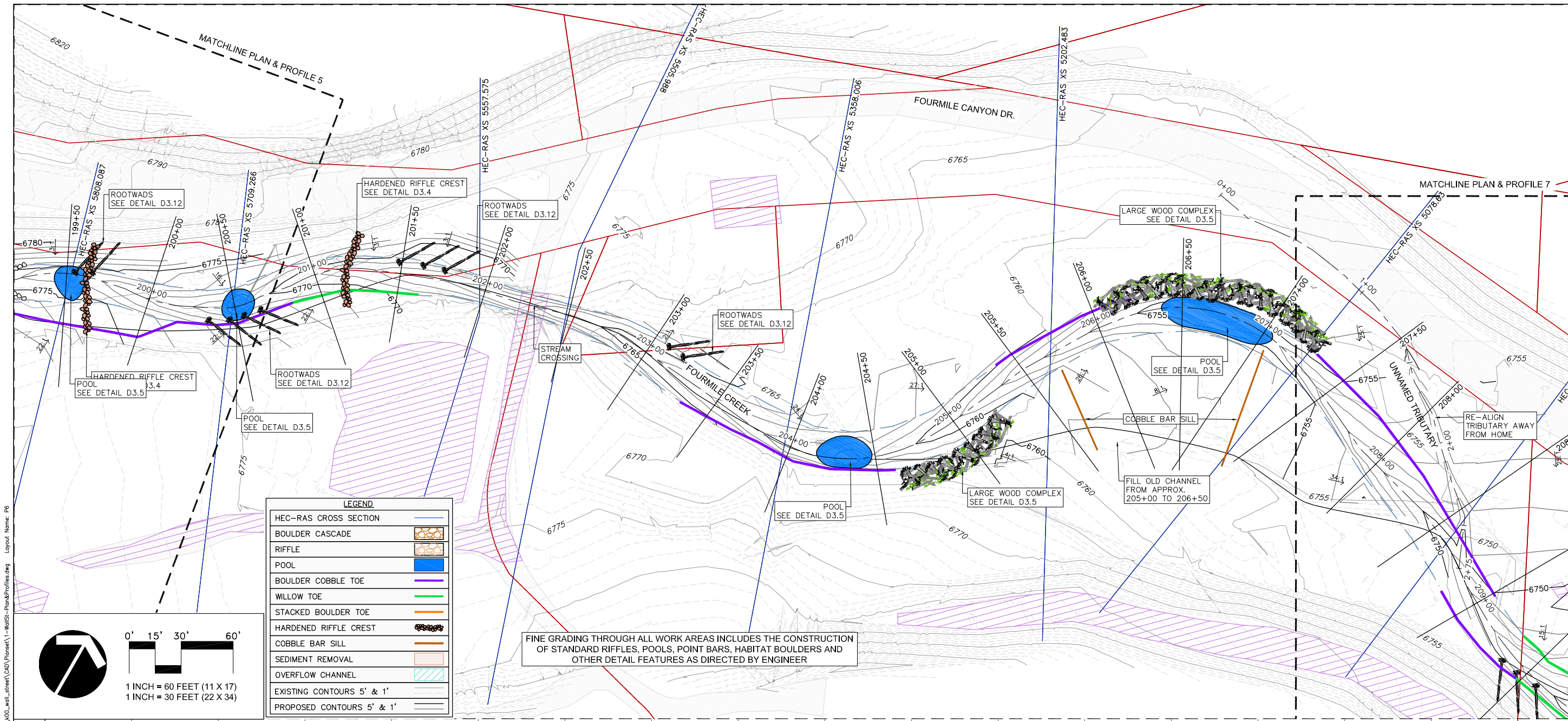
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

32610K
Project No. Drawing No.
P1.5
Sheet No.
© Otak, Inc. 2015

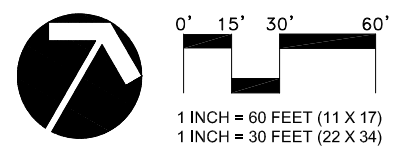
Plotfile: May 24, 2017 - 5:33pm
 rootpath: C:\vtpbox (otak co wrr)\otak co wrr team folder\Project\32610_kmp_phase_2\w00_well_street\1-HEC-RAS-Plan&Profiles.dwg
 Layout Name: P5

DRAFT

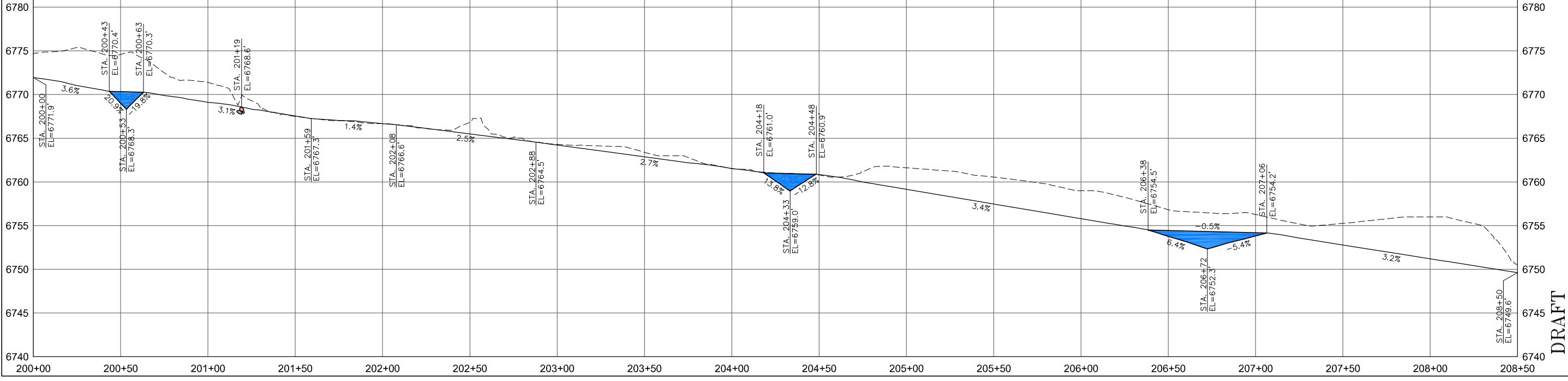


LEGEND

HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER



NO. DATE BY REVISION COMMENTS

DESIGN: KJ HEW, ALN
DRAWN: ALN
CHECKED: ALN
DATE: 5/24/17
INITIAL ISSUE DATE: 5/24/17

PREPARED FOR:

PLAN & PROFILE 6
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

32610K
Project No. Drawing No.
P1.6

Sheet No.
© Otak, Inc. 2015

DRAFT

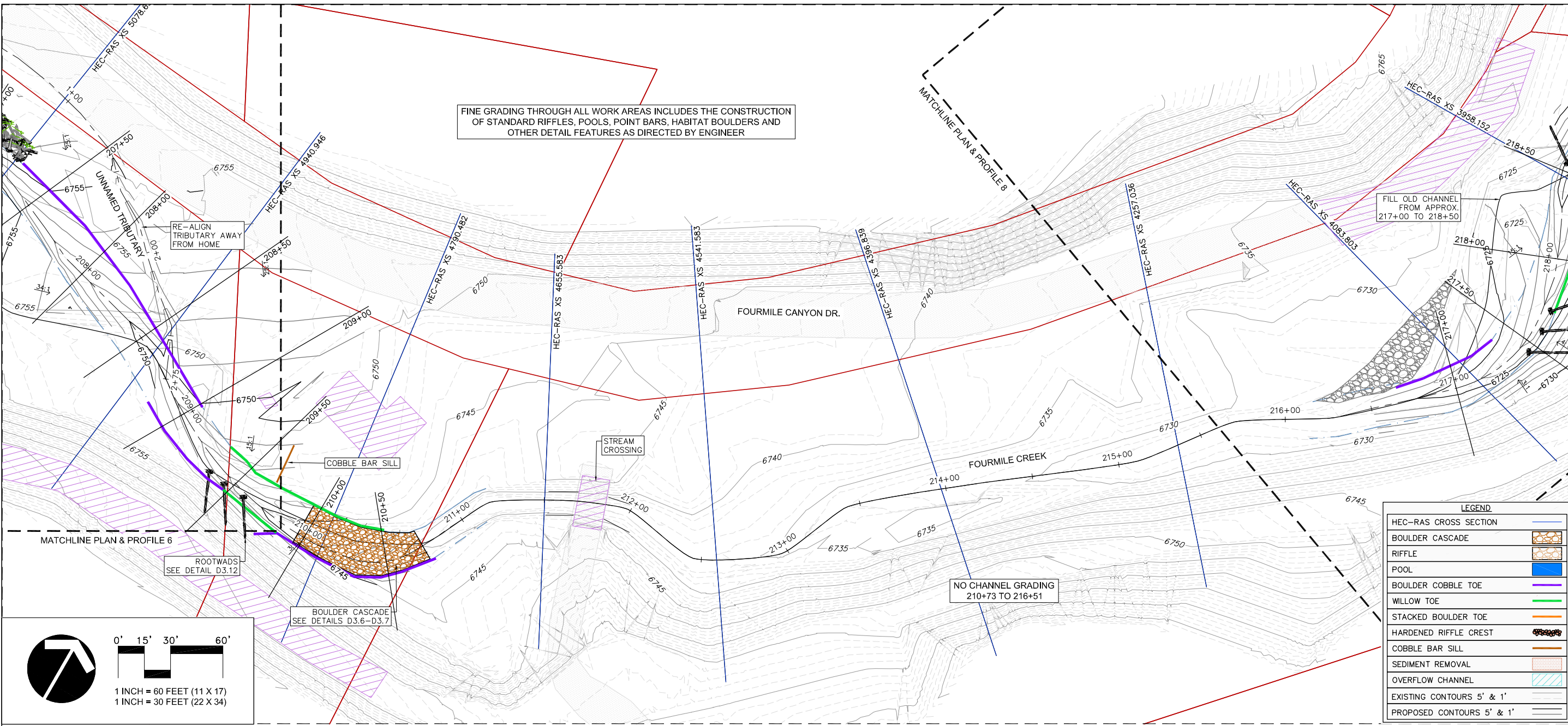
FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER

MATCHLINE PLAN & PROFILE 8

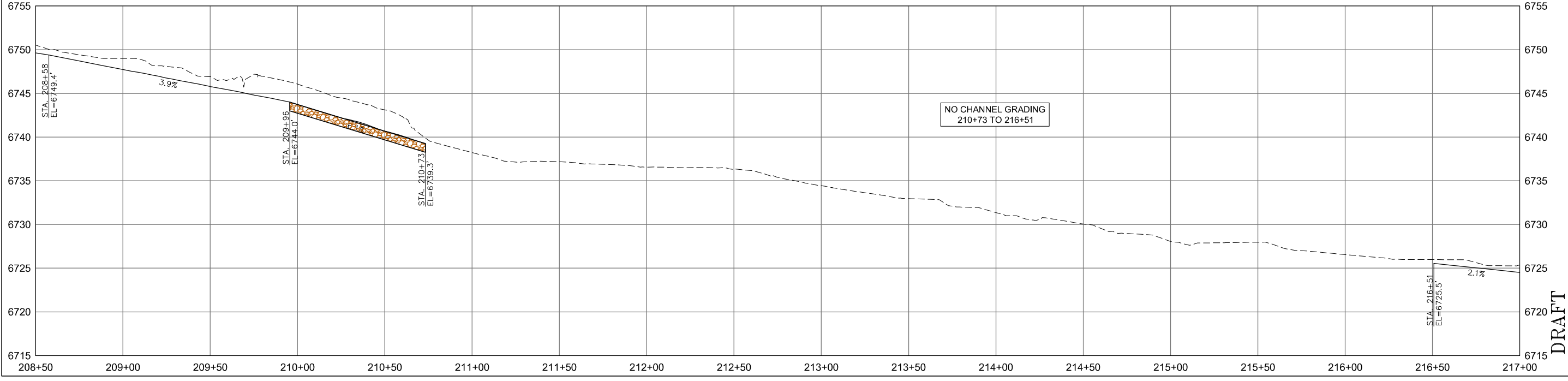
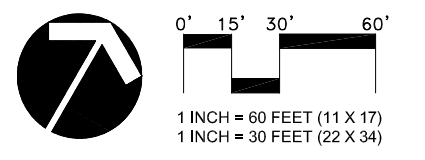
FILL OLD CHANNEL FROM APPROX. 217+00 TO 218+50

NO CHANNEL GRADING 210+73 TO 216+51

NO CHANNEL GRADING 210+73 TO 216+51



LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 7

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

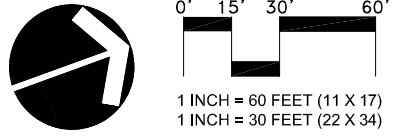


5777 Central Avenue
Suite 220
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

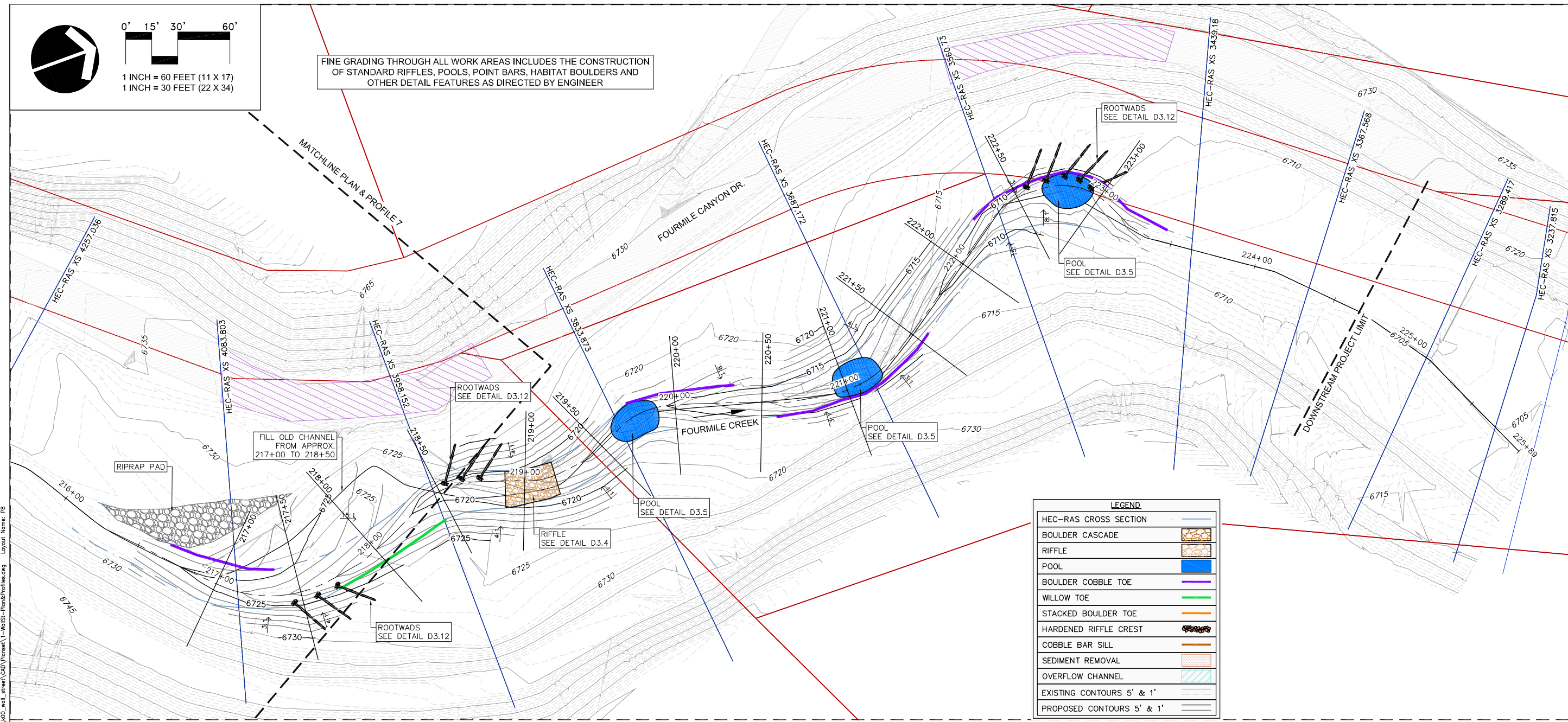
32610K
Project No. Drawing No.
P1.7
Sheet No.
© Otak, Inc. 2015

DRAFT

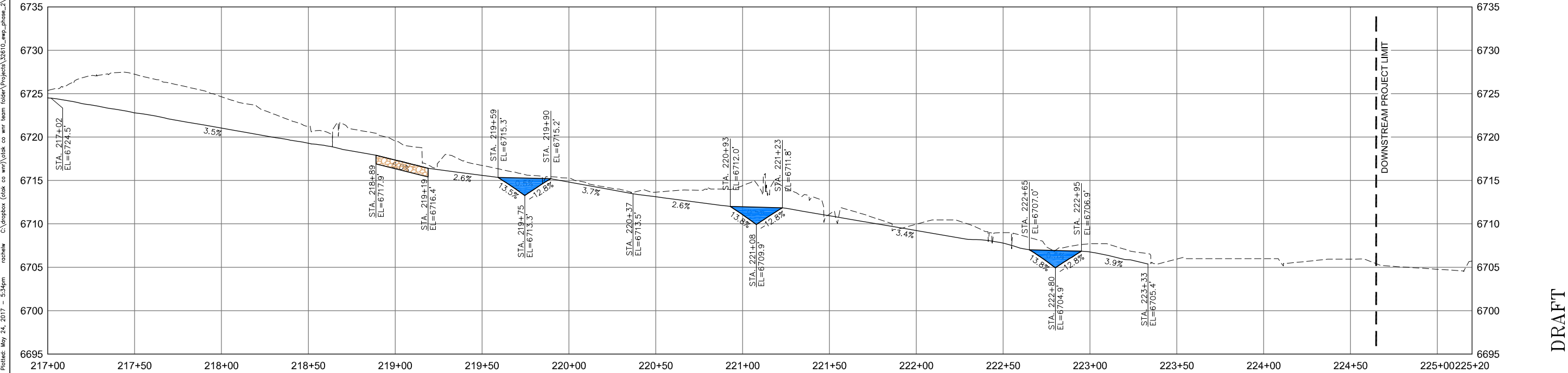
Plotfile: May 24, 2017 - 5:34pm c:\temp\otak\otak co\wrt\team\folder\project\32610\emp_phase_2\w00_wrt\street\CD\Profile\1-HEC-RAS-Plan&Profiles.dwg Layout Name: P7



FINE GRADING THROUGH ALL WORK AREAS INCLUDES THE CONSTRUCTION OF STANDARD RIFFLES, POOLS, POINT BARS, HABITAT BOULDERS AND OTHER DETAIL FEATURES AS DIRECTED BY ENGINEER



LEGEND	
HEC-RAS CROSS SECTION	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



Plotfile: May 24, 2017 - 5:34pm
 notshw
 C:\vrbpbox (otak co wrf)\otak co wrf team folder\Projects\32610K_emp_phase_2\100_wdl_atrnet\CAD\Profile\1-HEC-RAS-Plan&Profile.dwg
 Layout Name: P8

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

PLAN & PROFILE 8

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

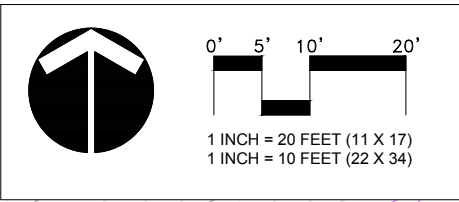


5777 Central Avenue
Suite 220
Boulder, Colorado 80301
Phone: 303-296-3904
Fax: 303-296-3699

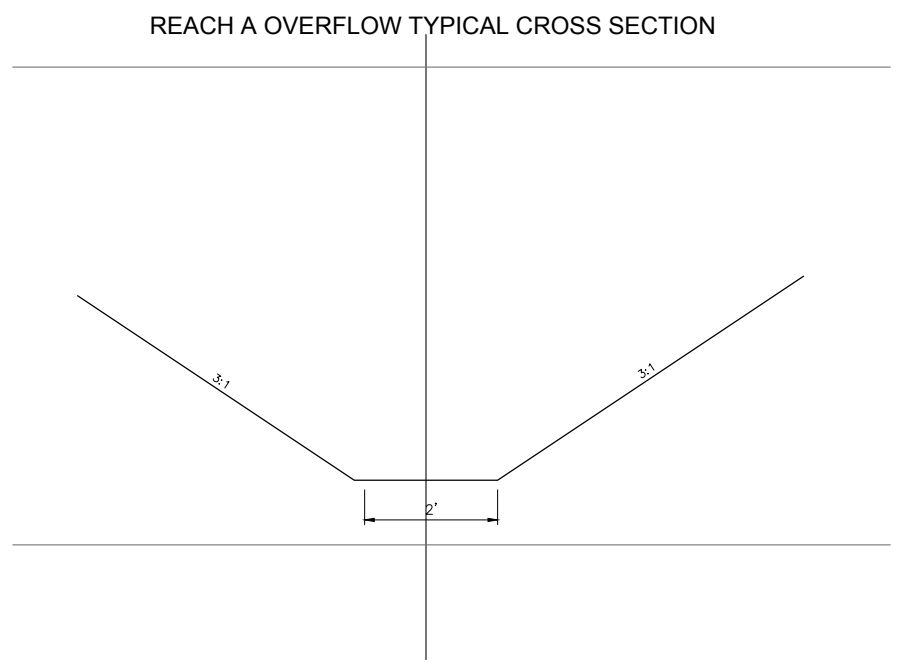
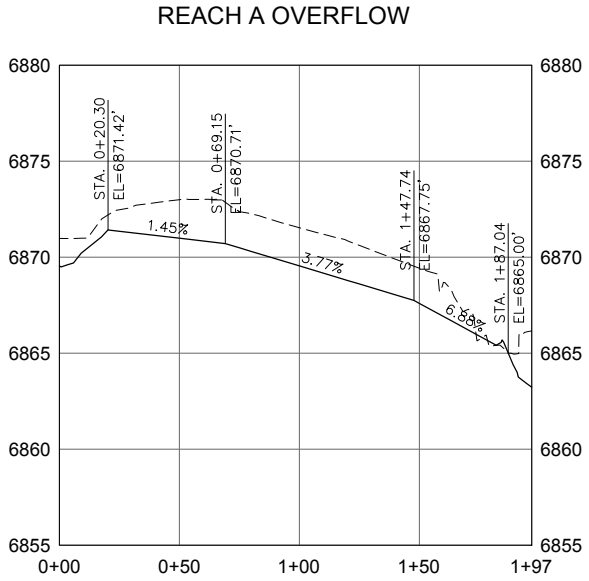
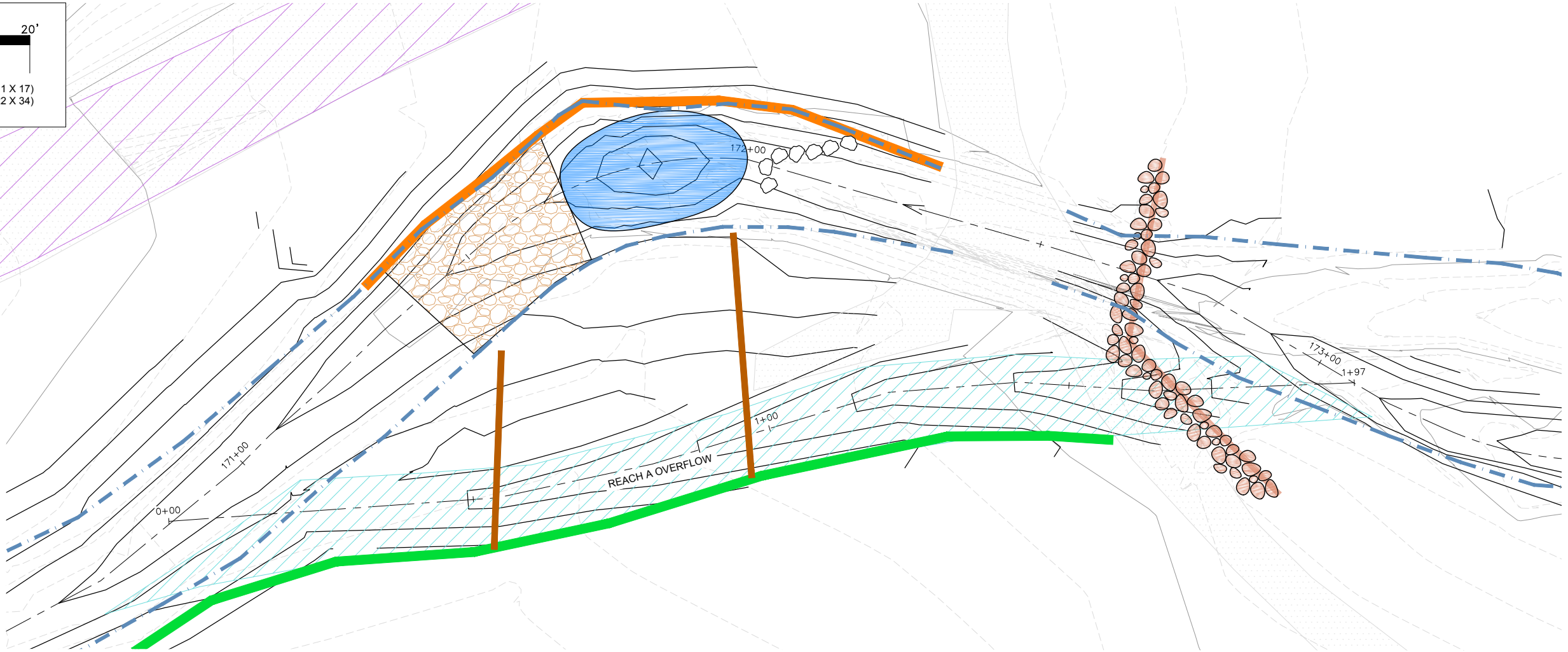
32610K
Project No. Drawing No.
P1.8
Sheet No.
© Otak, Inc. 2015

DRAFT

Plotted: May 24, 2017 - 3:26pm
 alisonn C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_Wall_Street\Phase_2\KOD_Wall_Street\CAD\Plan\1--WallSI--Plan&Profile_Tribs&Overflow.dwg Layout Name: REACH A OVERFLOW PLAN & PROFILE



LEGEND	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	



5X VERTICAL EXAGGERATION - - - EXISTING CONDITION (EC) ——— PROPOSED CONDITION (PC)

NO.	DATE	BY	REVISION COMMENTS



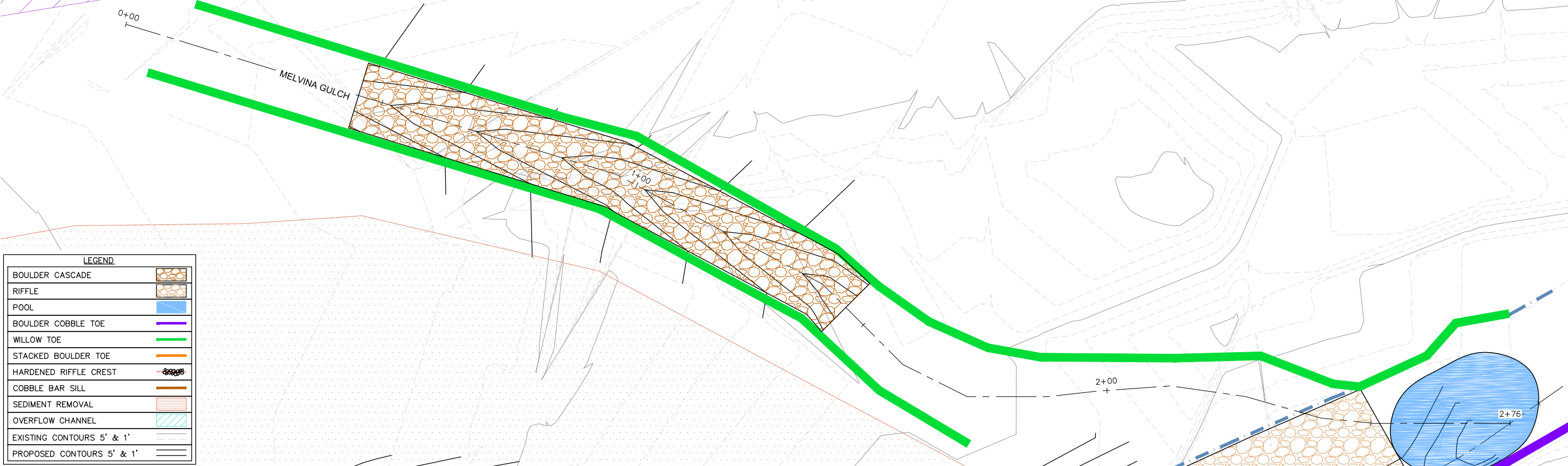
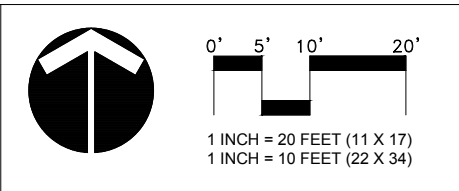
REACH A OVERFLOW PLAN & PROFILE
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

