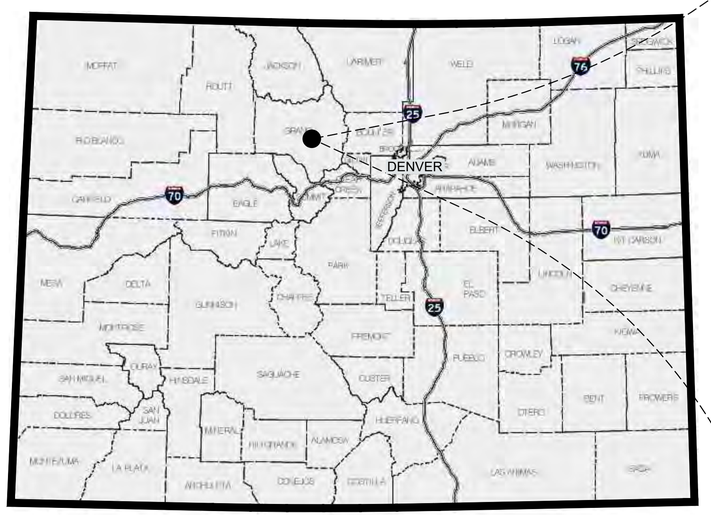
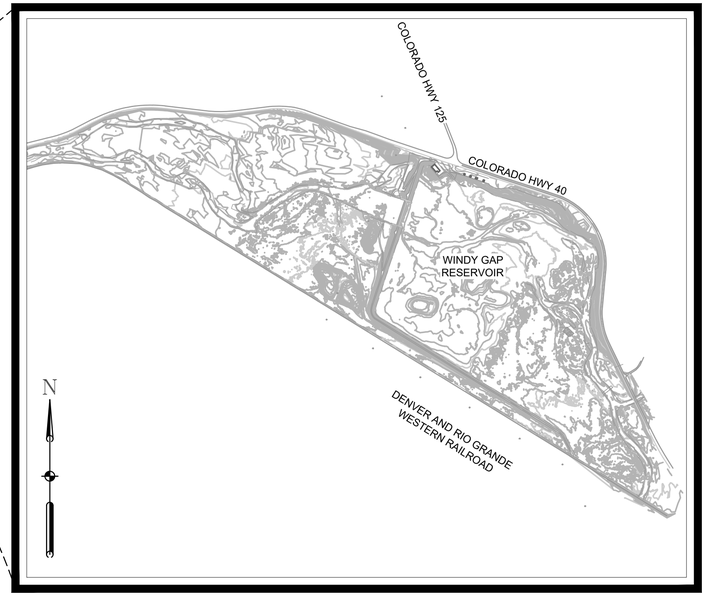
COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP
WINDY GAP DAM COMPLEX, WATER DIVISION: 5, WATER DISTRICT: 51,
SEO DAM ID: 510132
GRAND COUNTY, COLORADO

PREPARED FOR:
MUNICIPAL SUBDISTRICT
NORTHERN COLORADO WATER CONSERVANCY DISTRICT
MAY, 2022



COLORADO
STATE MAP
NOT TO SCALE

N



VICINITY MAP

500 0 500 1000
SCALE IN FEET

FOR BURIED UTILITY INFORMATION
THREE (3) BUSINESS DAYS
BEFORE YOU DIG
CALL 811
(or 1-800-922-1987)
UTILITY NOTIFICATION
CENTER OF COLORADO (UNCC)
www.uncc.org

COLORADO PROFESSIONAL ENGINEER CERTIFICATION

THESE PLANS HAVE BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

BY: GREG GLUNZ

COLORADO P.E. NO. 37737

GREGORY ALAN GLUNZ
37737
PROFESSIONAL ENGINEER
5/31/22

STATE ENGINEER APPROVAL

APPROVED ON THE 13th DAY OF June, 2022.

Kevin Rein

STATE ENGINEER

BY: JOHN E. HUNYADI

CHIEF, DAM SAFETY

COLORADO P.E. NO. 42709

STATE ENGINEER OF COLORADO

ENGINEER OF RECORD

THESE PLANS REPRESENT THE AS-CONSTRUCTED CONDITIONS OF THE CRCC PROJECT TO THE BEST OF MY KNOWLEDGE AND JUDGEMENT, BASED ON INFORMATION FURNISHED BY OTHERS, AS OF THE

_____ DAY OF _____, 20___.

BY: _____

COLORADO P.E. NO._____

ISSUED FOR CONSTRUCTION

AECOM

PROJECT
COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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Northern Colorado Water Conservancy District
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SEO CONSTRUCTION NUMBER
C-1521A

PROJECT NUMBER
60619047

SHEET TITLE
COVER

SHEET NUMBER
G-01

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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DRAWING LIST

SHEET NO.	SHEET TITLE
GENERAL	
G-01	COVER
G-02	GENERAL NOTES AND SHEET INDEX
G-03	LEGEND AND ABBREVIATIONS
G-04	EXISTING CONDITIONS AND DEMOLITION PLAN
G-05	SURVEY CONTROL PLAN
G-06	GENERAL PLAN OF WORKS
G-07	GEOLOGY PLAN AND PROFILE
G-08	GEOLOGY PLAN AND PROFILE
G-09	GEOLOGY PLAN AND PROFILE
G-10	GEOLOGY PLAN AND PROFILE
G-11	GEOLOGY LEGEND
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C-02	EMBANKMENT PROFILE AND WEST ACCESS ROAD PROFILE AND SECTION
C-03	EMBANKMENT SECTIONS
C-04	EMBANKMENT DETAILS SHEET 1 OF 2
C-05	EMBANKMENT DETAILS SHEET 2 OF 2
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C-20	OVERFLOW SPILLWAY, DIVERSION STRUCTURE & HWY 40 ACCESS ROAD PLAN
C-21	OVERFLOW SPILLWAY, DIVERSION STRUCTURE & HWY 40 PROFILE
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C-23	OVERFLOW SPILLWAY AND CONTROL BUILDING DETAILS
C-24	DIVERSION CHANNEL AND FISH PASSAGE PLAN
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C-30	CRCC AND GRADE CONTROL STRUCTURE PLAN
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C-35	CRCC PLAN AND PROFILE SHEET 2 OF 7
C-36	CRCC PLAN AND PROFILE SHEET 3 OF 7
C-37	CRCC PLAN AND PROFILE SHEET 4 OF 7
C-38	CRCC PLAN AND PROFILE SHEET 5 OF 7
C-39	CRCC PLAN AND PROFILE SHEET 6 OF 7
C-40	CRCC PLAN AND PROFILE SHEET 7 OF 7
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REGISTRATION

GREGORY GENE GLUTH — 37737 — PROFESSIONAL ENGINEER — STATE OF COLORADO
5/31/22

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PROJECT NUMBER

60619047

SHEET TITLE

GENERAL NOTES AND SHEET INDEX

SHEET NUMBER

G-02

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ABBREVIATIONS

±	PLUS OR MINUS
&	AND
@	AT
#	NUMBER
AB	ANCHOR BOLT
AC	ACRE(S)
ACI	AMERICAN CONCRETE INSTITUTE
ADAS	AUTOMATED DATA ACQUISITION SYSTEM
AF	ACRE FEET
ANR	ANCHOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPD	APPROVED
APPROX OR ~	APPROXIMATE
ASPHT	ASPHALT
B	BORING
BM	BENCHMARK
BP	BEGINNING POINT
C	CIVIL
CC or C TO C	CENTER TO CENTER
CFM	CUBIC FEET PER MINUTE
CIR	CIRCULAR
CKD	CHECKED
℄ or CL	CENTER LINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT OR COLORADO
CONC	CONCRETE
CONT	CONTINUOUS
COR	CONTRACTING OFFICER'S REPRESENTATIVE
CP	CONTROL POINT
CTR	CENTER OR CENTERS
CY	CUBIC YARDS
d	PENNY (as in nail - 10d)
D	DATUM
DBL	DOUBLE
DB	NOMINAL DIA. OF REINFORCEMENT BAR
DCJ	DOWELED CONTROL JOINT
DEG OR °	DEGREE
DIA OR Ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DP	DAMPPROOFING
DRN	DRAIN
D/S OR DS	DOWNSTREAM
DWG	DRAWING
DWL	DOWEL
E	EASTING
EA	EACH
ELEV	ELEVATION - GRADE or BUILDING
ELEC	ELECTRIC
EP	END POINT
EQ	EQUAL
EQ SPC	EQUALLY SPACED
EX	EXISTING
FES	FLARED END SECTION
FIG	FIGURE
FIN	FINISH
FT OR '	FEET
FTG	FOOTING
G	GENERAL
GA	GAGE or GAUGE GAL GALLON
GALV	GALVANIZED
GND or GRND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
>	GREATER THAN
H	HORIZONTAL
HDPE	HIGH DENSITY POLYETHYLENE
HL	HIGH LIGHT
HOR	HORIZONTAL
HP	HIGH POINT
HPU	HYDRAULIC POWER UNIT
HR	HOUR
ID	INSIDE DIAMETER OR IDENTIFICATION
INV	INVERT ELEVATION
INC	INCORPORATED IN OR " INCH INV
JT	JOINT
LAT	LATTITUDE
LBS	POUNDS
LD	DEVELOPMENT LENGTH
LIDAR	LIGHT DETECTION AND RANGING
LL	LOW LIGHT
LONG	LONGITUDINAL
LP	LOW POINT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
MSL	MEAN SEA LEVEL
N	NORTH OR NORTHING
NA	NOT APPLICABLE OR NOT AVAILABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NO	NUMBER
NTS	NOT TO SCALE
NWS	NORMAL WATER SURFACE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OHP	OVERHEAD POWER
OHU	OVERHEAD UTILITY LINE
PC	POINT OF CURVATURE
%	PERCENT
PI	POINT OF INTERSECTION
PMT	PADMOUNT TRANSFORMER
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PZ	PIEZOMETER
RAD or R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROUND OR ROAD
REINF	REINFORCEMENT
REV	REVISION
RTE	ROUTE
S	SOUTH, SLOPE, OR STRUCTURAL
SCH	SCHEDULE
SF	SQUAR FEET
SHT	SHEET
SIM	SIMILAR
SQ	SQUARE
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STR	STRUCTURAL
TAN	TANGENT
TBD	TO BE DETERMINED
TOP	TOP ELEVATION
TOC	TOP OF CONCRETE
TYP	TYPICAL
US	UNITED STATES
U/S OR US	UPSTREAM
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
USGS	UNITED STATES GEOLOGICAL SURVEY
V OR VERT	VERTICAL
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
W	WEST
W/	WITH
WS	WATERSTOP
X	BY
XFRMR	TRANSFORMER

LEGEND

- 7850 — EXISTING SURFACE MAJOR CONTOUR
- 7854 — EXISTING SURFACE MINOR CONTOUR
- PARCEL / PROPERTY LINE
- EXISTING RIVER BANK
- OHE — EXISTING OVERHEAD ELECTRIC
- 7850 — FINISHED SURFACE MAJOR CONTOUR
- 7854 — FINISHED SURFACE MINOR CONTOUR
- LIMIT OF GRADING
- SHEETPILE
- LIMIT NORMAL WATER POOL
- ?- - - - - ?- - - - APPROXIMATE BEDROCK
- 4.0H:1V — SLOPE LABEL
- WATER FLOW DIRECTION
- INDICATIVE LIMITS OF EMBANKMENT
  TRI-LOCK BLOCK EROSION PROTECTION.
  ACTUAL LIMITS OF TRI-LOCK
  BLOCK BASED ON TYPICAL SECTIONS
- EXISTING WETLANDS (MCMILLAN JACOBS 2020)
- NEW WETLANDS
- RIPRAP
- RIPRAP WITH GROWTH MEDIUM
- BEDDING
- UNDISTURBED SOIL
- CONCRETE
- GROUT

NOTE → 1 / C-XX — SECTION IDENTIFICATION; NOTE REFERENCE BUBBLE; SHEET REFERENCE

A / C-XX — SECTION IDENTIFICATION; SECTION REFERENCE; SHEET REFERENCE

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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REGISTRATION