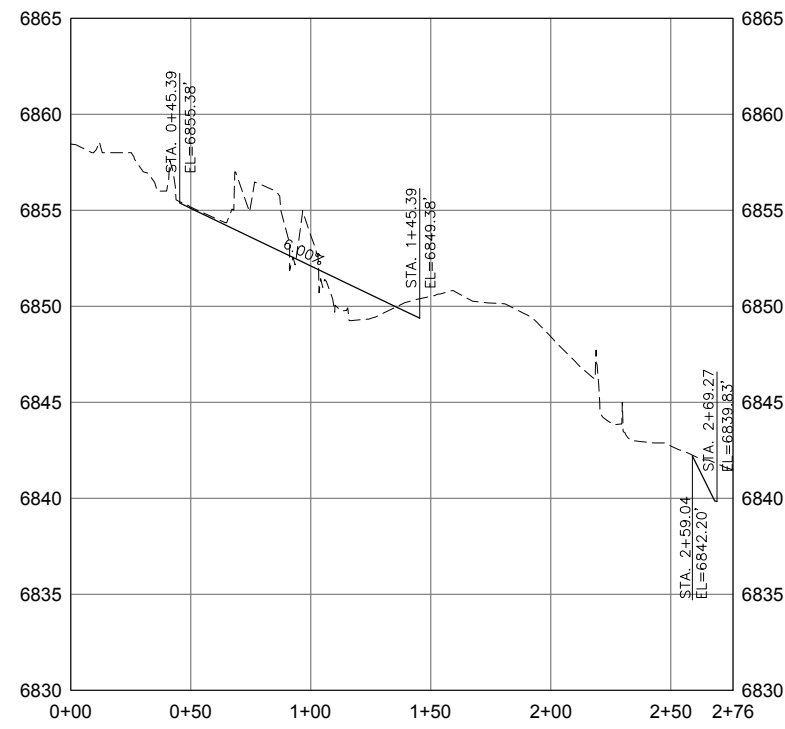
DRAFT

32610K
 Project No. Drawing No.
P1.9
 Sheet No.
 © Otak, Inc. 2015



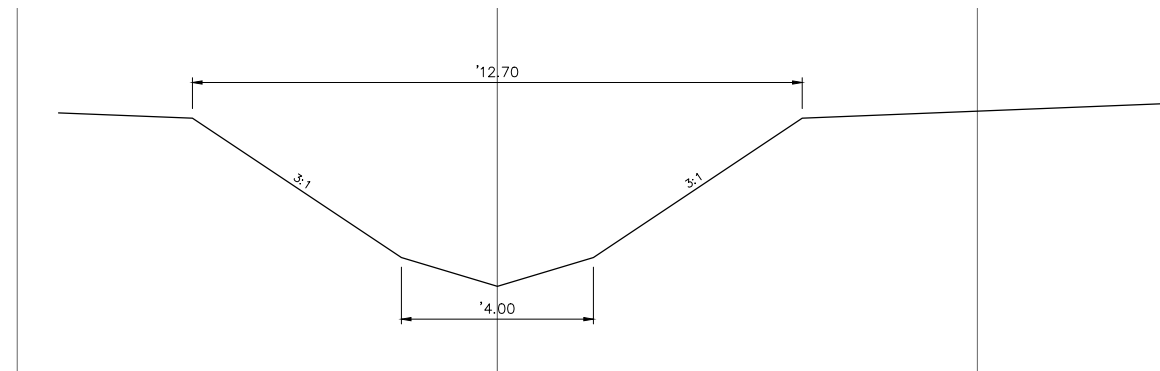
LEGEND	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	

MELVINA GULCH PROFILE



5X VERTICAL EXAGGERATION - - - EXISTING CONDITION (EC) ——— PROPOSED CONDITION (PC)

MELVINA GULCH TYPICAL CROSS SECTION



NO.	DATE	BY	REVISION COMMENTS



MELVINA GULCH PLAN & PROFILE
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



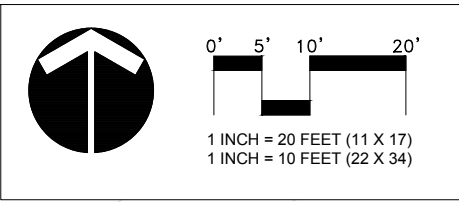
5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

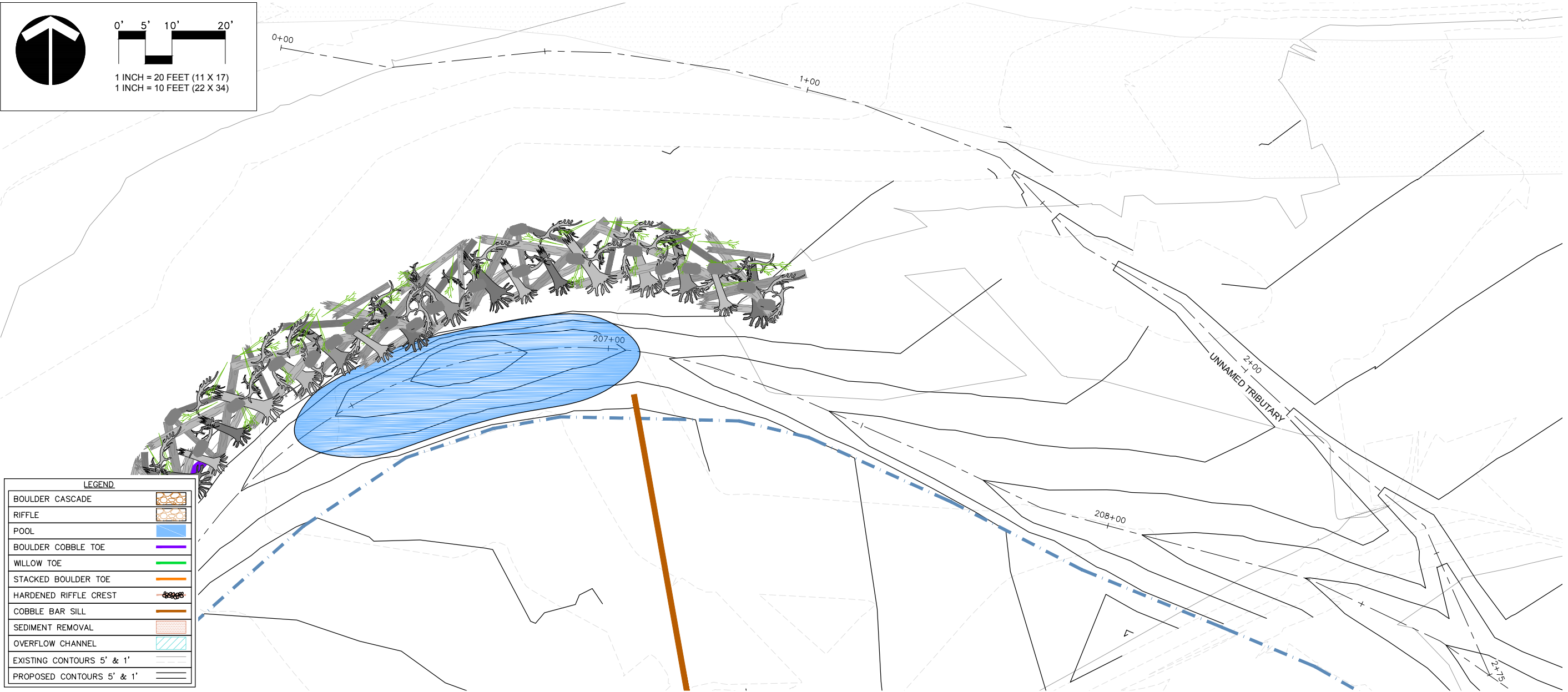
32610K
 Project No. Drawing No.
P1.10
 Sheet No.
 © Otak, Inc. 2015

Plotted: May 24, 2017 - 3:26pm C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_EMP_Phase_2\KOD_Wall_Street\CAD\PlanSet\1--WallSt--Plan&Profile--Tribs&Overflow.dwg Layout Name: MELVINA GULCH PLAN & PROFILE

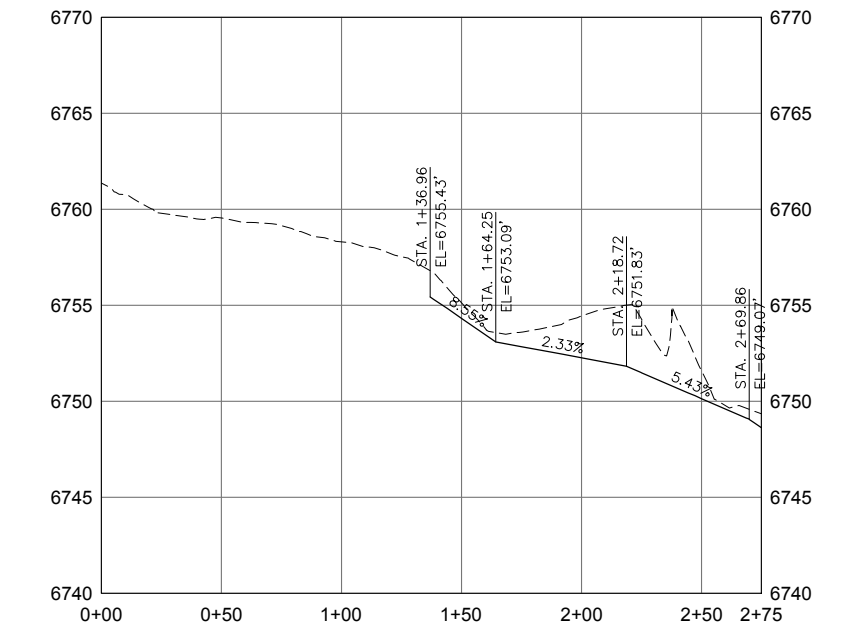
Plotted: May 24, 2017 - 3:26pm
 alisonn C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_LMP_Phase2\KOD_Wall_Street\CAD\Planset\1--WallStreet-Plan&Profile.dwg
 Layout Name: UNNAMED TRIBUTARY PLAN & PROFILE



LEGEND	
BOULDER CASCADE	
RIFFLE	
POOL	
BOULDER COBBLE TOE	
WILLOW TOE	
STACKED BOULDER TOE	
HARDENED RIFFLE CREST	
COBBLE BAR SILL	
SEDIMENT REMOVAL	
OVERFLOW CHANNEL	
EXISTING CONTOURS 5' & 1'	
PROPOSED CONTOURS 5' & 1'	

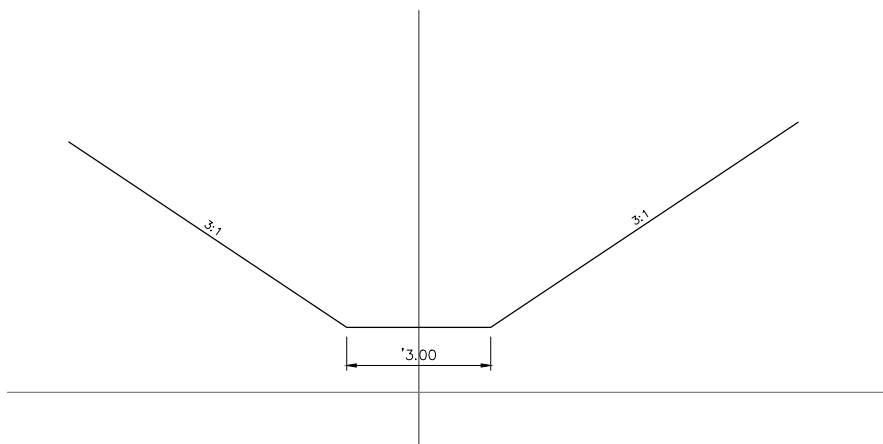


UNNAMED TRIBUTARY PROFILE



5X VERTICAL EXAGGERATION - - - EXISTING CONDITION (EC) ——— PROPOSED CONDITION (PC)

UNNAMED TRIBUTARY TYPICAL SECTION



NO.	DATE	BY	REVISION COMMENTS



UNNAMED TRIBUTARY PLAN & PROFILE
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

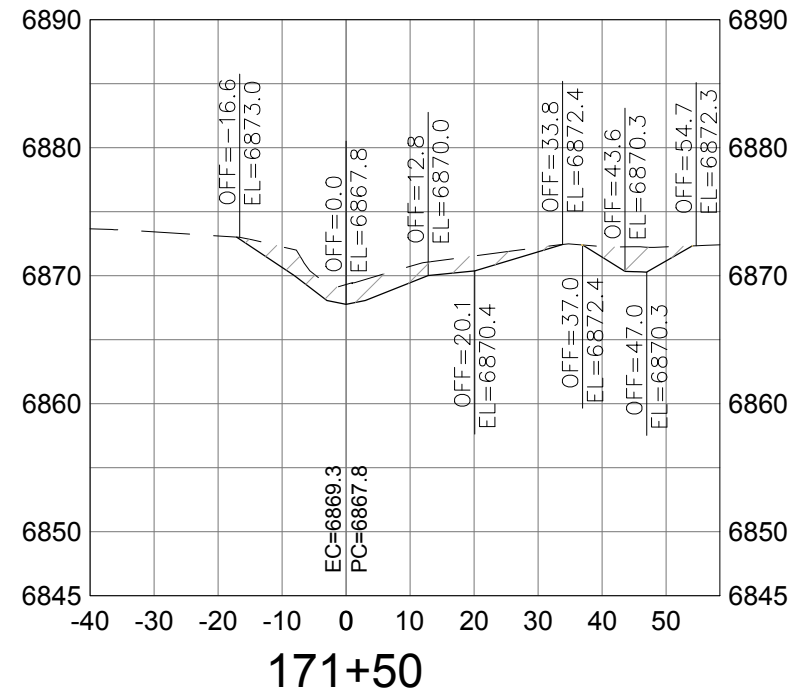
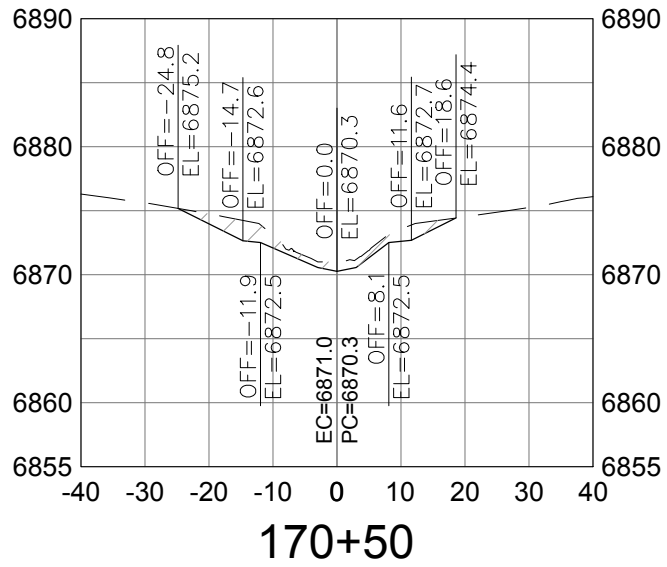
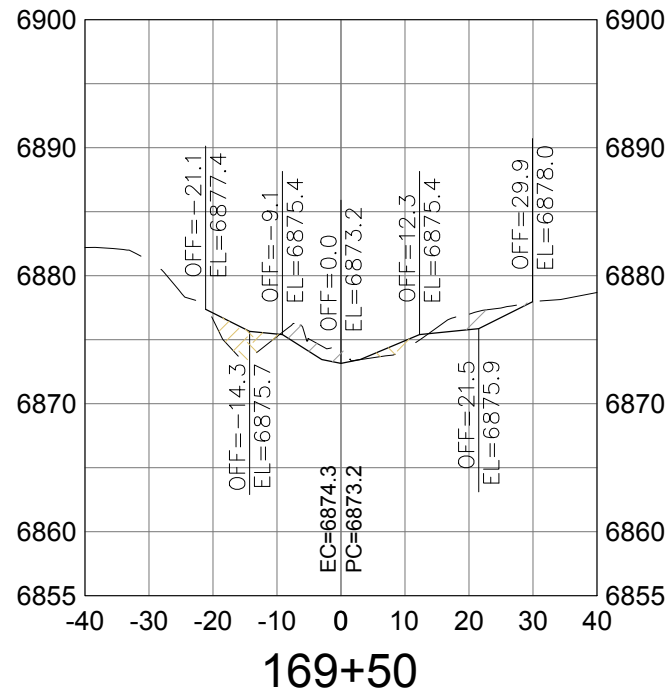
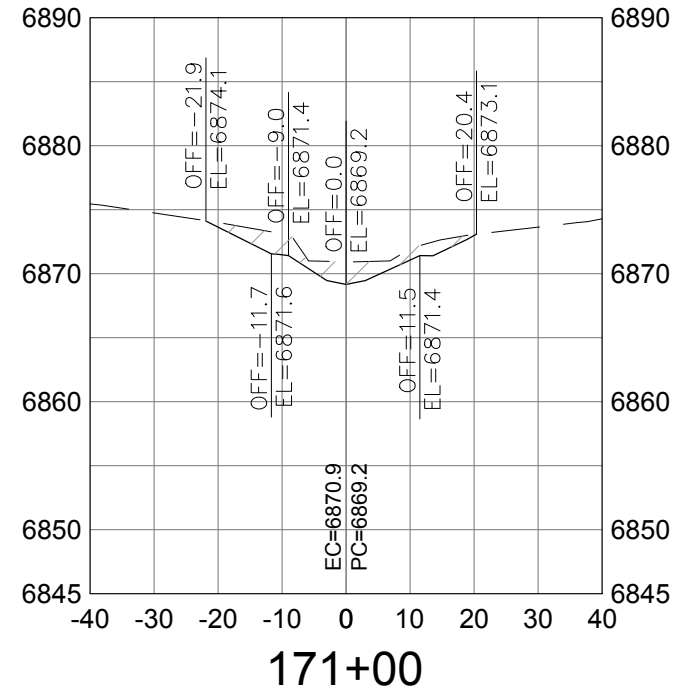
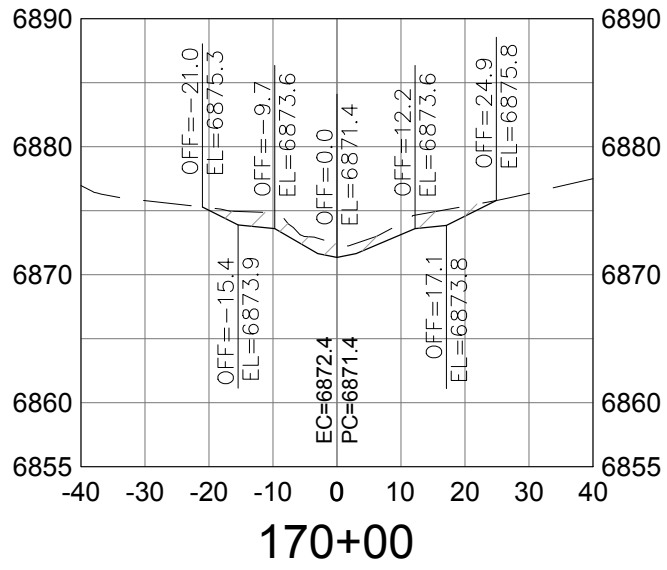
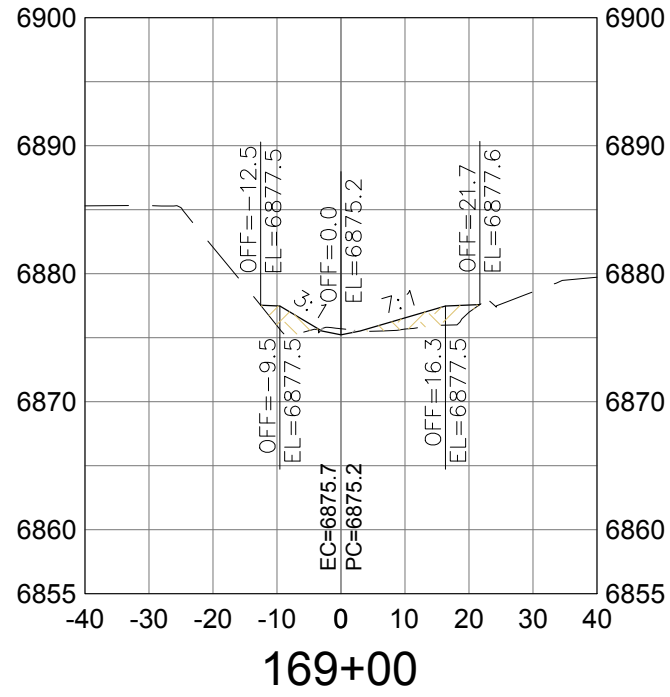


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

32610K
 Project No. Drawing No.
P1.11
 Sheet No.
 © Otak, Inc. 2015

DRAFT

C:\Dropbox (Ota, CO WMP)\Ota, CO WMP Team Folder\Projects\32610_LWP_Phase_2\W00_Wall_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 1
 dillon
 Printed: May 24, 2017 - 3:26pm



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

SECTION VIEWS 1

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO



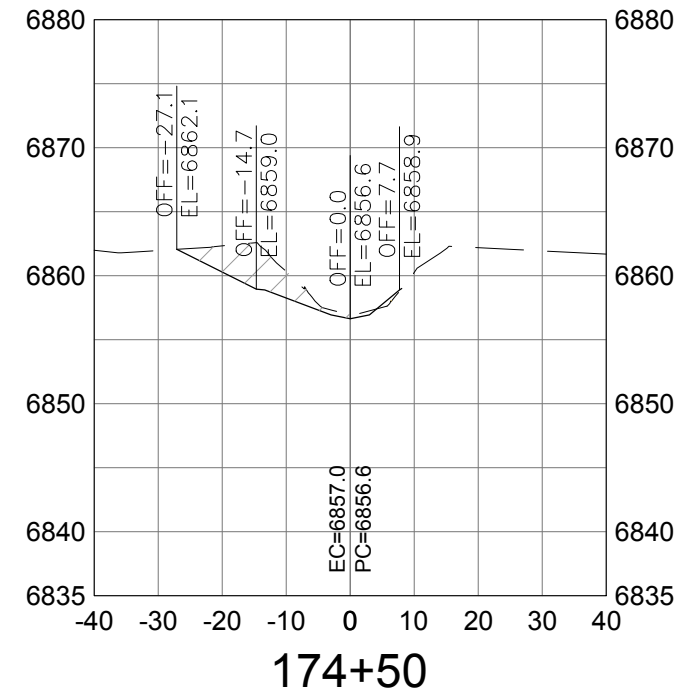
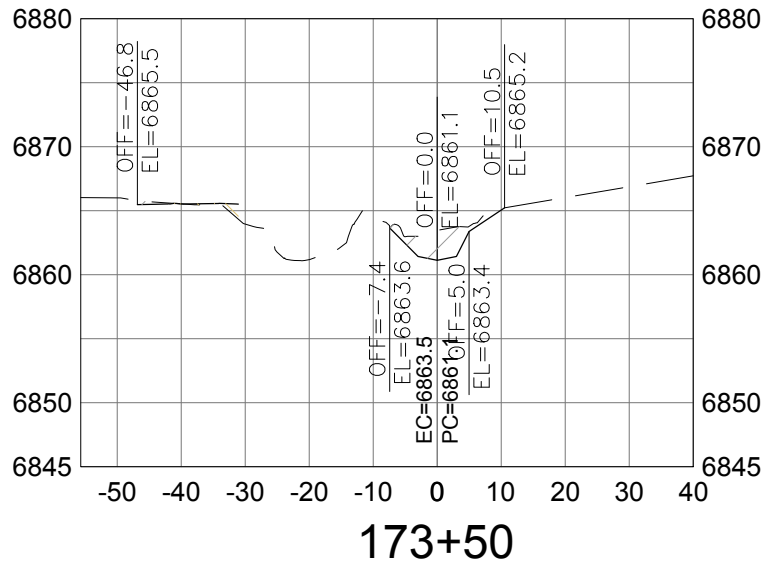
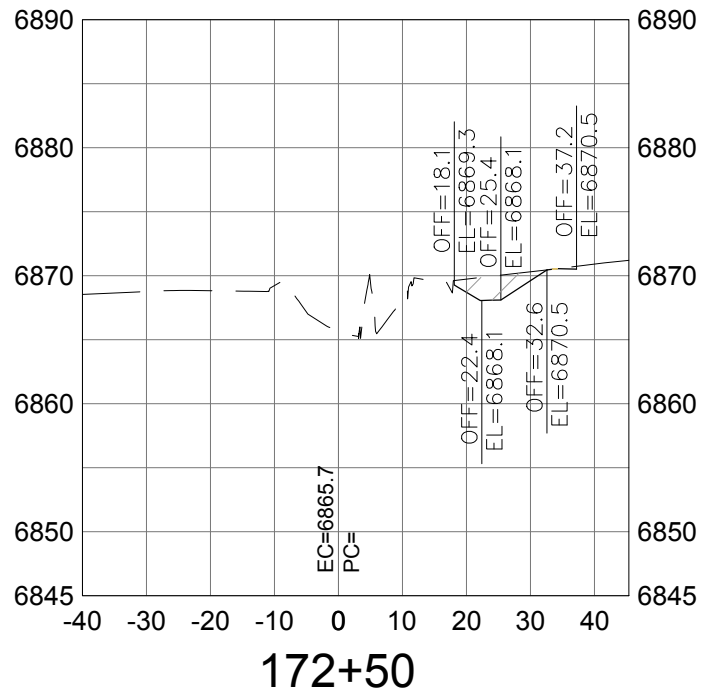
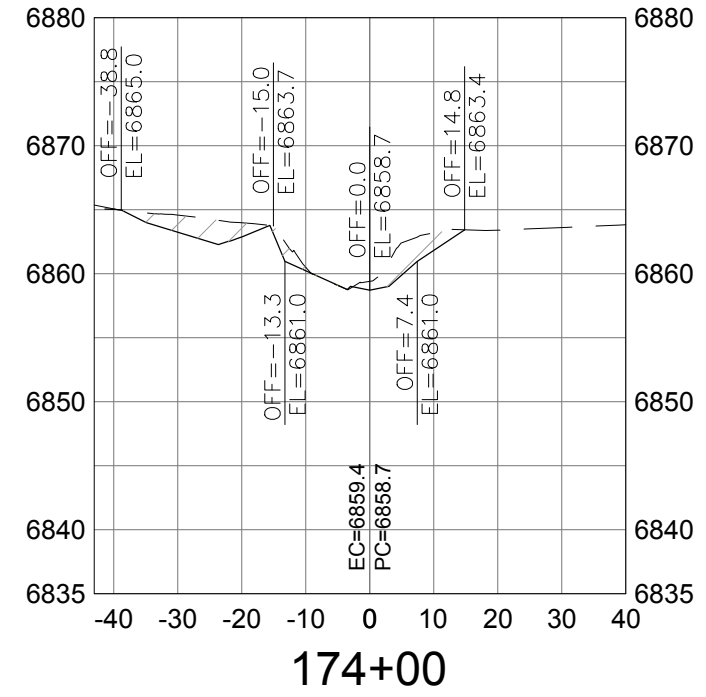
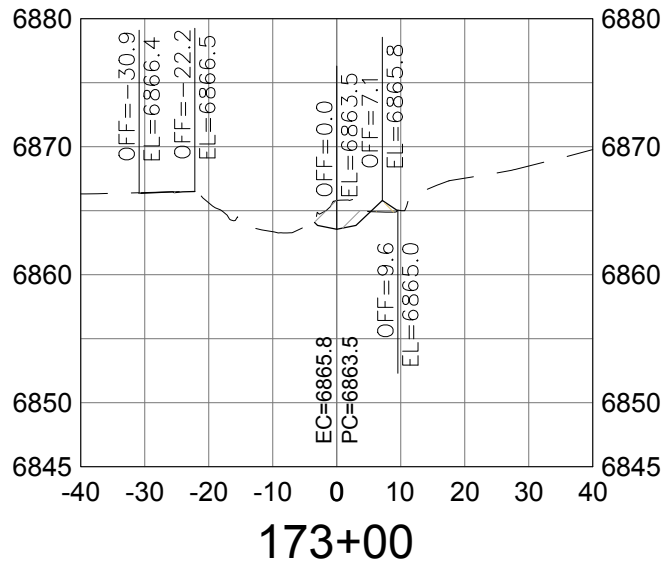
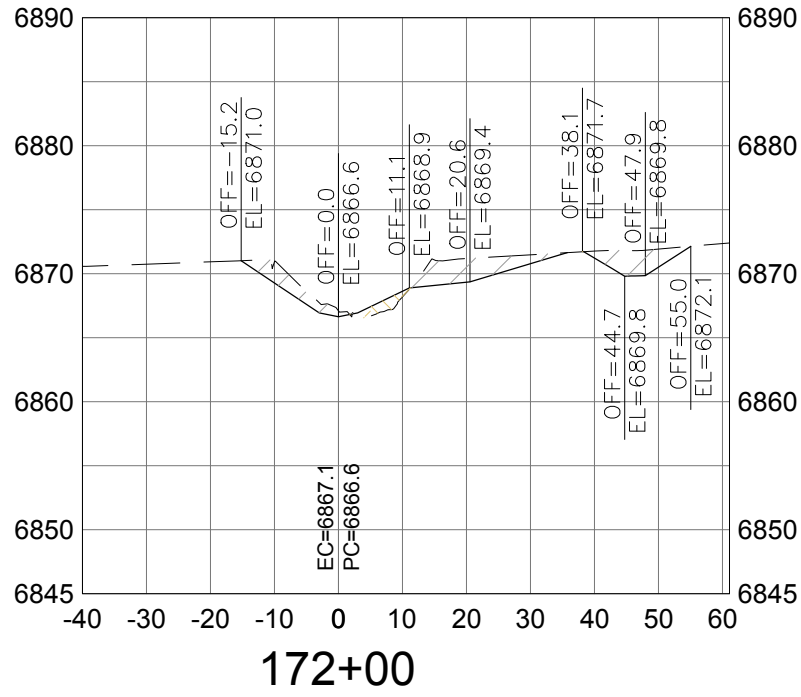
5777 Central Avenue
Suite 228
Boulder, Colorado 80304
Phone: 303-296-3304
Fax: 303-296-3699

DRAFT

32610K
Project No. Drawing No.
S2.1
Sheet No.
© Otak, Inc. 2015

Design Drawn Checked Date Initial Issue Date:
K.J. REW, ALJ 5/24/17 5/24/17

Plotted: May 24, 2017 - 3:26pm ellison C:\Dropbox (Otek, CO WMP) \Otek, CO WMP Team Folder\Projects\32610_LWP_Phase_2\VOO_Wall_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 2



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

SECTION VIEWS 2
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

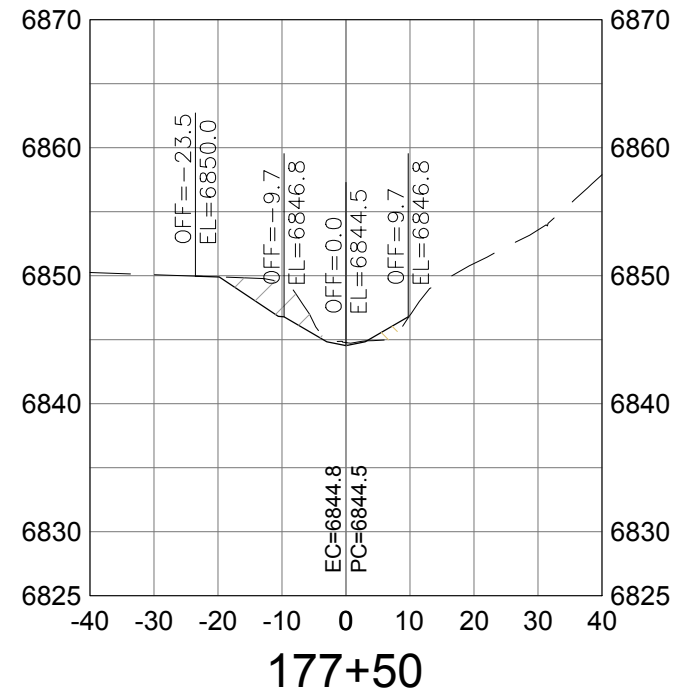
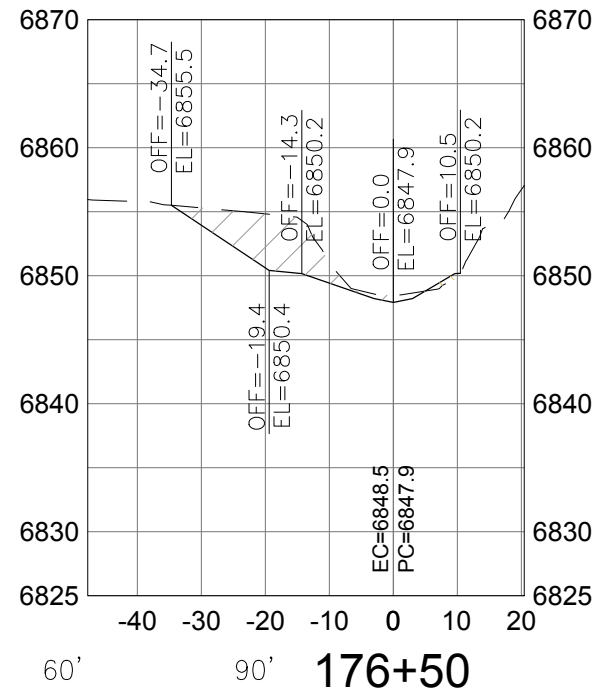
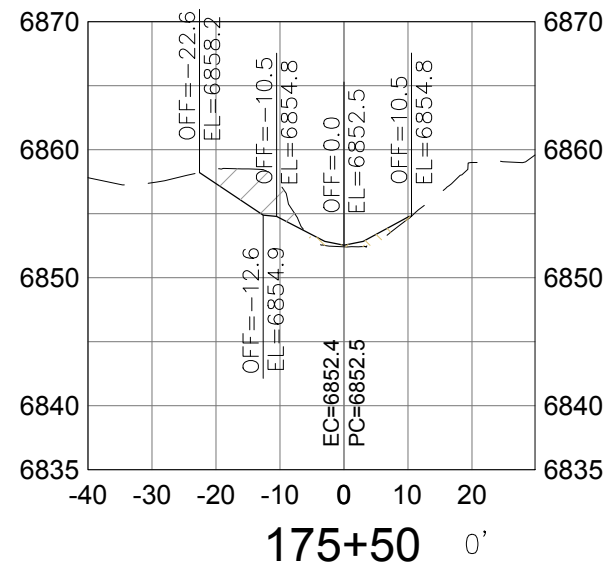
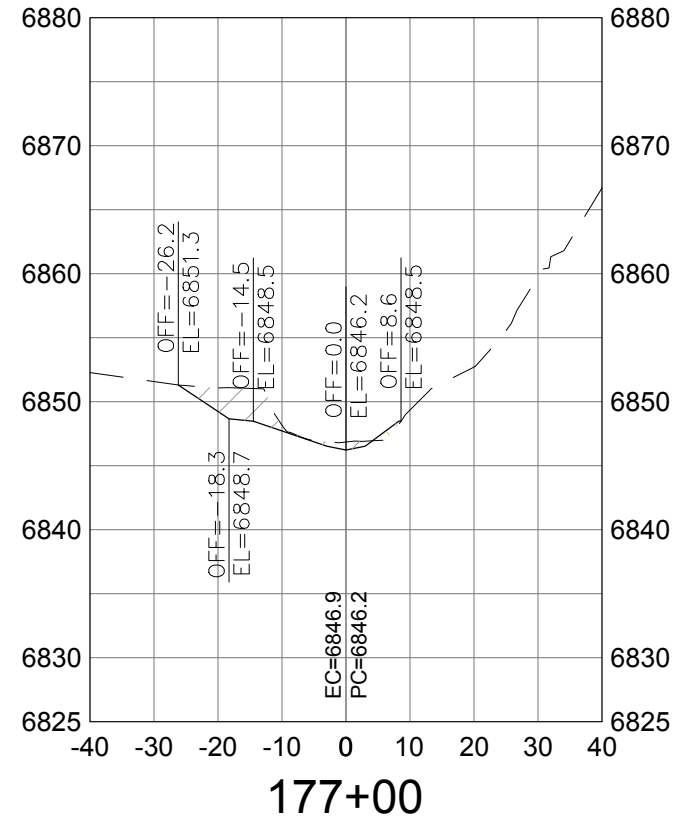
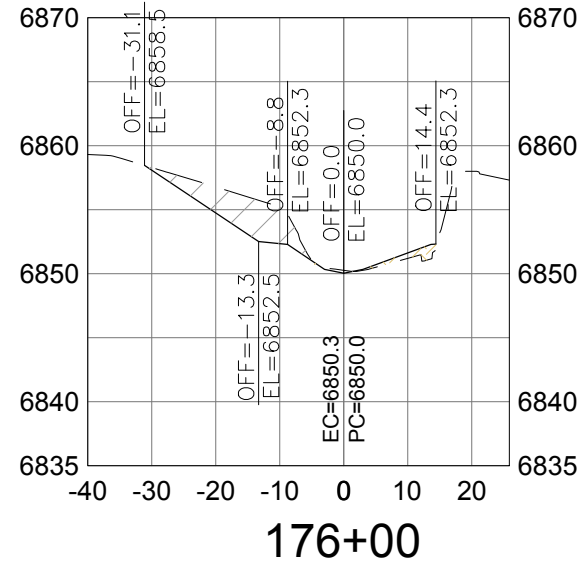
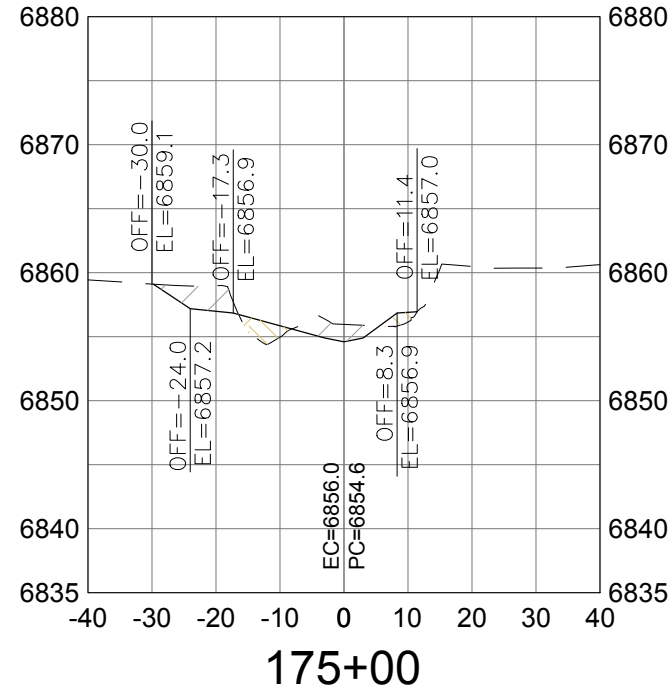


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80304
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

32610K
 Project No. Drawing No.
S2.2
 Sheet No.
 © Otak, Inc. 2015

Project: May 24, 2017 - 3:26pm ellison C:\Dropbox (Otek, CO WNR)\Otek, CO WNR Team Folder\Projects\32610_LWP_Phase_2\VOO_Wall_Street\CAD\Planets\2-Section_VIEWS.dwg Layout Name: SECTION VIEWS 3



2X VERTICAL EXAGGERATION

— PROPOSED CONDITION (PC)
 — EXISTING CONDITION (EC)

PROPOSED CUT
 PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

Design | Drawn | Checked | Date | Initial Issue Date:

K.J. REW, ALJ | 5/24/17 | 5/24/17

SECTION VIEWS 3
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
 Suite 228
 Boulder, Colorado 80304
 Phone: 303-296-3304
 Fax: 303-296-3699

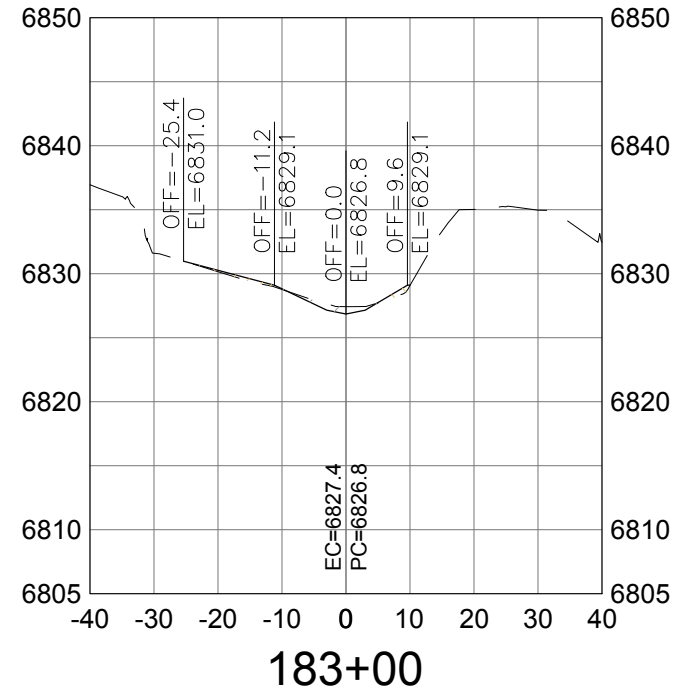
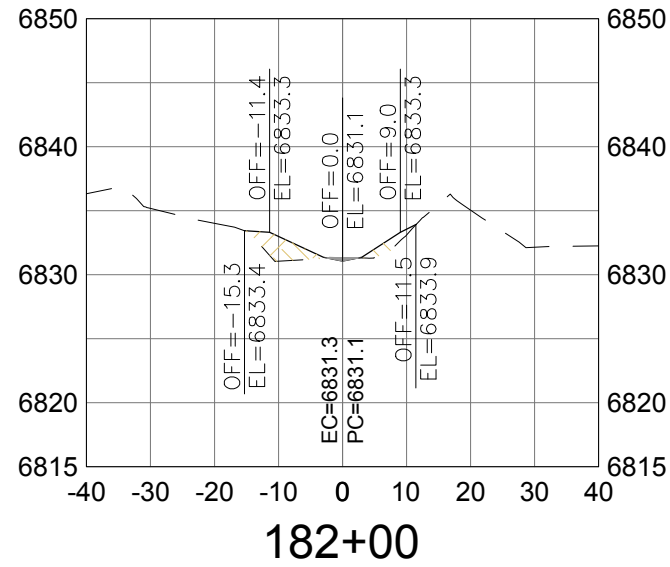
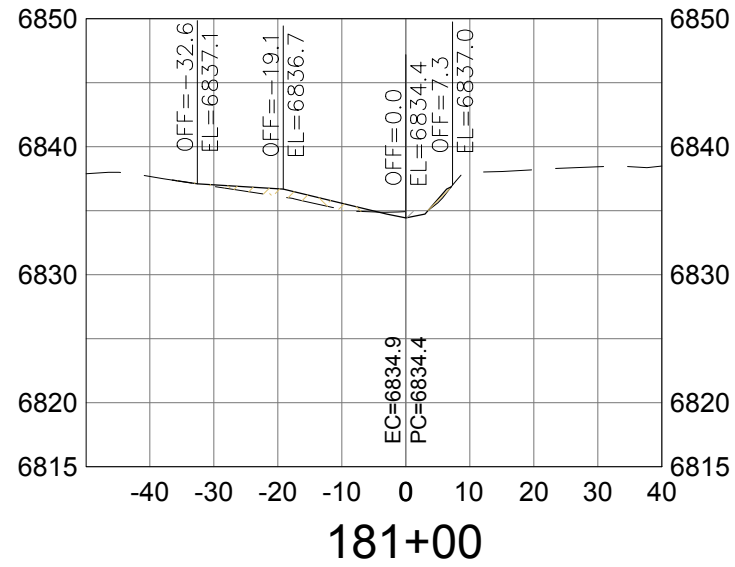
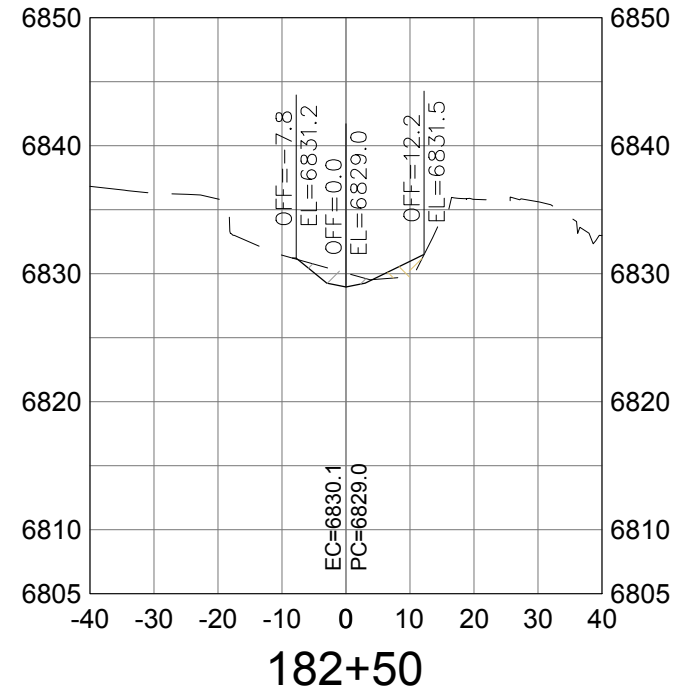
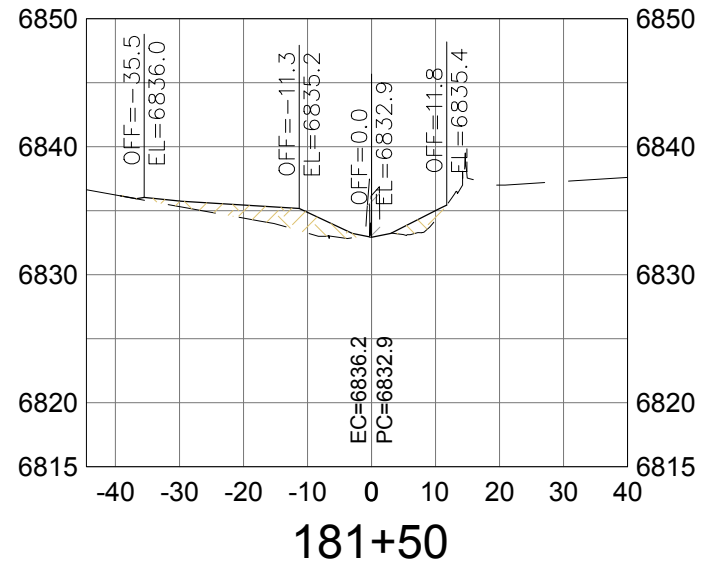
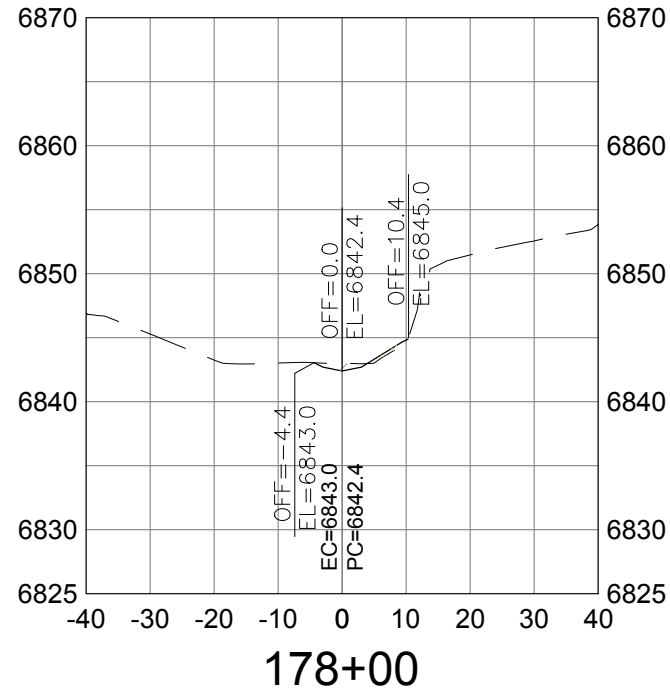
32610K
 Project No. Drawing No.

S2.3

Sheet No. © Otak, Inc. 2015

DRAFT

P:\Projects\2017\05\24\2017 - 326pm ellison C:\Dropbox (Otak, CO WNR) Team Folder\Projects\32610_LWP_Phase_2\WDR_Street\CAD\Planets\2-Section_VIEWS.dwg Layout Name: SECTION VIEWS 4



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



NO.	DATE	BY	REVISION COMMENTS

SECTION VIEWS 4
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



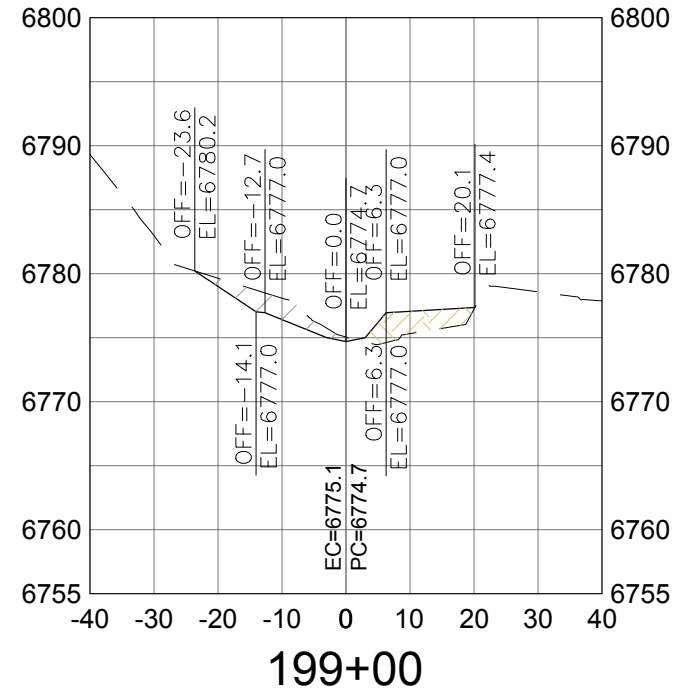
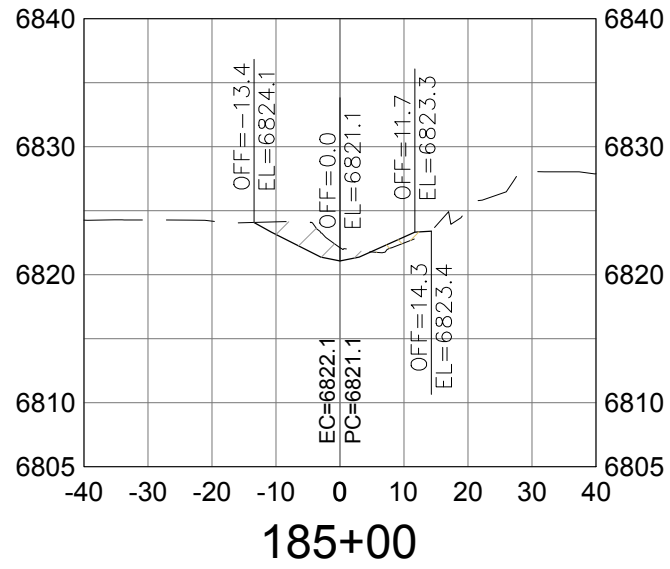
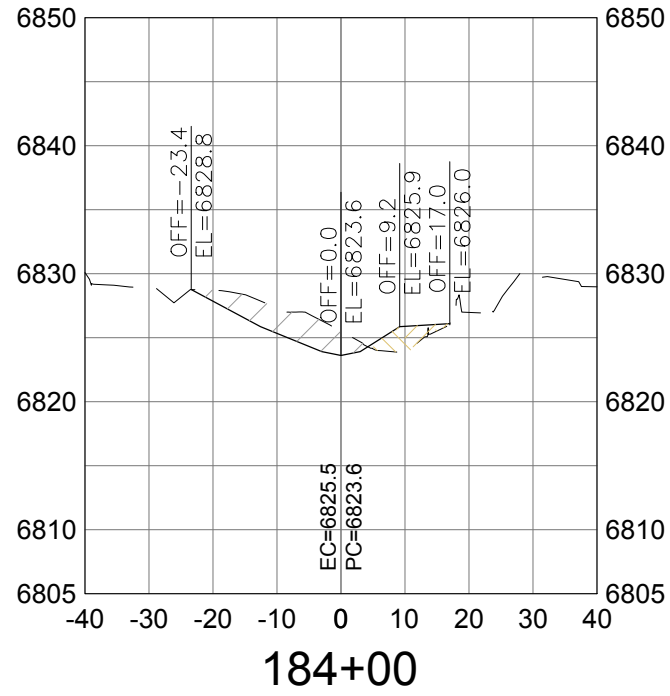
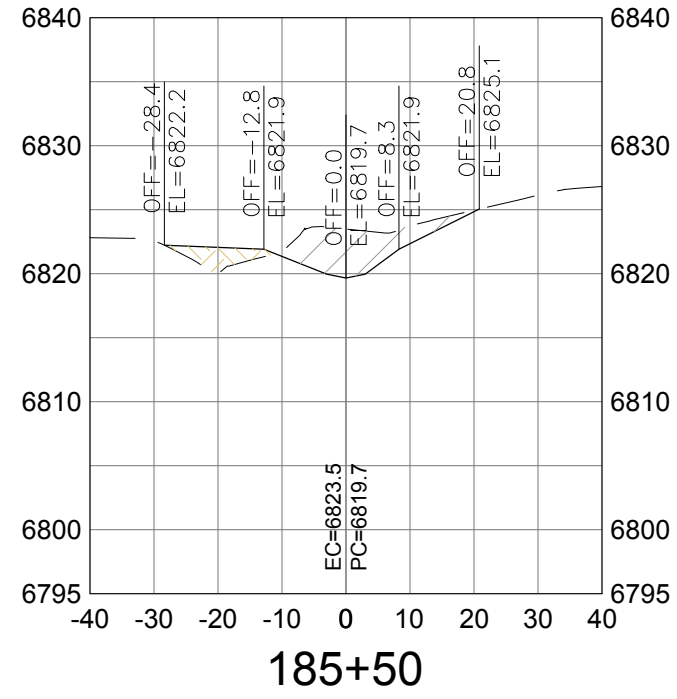
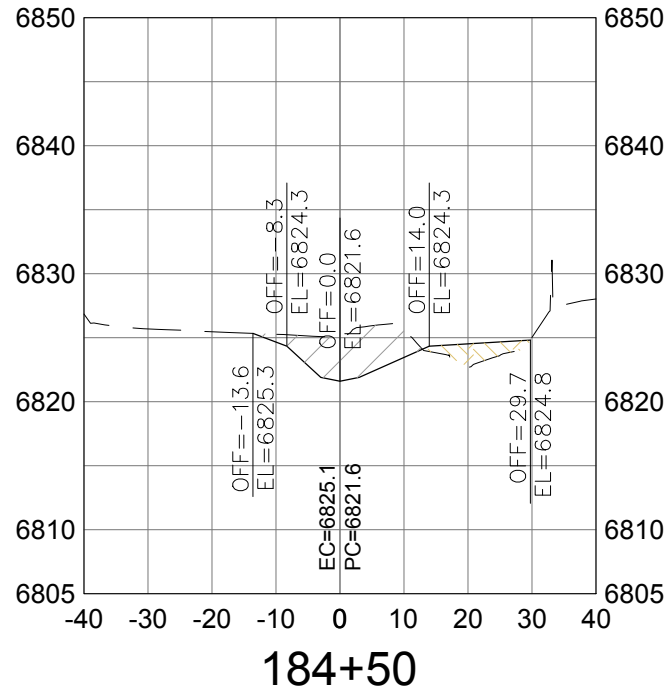
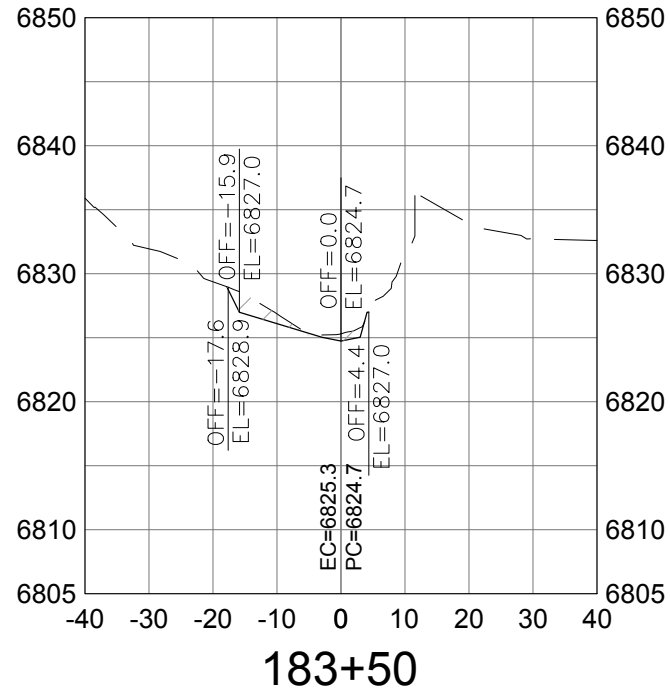
5777 Central Avenue
 Suite 228
 Boulder, Colorado 80304
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