REGISTERED PROFESSIONAL ENGINEER — GREGORY GENE GUNTER — 37737 — 5/31/22

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SHEET TITLE

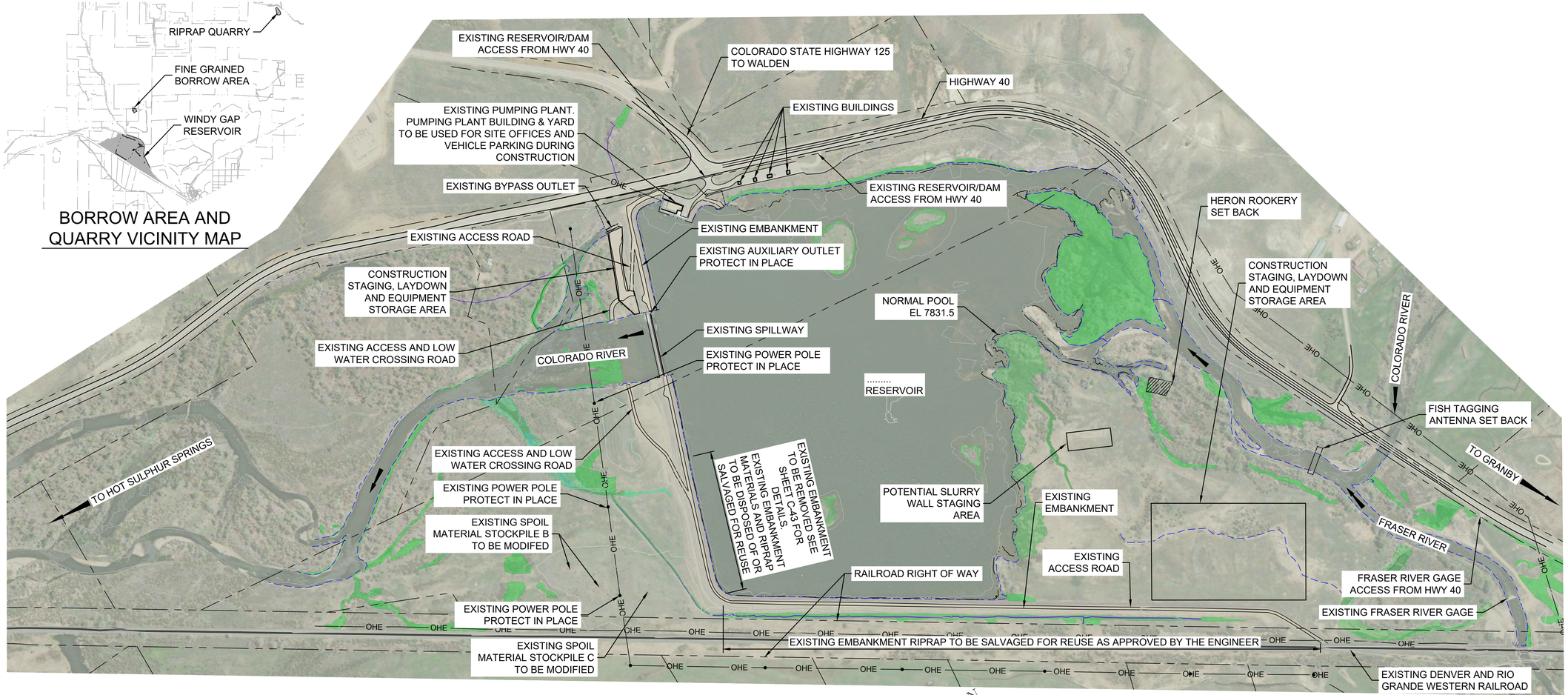
LEGEND AND ABBREVIATIONS

SHEET NUMBER

G-03

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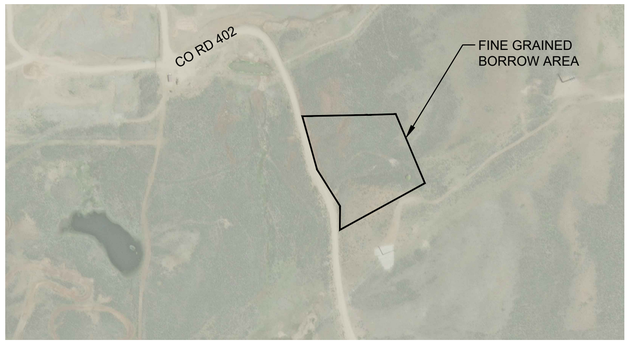
BORROW AREA AND QUARRY VICINITY MAP



EXISTING CONDITIONS AND DEMOLITION PLAN

300 0 300 600
SCALE IN FEET

CONTOUR INTERVAL: MINOR 5 FOOT
MAJOR 25 FOOT



FINE GRAINED BORROW AREA

300 0 300 600
SCALE IN FEET



RIPRAP AND BEDDING QUARRY

300 0 300 600
SCALE IN FEET

NOTES:

1. SEE SHEET C-60 FOR EXISTING PIEZOMETER LOCATIONS.
2. BORROW AND QUARRY AREAS ARE INDICATIVELY SHOWN. ACTUAL EXTENTS OF BORROW AREA AND QUARRY TO BE CONFIRMED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF BORROW OR QUARRY ACTIVITY.
3. ANY DISTURBANCE TO EXISTING WETLANDS SHALL BE IN ACCORDANCE WITH PROJECT CLEAN WATER ACT SECTION 404 NATIONWIDE PERMIT 27.

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EXISTING CONDITIONS AND DEMOLITION PLAN

SHEET NUMBER

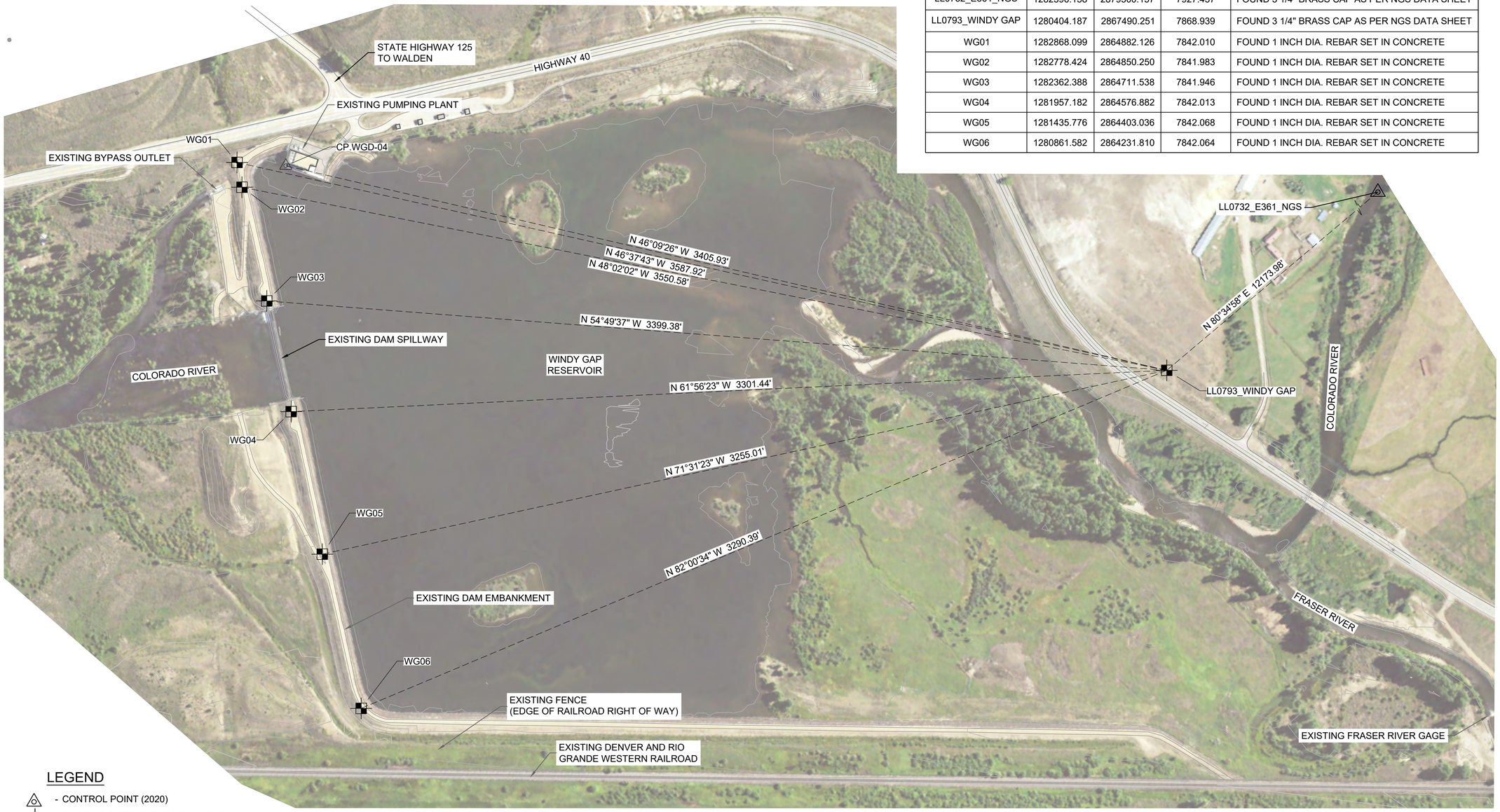
G-04

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP.WGD-04	1282763.417	2865033.753	7845.670	CP.WGD-04
LL0732_E361_NGS	1282396.138	2879500.157	7927.457	FOUND 3 1/4" BRASS CAP AS PER NGS DATA SHEET
LL0793_WINDY GAP	1280404.187	2867490.251	7868.939	FOUND 3 1/4" BRASS CAP AS PER NGS DATA SHEET
WG01	1282868.099	2864882.126	7842.010	FOUND 1 INCH DIA. REBAR SET IN CONCRETE
WG02	1282778.424	2864850.250	7841.983	FOUND 1 INCH DIA. REBAR SET IN CONCRETE
WG03	1282362.388	2864711.538	7841.946	FOUND 1 INCH DIA. REBAR SET IN CONCRETE
WG04	1281957.182	2864576.882	7842.013	FOUND 1 INCH DIA. REBAR SET IN CONCRETE
WG05	1281435.776	2864403.036	7842.068	FOUND 1 INCH DIA. REBAR SET IN CONCRETE
WG06	1280861.582	2864231.810	7842.064	FOUND 1 INCH DIA. REBAR SET IN CONCRETE



LEGEND

- CONTROL POINT (2020)
- EXISTING SETTLEMENT MONUMENT

HORIZONTAL DATUM:

UNITED STATES STATE PLANE 1983, COLORADO NORTH 0501 GRID COORDINATES NAD83(2011). HORIZONTAL COORDINATES ARE BASED UPON A POST-PROCESSED STATIC SURVEY PERFORMED IN MAY OF 2020 BY AECOM, REFERENCING THE NGS PUBLISHED SURVEY MARKS OF WINDY GAP (LL0793) AND E361 (LL0732).

VERTICAL DATUM:

NORTH AMERICAN VERTICAL DATUM OF 1988. THE VERTICAL BENCHMARK USED TO DETERMINE ELEVATIONS WAS THE NGS PUBLISHED SURVEY MARK WINDY GAP (LL0793).

SETTLEMENT MONUMENT CONTROL PLAN

200 0 200 400
SCALE IN FEET

N

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REGISTERED PROFESSIONAL ENGINEER
37737
PROFESSIONAL ENGINEER
5/31/22

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SHEET TITLE

SURVEY CONTROL PLAN

SHEET NUMBER

G-05

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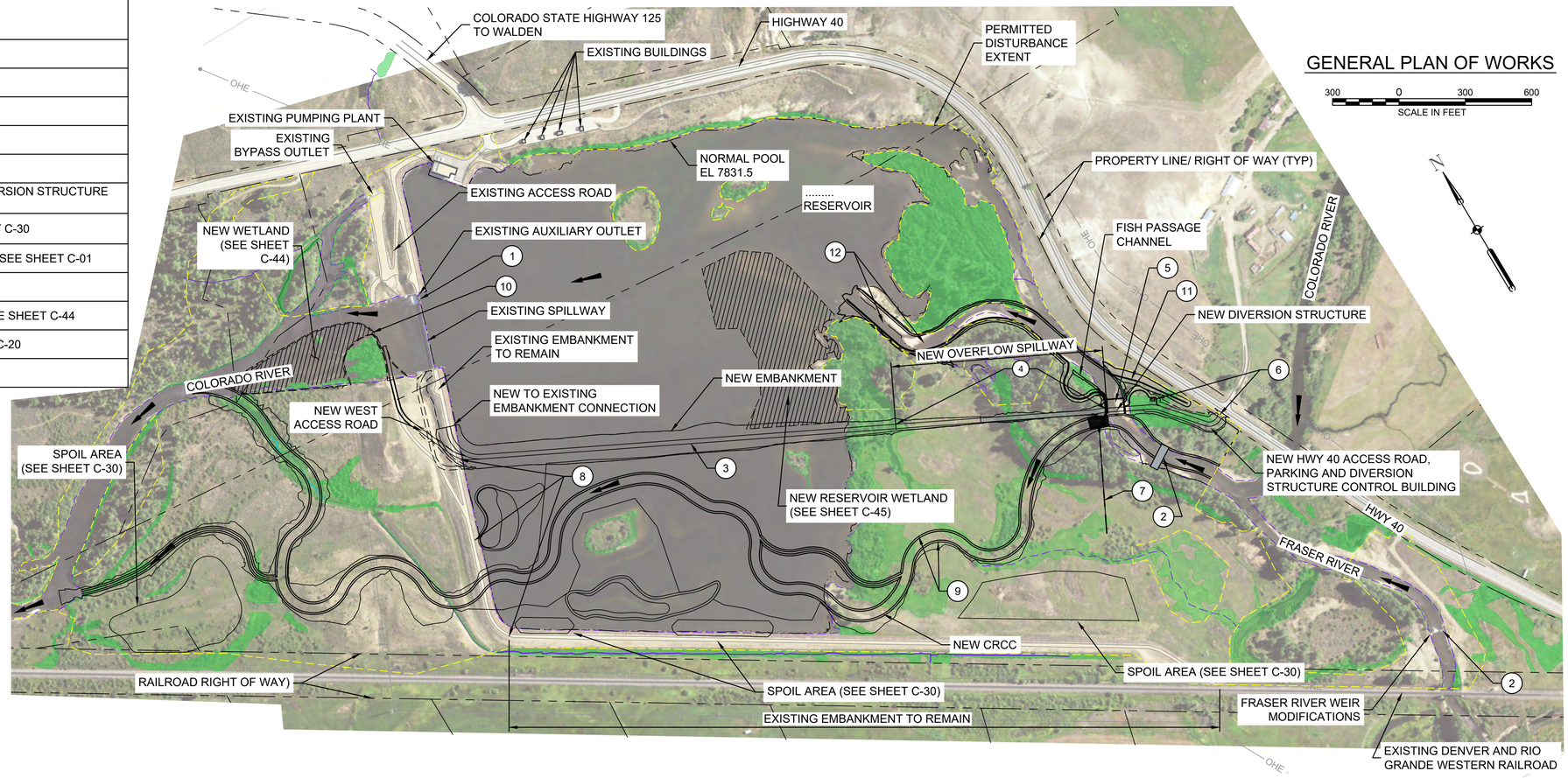
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CALLOUT INDEX	
TAG ID	DESCRIPTION
1	EXISTING LOW BLOCK SPILLWAY CREST
2	NEW RIVER CROSSING - SEE SHEET F-05
3	NEW EMBANKMENT - SEE SHEET C-01
4	OVERFLOW SPILLWAY - SEE SHEET C-20
5	DIVERSION STRUCTURE - SEE SHEET S-01
6	HWY 40 ACCESS ROAD, PARKING AND DIVERSION STRUCTURE CONTROL BUILDING - SEE SHEET C-20
7	GRADE CONTROL STRUCTURE - SEE SHEET C-30
8	EXISTING EMBANKMENT TO BE REMOVED - SEE SHEET C-01
9	CRCC - SEE SHEET C-30 AND SHEET P-01
10	NEW BOULDER CHANNEL NARROWING - SEE SHEET C-44
11	HIGHWAY 40 CULVERT DITCH - SEE SHEET C-20
12	DIVERSION CHANNEL - SEE SHEET C-24

GENERAL NOTES:

1. LIMITS OF CONSTRUCTION, ACCESS ROADS, LAYDOWN LOCATIONS AND EMBANKMENT REMOVALS TO BE DETERMINED BY THE CONTRACTOR AND AS AGREED WITH THE ENGINEER AND NORTHERN WATER, PRIOR TO CONSTRUCTION.
2. SURFACE AREA AND RESERVOIR STORAGE INFORMATION BASED ON EXISTING TOPOGRAPHY (GROUND SURVEY AND DRONE SURVEY) AND DESIGN CONDITIONS. THE IMPACT OF CONSTRUCTION ACTIVITIES, SUCH AS CONSTRUCTION OF BORROW AREAS, ON THIS INFORMATION TO BE ASSESSED BASED ON AS BUILT CONDITIONS. BORROW SOURCES WITHIN THE RESERVOIR TO BE LOCATED A MINIMUM OF 200 FT FROM THE UPSTREAM TOE OF THE EXISTING DAM EMBANKMENT TO COMPLY WITH SEO RULE 7.3.4.5.2 (RULES AND REGULATIONS FOR DAM SAFETY AND DAM CONSTRUCTION, STATE OF COLORADO).
3. ANY DISTURBANCE TO EXISTING WETLANDS SHALL BE MINIMIZED AND IN ACCORDANCE WITH PROJECT CLEAN WATER ACT SECTION 404 NATIONWIDE PERMIT 27.