32610K
 Project No.
 S2.4
 Sheet No.
 © Otak, Inc. 2015

Design Drawn Checked Date Initial Issue Date:
 K.J. REW, ALJ 5/24/17 5/24/17

Plotted: May 24, 2017 - 3:27pm ellison C:\Dropbox (Otek, CO WNR) \Otek, CO WNR Team Folder\Projects\32610_LWP_Phase_2\WOD_Wall_Street\CAD\Planets\2-Section_VIEWS.dwg Layout Name: SECTION VIEWS 5



2X VERTICAL EXAGGERATION

— PROPOSED CONDITION (PC)
 - - - EXISTING CONDITION (EC)

PROPOSED CUT
 PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

SECTION VIEWS 5
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



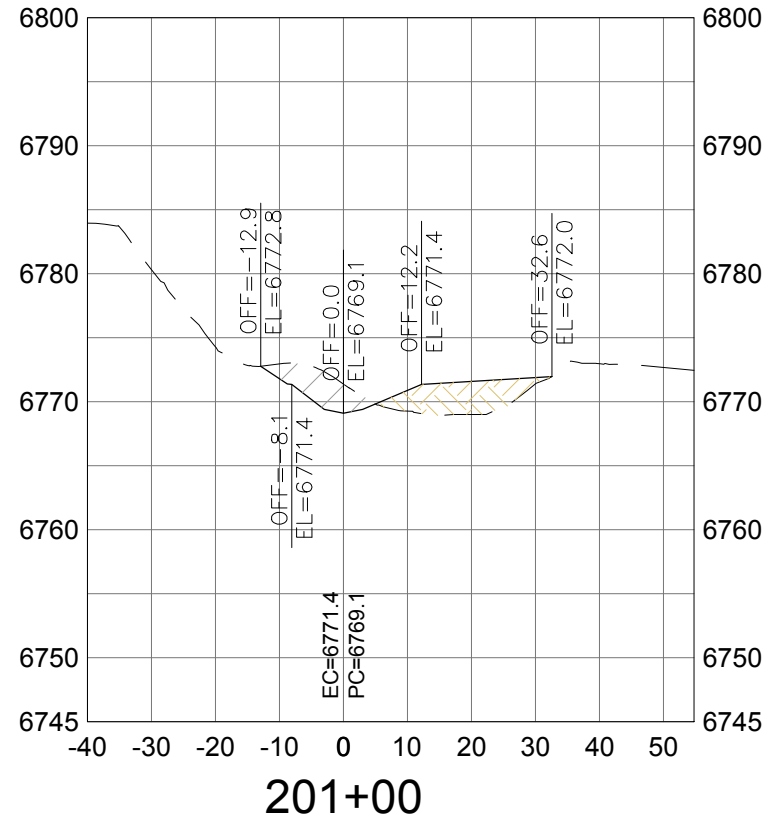
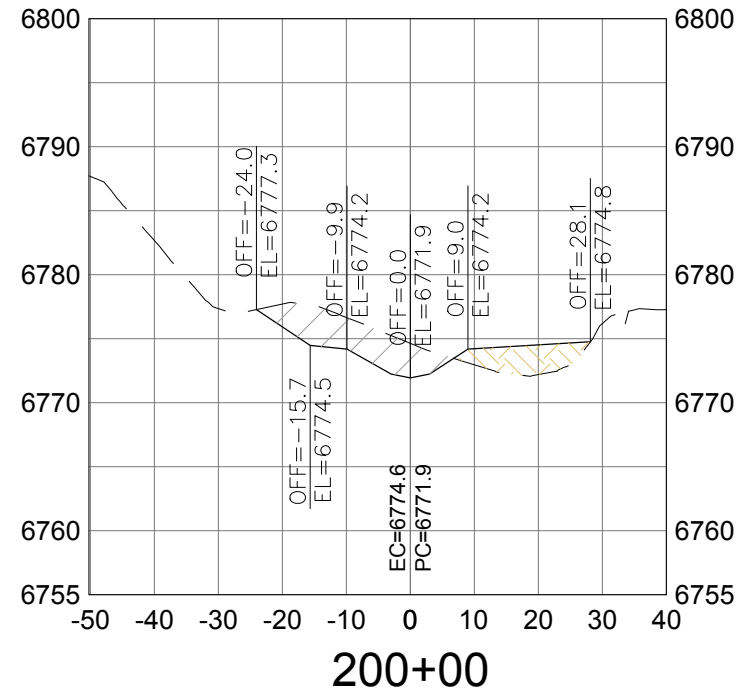
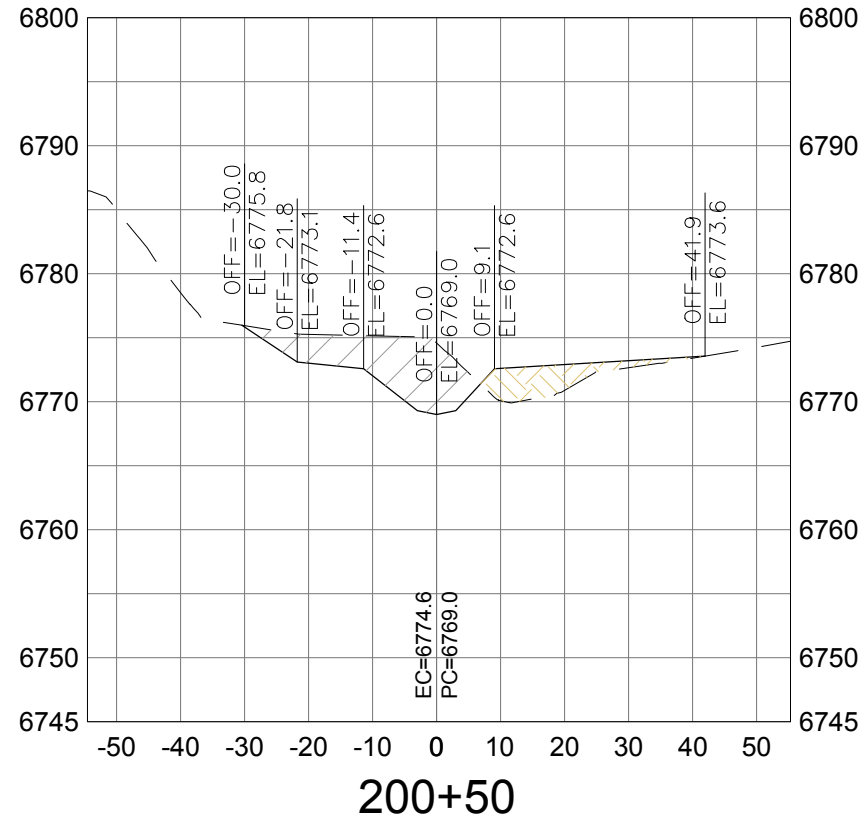
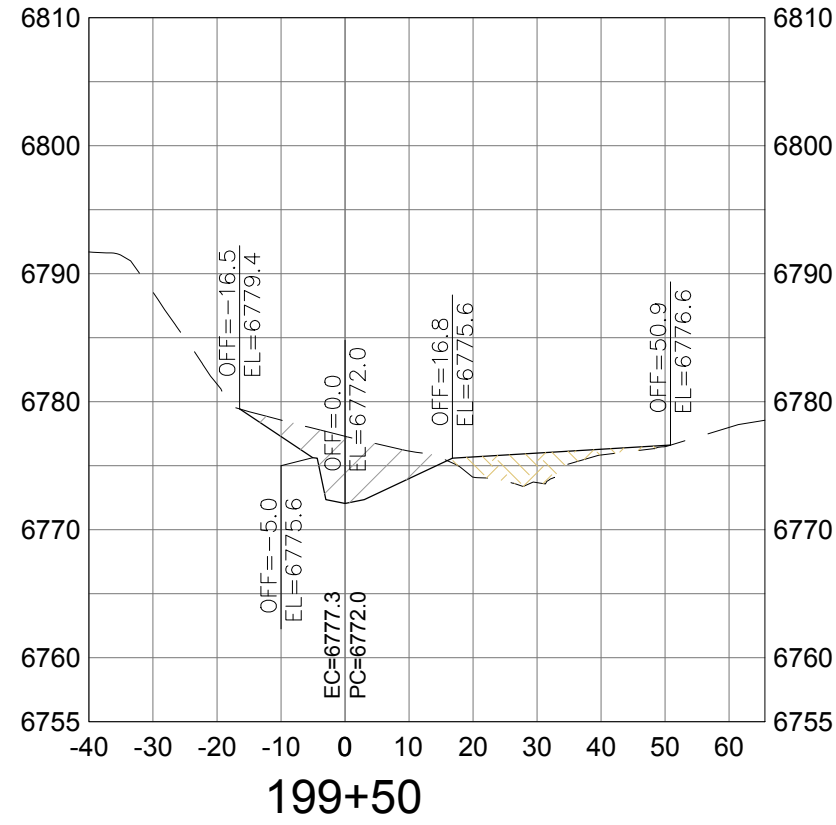
5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

32610K
 Project No. Drawing No.
S2.5
 Sheet No.
 © Otak, Inc. 2015

Design Drawn Checked Date Initial Issue Date:
 K.J. R.E.W. A.L.J. 5/24/17 5/24/17

Plotted: May 24, 2017 - 3:27pm ellison C:\Dropbox (Otak, CO WNR) Team Folder\Projects\32610_LWP_Phase_2\WOOD_Wall_Street\CAD\Planes\2-Section_VIEWS.dwg Layout Name: SECTION VIEWS 6



- 2X VERTICAL EXAGGERATION
- PROPOSED CONDITION (PC)
- - - EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

Design	Drawn	Checked	Date	Initial	Issue Date
K.J.	REW, ALJ		5/24/17		5/24/17

SECTION VIEWS 6
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

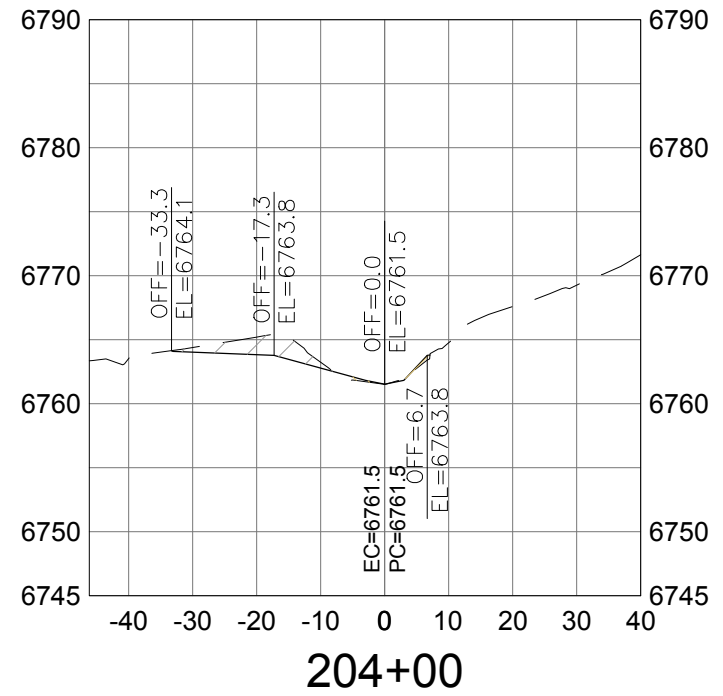
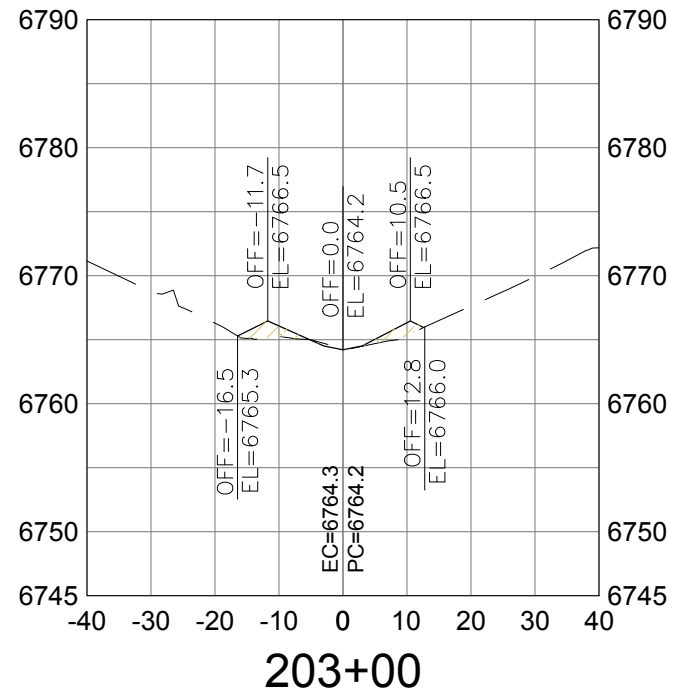
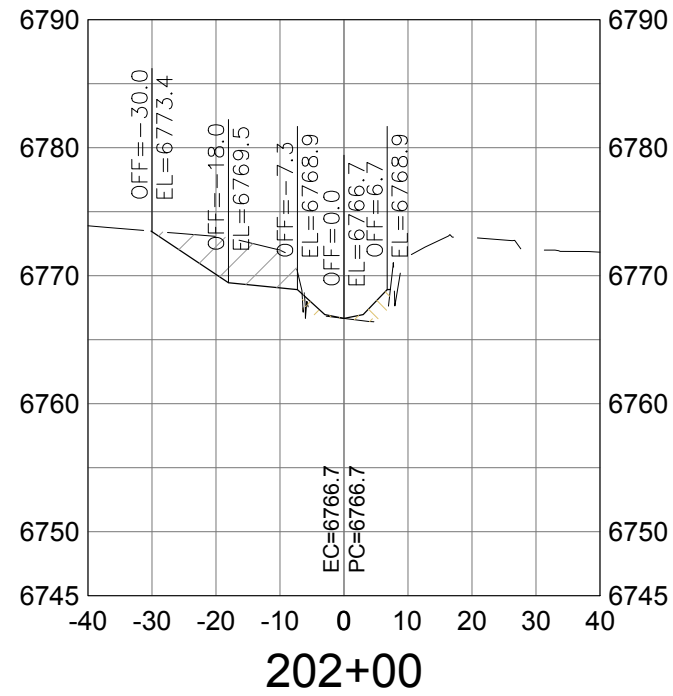
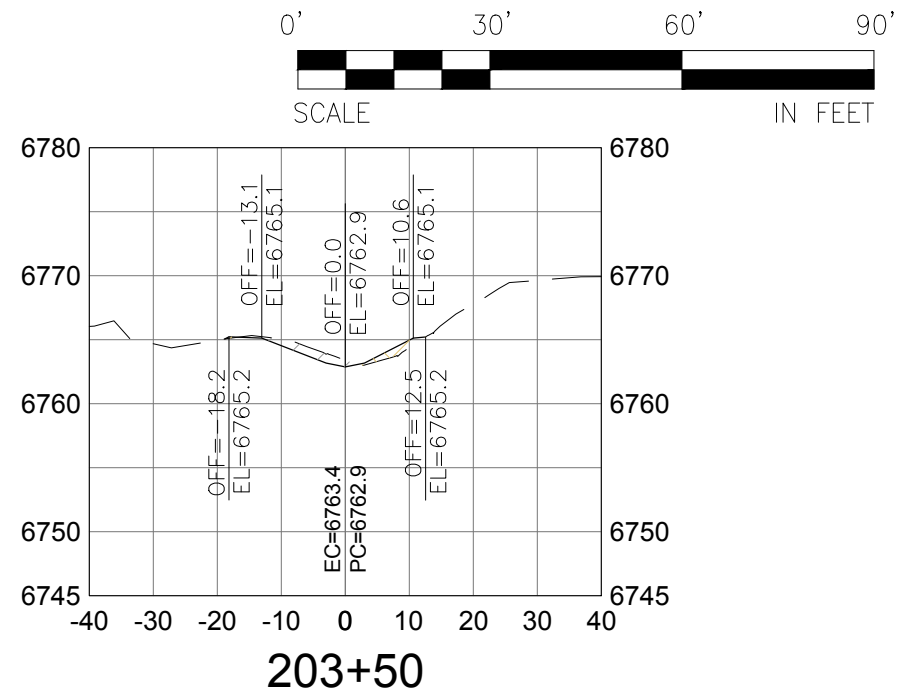
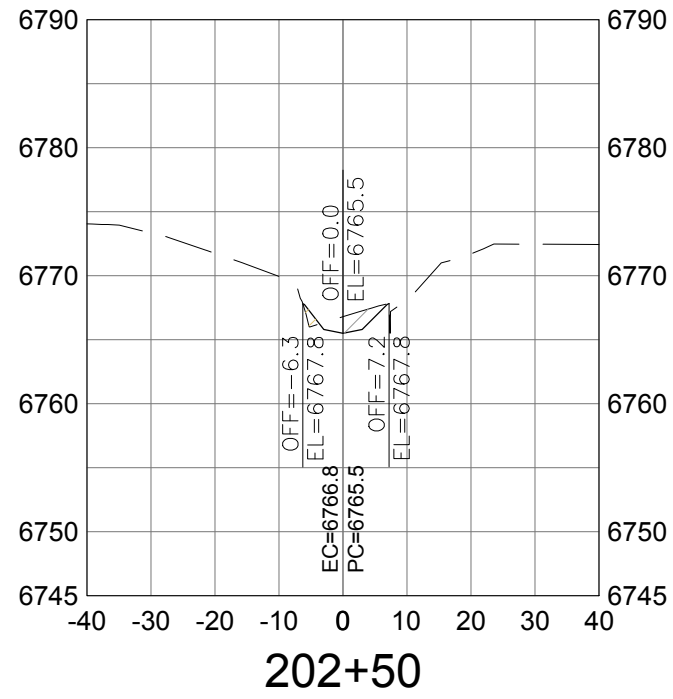
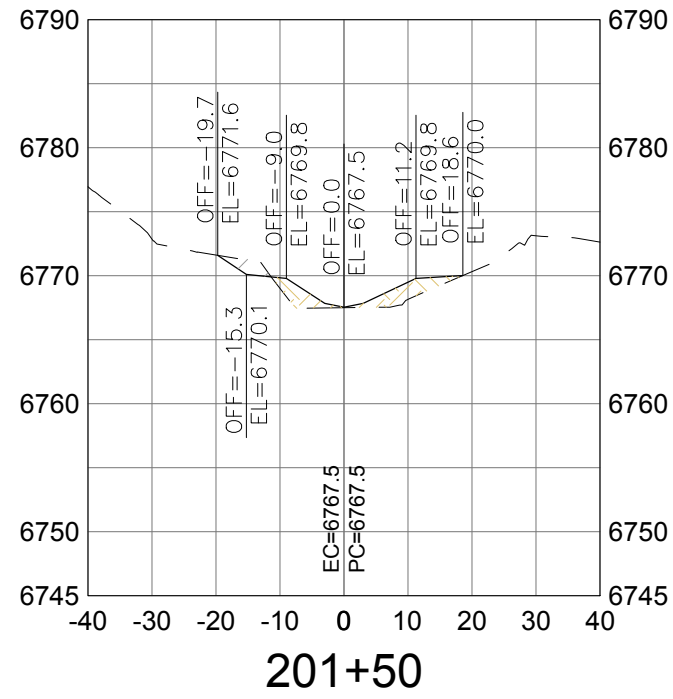


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

32610K
 Project No. Drawing No.
S2.6
 Sheet No.
 © Otak, Inc. 2015

DRAFT

C:\Dropbox (Ota, CO WNR)\Ota, CO WNR Team Folder\Projects\32610_LWP_Phase_2\WDR_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 7
 Printed: May 24, 2017 - 3:27pm ellison



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

Design Drawn Checked Date Initial Issue Date:
K.J. REW, ALJ 5/24/17 5/24/17

SECTION VIEWS 7
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

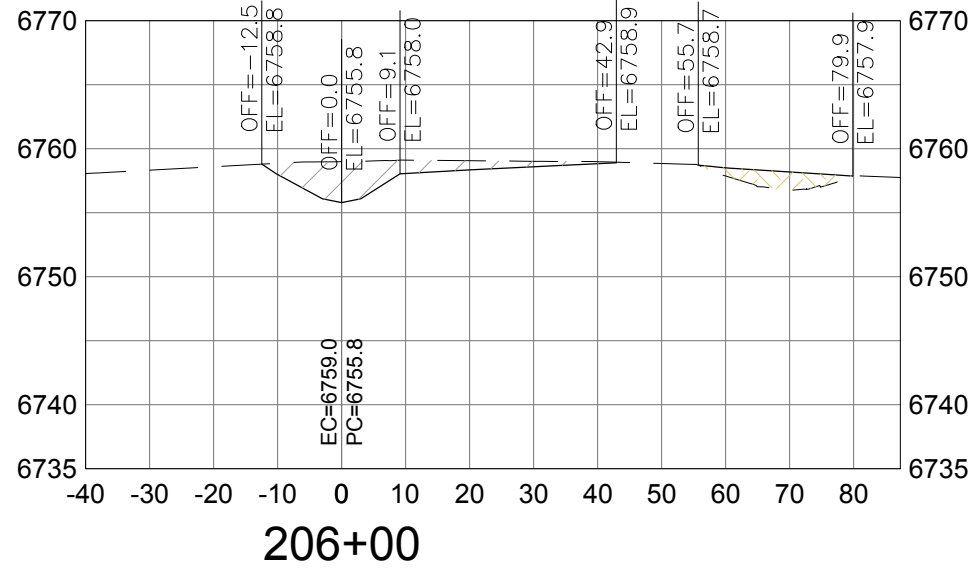
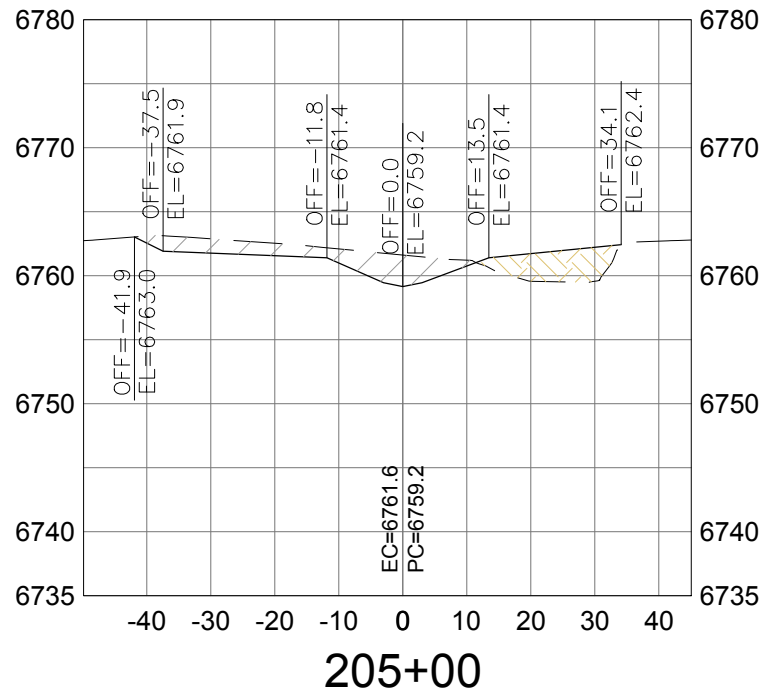
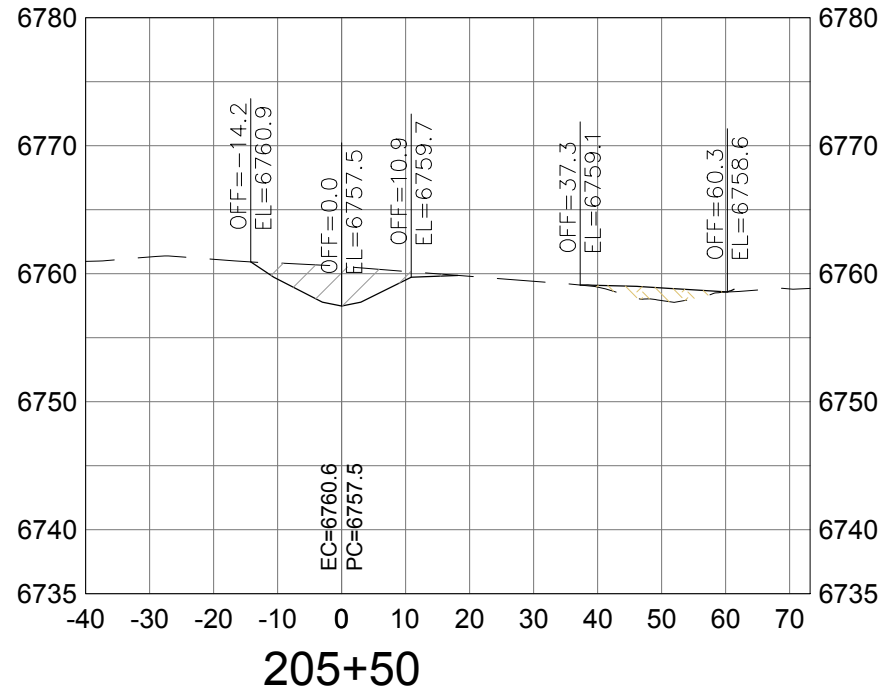
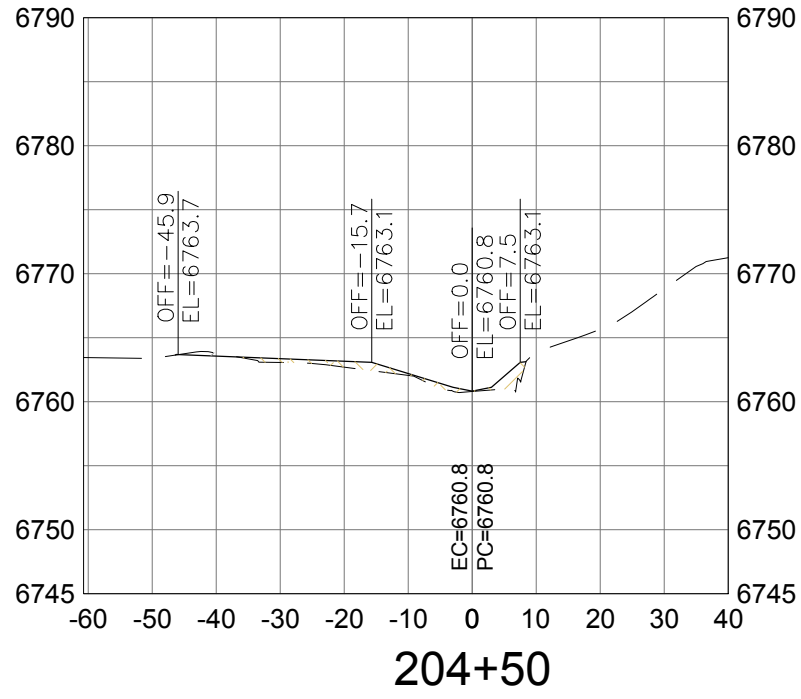


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

32610K
 Project No. Drawing No.
S2.7
 Sheet No.
 © Otak, Inc. 2015

DRAFT

Plotted: May 24, 2017 - 3:27pm ellison C:\Dropbox (Otek, CO WNR)\Otek, CO WNR Team Folder\Projects\32610_LWP_Phase_2\WDR_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 8



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- - - EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL

PREPARED FOR:

SECTION VIEWS 8

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3304
Fax: 303-296-3699

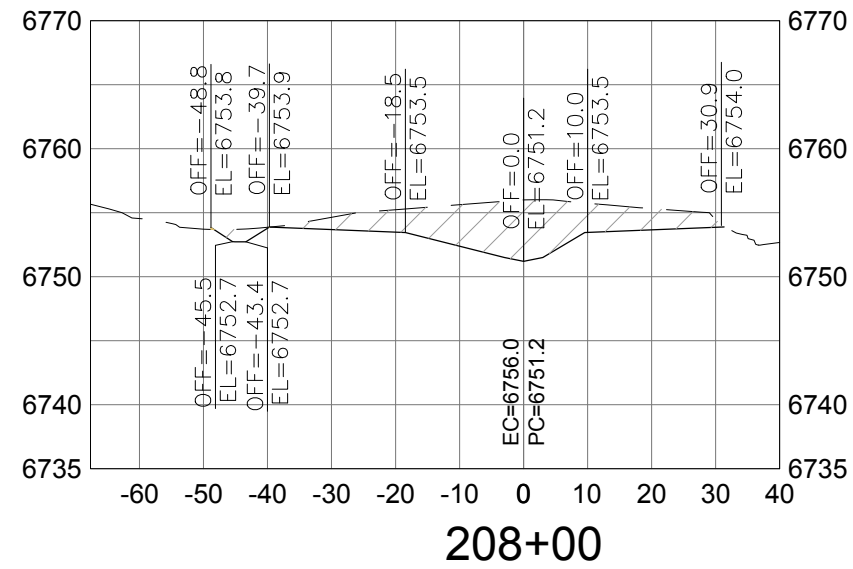
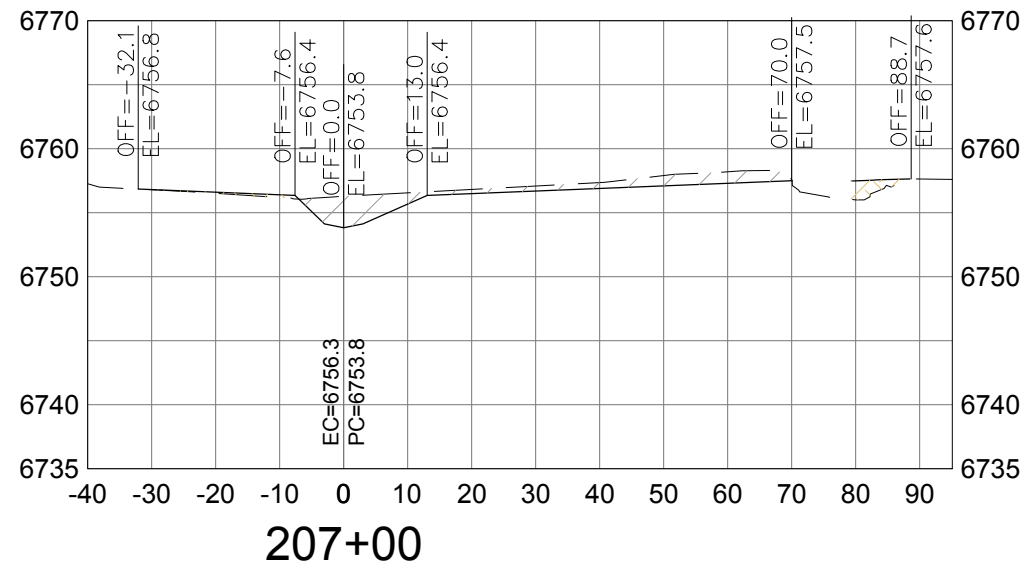
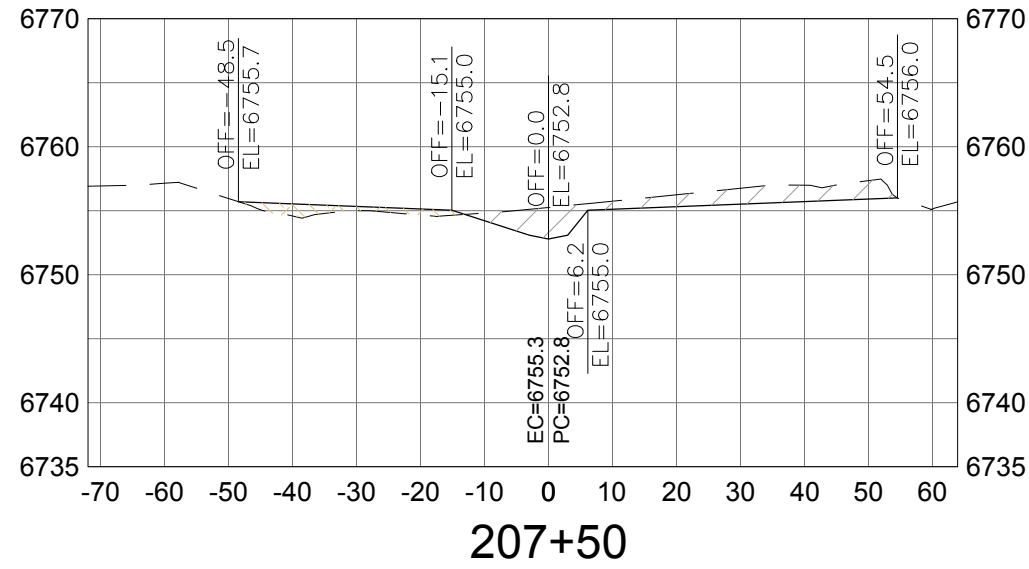
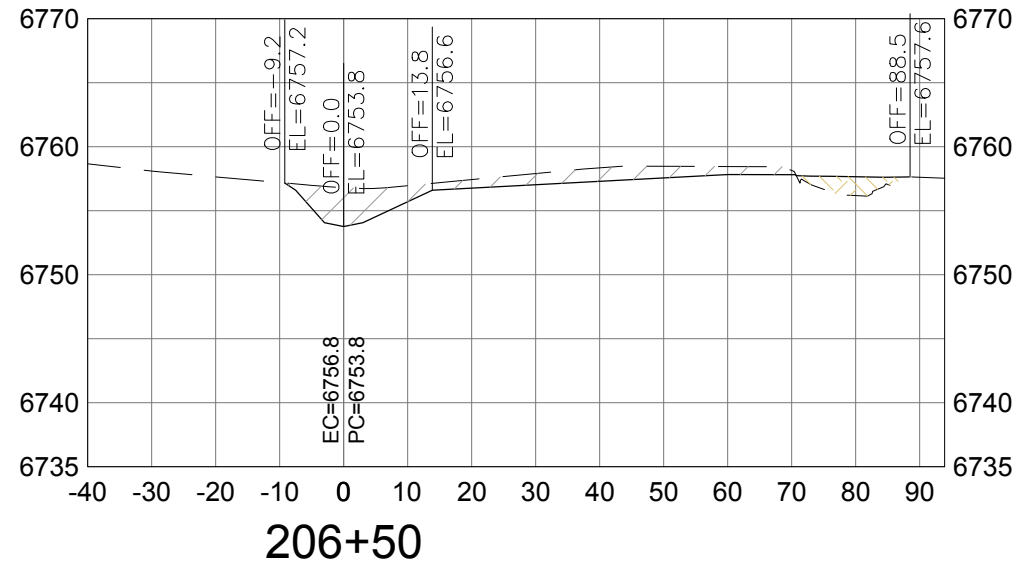
32610K
Project No. Drawing No.
S2.8
Sheet No.
© Otak, Inc. 2015

NO.	DATE	BY	REVISION COMMENTS

Design	Drawn	Checked	Date	Initial Issue Date:
K.J. REW, ALJ			5/24/17	5/24/17



DRAFT

Plotted: May 24, 2017 - 3:27pm
 ellison
 C:\Dropbox (Otek, CO WNR)\Otek, CO WNR Team Folder\Projects\32610_LWP_Phase_2\W00_Wall_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 9



2X VERTICAL EXAGGERATION

——— PROPOSED CONDITION (PC)
 ——— EXISTING CONDITION (EC)

 PROPOSED CUT
 PROPOSED FILL

SECTION VIEWS 9
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

32610K
 Project No. Drawing No.

S2.9

Sheet No.
 © Otak, Inc. 2015

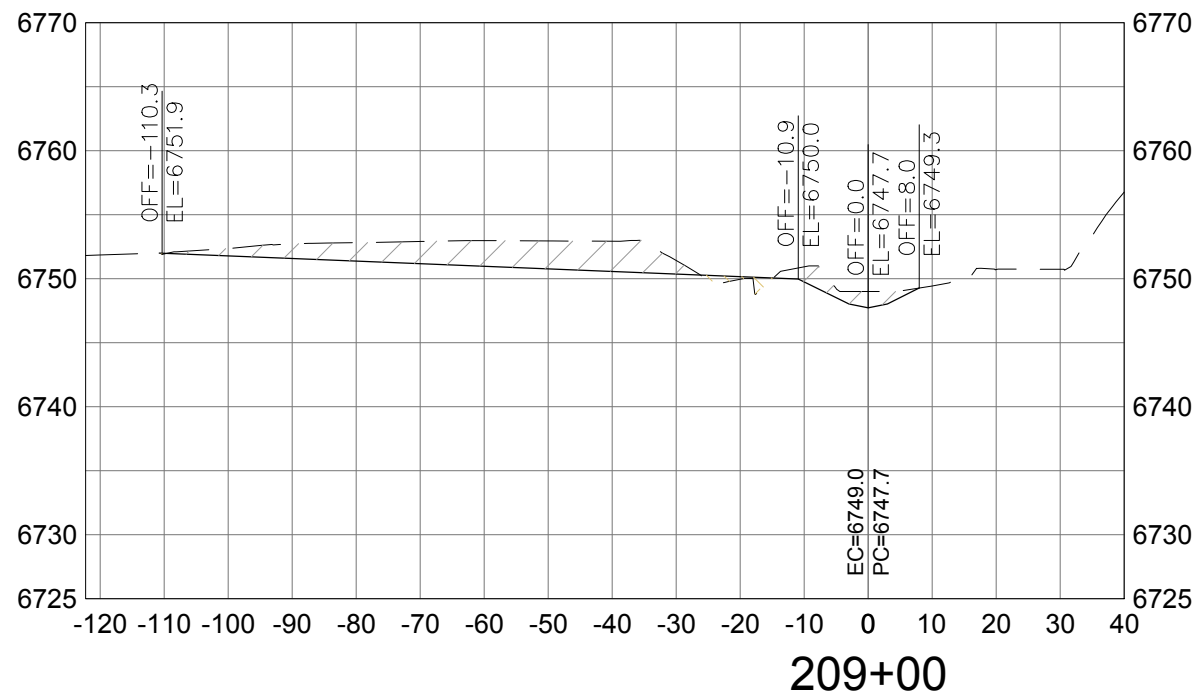
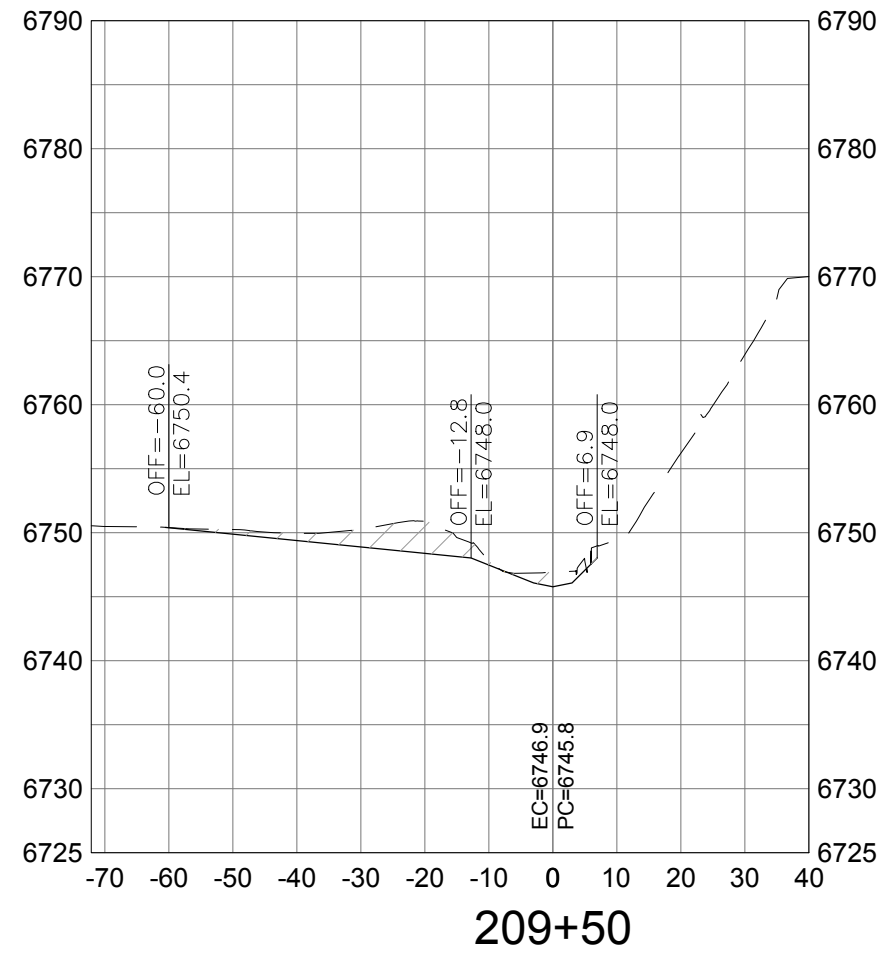
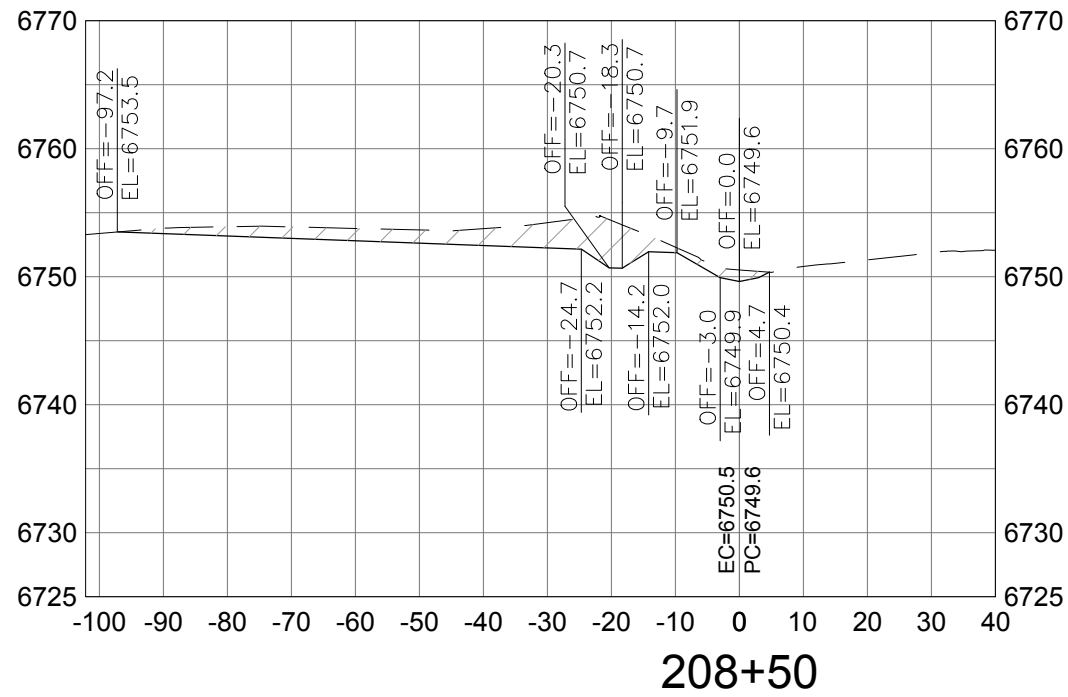
DRAFT

PREPARED FOR:



NO.	DATE	BY	REVISION COMMENTS
Design	Drawn	Checked	Date
K.J.	REW, ALJ		5/24/17
			Initial Issue Date:

Plotted: May 24, 2017 - 3:27pm ellison C:\Dropbox (Otek CO WNR) Team Folder\Projects\32610_LWP_Phase_2\WOD_Wall_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 10



2X VERTICAL EXAGGERATION



- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL

PREPARED FOR:

SECTION VIEWS 10
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

otak
 5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-298-3304
 Fax: 303-298-3899

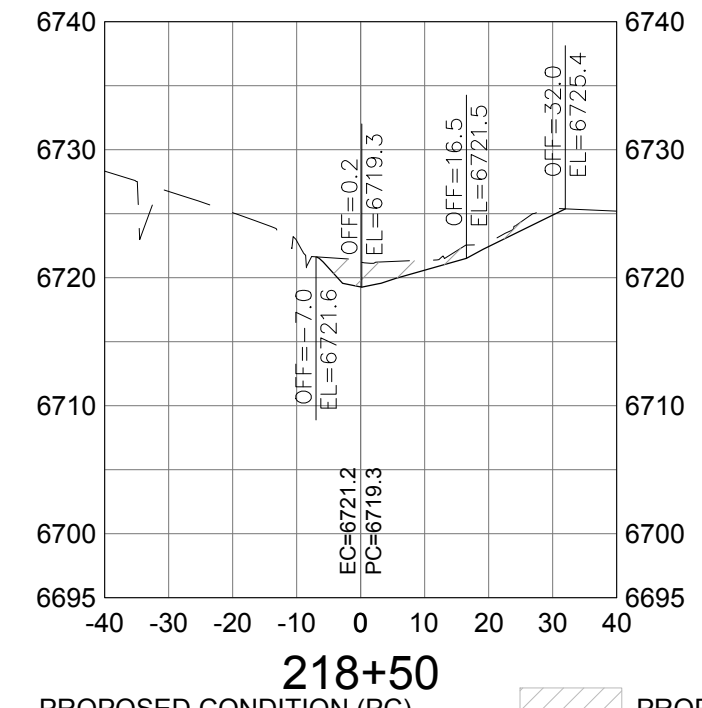
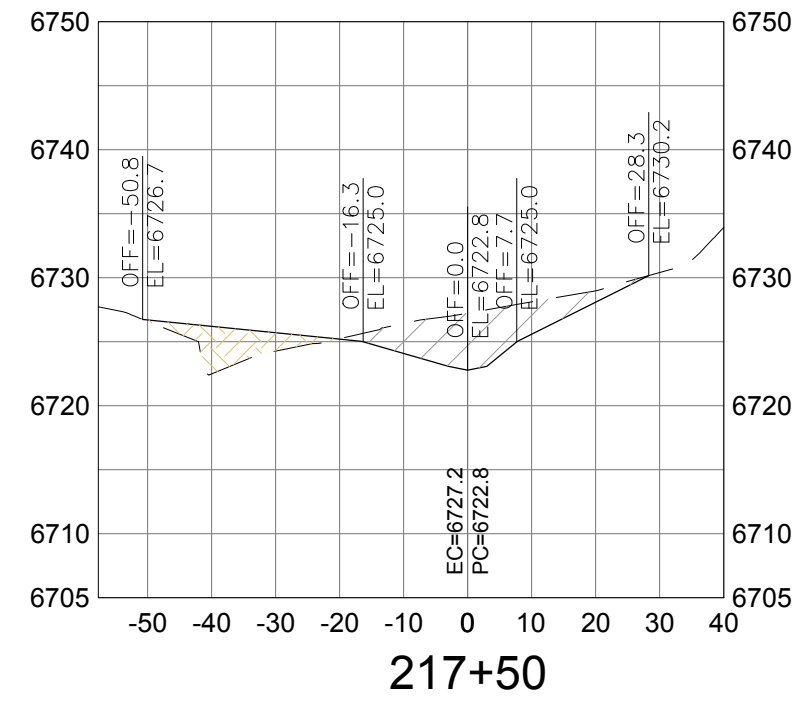
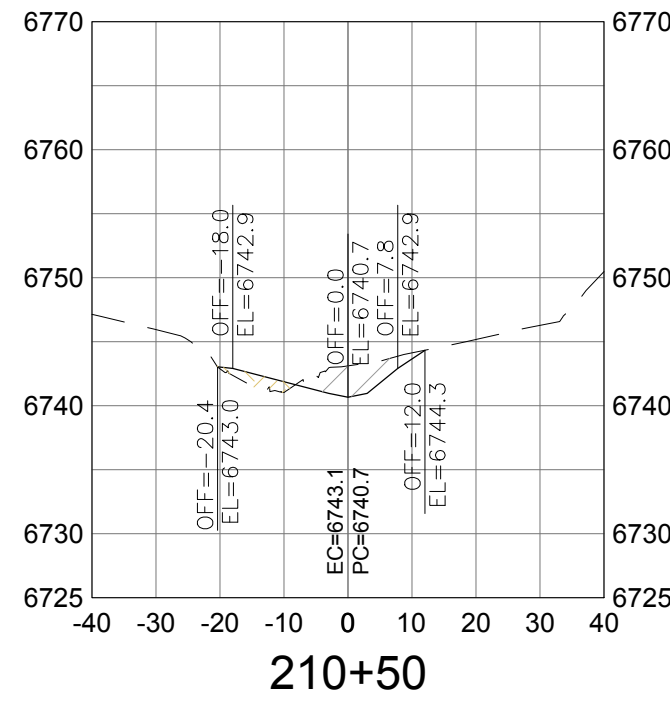
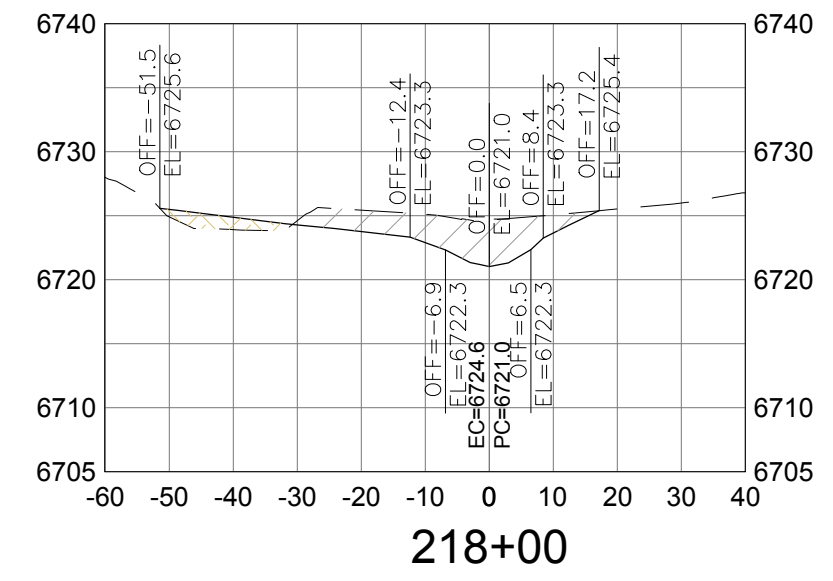
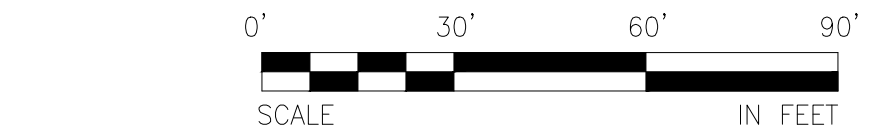
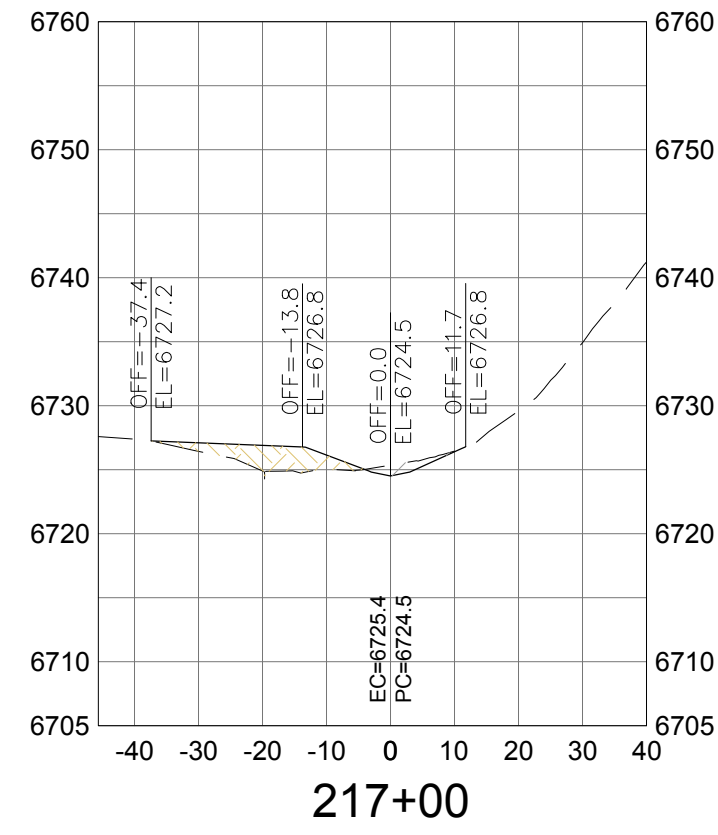
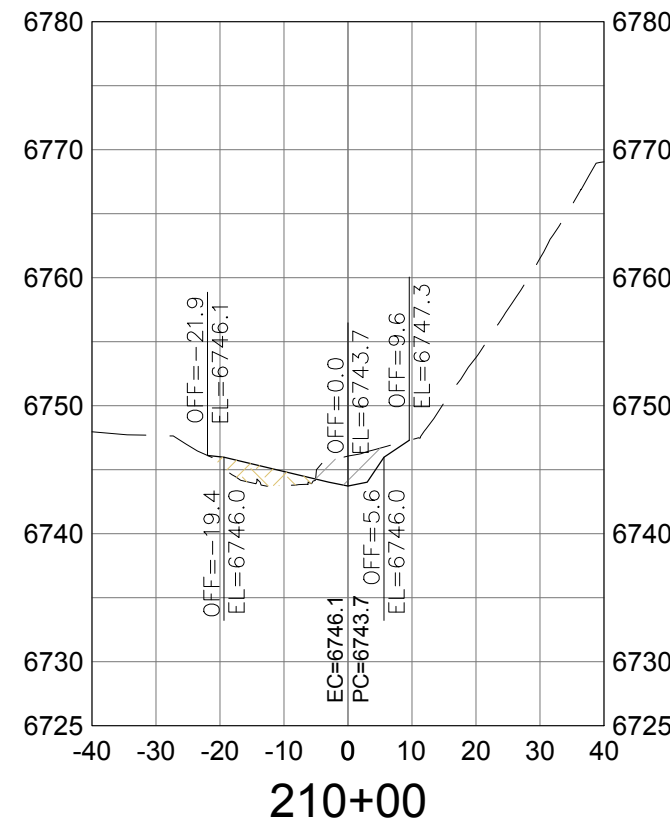
DRAFT

32610K
 Project No. Drawing No.
S2.10
 Sheet No.
 © Otak, Inc. 2015

NO.	DATE	BY	REVISION COMMENTS

Design	Drawn	Checked	Date	Initial Issue Date:
K.J.	REW, ALJ		5/24/17	5/24/17

Project: May 24, 2017 - 3:27pm
 ellison C:\Dropbox (Olat, CO WRR)\Olat, CO WRR Team Folder\Projects\32610_LWP_Phase_2\WDR_Wall_Street\CAD\Planets\2-Section Views.dwg Layout Name: SECTION VIEWS 11