GENERAL PLAN OF WORKS

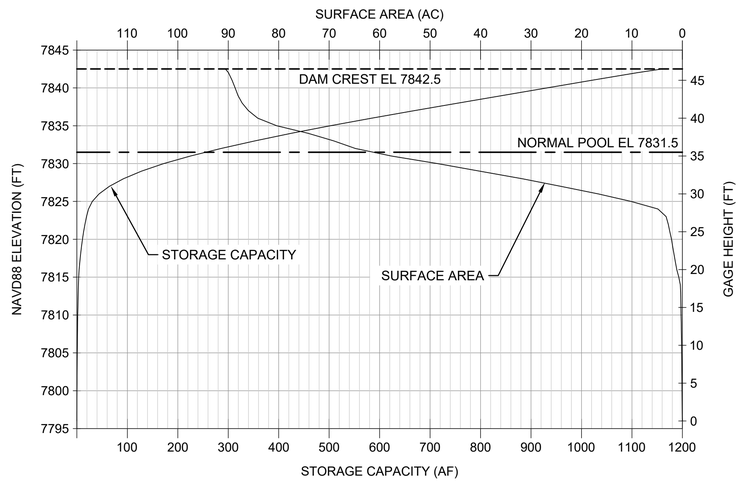
300 0 300 600
SCALE IN FEET

N

ELEVATION, GAGE HEIGHT, SURFACE AREA & RESERVOIR STORAGE				
NAVD 88 ELEVATION (FT)	GAGE HEIGHT (FT)	SURFACE AREA (AC)	STORAGE CAPACITY (AF)	NOTES
7796.0	0.0	0.00	0.00	
7797.0	1.0	0.04	0.02	
7798.0	2.0	0.05	0.07	
7799.0	3.0	0.07	0.13	
7800.0	4.0	0.08	0.20	
7801.0	5.0	0.09	0.28	
7802.0	6.0	0.10	0.38	
7803.0	7.0	0.12	0.49	
7804.0	8.0	0.13	0.62	
7805.0	9.0	0.15	0.76	
7806.0	10.0	0.17	0.92	
7807.0	11.0	0.19	1.10	
7808.0	12.0	0.21	1.30	
7809.0	13.0	0.23	1.52	
7810.0	14.0	0.26	1.77	
7811.0	15.0	0.29	2.05	
7812.0	16.0	0.32	2.35	
7813.0	17.0	0.34	2.68	
7814.0	18.0	0.41	3.05	

ELEVATION, GAGE HEIGHT, SURFACE AREA & RESERVOIR STORAGE				
NAVD 88 ELEVATION (FT)	GAGE HEIGHT (FT)	SURFACE AREA (AC)	STORAGE CAPACITY (AF)	NOTES
7815.0	19.0	0.72	3.61	
7816.0	20.0	1.12	4.53	
7817.0	21.0	1.39	5.79	
7818.0	22.0	1.65	7.31	
7819.0	23.0	1.91	9.09	
7820.0	24.0	2.16	11.10	
7821.0	25.0	2.49	13.40	
7822.0	26.0	2.81	16.10	
7823.0	27.0	3.23	19.10	
7824.0	28.0	4.85	23.10	
7825.0	29.0	10.17	30.60	
7826.0	30.0	16.67	44.00	
7827.0	31.0	24.10	64.40	
7828.0	32.0	31.72	92.30	
7829.0	33.0	40.14	128.00	
7830.0	34.0	48.51	172.00	
7831.0	35.0	57.67	225.00	
7831.5	35.5	61.24	255.50	NORMAL POOL
7832.0	36.0	64.82	286.00	

ELEVATION, GAGE HEIGHT, SURFACE AREA & RESERVOIR STORAGE				
NAVD 88 ELEVATION (FT)	GAGE HEIGHT (FT)	SURFACE AREA (AC)	STORAGE CAPACITY (AF)	NOTES
7833.0	37.0	69.10	353.00	
7834.0	38.0	74.18	425.00	
7835.0	39.0	80.38	502.00	
7836.0	40.0	84.14	584.00	
7837.0	41.0	86.01	669.00	
7838.0	42.0	87.25	756.00	
7839.0	43.0	88.07	844.00	
7840.0	44.0	88.64	932.00	
7841.0	45.0	89.24	1,020.00	
7842.0	46.0	89.95	1,110.00	
7842.5	46.5	90.57	1,160.00	DAM CREST



WINDY GAP DAM RESERVOIR
SURFACE AREA - RESERVOIR CAPACITY CURVES

ISSUED FOR CONSTRUCTION

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
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CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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CONSULTANTS

REGISTRATION

REGISTERED GREGORY GENE GUNTEN PROFESSIONAL ENGINEER 37737 STATE OF COLORADO 5/24/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	05/24/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

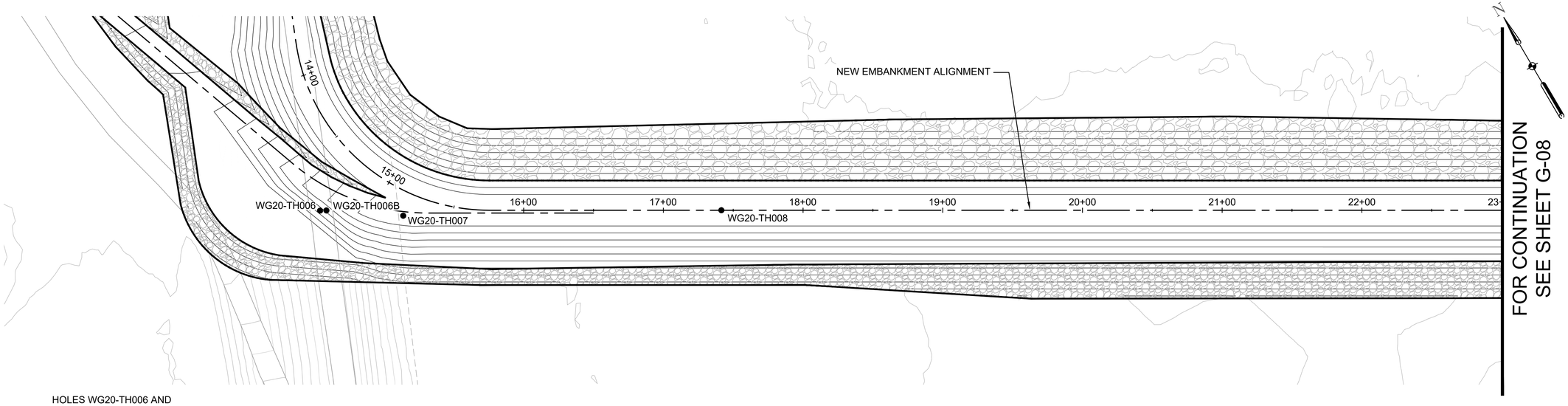
GENERAL PLAN OF WORKS

SHEET NUMBER

G-06

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Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

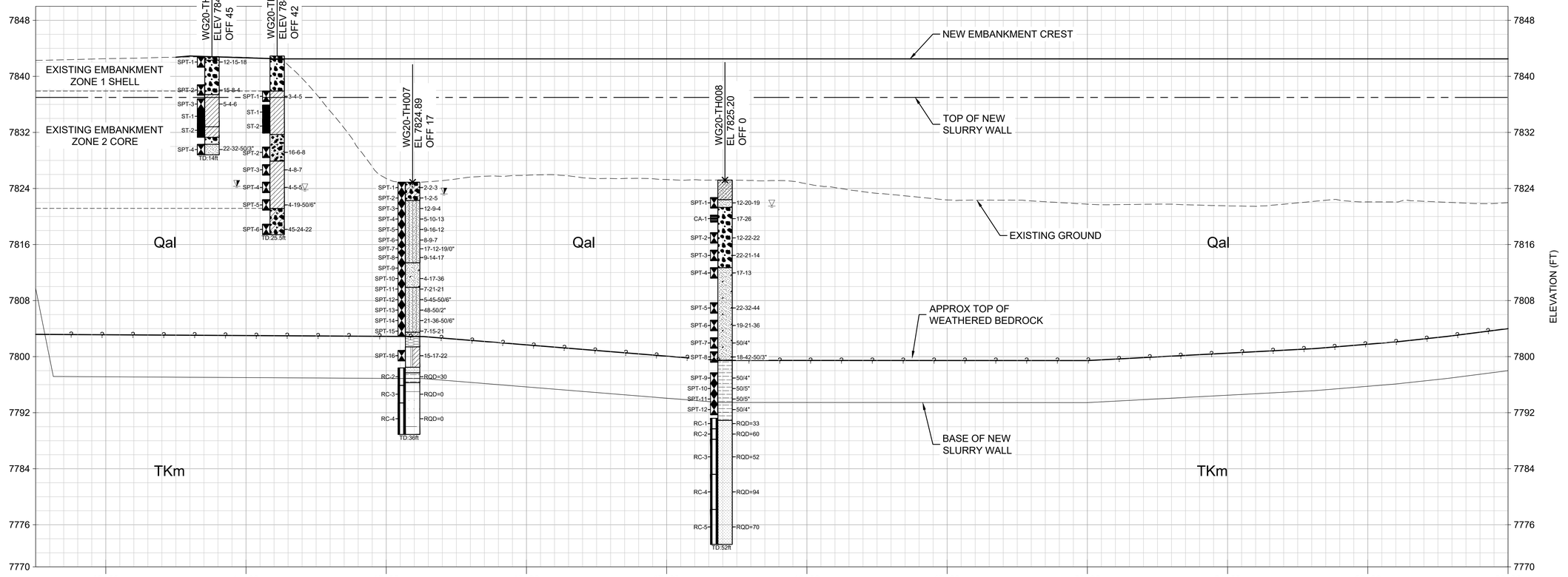


EMBANKMENT LAYOUT PLAN

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

HOLES WG20-TH006 AND WG20-TH006B ARE LOCATED NEXT TO EACH OTHER, THEY HAVE BEEN SEPARATED IN PROFILE VIEW TO SHOW THE DATA



NOTE: EXISTING EMBANKMENT CORE AND SHELL EXTENTS SHOWN AS APPROXIMATE

EMBANKMENT ALIGNMENT PROFILE
STA: 12+50 TO STA: 23+00

40 0 40 80
SCALE IN FEET

8 0 8 16
SCALE IN FEET

ISSUED FOR CONSTRUCTION

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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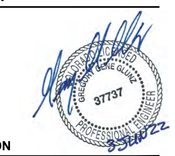
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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	04/29/2022	ISSUED FOR CONSTRUCTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

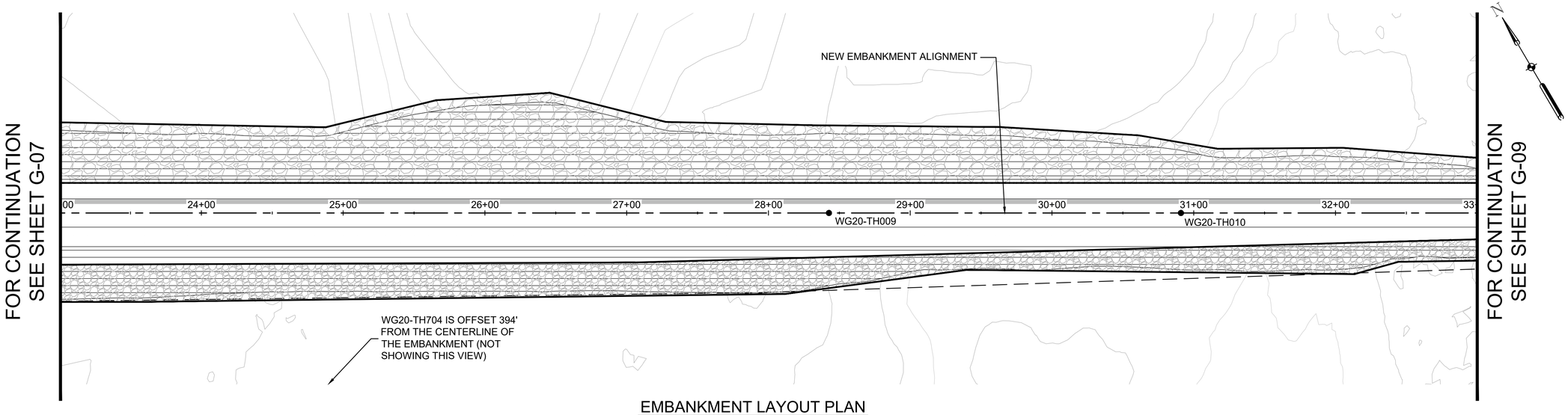
GEOLOGY PLAN AND PROFILE

SHEET NUMBER

G-07

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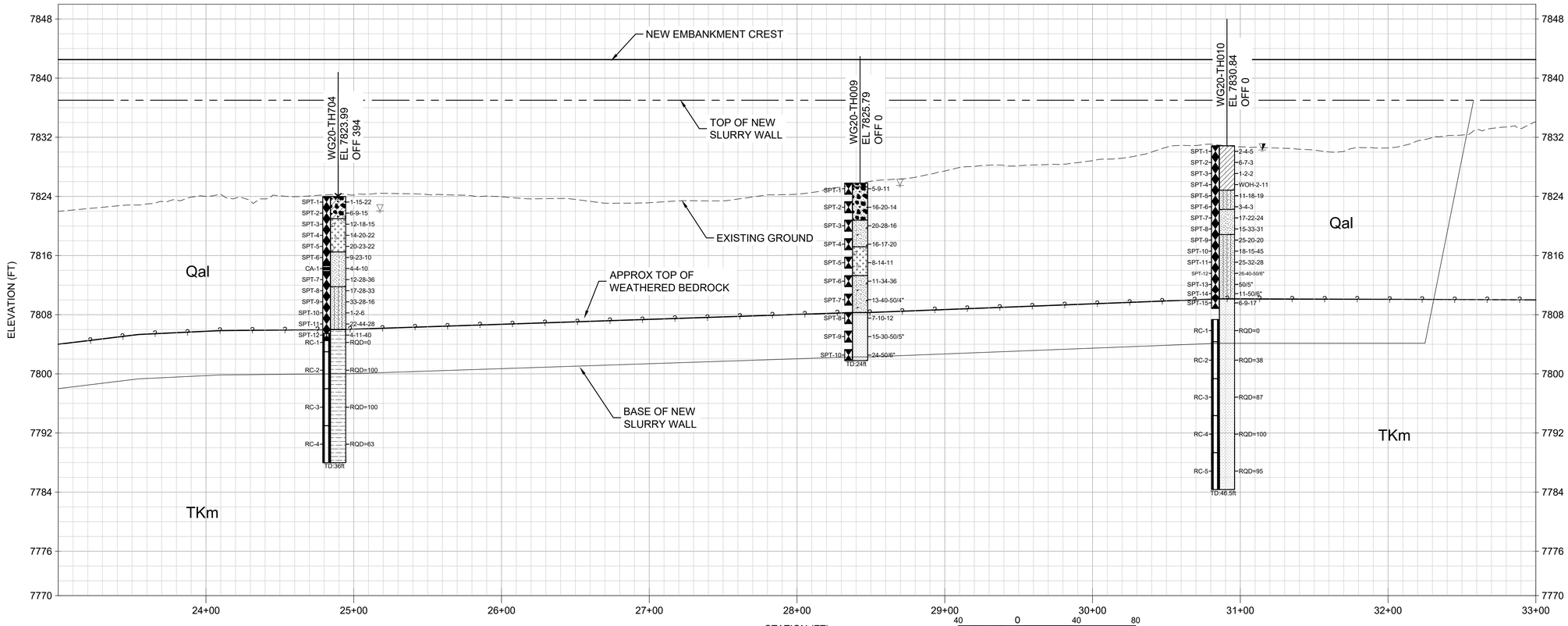
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EMBANKMENT LAYOUT PLAN

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT



EMBANKMENT ALIGNMENT PROFILE
STA: 23+00 TO STA: 33+00

40 0 40 80
SCALE IN FEET

8 0 8 16
SCALE IN FEET

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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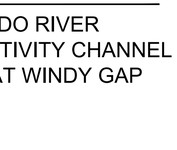
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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	04/29/2022	ISSUED FOR CONSTRUCTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

GEOLOGY PLAN AND PROFILE

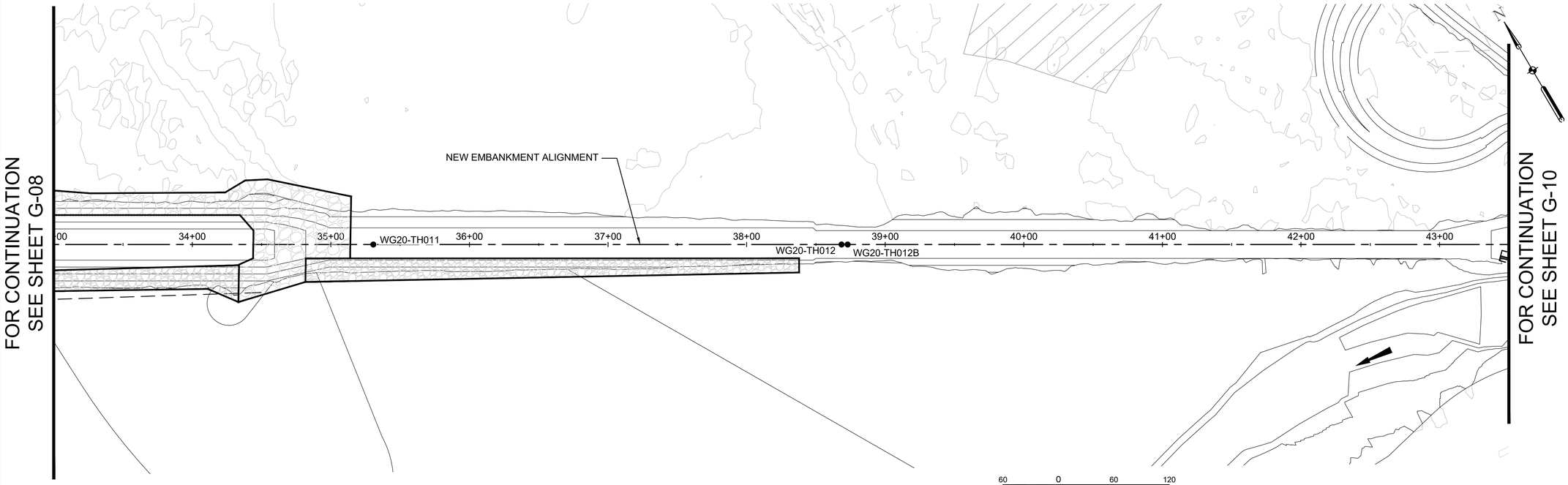
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G-08

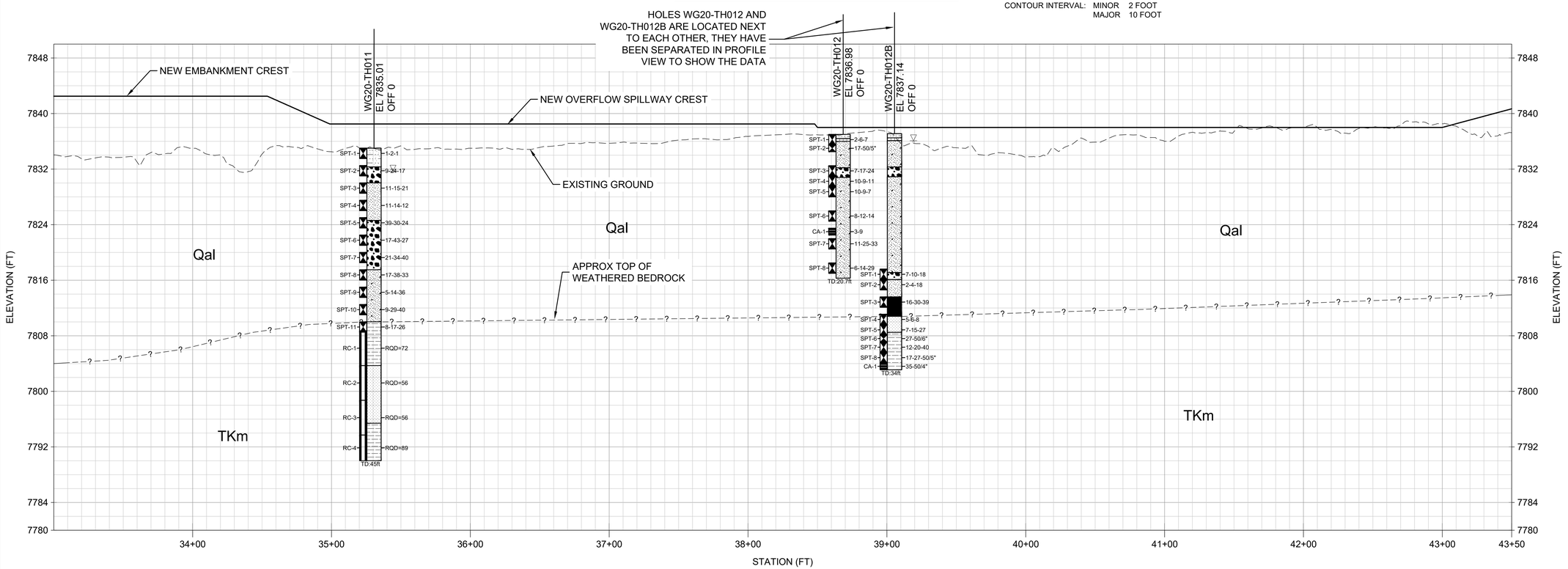
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Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"



OVERFLOW SPILLWAY LAYOUT PLAN



EMBANKMENT ALIGNMENT PROFILE
STA: 33+00 TO STA: 43+50

40 0 40 80
SCALE IN FEET

8 0 8 16
SCALE IN FEET

ISSUED FOR CONSTRUCTION

AECOM

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COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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CONSULTANTS

REGISTRATION

GREGORY MARK DUNN 37737 PROFESSIONAL ENGINEER 3/31/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

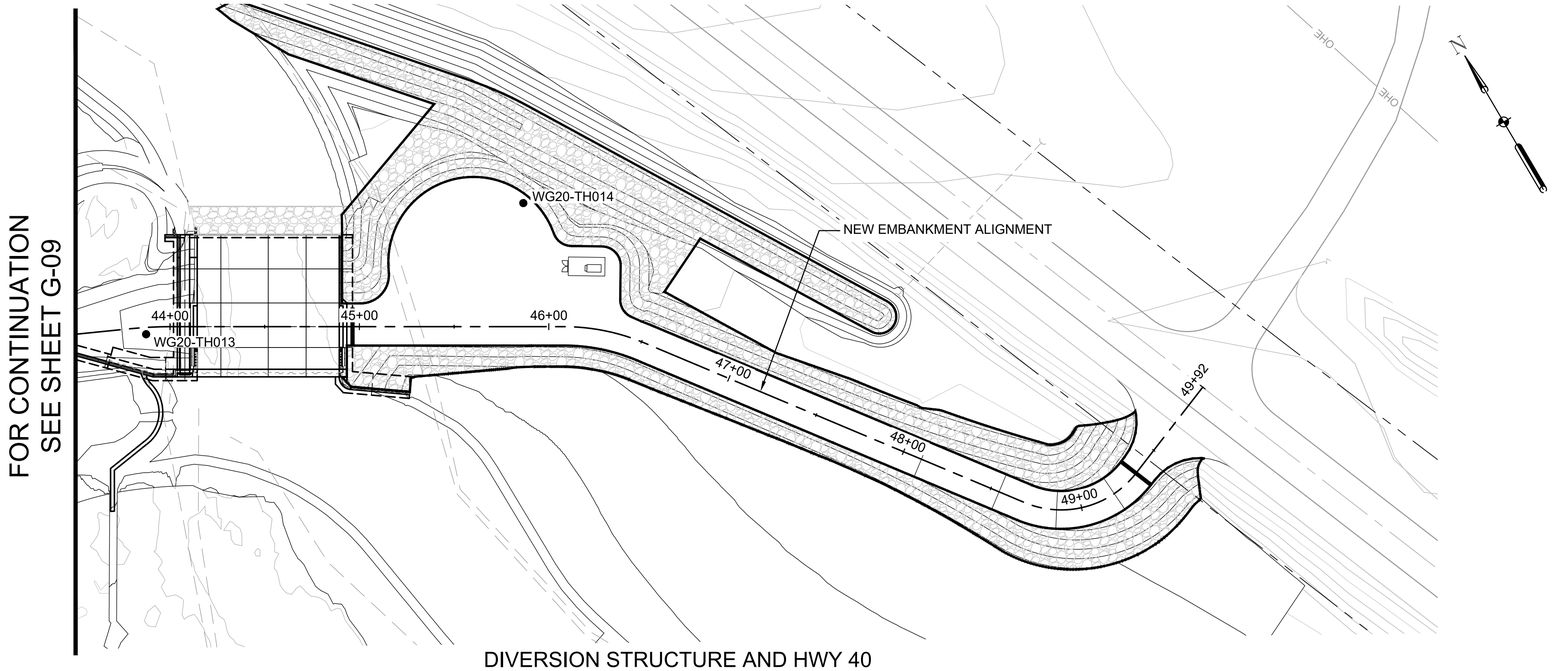
GEOLOGY PLAN AND PROFILE

SHEET NUMBER

G-09

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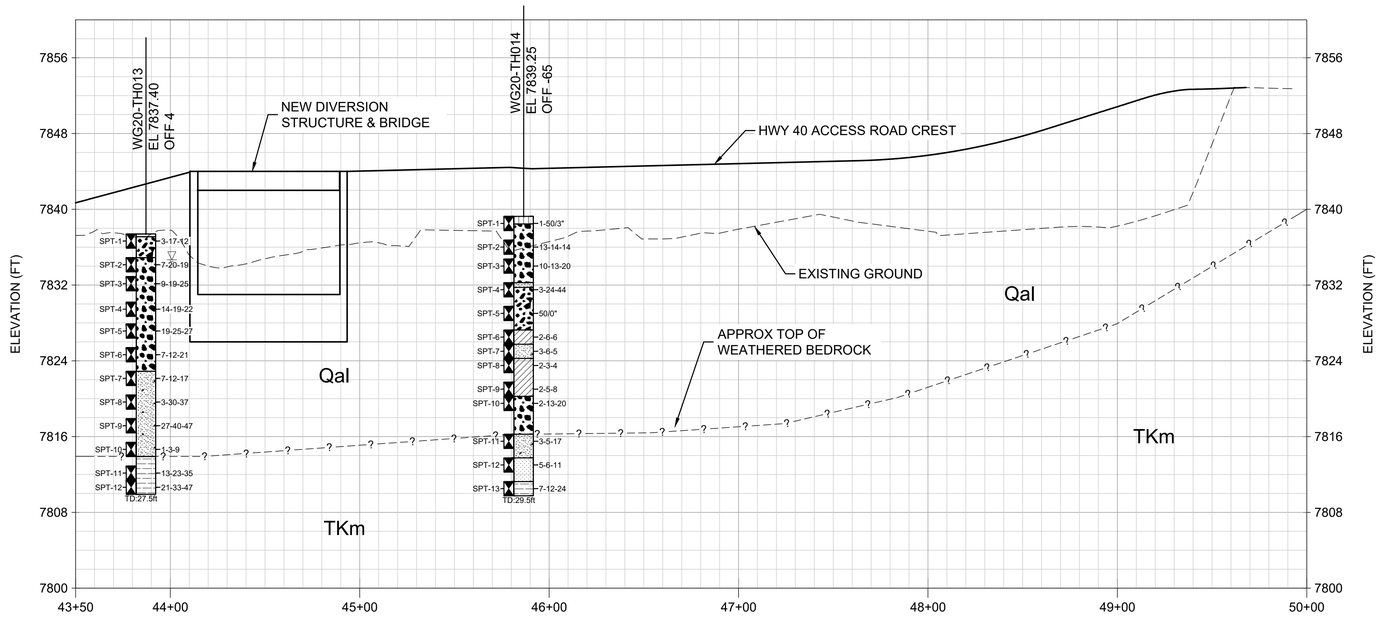
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DIVERSION STRUCTURE AND HWY 40
ACCESS ROAD LAYOUT PLAN