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL

PREPARED FOR:

SECTION VIEWS 11

WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO



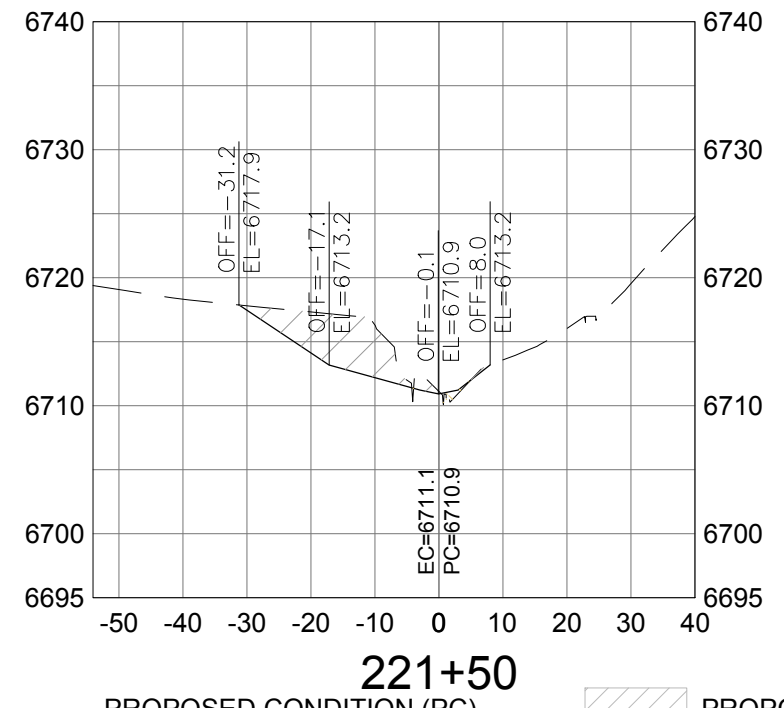
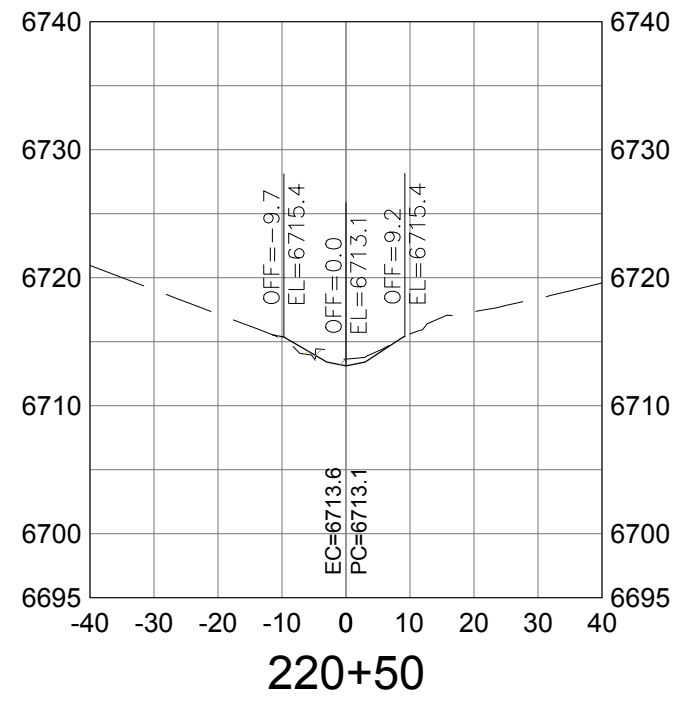
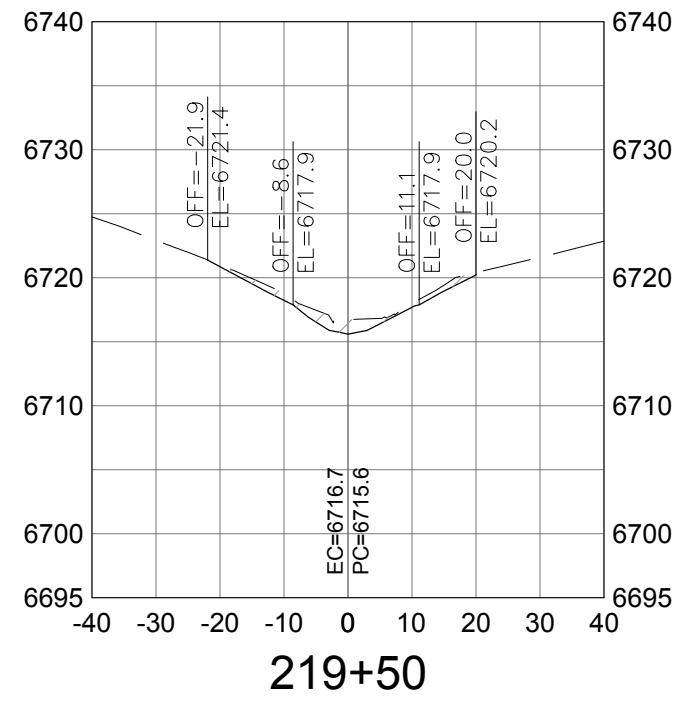
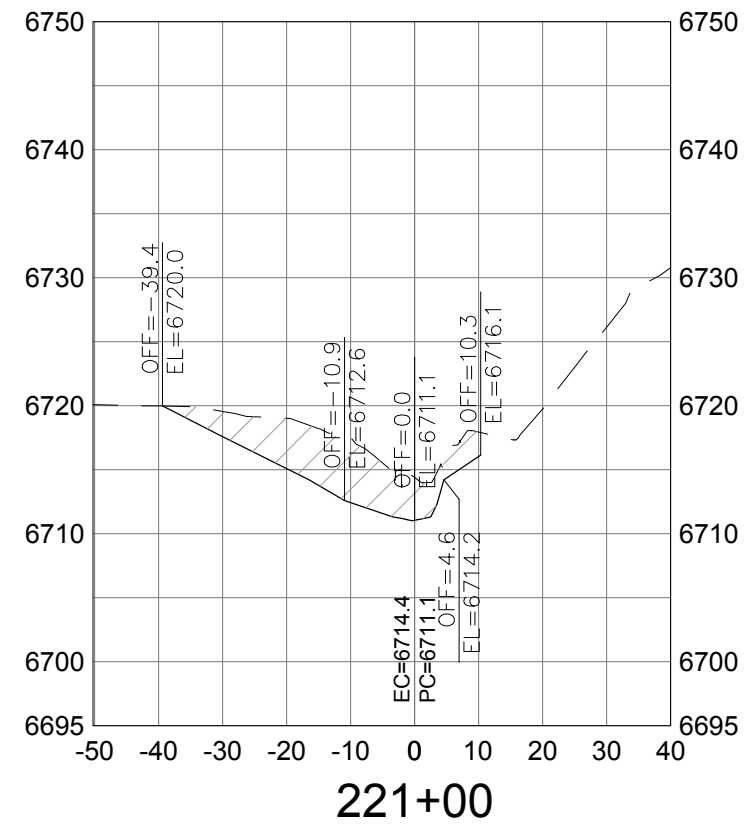
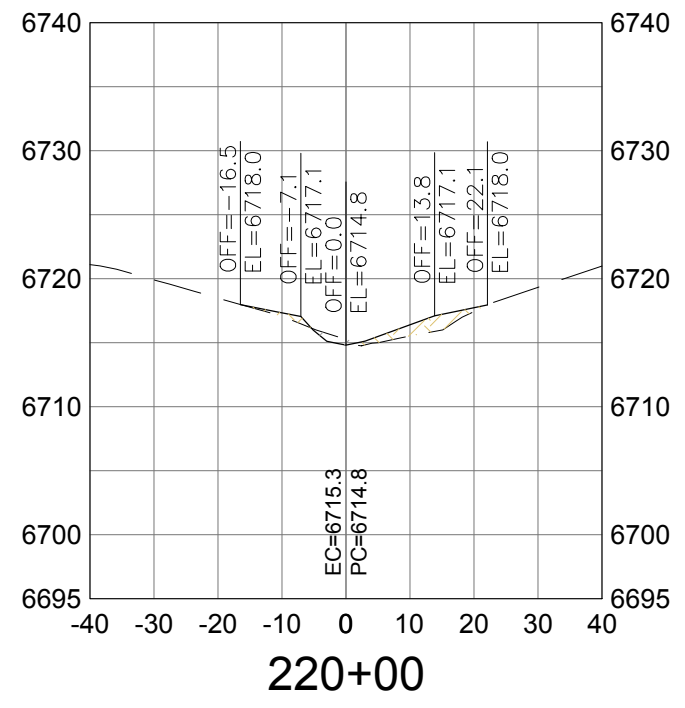
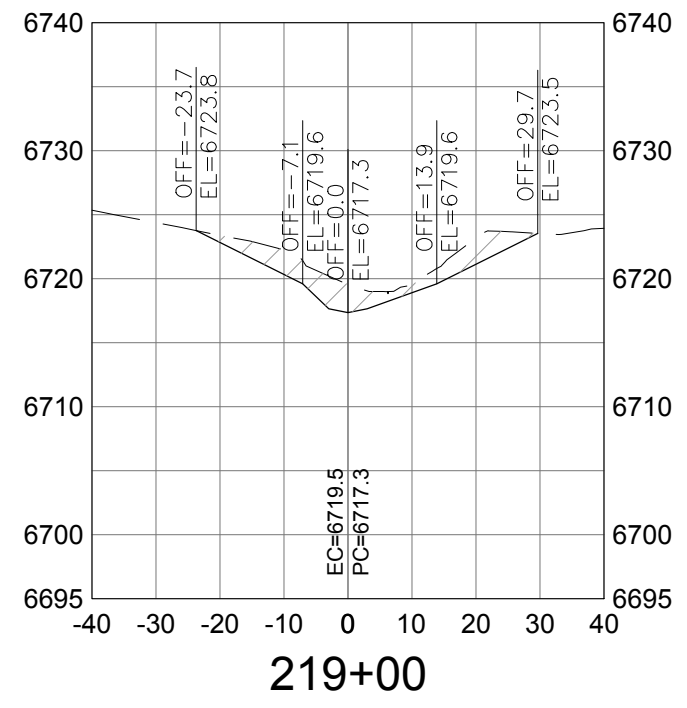
5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3304
Fax: 303-296-3699

32610K
Project No. Drawing No.
S2.11
Sheet No.
© Otak, Inc. 2015

NO.	DATE	BY	REVISION COMMENTS

DRAFT

Project: May 24, 2017 - 3:27pm ellison C:\Dropbox (Olat, CO WNR)\Olat, CO WNR Team Folder\Projects\32610_LWP_Phase_2\WOD_Wall_Street\CAD\Planets\2-Section_VIEWS.dwg Layout Name: SECTION VIEWS 12



2X VERTICAL EXAGGERATION

- PROPOSED CONDITION (PC)
- EXISTING CONDITION (EC)
- PROPOSED CUT
- PROPOSED FILL



PREPARED FOR:

NO.	DATE	BY	REVISION COMMENTS

5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-298-3304
Fax: 303-298-3899

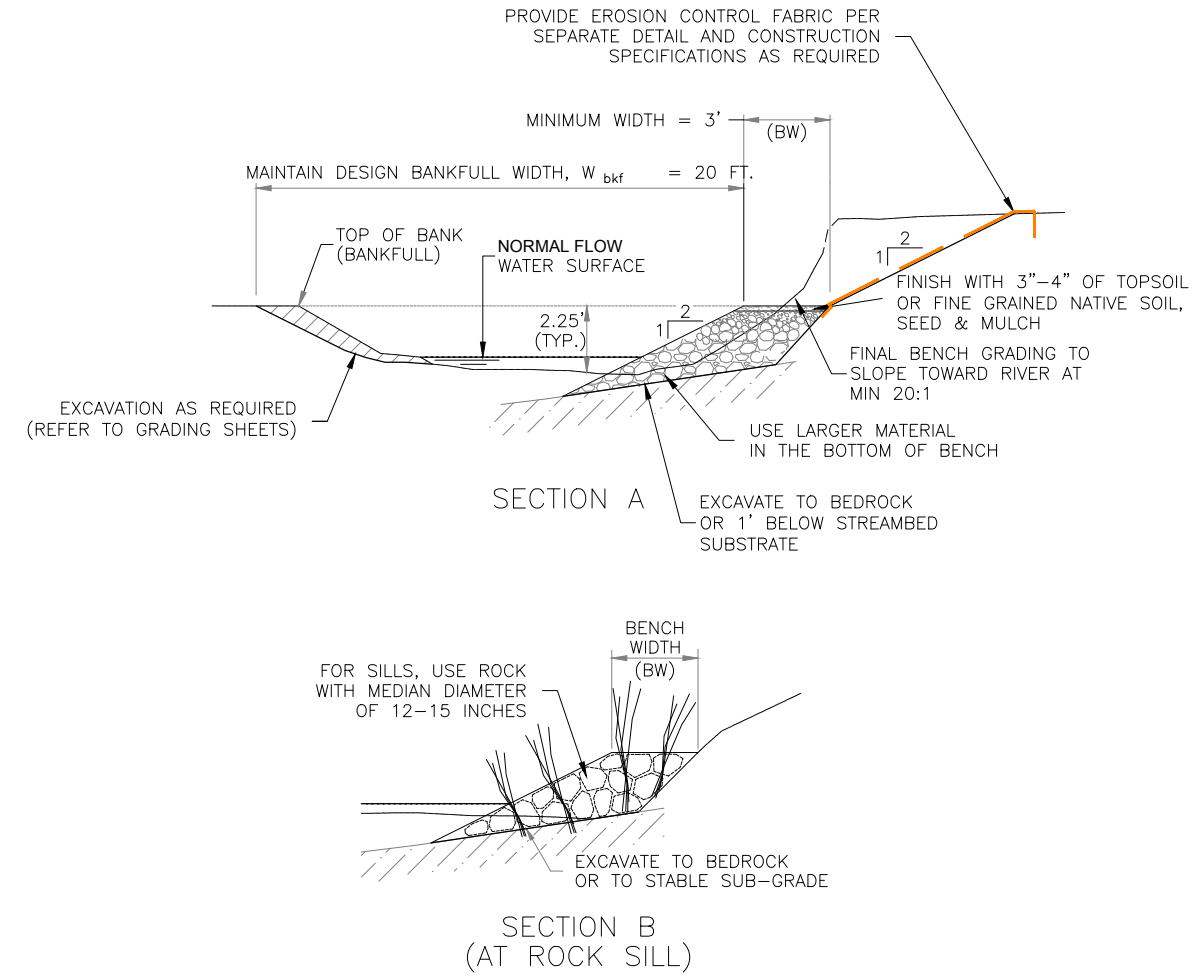
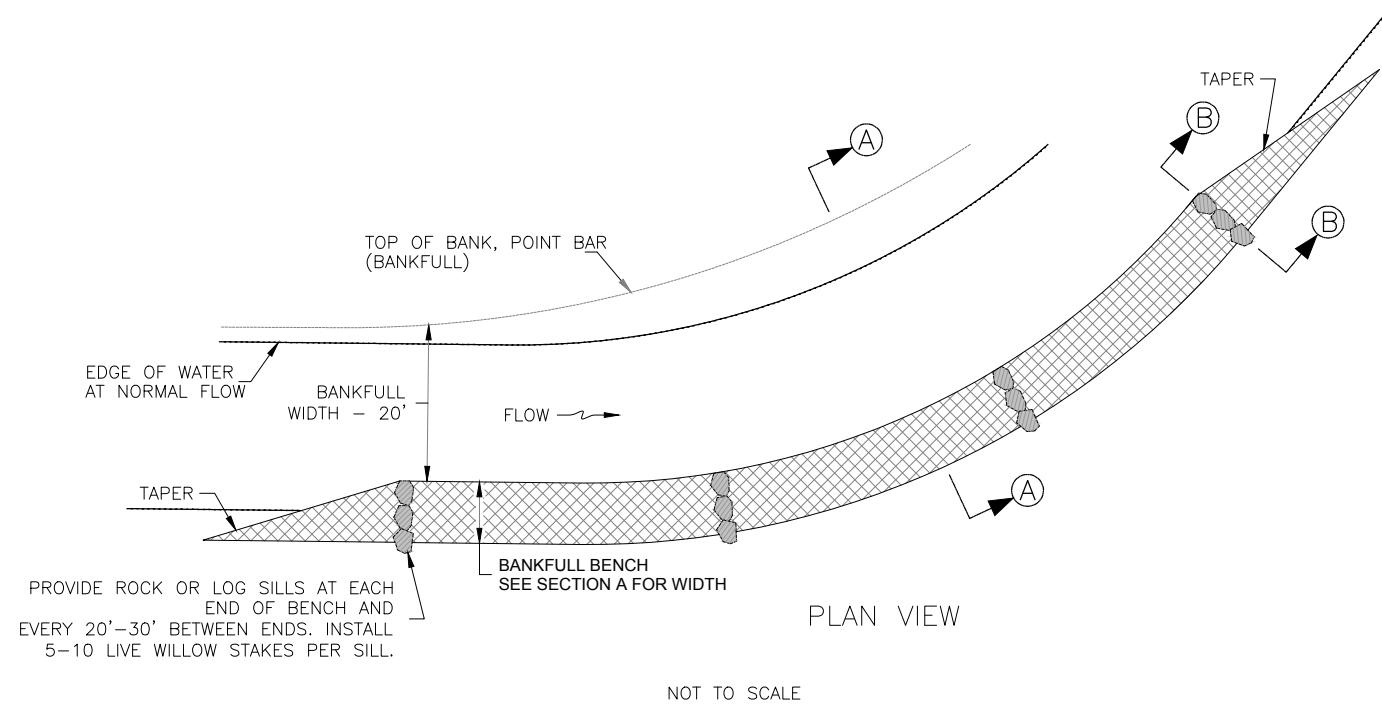
32610K
Project No. Drawing No.
S2.12
Sheet No.
© Otak, Inc. 2015

DRAFT

SECTION VIEWS 12
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



Plotted: May 24, 2017 - 3:28pm
 c:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_EMP_Phase_2\K00_Mat_Street\CAD\Plant\Detail\Grading\Details.dwg
 Layout Name: BANKFULL CHANNEL SHAPING



TYPICAL BANKFULL BENCH DETAIL

NOTES:

1. ENGINEER WILL PROVIDE SURVEY CONTROL POINTS AND BANKFULL ELEVATION. THE FINISHED TOP OF THE BENCH SHALL SLIGHTLY BELOW THE REQUIRED BANKFULL ELEVATION.
2. USE ON-SITE MATERIAL OR DESIGNATED BORROW FOR BANKFULL BENCH MATERIAL. PLACE LARGER COBBLE AND ROCK IN LOWER PORTIONS OF BENCH WITH FINE GRAINED MATERIAL OR SALVAGED TOPSOIL ON TOP.
3. COMPACT FILL IN 12-18 INCH LIFTS USING EQUIPMENT AND BY ADDING MOISTURE AS NEEDED FROM THE STREAM. WASH THE FILL USING EXCAVATOR BUCKET AND STREAM WATER TO CONSOLIDATE MATERIALS.

ADAPTED FROM NRCS DETAIL

NO.	DATE	BY	REVISION COMMENTS



BANKFULL CHANNEL SHAPING

WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

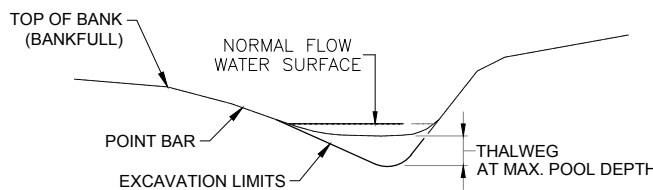


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

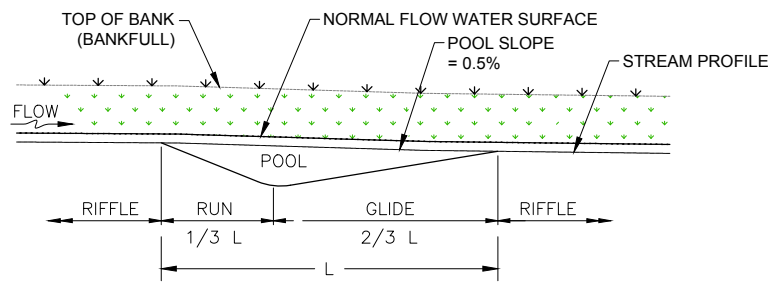
32610K
 Project No. Drawing No.
D3.2
 Sheet No.
 © Otak, Inc. 2015

Plotted: May 24, 2017 - 3:28pm
 allison C:\Dropbox (otak CO WNR)\otak CO WNR Team Folders\Projects\32610_LMP_Phase_2\K00_Mail_Street\CAD\Plant\Details\Grading\Details.dwg Layout Name: POOL

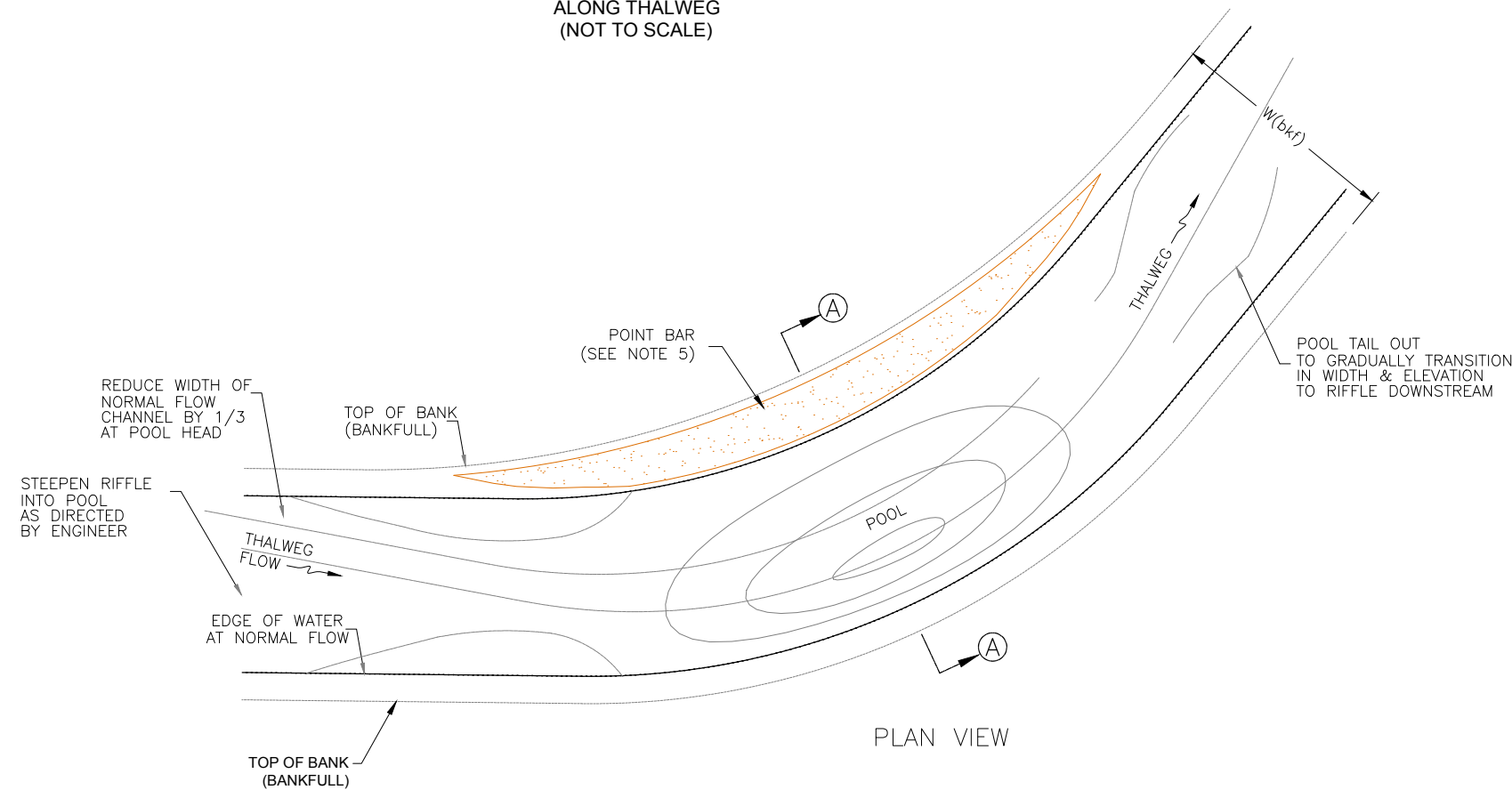


EXCAVATE DEEPEST PART OF POOL TO A MAXIMUM DEPTH OF 4 FEET. DURING NORMAL FLOW CONDITIONS.

**SECTION A
(NOT TO SCALE)**



**PROFILE
ALONG THALWEG
(NOT TO SCALE)**



PLAN VIEW

ADAPTED FROM NRCS DETAIL



EXAMPLE 1: CONSTRUCTED POOL HEAD: RIFFLE STEEPENS AND CHANNEL CONSTRICTS AT POOL ENTRANCE



EXAMPLE 2: CONSTRUCTED POOL TAILOUT: GRADUAL AND SMOOTH TRANSITION WITH COBBLE INTO DOWNSTREAM RIFFLE

CHANNEL SHAPING AT POOL TYPICAL DETAIL

NOTES:

1. USE EXCAVATED MATERIAL TO RE-SHAPE BANKS, BUILD POINT BARS, OR FOR BACKFILL OF OTHER WORK.
2. POOL LOCATIONS MAY BE ADJUSTED IN FIELD..
3. TYPICAL POOL-TO-POOL SPACING IS EVERY 5-7 BANKFULL WIDTHS, APPROXIMATE LOCATIONS ON PLANS PREVAIL OVER THIS TYPICAL.
4. USE THIS DETAIL WITH OTHER STREAM RESTORATION MEASURES TO SHOW FEATURES OF A NATURAL CHANNEL SHAPE.
5. SHAPE THE POINT BAR THROUGHOUT BANKFULL CHANNEL AND ANY BANKFULL BENCHES. POINT BAR SHAPING BEGINS AT POOL BOTTOM.