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT



EMBANKMENT ALIGNMENT PROFILE
STA: 43+50 TO STA: 50+00

40 0 40 80
SCALE IN FEET

8 0 8 16
SCALE IN FEET

ISSUED FOR CONSTRUCTION

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GREGORY ROBERTSON 37737 REGISTERED PROFESSIONAL ENGINEER 5/31/22

ISSUE/REVISION

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1	04/29/2022	ISSUED FOR CONSTRUCTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

GEOLOGY PLAN AND PROFILE

SHEET NUMBER

G-10

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

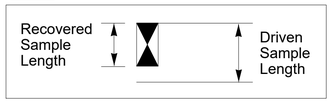
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Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

TYPICAL SOIL MATERIAL GRAPHIC SYMBOLS

- Asphalt
- Claystone
- Low Plasticity Sandy Clay
- Silty Gravel
- Poorly-graded Sandy Gravel
- Well-graded Gravel with Sand
- Gravelly Silt
- Silty Sand
- Sand and Gravel
- Well-graded Gravelly Sand
- Topsoil
- Low Plasticity Clay
- Low to High Plasticity Clay
- Clayey Gravel
- Poorly-graded Gravel
- Well-graded Gravel
- Silt
- Clayey Sand
- Poorly-graded Sand
- Well-graded Sand
- Well-graded Sand with Silty Sand



Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced; they are not warranted to be representative of subsurface conditions at other locations or times.

TYPICAL ROCK MATERIAL GRAPHIC SYMBOLS

- Claystone and Siltstone
- Siltstone
- Sandstone
- Interbedded Sandstone and Siltstone

GEOLOGIC UNITS

Alluvium (Qal): Sandy Gravels, Gravelly Sands (20-40% Cobbles)

Middle Park Formation (TKm): Interbedded Claystone, Siltstone and Shale

TYPICAL SAMPLER GRAPHIC SYMBOLS

- CA: California Sample
- RC: Rock Core
- ST: Shelby Tube
- CC: Continuous Coring
- SPT: Standard Penetration Test

ABBREVIATIONS

ATD: At Time of Drilling
NR: No Recovery
NA: Not Applicable
bgs: Below Ground Surface

WATER LEVEL LEGEND

- Water Level at Time of Drilling, or as Shown
- Water Level at End of Drilling, or as Shown
- Water Level After 24 Hours, or as Shown

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Suite 201
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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	04/29/2022	ISSUED FOR CONSTRUCTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

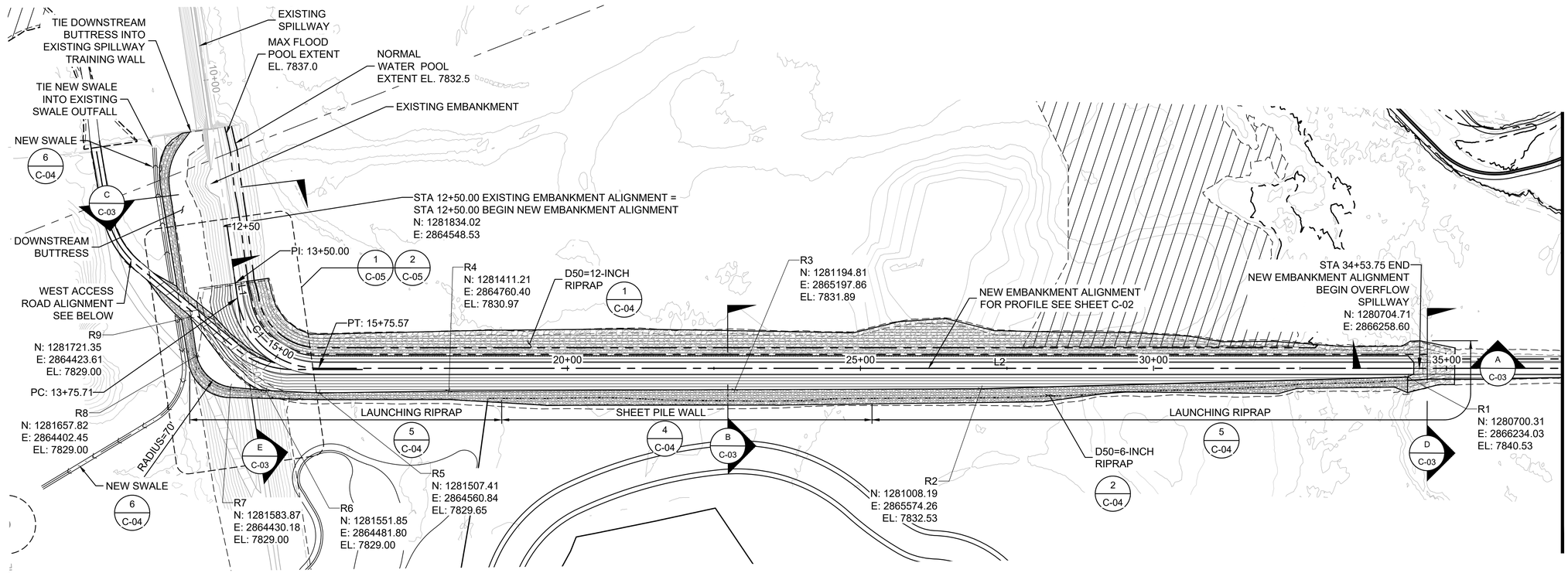
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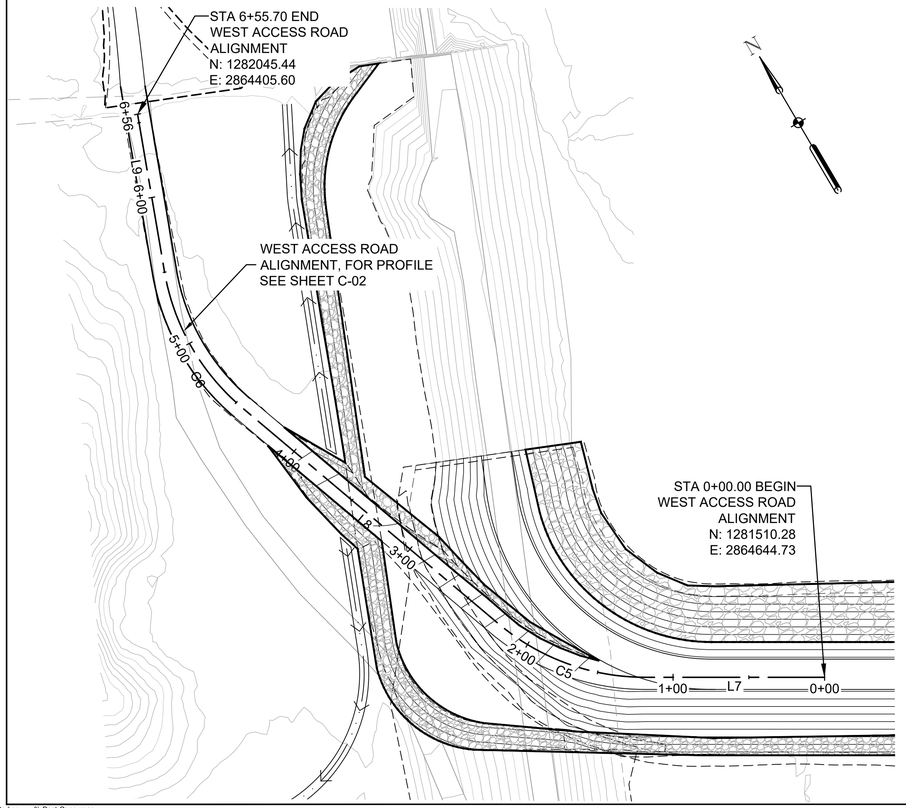
GEOLOGY LEGEND

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G-11

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LINE TABLE		
LINE	LENGTH	BEARING
L1	25.71	S18°23'12"W
L2	2774.43	S63°24'36"E
L7	118.51	N63°24'36"W
L8	221.27	N23°16'46"W
L9	105.71	N16°52'59"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	199.87	140.00	81°47'48"	121.26	183.32
C5	105.06	150.00	40°07'51"	54.79	102.93
C6	105.15	150.00	40°09'45"	54.84	103.01

WEST ACCESS ROAD LAYOUT PLAN

50 0 50 100
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

EMBANKMENT LAYOUT PLAN

100 0 100 200
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. EXCAVATE AND SALVAGE EXISTING RIPRAP (IF PRESENT) FOR REUSE WHEN IMPACTED BY NEW FEATURES
2. SETOUT POINTS R1 THROUGH R9 SHOWN ON PLAN PROVIDED TO DEFINE UPPER LIMITS OF RIPRAP ON DOWNSTREAM SLOPE OF THE NEW EMBANKMENT. IN NO CASES SHOULD THE UPPER LIMITS OF THE RIPRAP BE LOWER THAN THE ELEVATION PROVIDED AS PART OF THE SETOUT POINTS

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COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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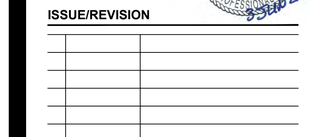
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PROJECT NUMBER

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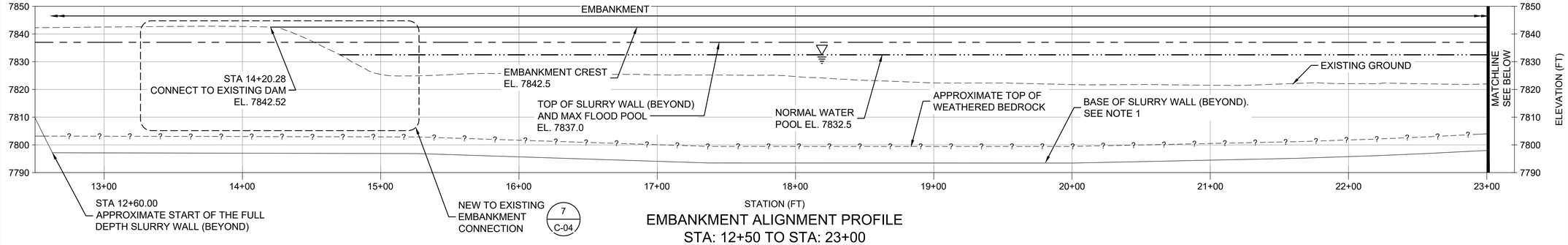
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EMBANKMENT PLAN

SHEET NUMBER

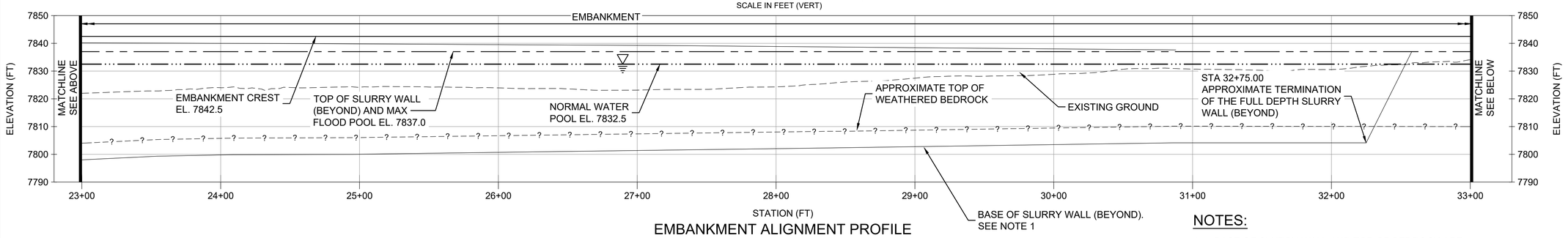
C-01

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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Printed on ___% Post-Consumer Recycled Content Paper



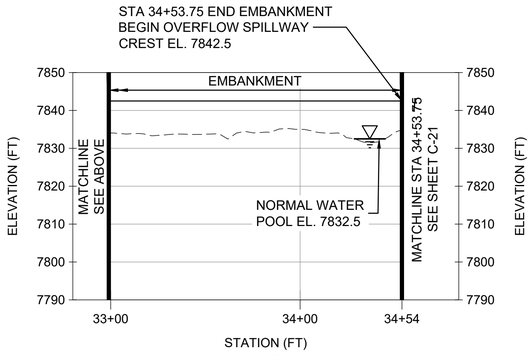
EMBANKMENT ALIGNMENT PROFILE
STA: 12+50 TO STA: 23+00

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)



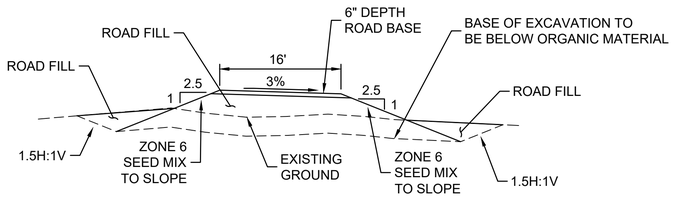
EMBANKMENT ALIGNMENT PROFILE
STA: 23+00 TO STA: 33+00