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

POOL
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

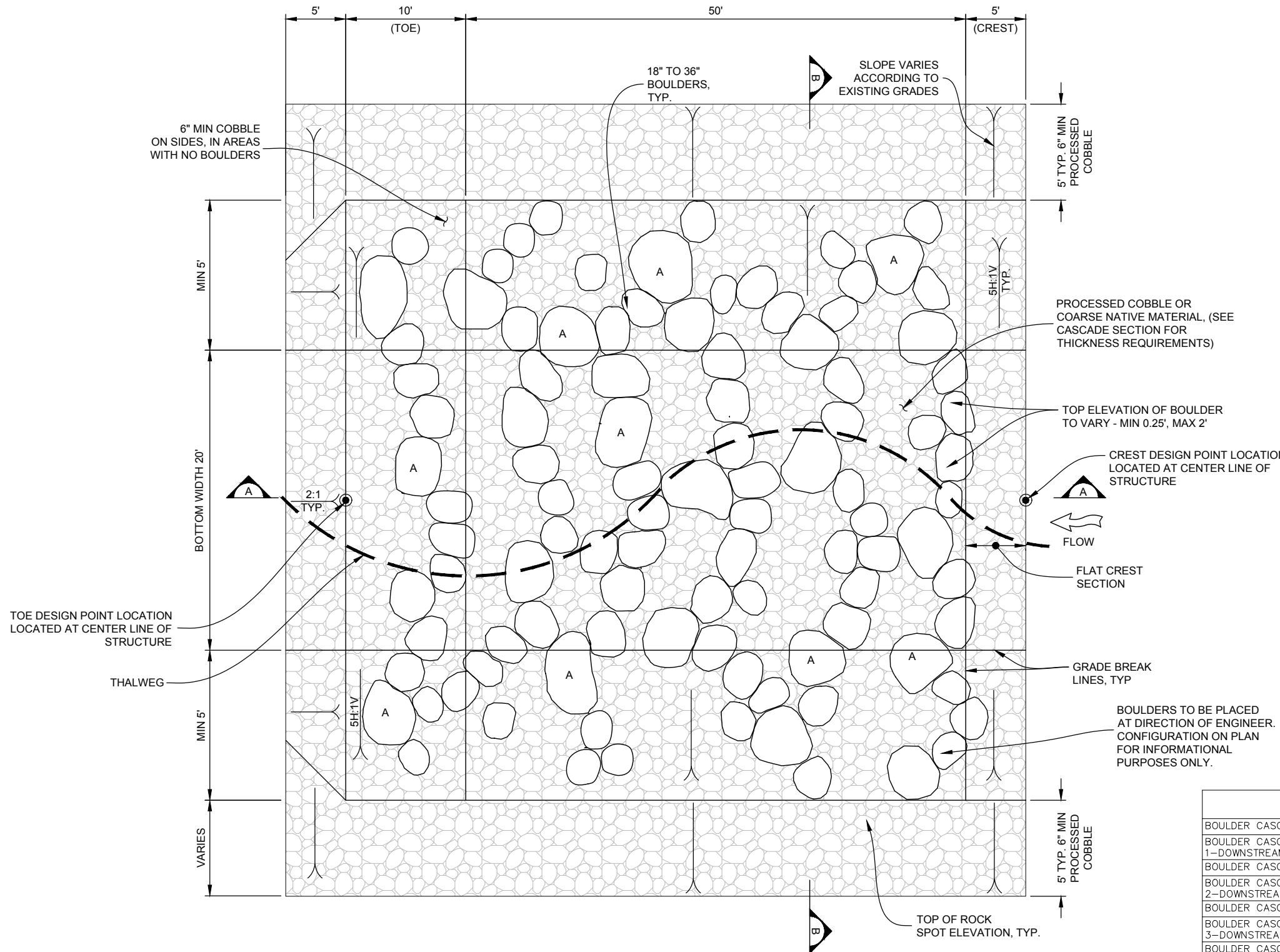


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

32610K
 Project No. Drawing No.
D3.5
 Sheet No.
 © Otak, Inc. 2015

Plotted: May 24, 2017 - 3:28pm
 alisonn
 C:\Dropbox (Otak CO WNF)\Otak CO WNF\Team Folder\Projects\32610_EMP_Phase_2\K00_Wall_Street\CAD\Plant\Details\Boulder_Cascade.dwg
 Layout Name: BOULDER CASCADE 1



**BOULDER CASCADE PLAN
(NOT TO SCALE)**

- NOTES:**
1. ALL MATERIAL EXCEPT FOR RIPRAP PAD GENERATED ON-SITE VIA SORTING, PROCESSING & STOCKPILING OF UNCLASSIFIED EXCAVATION MATERIALS.
 2. "A" DENOTES LARGER ANCHOR BOULDERS KEYED INTO RIPRAP PAD.
 3. PROCESSED COBBLE BED MATERIAL MAY BE SUBSTITUTED WITH NATIVE MATERIAL IF APPROVED BY ENGINEER
 4. PROCESSED 6" COBBLE TO HAVE $D_{50} > 6"$.
 5. PROCESSED 6" COBBLE TO BE VOID FILLED WITH NATIVE GRAVEL DURING INSTALLATION.
 6. TO THE GREATEST EXTENT POSSIBLE, ROUNDED BOULDERS SHALL BE USED FOR ALL ROCK EXPOSED AT NORMAL FLOWS.

	STATION	ELEVATION (FT)	LENGTH (FT)	DROP	SLOPE
BOULDER CASCADE 1-UPSTREAM	169+25	6874.4	50	2.5	5.0%
BOULDER CASCADE 1-DOWNSTREAM	169+75	6871.9			
BOULDER CASCADE 2-UPSTREAM	175+47	6852.7	80	4.0	5.0%
BOULDER CASCADE 2-DOWNSTREAM	176+27	6848.7			
BOULDER CASCADE 3-UPSTREAM	209+96	6744.0	77	4.7	6.1%
BOULDER CASCADE 3-DOWNSTREAM	210+73	6739.3			
BOULDER CASCADE 4-MELVINA GULCH-UPSTREAM	0+45	6855.4	100	6.0	6.0%
BOULDER CASCADE 4-MELVINA GULCH-DOWNSTREAM	1+45	6849.4			

NO.	DATE	BY	REVISION COMMENTS



BOULDER CASCADE 1
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

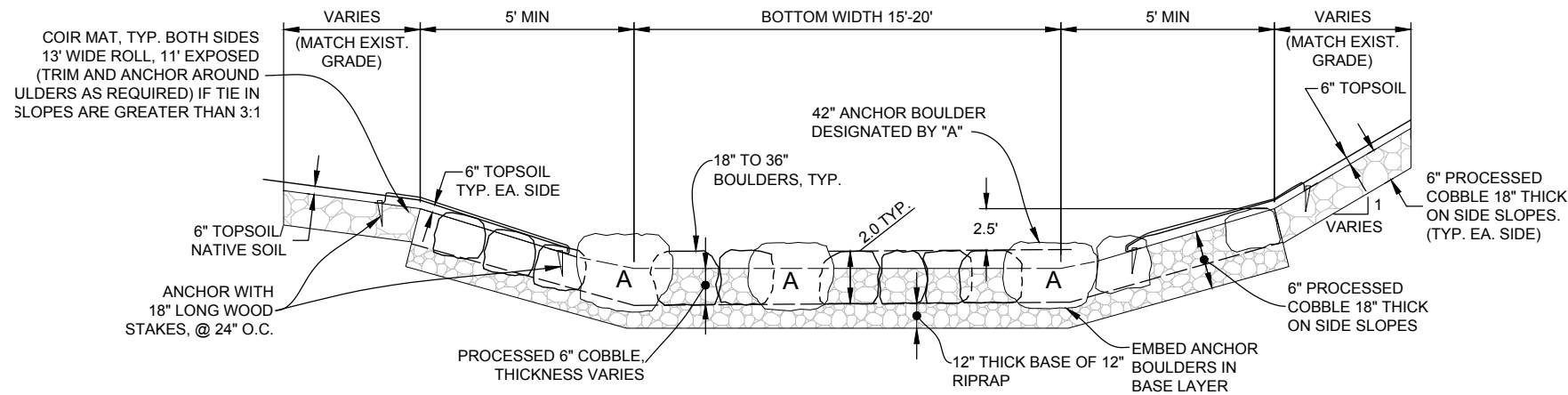
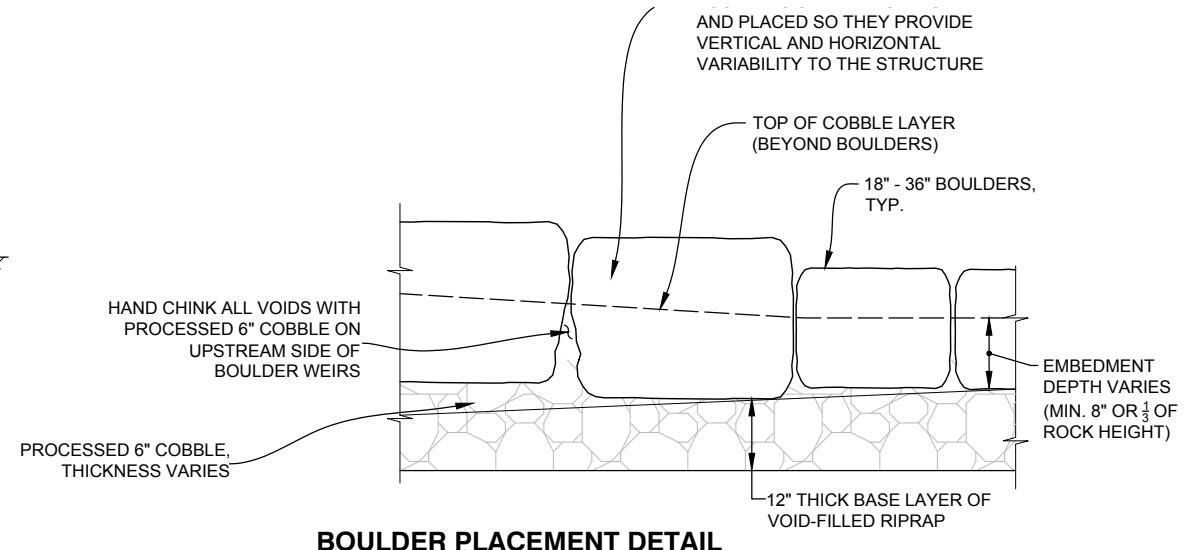
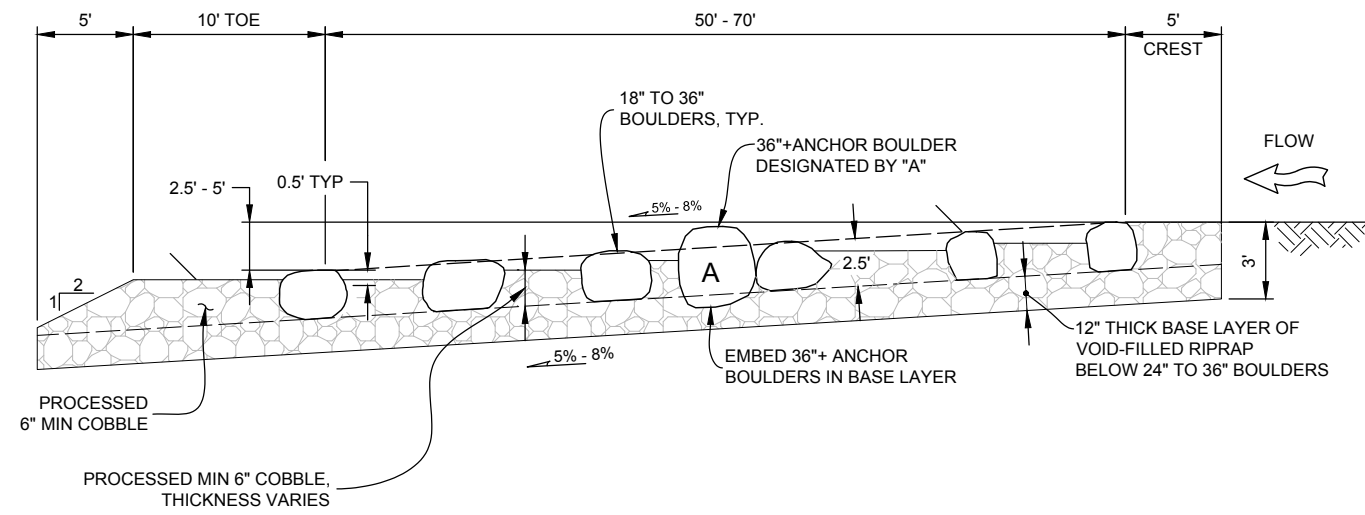


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

32610K
 Project No. Drawing No.
D3.6
 Sheet No.
 © Otak, Inc. 2015

Plotted: May 24, 2017 - 3:28pm
 C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_LMP_Phase_2\K00_Wall_Street\CAD\Plant\Details\Boulder_Cascade.dwg
 Layout Name: BOULDER CASCADE 2



NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

RESILIENT WATERSHED PARTNERS

BOULDER CASCADE 2
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

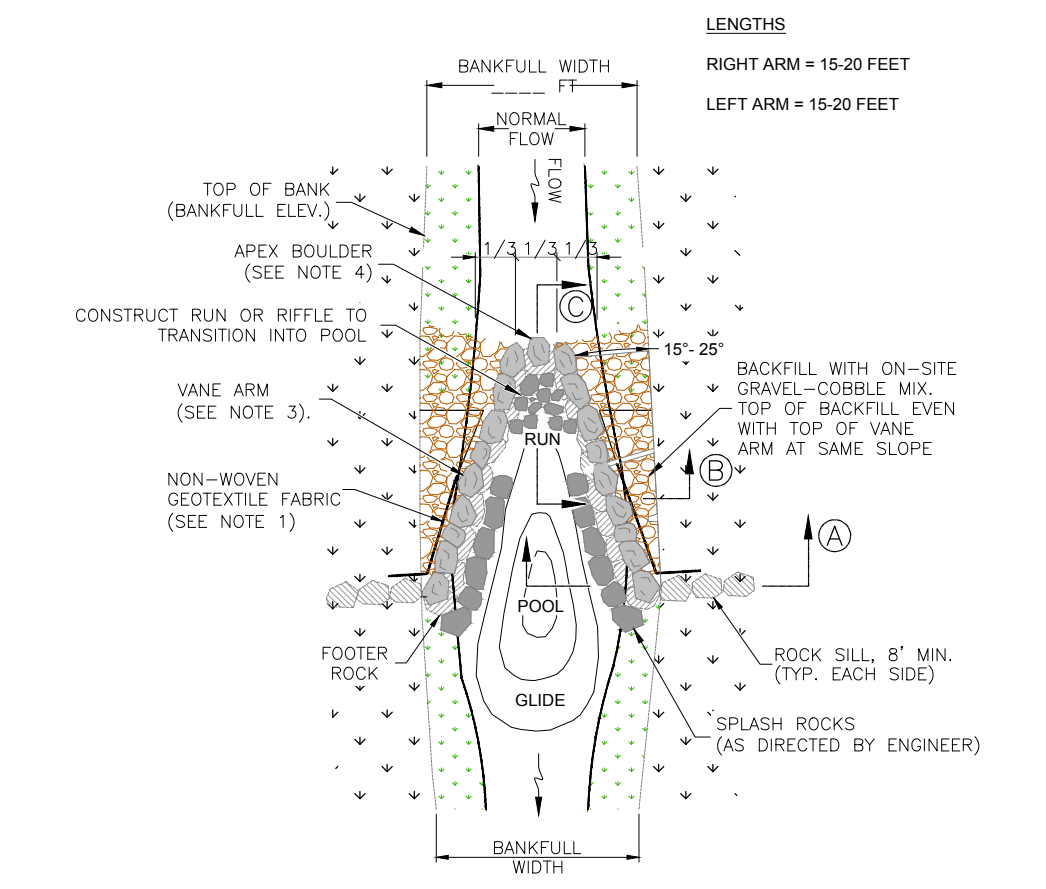
5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

32610K
 Project No. Drawing No.
D3.7
 Sheet No.

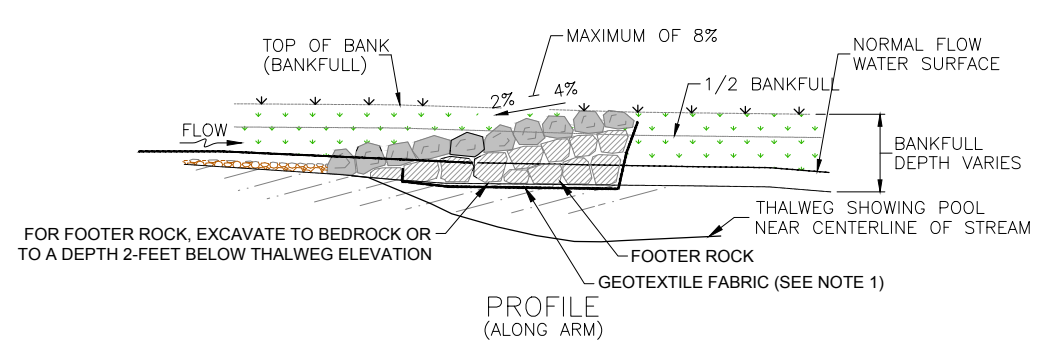
DRAFT

© Otak, Inc. 2015

Plotted: May 24, 2017 - 3:29pm
 alisonn C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_LWP_Phase_2\K00_Mail_Street\CAD\Planest\Details\Bank_Stability_Details.dwg
 Layout Name: ROCK CROSS VANE



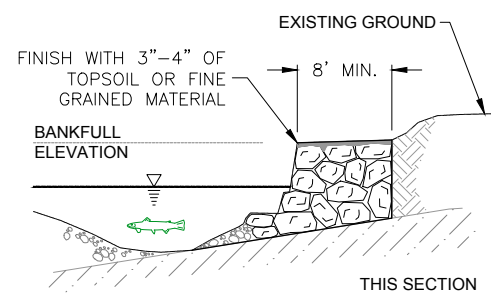
PLAN VIEW
NOT TO SCALE



PROFILE
(ALONG ARM)

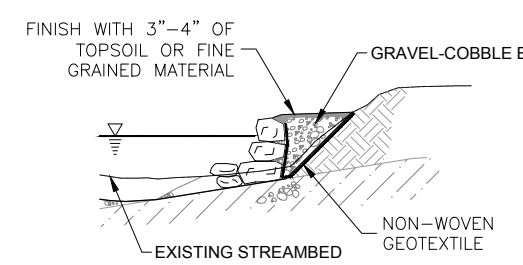
LENGTHS
 RIGHT ARM = 15-20 FEET
 LEFT ARM = 15-20 FEET

ROCK CROSS VANE (TYPICAL DETAIL)



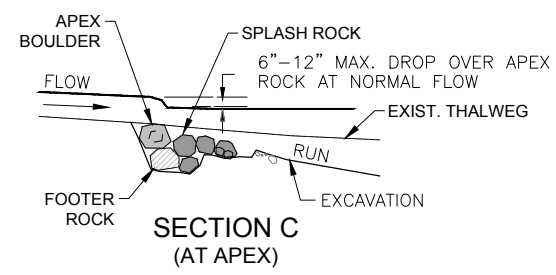
SECTION A
(AT CUTOFF SILL)

THIS SECTION SHOWS A FILL OPTION FOR AN OVERWIDE CHANNEL. STRUCTURES MAY BE INSTALLED AS CUTS, CUT/FILL, OR FILL.



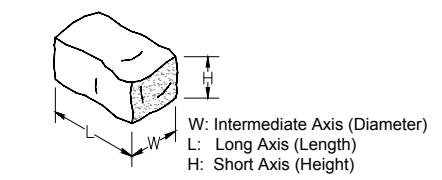
SECTION B
(AT VANE ARM)

THE SLOPE AND ANGLE OF THE VANE ARMS MAY BE ADJUSTED WITHIN THE SPECIFIED RANGE TO MEET EXISTING SITE CONDITIONS.



SECTION C
(AT APEX)

ENSURE NO STEPS OR FISH PASSAGE BARRIERS ARE CREATED



	STRUCTURE ROCK SIZE		
	Representative Size		
	W or Dia	Length	Height
Minimum	18"	18"	12"
Average (D50)	24"	24"	18"

Assumed Rock Density: 165 LB/CU-FT

ROCK NOTES:

1. SMALLER HEIGHT ROCKS MAY BE REQUIRED TO TAPER STRUCTURES AT APEX ON BEDROCK AND ON ARMS. FOOTER ROCKS SHALL MEET STRUCTURE ROCK REQUIREMENTS.
2. FOR MAIN STRUCTURE ROCK, SILL, AND FOOTER ROCK, THE ROCK SOURCE SHALL BE FROM AN ACCEPTABLE CDOT QUARRY OR FROM ENGINEER APPROVED SOURCE.
3. ON-SITE COBBLE AND BOULDERS MAY BE USED TO FILL VOIDS AND FOR SPLASH ROCKS.

NOTES:

1. USE CLASS I, NON-WOVEN GEOTEXTILE FABRIC AS DESCRIBED IN THE SPECIFICATIONS. PLACE GEOTEXTILE BEHIND THE ARM (UPSTREAM SIDE), DRAPED FROM TOP OF ROCK STRUCTURE TO BOTTOM OF FOOTER ROCK AND EXTEND A MINIMUM OF HALF THE TRENCH BOTTOM WIDTH. TRIM EXCESS OR VISIBLE FABRIC.
2. FOR STEEP STREAM SLOPES OR WHERE ADDITIONAL GRADE DROP IS REQUIRED, STEPS MAY BE ADDED ACCORDING TO THE CROSS VANE (WITH STEP) DETAIL.
3. BOULDER VANE ARMS MAY NOT BE SYMMETRICAL. ARM LENGTHS MAY BE SKEWED TO MATCH EXISTING SITE CONDITIONS OR STREAM ALIGNMENT.
4. PROVIDE GAPS BETWEEN APEX BOULDERS 1/3 TO 1/2 THE DIAMETER OF BOULDERS FOR FISH PASSAGE.
5. THE NUMBER OF ROCK COURSES VARIES BY BANK HEIGHT AND DEPTH TO STABLE SUBSTRATE.
6. ROCK CROSS VANES MAY BE BUILT WITH SORTED & PROCESSED ROCK FROM ON-SITE OR IMPORTED MATERIAL.



BLEND VANE ARMS INTO CHANNEL & BANKS

NO.	DATE	BY	REVISION COMMENTS



ROCK CROSS VANE
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

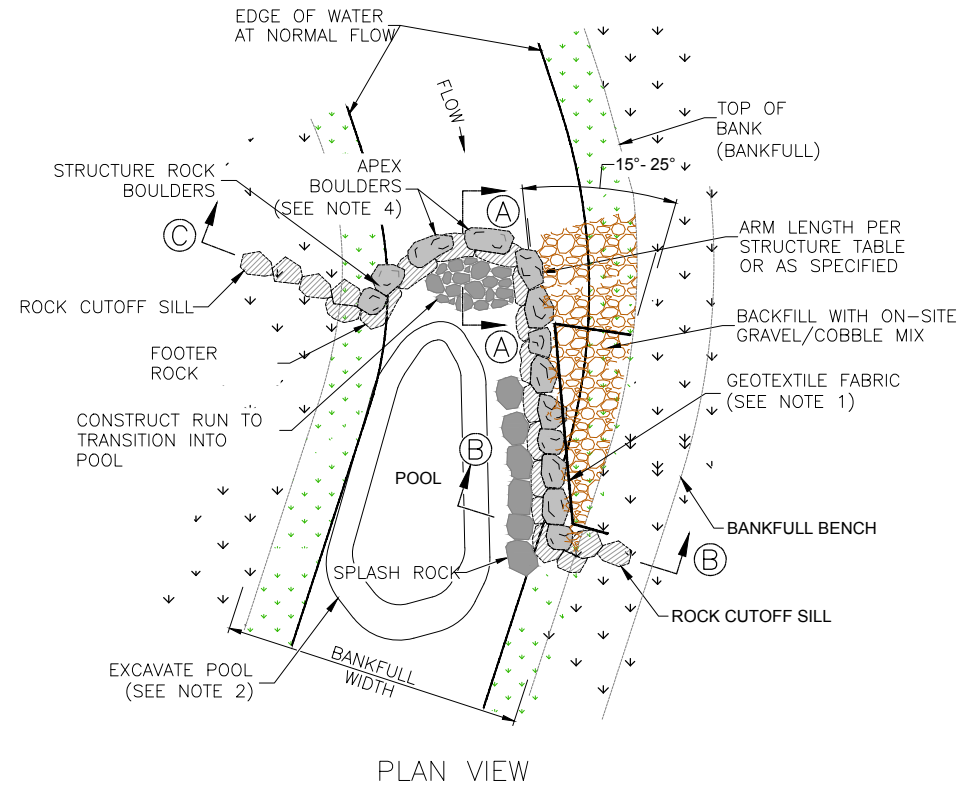


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

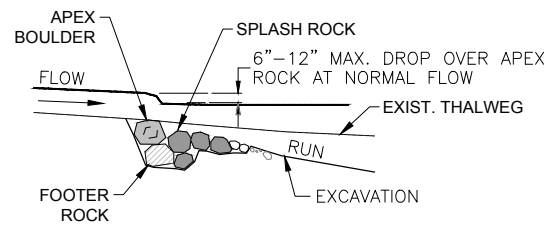
DRAFT
 32610K
 Project No. Drawing No.
D3.8
 Sheet No.
 © Otak, Inc. 2015

ADAPTED FROM NRCS DETAIL

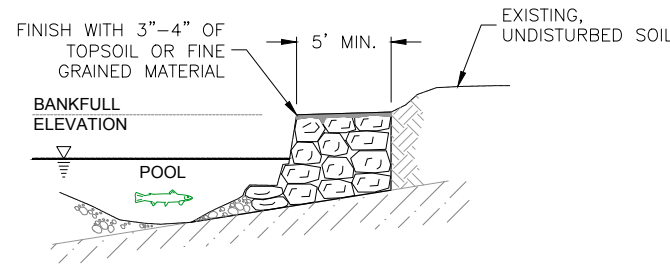
TYPICAL J-HOOK VANE DETAIL



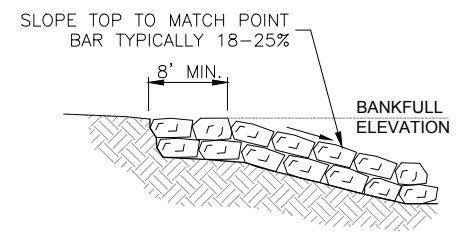
PLAN VIEW



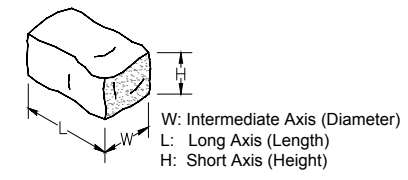
SECTION A
(AT APEX OF HOOK)



SECTION B
(AT CUTOFF SILL)



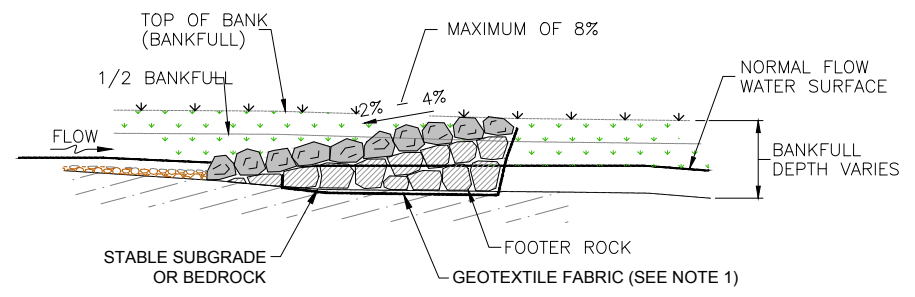
SECTION C
(HOOK CUTOFF SILL)
NOT TO SCALE



STRUCTURE ROCK SIZE	Representative Size		
	W or Dia (Feet)	Length (Feet)	Height (Feet)
Minimum	18"	18"	12"
Average (D50)	24"	24"	24"

Assumed Rock Density: 165 LB/CU-FT

- ROCK NOTES:**
1. SMALLER HEIGHT ROCKS ARE REQUIRED TO TAPER STRUCTURES AT APEX AND ARMS ON BEDROCK. FOOTER ROCKS SHALL MEET STRUCTURE ROCK REQUIREMENTS.
 2. FOR MAIN STRUCTURE ROCK, SILL, AND FOOTER ROCK, THE ROCK SOURCE SHALL BE FROM AN ACCEPTABLE CDOT QUARRY OR FROM ENGINEER APPROVED SOURCE.
 3. ON-SITE COBBLE AND BOULDERS MAY BE USED TO FILL VOIDS AND FOR SPLASH ROCKS.
 4. ROCK J-HOOK MAY BE BUILT WITH SORTED AND PROCESSED ROCK FROM ON-SITE OR IMPORTED MATERIAL.



PROFILE
(ALONG ARM)

- NOTES:**
1. USE CLASS I, NON-WOVEN GEOTEXTILE FABRIC AS DESCRIBED IN THE SPECIFICATIONS. PLACE GEOTEXTILE BEHIND THE ARM (UPSTREAM SIDE), DRAPED FROM TOP OF ROCK STRUCTURE TO BOTTOM OF FOOTER ROCK AND EXTEND A MINIMUM OF HALF THE TRENCH BOTTOM WIDTH. TRIM EXCESS OR VISIBLE FABRIC.
 2. ON BEDROCK STREAM BEDS, EXCAVATE POOL BEFORE INSTALLING STRUCTURE.
 3. MAXIMUM WATER SURFACE GRADE DROP ACROSS THE APEX OF ROCK HOOK IS 12 INCHES MEASURED ALONG THE STREAM PROFILE. SEE SECTION A.
 4. PROVIDE GAPS BETWEEN APEX BOULDERS OF 1/3 TO 1/2 THE DIAMETER OF BOULDERS. NO GAPS BETWEEN APEX BOULDERS WHEN INSTALLED ON BEDROCK BEDS OR HIGH BEDLOAD STREAMS.