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)



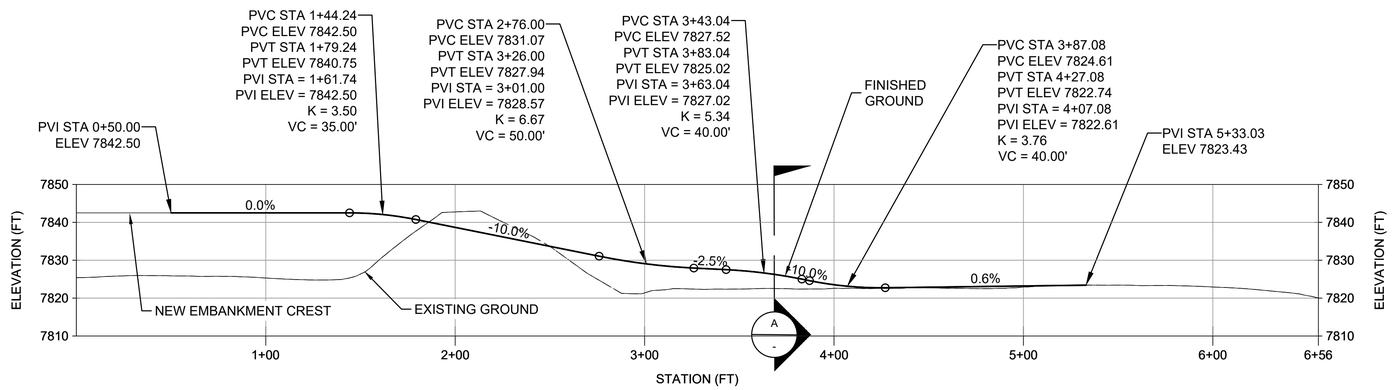
EMBANKMENT ALIGNMENT PROFILE
STA: 33+00 TO STA: 34+54

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)



A - TYPICAL WEST ACCESS ROAD SECTION
1" = 10'

10 0 10 20
SCALE IN FEET



WEST ACCESS ROAD ALIGNMENT PROFILE
STA: 0+00 TO STA: 6+56

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)

NOTES:

1. BASE OF SLURRY WALL AND TOP OF BEDROCK ARE APPROXIMATE AND WERE ESTIMATED BASED ON GEOTECHNICAL INVESTIGATIONS UNDERTAKEN BY AECOM IN NOVEMBER 2020
2. EXCAVATE AND SALVAGE EXISTING RIPRAP (IF PRESENT) FOR REUSE WHEN IMPACTED BY NEW FEATURES
3. FOUNDATION EXCAVATION NOT SHOWN
4. RIPRAP NOT SHOWN
5. ROAD BASE NOT SHOWN ON THE PROFILES
6. FOR THE TESTS HOLES UNDERTAKEN AS PART O F THE GEOTECHNICAL INVESTIGATION SEE SHEETS G-07 TO G-11

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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CONSULTANT

AECOM
804 COLORADO AVE.
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CONSULTANTS

REGISTRATION

GREGORY ALAN OLSEN
37737
REGISTERED PROFESSIONAL ENGINEER
COLORADO
5/31/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

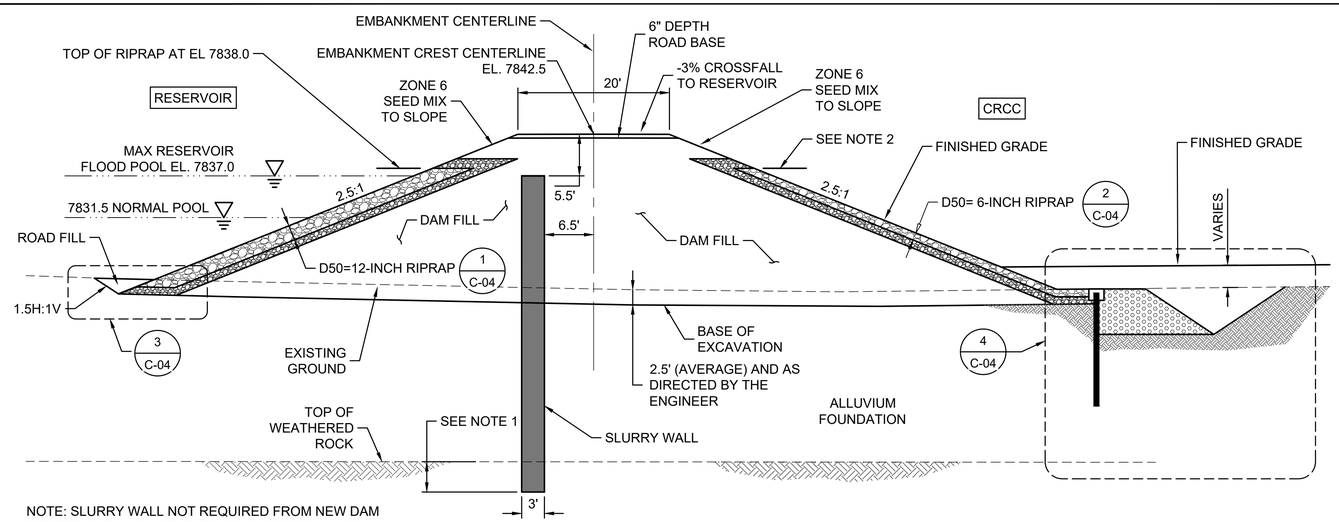
SHEET TITLE

EMBANKMENT PROFILE AND WEST ACCESS ROAD PROFILE AND SECTION

SHEET NUMBER

C-02

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"
Last saved by: CASEY.ROBERTSON (2022-04-29) Last Plotted: 2022-05-04
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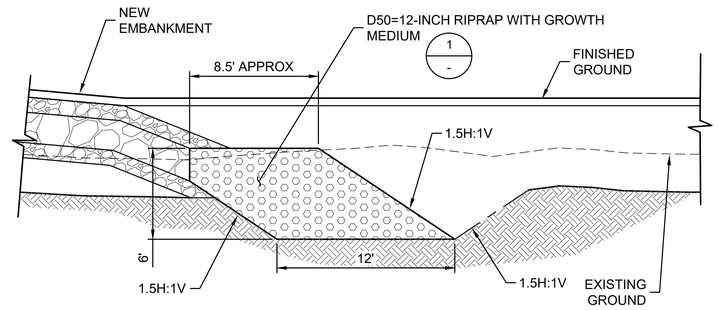


NOTE: SLURRY WALL NOT REQUIRED FROM NEW DAM CENTERLINE ALIGNMENT STA 32+75.00 TO 34+54.00

B C-01 TYPICAL EMBANKMENT SECTION

1" = 10'

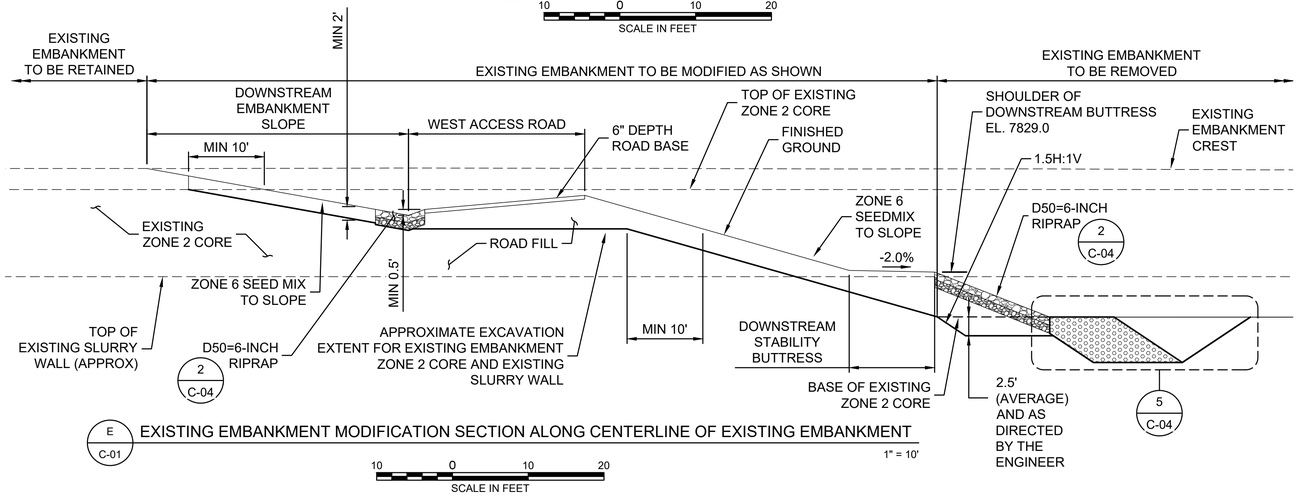
SCALE IN FEET: 10 0 10 20



1 - LAUNCHING RIPRAP TYPICAL SECTION AT EMBANKMENT TO OVERFLOW SPILLWAY TRANSITION

1" = 5'

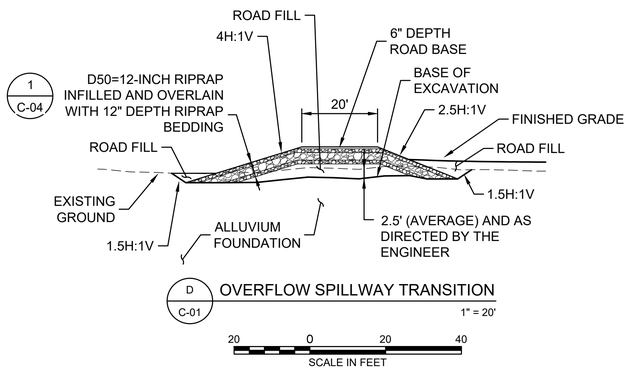
SCALE IN FEET: 5 0 5 10



E C-01 EXISTING EMBANKMENT MODIFICATION SECTION ALONG CENTERLINE OF EXISTING EMBANKMENT

1" = 10'

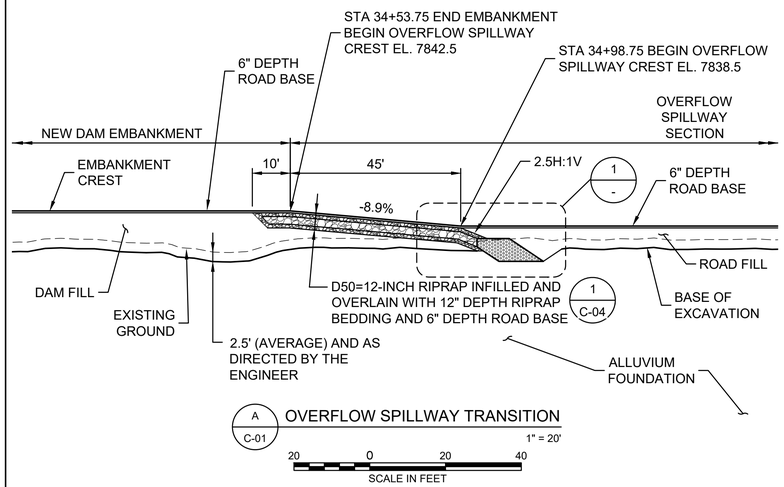
SCALE IN FEET: 10 0 10 20



D C-01 OVERFLOW SPILLWAY TRANSITION

1" = 20'

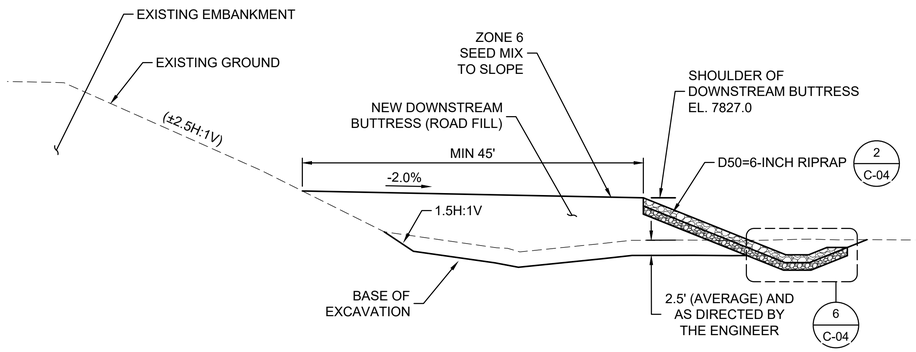
SCALE IN FEET: 20 0 20 40



A C-01 OVERFLOW SPILLWAY TRANSITION

1" = 20'

SCALE IN FEET: 20 0 20 40



C C-01 TYPICAL EXISTING EMBANKMENT SECTION WITH STABILITY BUTTRESSES

1" = 10'

SCALE IN FEET: 10 0 10 20

NOTES:

1. SLURRY WALL SHALL BE KEYED INTO BEDROCK. ADVANCE INTO ROCK MIN 6' OR TO REFUSAL, OR SHALLOWER, AS DEFINED BY THE SPECIFICATIONS
2. TOP EL OF RIPRAP VARIES IN ACCORDANCE WITH THE EXTENT SHOWN ON SHEET C-01
3. EXCAVATE AND SALVAGE EXISTING RIPRAP (IF PRESENT) FOR REUSE WHEN IMPACTED BY NEW FEATURES

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Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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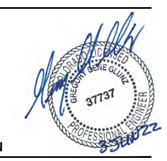
CONSULTANT

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

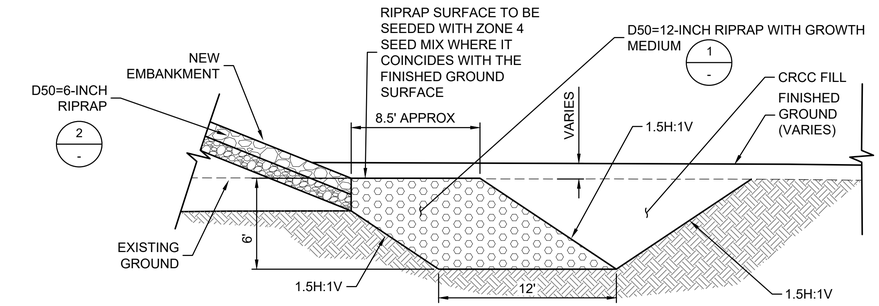
60619047

SHEET TITLE

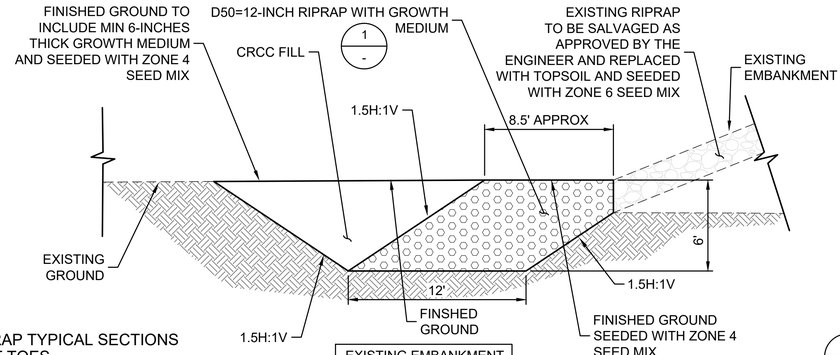
EMBANKMENT SECTIONS

SHEET NUMBER

C-03



NEW EMBANKMENT

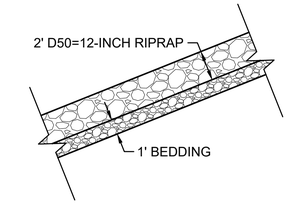


EXISTING EMBANKMENT

5 C-01 LAUNCHING RIPRAP TYPICAL SECTIONS AT EMBANKMENT TOES

1" = 5'

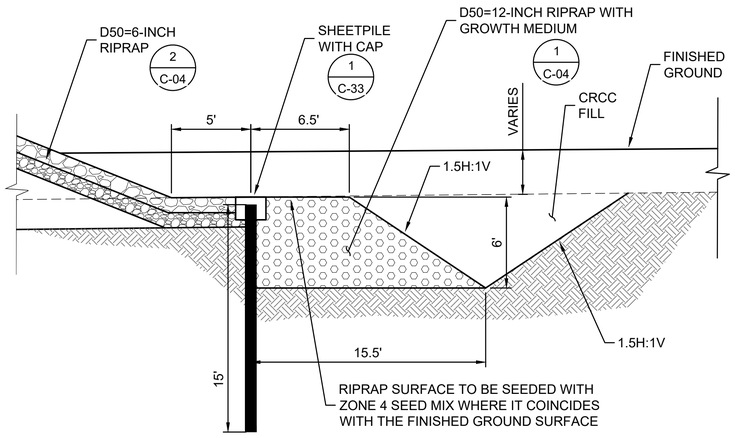
SCALE IN FEET 5 0 5 10



1 - D50=12-INCH RIPRAP DETAIL

1" = 5'

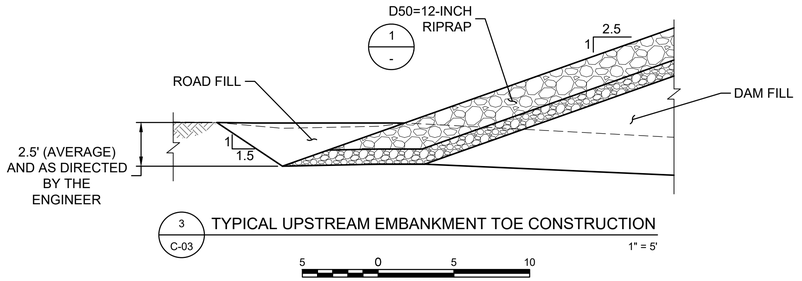
SCALE IN FEET 5 0 5 10



4 C-01 TYPICAL SHEET PILE WALL DETAIL

1" = 5'

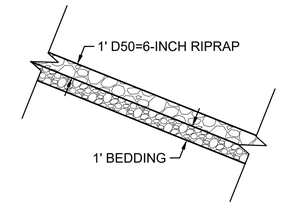
SCALE IN FEET 5 0 5 10



3 C-03 TYPICAL UPSTREAM EMBANKMENT TOE CONSTRUCTION

1" = 5'

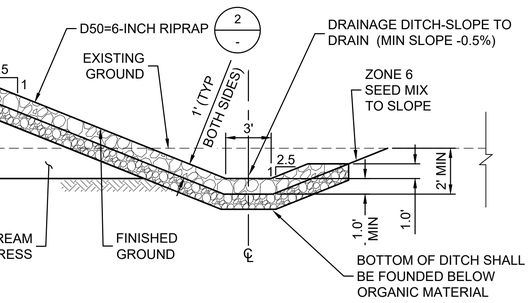
SCALE IN FEET 5 0 5 10



2 - D50=6-INCH RIPRAP DETAIL

1" = 5'

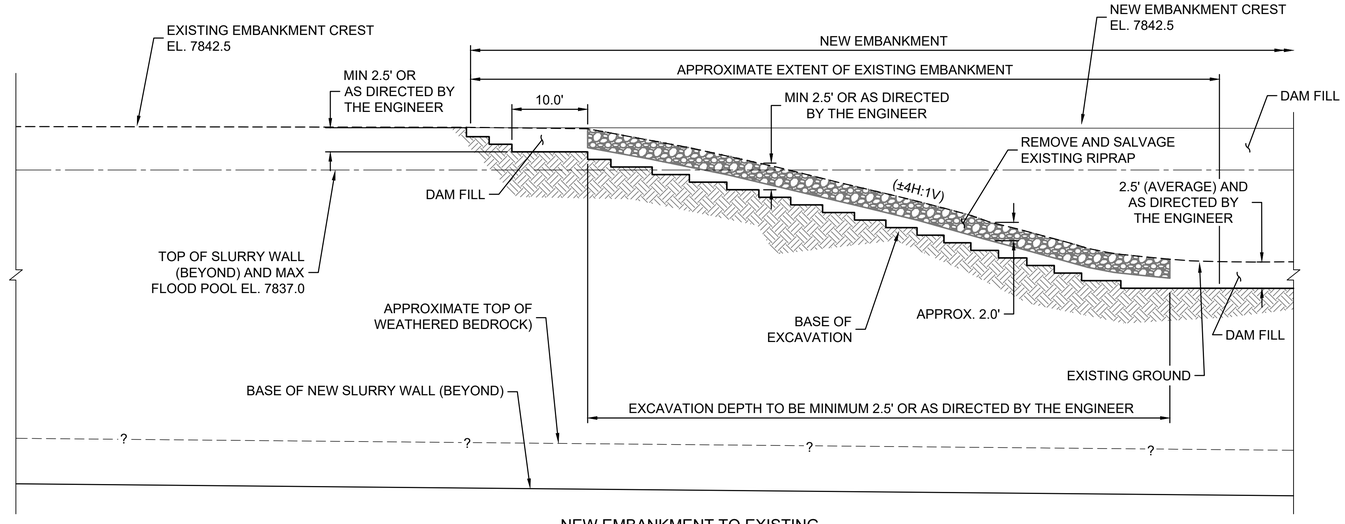
SCALE IN FEET 5 0 5 10



6 C-01 TYPICAL DRAINAGE DITCH DETAIL

1" = 5'

SCALE IN FEET 5 0 5 10



7 C-02 NEW EMBANKMENT TO EXISTING EMBANKMENT CONNECTION DETAIL

1" = 10'

SCALE IN FEET 10 0 10 20

NOTES:

1. DRAINAGE DITCH (DETAIL 6) TO BE MIRRORED ALONG THE CENTERLINE (RIGHT TO LEFT) WHEN NOT LOCATED ADJACENT TO THE DAM EMBANKMENT
2. THE NEED FOR RIPRAP BEDDING (DETAIL 1 AND 2) FOR AREAS OUTSIDE OF THE NEW DAM EMBANKMENT TO BE CONFIRMED ON SITE BY THE ENGINEER AND BASED ON THE ADEQUACY OF THE EXISTING ALLUVIAL MATERIAL OR ROAD FILL AS A SUBSTITUTE FOR RIPRAP BEDDING
3. AREAS OUTSIDE OF THE NEW DAM EMBANKMENT SHOWN TO HAVE D50=12-INCH OR D50=6-INCH RIPRAP MAY BE SUBSTITUTED WITH 2' OF RIPRAP SALVAGED FROM THE EXISTING DAM EMBANKMENT AS APPROVED BY THE ENGINEER AND FROM A LOCATION APPROVED BY THE ENGINEER
4. FOUNDATION PREPARATION AT EXISTING TO NEW EMBANKMENT CONNECTION (DETAIL 7 HEREON) TO BE UNDERTAKEN AS EMBANKMENT FILL IS BEING CONSTRUCTED IN LIFTS AND IN ACCORDANCE WITH DIRECTION FROM THE ENGINEER

ISSUED FOR CONSTRUCTION

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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PROJECT

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CLIENT

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Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
800-369-7246 • www.northernwater.org

CONSULTANT

AECOM
804 COLORADO AVE.
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GLENWOOD SPRINGS, CO. 81601

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ISSUE/REVISION

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1	12/13/2021	90% SUBMITTAL
I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