ADAPTED FROM NRCS DETAIL

NO.	DATE	BY	REVISION COMMENTS



ROCK J-HOOK
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO

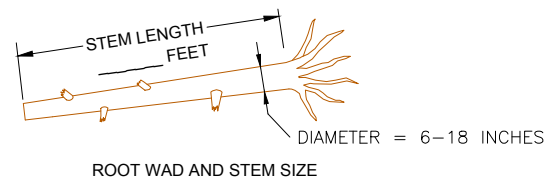
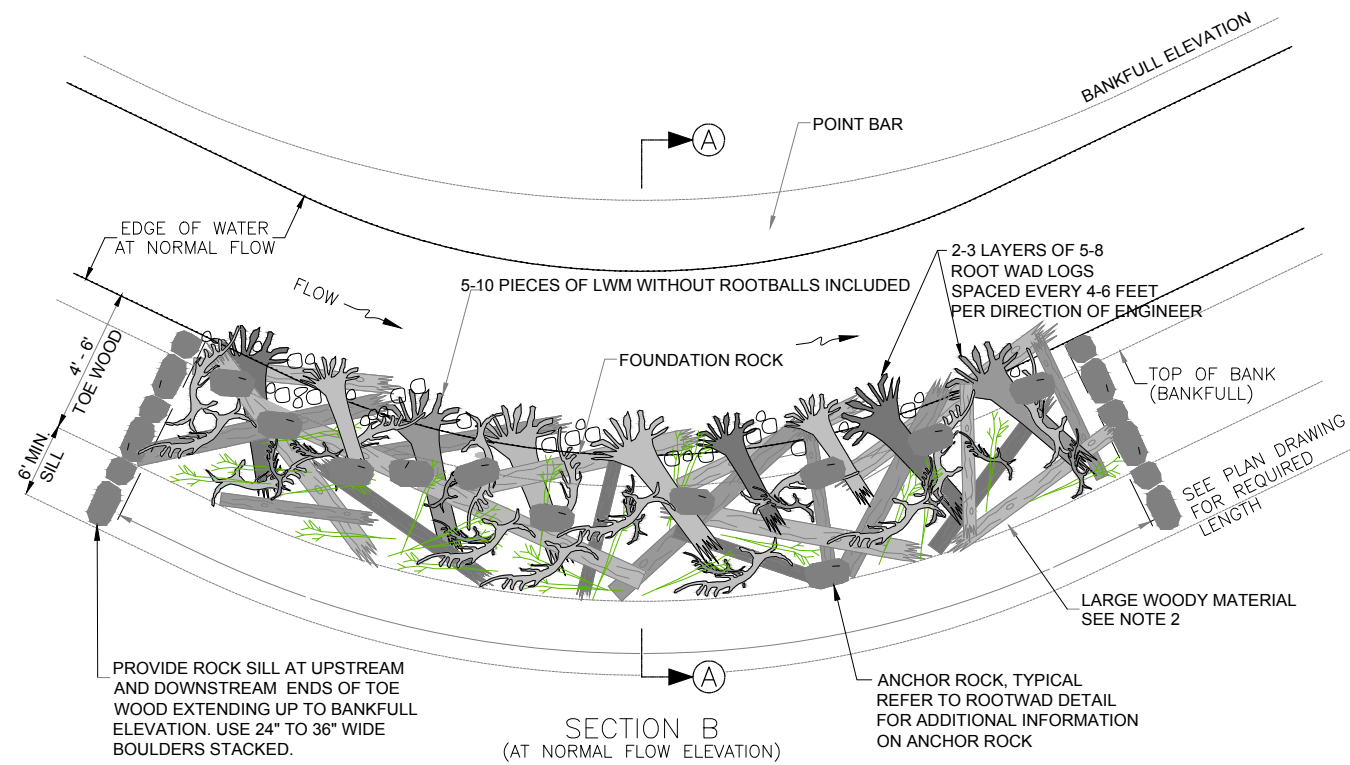
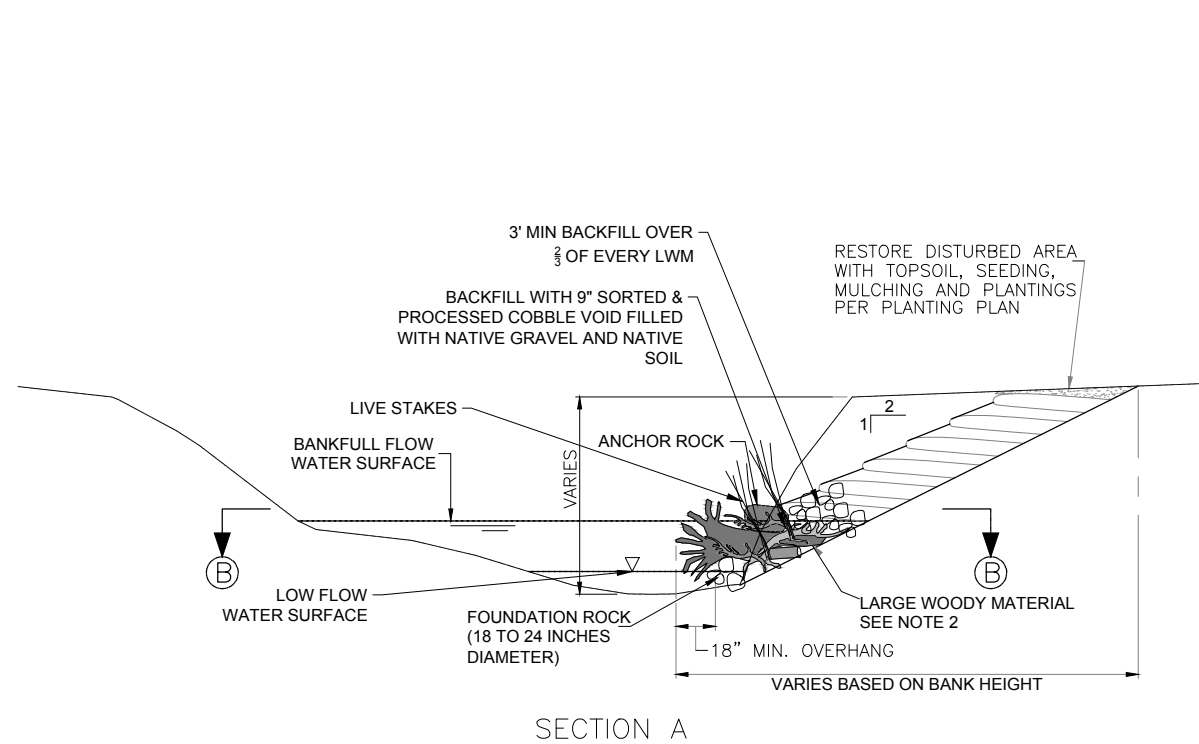


5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3304
Fax: 303-296-3699

DRAFT

32610K
Project No. Drawing No.
D3.9
Sheet No.
© Otak, Inc. 2015

Plotted: May 24, 2017 - 3:29pm
 allison C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folder\Projects\32610_EMP_Phase_2\K00_Wall_Street\CAD\Planest\Details\Bank_Stability_Details.dwg
 Layout Name: ROCK J-HOOK



LARGE WOOD COMPLEX IN CONSTRUCTION (PHOTO SHOWS INSTALATION BIGGER THAN THOSE IN THE WALL STREET PROJECT)



NOTES:

1. LARGE WOODY MATERIAL (LWM) CONSISTS OF A MIX OF "DEAD WOOD" LOGS, BRANCHES, SHRUBS, AND OTHER WOODY VEGETATION INSTALLED AT VARIOUS ANGLES, BUT NOT PARALLEL TO THE FLOW. LAYER THE WOOD WITH LARGER MATERIAL ON BOTTOM AND FORM A MAT OF BRANCHES ON TOP LAYER. ANGLE ROOT WADS SLIGHTLY UPSTREAM INTO FLOW. THE TOP LAYER OF LWM SHALL BE AT OR ABOVE THE ESTABLISHED FLOW ELEVATION.
2. THE BOTTOM LAYER OF LWM SHALL BE AT OR BELOW THE CHANNEL INVERT
3. FILL BETWEEN ROOT WAD LOGS WITH MIX OF WOODY DEBRIS PER NOTE 2.
4. INSTALL WILLOW STAKES, APPROXIMATELY INVERT 100 PER STRUCTURE WITH THE LWM, BEFORE EXCAVATION IS BACKFILLED
5. REFER TO ROOTWAD DETAIL FOR ANCHOR ROCK REQUIREMENTS
6. ASSUME 15-30 PIECES OF LWM PER STRUCTURE, HARVESTED FROM THE PROJECT AREA.

* LARGE WOODY MATERIAL CONSISTS OF DEAD WOODY MATERIALS NOT INTENDED TO GROW. WILLOW CUTTINGS AND LIVE STAKES ARE DORMANT PLANTS THAT ARE EXPECTED TO LIVE AND GROW.

NOT TO SCALE

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:

LARGE WOOD COMPLEX
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO

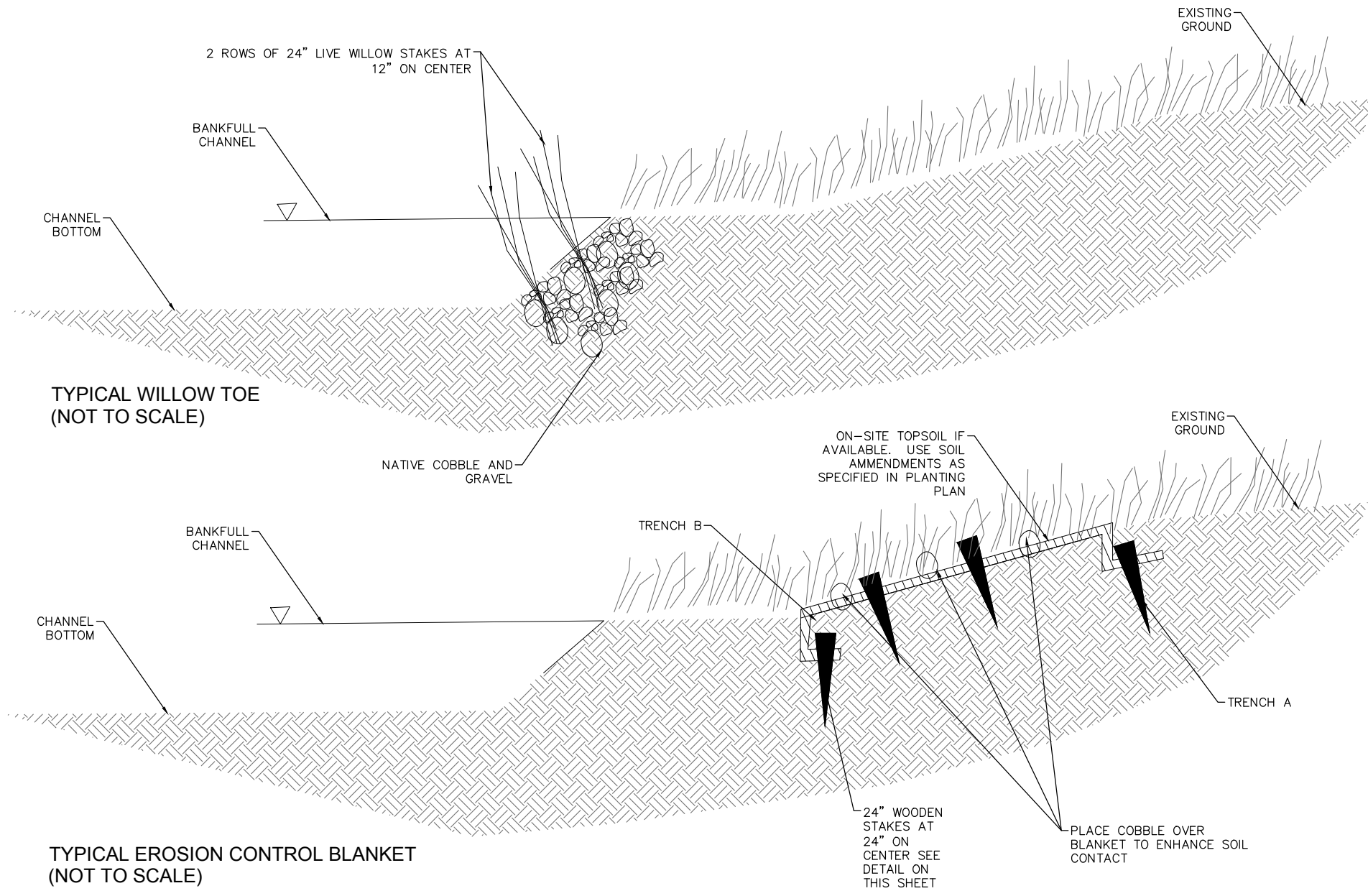


5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

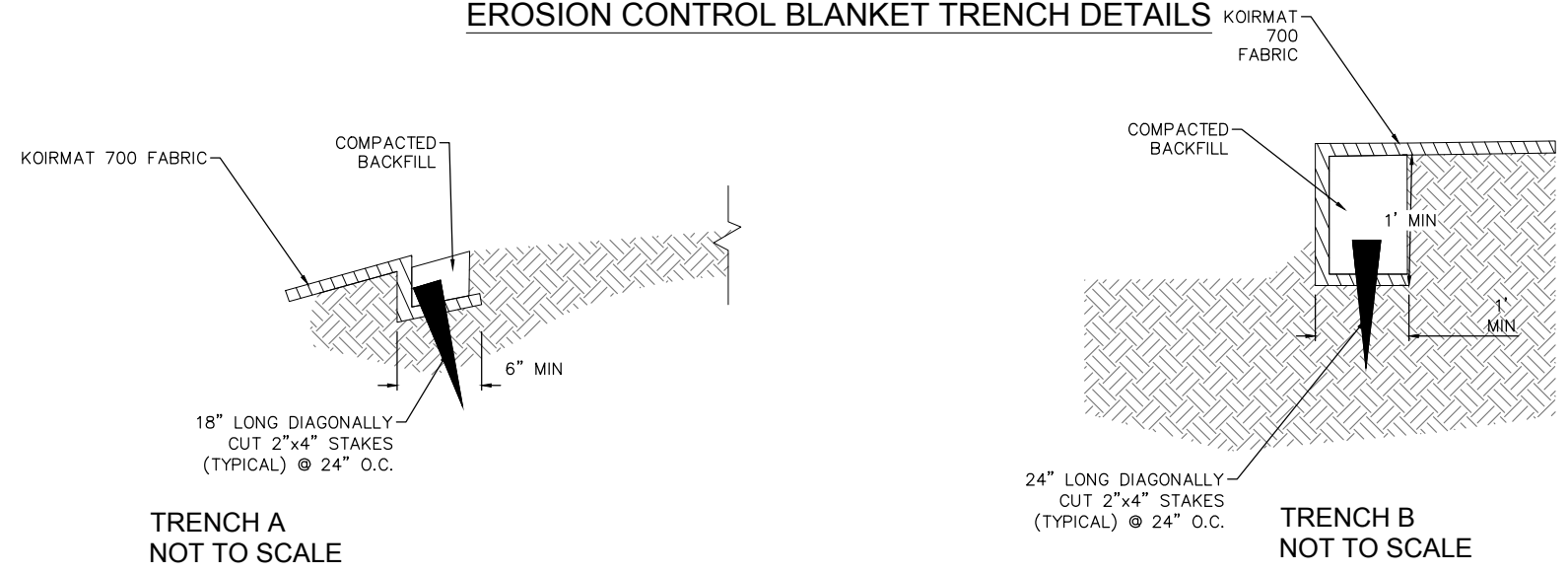
DRAFT

32610K
 Project No. Drawing No.
D3.14
 Sheet No.
 © Otak, Inc. 2015

Plotted: May 24, 2017 - 3:29pm
 d:\sonn
 C:\Dropbox (Otak CO WNR)\Otak CO WNR Team Folders\Projects\32610_LMP_Phase_2\KOD_Mail_Street\CAD\Plant\Detail\Bank Stability Details.dwg
 Layout Name: WILLOW TOE & EROSION CONTROL BLANKET

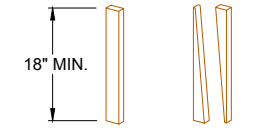


EROSION CONTROL BLANKET TRENCH DETAILS



EROSION CONTROL BLANKET NOTES:

1. BLANKET TO BE INSTALLED ON ALL CONSTRUCTED SLOPES STEEPER THAN 2:1.
2. THE CREATION OF SLOPES STEEPER THAN 2:1 SHALL BE MINIMIZED.
3. CONTRACTOR SHALL USE STEEL PENETRATION RODS OR OTHER MEANS AS NECESSARY TO PENETRATE RIPRAP LAYER WITH WOOD STAKES.
4. IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON PLANS, THE CONTRACTOR SHALL PLACE TOPSOIL, IF PRESENT, AND PERFORM FINAL GRADING, RAKE SURFACE SMOOTH, SEED, BIOSOL AND VERYDOL, AND RE-RAKE TO COVER SEED BEFORE INSTALLING THE EROSION CONTROL BLANKET. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL CONTACT WITH THE SUBGRADE, NO GAPS OR VOIS SHALL EXIST UNDER THE BLANKET.
5. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED.
6. ALL AREAS OF CONSTRUCTION DISTURBANCE SHALL BE DECOMPACTED TO 18". SEEDED, RE-RAKED TO COVER SEED, BIOSOLED, AND MULCHED WITH FABRIC OR HYDROMYLCH AS SHOWN ON DETAILS
7. ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED (IN AREAS WHERE BLANKET IS NOT INSTALLED) AND THE EROSION CONTROL BLANKET REINSTALLED. STAKE SALVAGE (UNCUT) EDGES AT LEAST 4 INCHES FROM EDGE OF FABRIC.
8. INSTALL BLANKET AT THE TOE OF SLOPE FIRST.
9. THERE SHALL BE A MINIMUM 12" OVERLAP OF BLANKETS THAT IS STAKED IN THE MIDDLE WHERE BLANKETS JOIN. FOLD UNDER OR COVER ALL CUT EDGES 6".
10. WOOD STAKES SHALL BE INSTALLED SUCH THAT THE TOPS OF THE STAKES ARE 3" ABOVE FINISHED GRADE.



STAKES MAY BE MADE BY SAWING A 2 x 4 DIAGONALLY TO PRODUCE 2 DEAD STOUT STAKES.

WOOD STAKE

NO.	DATE	BY	REVISION COMMENTS



WILLOW TOE & EROSION CONTROL BLANKET
 WALL STREET RESTORATION
 FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
 Suite 228
 Boulder, Colorado 80301
 Phone: 303-296-3304
 Fax: 303-296-3699

DRAFT

Project No. 32610K
 Drawing No. D3.15
 Sheet No.

© Otak, Inc. 2015

TABLE 1: PLANTS NEEDED FOR REVEGETATION PLAN

ASSOCIATED REVEGETATION BID ITEM	COMMON NAME	SCIENTIFIC NAME	PLANT SIZE	PLANTS PER ACRE	TOTAL PLANTS	ESTIMATED ACRES
ZONE A: CHANNEL EDGE²						
12.9	BLUEJOINT	CALAMAGROSTIS CANADENSIS	10	300	114	
12.9	NEBRASKA SEDGE	CAREX NEBRASCENSIS	10	600	229	
12.9	WOOLLY SEDGE	CAREX PELLITA	10	400	152	
12.9	CREEPING SPIKERUSH	ELEOCHARIS PALUSTRIS	10	400	152	
12.9	BALTIC RUSH	JUNCUS BALTICUS	10	400	152	
12.9	RED-TINGE BRUSH	SCIRPUS MICROCARPUS	10	300	114	
			Total	2,400	915	0.4
ZONE B: LOWER RIPARIAN²						
12.1	THINKLEAF ALDER	ALNUS INCANA	40	400	381	
12.1	WATER BIRCH	BETULA OCCIDENTALIS	40	300	286	
12.1	REDSIER DOGWOOD	CORNUS ALBA	40	300	286	
12.1	NARROWLEAF COTTONWOOD	POPULUS ANGUSTIFOLIA	40	500	476	
12.1	NARROLEAF WILLOW	SALIX EXIGUA	40	500	476	
12.1	DEWYSTEM WILLOW	SALIX IRRORATA	40	400	381	
			Total	2,400	2,287	0.95
12.7	NARROWLEAF COTTONWOOD	POPULUS ANGUSTIFOLIA	5' CUTTING	40	38	
12.7	MIXED WILLOW*	SALIX SPP.	5' CUTTING	100	95	
			Total	2,940	2,801	0.95
ZONE C: UPPER RIPARIAN³						
12.1	NARROWLEAF COTTONWOOD	POPULUS ANGUSTIFOLIA	40	140	267	
12.1	CHOKECHERRY	PRUNUS VIRGINIANA	40	100	191	
12.1	COMMON SNOWBERRY	SYMPHORICARPOS ALBA	40	100	191	
12.1	WHITE-STEM GOOSEBERRY	RIBES INERME	40	80	152	
12.1	WOOD'S ROSE	ROSA WOODSII	40	140	267	
			Total	560	1,067	1.91
					TOTAL RIPARIAN AREAS	4.1919

¹ZONE A IS 0-1', ZONE B IS 1-2', AND ZONE C IS 2-3' ABOVE THE WATER SURFACE OF THE LOW-FLOW CHANNEL; EXACT PLANTING LOCATIONS WILL BE BASED ON FINAL GRADING AND DIRECTED BY A QUALIFIED ECOLOGIST; PLANT NOMENCLATURE FROM CORPS 2016

²QUANTITY OF CONTAINERIZED STOCK BASED ON APPROXIMATELY 3-FOOT CENTERS. WHENEVER POSSIBLE, ZONE B PLANTS WILL BE INSTALLED IN A TRENCH (EXCAVATED USING EARTHMOVING EQUIPMENT) PARALLEL TO THE CHANNEL LOCATED AT APPROXIMATELY THE EDGE OF THE BANKFULL CHANNEL; THE BOTTOM OF THE TRENCH WILL BE APPROXIMATELY THE ELEVATION OF THE LOW-FLOW WATER SURFACE; MIXED WILLOW WILL BE HARVESTED FROM BOULDER COUNTY (OR ADJACENT COUNTIES) WITHIN 1,000 VERTICAL FEET (SEE NOTES); ALL PLANTS RANDOMLY MIXED; PLANT NOMENCLATURE FROM CORPS 2016

³BASED ON APPROXIMATELY 6-FOOT CENTERS*SPECIES MIX NOT TO EXCEED 75% OF ANY ONE SPECIES. SPECIES RATIOS MUST BE APPROVED BY ECOLOGIST.

TABLE 2: PLANTS NEEDED FOR BIOENGINEERING STRUCTURAL ELEMENTS

ASSOCIATED STABILIZATION BID ITEM	STRUCTURE	COMMON NAME	SCIENTIFIC NAME	SIZE	NUMBER	UNIT	TOTAL NUMBER	NOTES
7.3	BANK STABILIZATION TREATMENT: BOULDER-COBBLE TOE	MIXED WILLOW*	SALIX SPP.	48" CUTTING	2	PER LINEAR FOOT	3450	See Sheet D3.11
7.4	BANK STABILIZATION TREATMENT: STACKED BOULDER TOE WITH WILLOWS	MIXED WILLOW*	SALIX SPP.	48" CUTTING	1	PER LINEAR FOOT	425	See Sheet D3.12
7.5	BED STABILIZATION TREATMENT: COBBLE BAR SILL	MIXED WILLOW*	SALIX SPP.	48" CUTTING	10	PER LINEAR FOOT	60	See Sheet D3.2
8.1	ROOTWAD	MIXED WILLOW*	SALIX SPP.	48" CUTTING	10	PER LINEAR FOOT	300	See Sheet D3.13
8.2	LARGE WOOD COMPLEX	MIXED WILLOW*	SALIX SPP.	48" CUTTING	50	PER LINEAR FOOT	100	
8.3	FLOODPLAIN WOOD/BRUSH TRENCH	MIXED WILLOW*	SALIX SPP.	48" CUTTING	1	PER LINEAR FOOT	200	SeeSheet D3.14
8.4	WILLOW TOE	MIXED WILLOW*	SALIX SPP.	48" CUTTING	2	PER LINEAR FOOT	2500	See Sheet D3.15
						TOTAL	7035	

*SPECIES MIX NOT TO EXCEED 75% OF ANY ONE SPECIES. SPECIES RATIOS MUST BE APPROVED BY ECOLOGIST.

RIPARIAN SEED MIX¹

TYPE	COMMON NAME	SCIENTIFIC NAME	VARIETY2	SEEDS PER POUND2	SEEDS PER SQUARE FOOT	POUNDS OF PURE LIVE SEED/ACRE
GRAMINIDS	SIDEOATS GRAMA	BOUTELOUA CURTIPENDULA	BUTTE OR PIERRE	191,000	5.3	1.2
	BLUE GRAMA3	BOUTELOUA GRACILIS3	BIRDS EYE, ALMA, OR LOVINGTON	825,000	11.4	0.6
	THICKSPIKE WHEATGRASS	ELYMUS LANCEOLATUS	-	153,000	4.2	1.2
	SLENDER WHEATGRASS	ELYMUS TRACHYCAULUS	WHITE RIVER OR SAN LUIS	159,000	4.4	1.2
	ROCKY MOUNTAIN FESCUE3	FESTUCA SAXIMONTANA3	-	530,000	9.7	0.8
	FOWL MANNAGRASS	GLYCERIA STRIATA	-	180,000	8.3	2.0
	NEEDLE AND THREAD	HESPEROSTIPA COMATE	-	115,000	5.3	2.0
	PRAIRIE JUNEGRASS3	KOELERIA MACRANTHA3	-	2.3 MILLION	5.3	0.1
	BALTIC RUSH3	JUNCUS BALTICUS3	-	10.9 MILLION	25.0	0.1
	TORREY'S RUSH3	JUNCUS TORREYI3	-	12.3 MILLION	28.2	0.1
	GREEN NEEDLEGRASS	NASSELLA VIRIDULA	CUCHARAS OR LODORM	181,000	4.2	1.0
	WESTERN WHEATGRASS	PASCOPYRUM SMITHII	ARRIBA	110,000	10.1	4.0
	FOWL BLUEGRASS3	POA PALUSTRIS3	-	3.2 MILLION	7.3	0.1
	SANDBERG BLUEGRASS3	POA SECUNDA3	SIMS MESA OR HIGH PLAINS	1 MILLION	6.9	0.3
FORBS	LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM	PASTURA, CIMARRON, OR CAMPER	260,000	6.0	1.0
	COMMON YARROW3	ACHILLEA MILLEFOLIUM VAR. OCCIDENTALIS3	-	2.7 MILLION	6.2	0.1
	ROCKY MOUNTAIN BEE PLANT	CLEOME SERRULATA	-	66,000	3.0	2.0
	GOLDEN TICKSEED3	COREOPSIS TINCTORIA3	-	1.4 MILLION	3.2	0.1
	BLANKETFLOWER	GAILLARDIA ARISTATA	MERIWEATHER	132,000	1.5	0.5
	SHOWY GOLDENEYE3	HELIOMERIS MULTIFLORA3	-	1 MILLION	2.3	0.1
	FRONT RANGE BEARDTONGUE	PENSTEMON VIRENS3	-	1.3 MILLION	3.0	0.1
	AMERICAN VETCH	VICIA AMERICANA	-	33,000	0.8	1.0
	BULK	RICE HULLS	-	-	-	5.4
				TOTAL	161.6	25.0

¹NOMENCLATURE FOLLOWS PLANTS DATABASE (NRCS 2016); SEEDING RATE BASED ON HAND-BROADCASTING; ANY SUBSTITUTIONS MUST BE NATIVE TO COLORADO AND FROM A US OR CANADA SEED SOURCE.

²SOURCES: NRCS 2016, GRANITE SEED 2016, WESTERN NATIVE SEED 2016, NSN 2016

³BAG SEPARATELY IF DRILL-SEEDING



PLANTING TABLES
WALL STREET RESTORATION
FOURMILE CREEK, BOULDER, CO



5777 Central Avenue
Suite 228
Boulder, Colorado 80301
Phone: 303-296-3304
Fax: 303-296-3699

32610K
Project No. Drawing No.

L4.4
Sheet No.

© Otak, Inc. 2015

DRAFT

NO.	DATE	BY	REVISION COMMENTS

PREPARED FOR:



DESIGN	DRAWN	CHECKED	DATE	INITIAL	ISSUE DATE
KJ	FEW	ALN	5/24/17		5/24/17