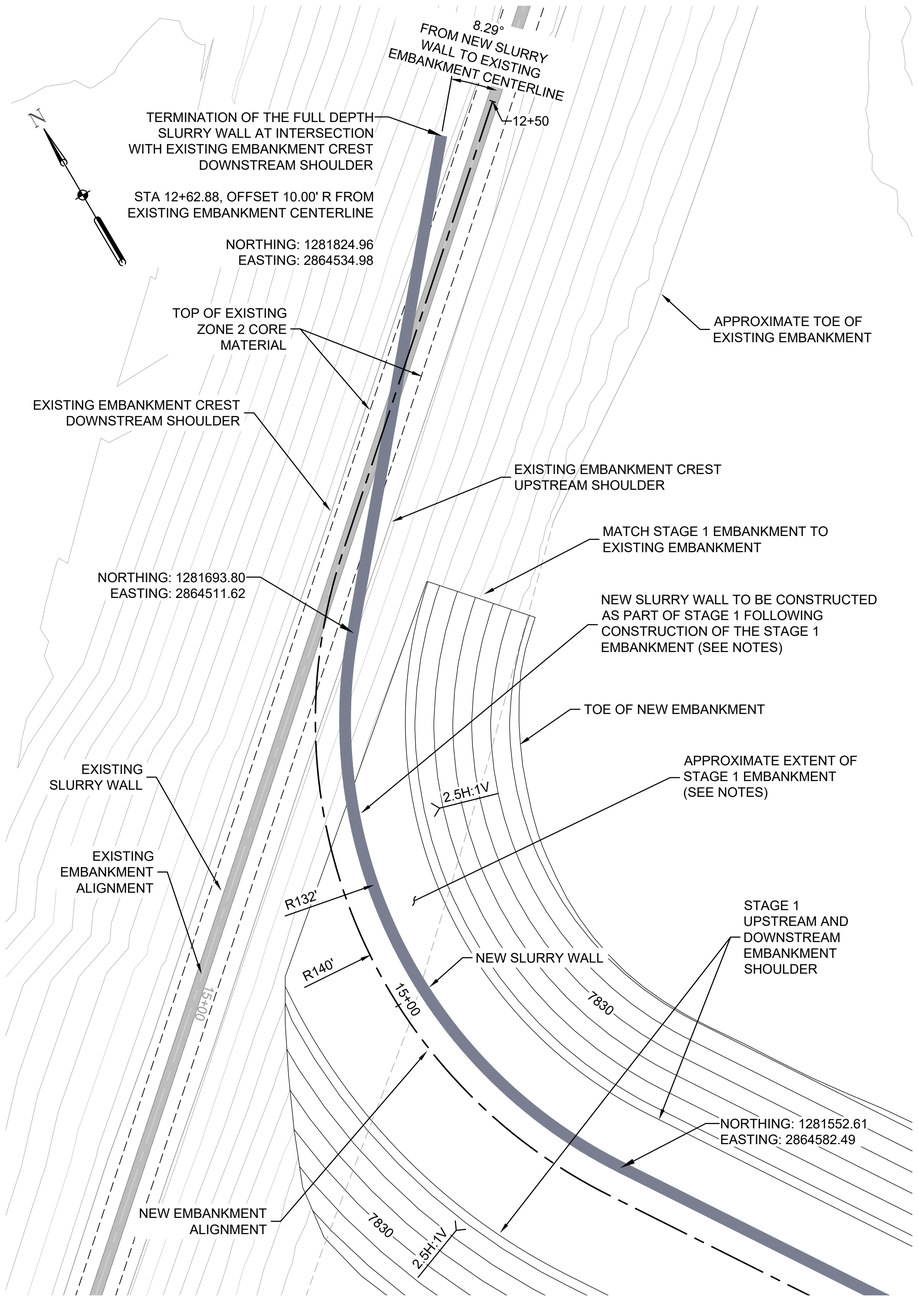
60619047

SHEET TITLE

EMBANKMENT DETAILS
SHEET 1 OF 2

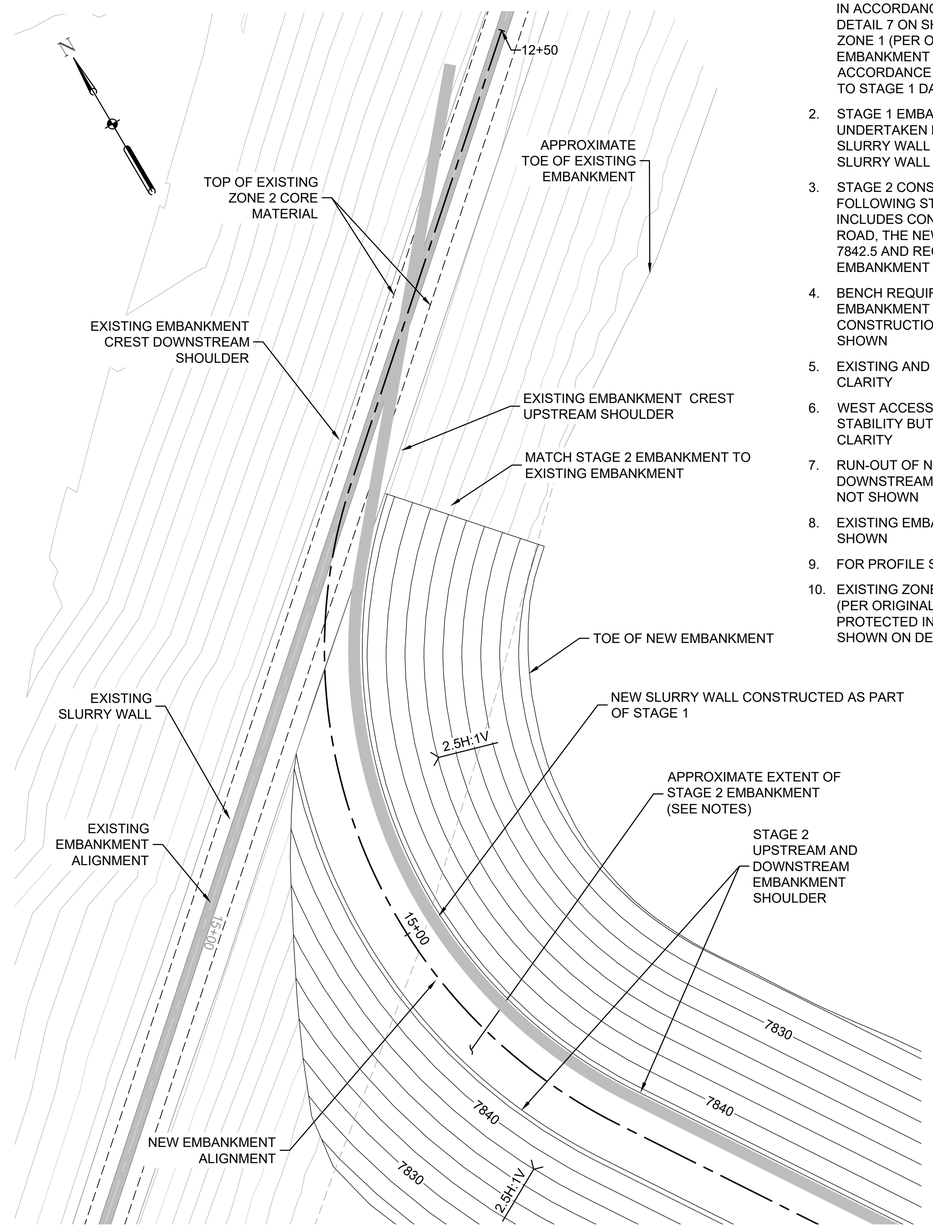
SHEET NUMBER

C-04



1 C-01 STAGE 1 - NEW EMBANKMENT AND SLURRY WALL CONNECTION DETAIL

1" = 20'



2 C-01 STAGE 2 - NEW EMBANKMENT AND SLURRY WALL CONNECTION DETAIL

1" = 20'

20 0 20 40
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. RIPRAP BETWEEN EXISTING EMBANKMENT AND NEW EMBANKMENT TO BE SALVAGED FOR REUSE IN ACCORDANCE WITH THE SPECIFICATIONS AND DETAIL 7 ON SHEET C-04. EXISTING EXPOSED ZONE 1 (PER ORIGINAL RECORD DRAWINGS) EMBANKMENT FILL TO BE PREPARED IN ACCORDANCE WITH THE SPECIFICATIONS PRIOR TO STAGE 1 DAM CONNECTION
2. STAGE 1 EMBANKMENT CONSTRUCTION TO BE UNDERTAKEN PRIOR TO INSTALLATION OF NEW SLURRY WALL AND CONNECTION TO EXISTING SLURRY WALL
3. STAGE 2 CONSTRUCTION TO BE COMPLETED FOLLOWING STAGE 1 CONSTRUCTION AND INCLUDES CONSTRUCTION OF WESTERN ACCESS ROAD, THE NEW EMBANKMENT TO CREST EL 7842.5 AND RECONSTRUCTION OF THE EXISTING EMBANKMENT CREST TO EL 7842.5
4. BENCH REQUIRED FOR EXISTING AND NEW EMBANKMENT AT EL. 7837.0 TO FACILITATE CONSTRUCTION OF NEW SLURRY WALL NOT SHOWN
5. EXISTING AND NEW RIPRAP NOT SHOWN FOR CLARITY
6. WEST ACCESS ROAD AND DOWNSTREAM STABILITY BUTTRESSES NOT SHOWN FOR CLARITY
7. RUN-OUT OF NEW SLURRY WALL ON DOWNSTREAM SLOPE OF EXISTING EMBANKMENT NOT SHOWN
8. EXISTING EMBANKMENT TO BE REMOVED NOT SHOWN
9. FOR PROFILE SEE SHEET C-02
10. EXISTING ZONE 1 AND 2 EMBANKMENT MATERIAL (PER ORIGINAL RECORD DRAWINGS) SHALL BE PROTECTED IN PLACE ONCE EXPOSED AS SHOWN ON DETAIL 7 ON SHEET C-04.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Northern Colorado Water Conservancy District
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SHEET TITLE

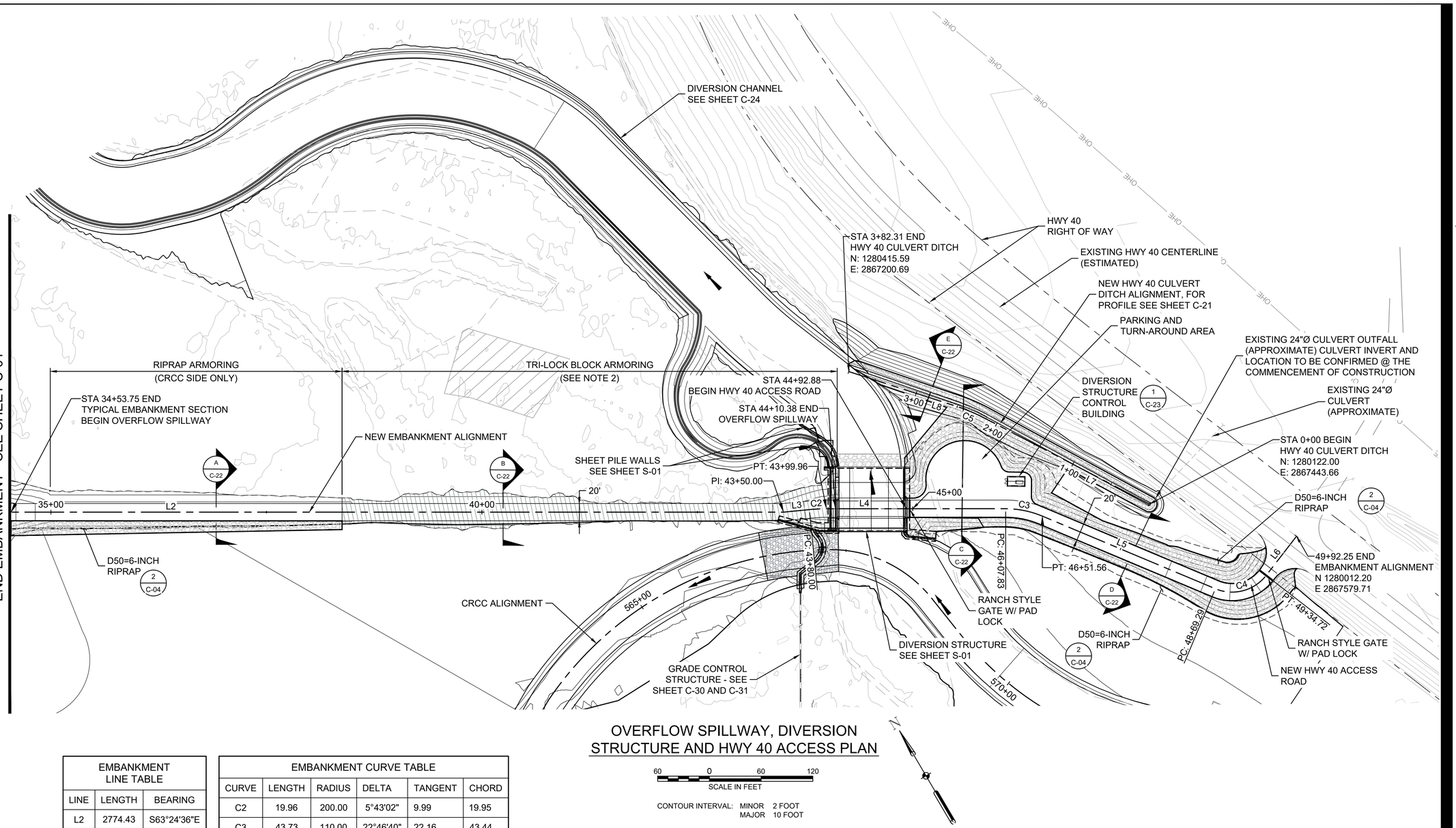
EMBANKMENT DETAILS
SHEET 2 OF 2

SHEET NUMBER

C-05

16 OF 89

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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OVERFLOW SPILLWAY, DIVERSION STRUCTURE AND HWY 40 ACCESS PLAN

60 0 60 120
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

EMBANKMENT LINE TABLE		
LINE	LENGTH	BEARING
L2	2774.43	S63°24'36"E
L3	30.00	S69°07'53"E
L4	207.87	S63°24'51"E
L5	217.73	S40°38'11"E
L6	57.52	N64°22'50"E

EMBANKMENT CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C2	19.96	200.00	5°43'02"	9.99	19.95
C3	43.73	110.00	22°46'40"	22.16	43.44
C4	65.44	50.00	74°58'59"	38.35	60.86

DITCH LINE TABLE		
LINE	LENGTH	BEARING
L7	216.70	N35°51'01"W
L8	131.85	N45°31'12"W

DITCH CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C5	33.75	200.00	9°40'11"	16.92	33.71

NOTES:

1. FOR OVERFLOW SPILLWAY, DIVERSION STRUCTURE AND HWY 40 ACCESS PROFILE SEE SHEET C-21.
2. LOCALIZED MODIFICATION TO THE DEPTH OF THE TRI-LOCK BLOCK ARMORING PERMITTED TO ENABLE CONSTRUCTION OF THE TOE IN STRAIGHT LINE SEGMENTS AS LONG AS MINIMUM EMBEDMENT DEPTHS (SEE SHEET C-23) ARE MET.

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SEO CONSTRUCTION NUMBER

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PROJECT NUMBER

60619047

SHEET TITLE

OVERFLOW SPILLWAY, DIVERSION STRUCTURE & HWY 40 ACCESS ROAD PLAN

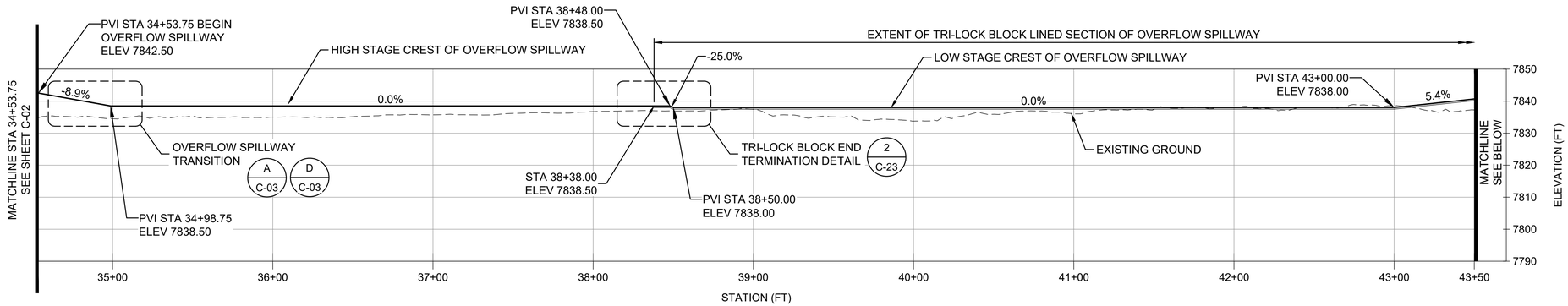
SHEET NUMBER

C-20

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

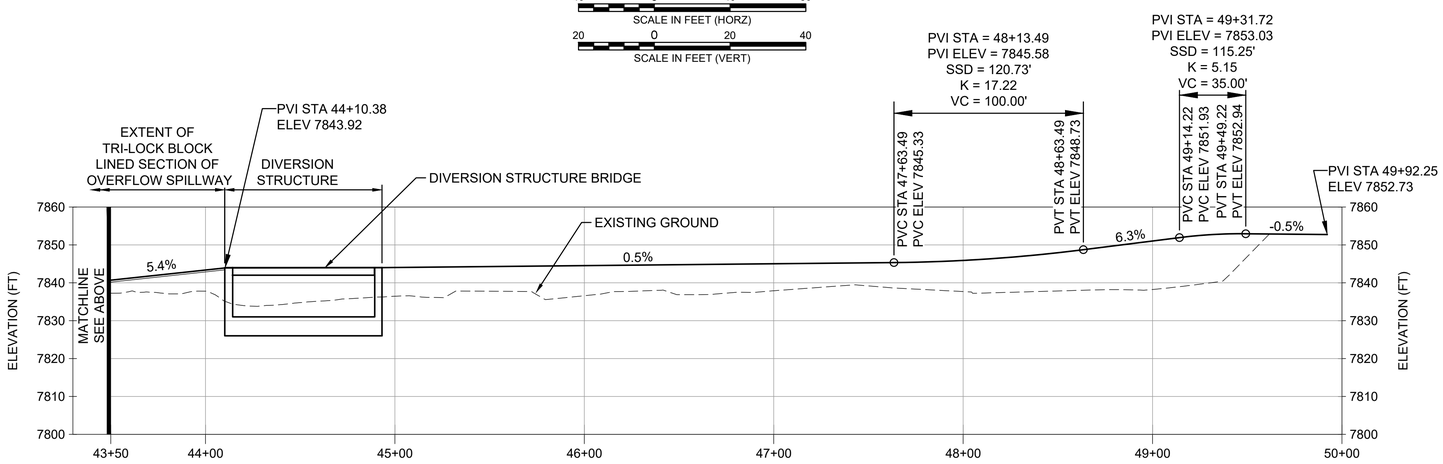
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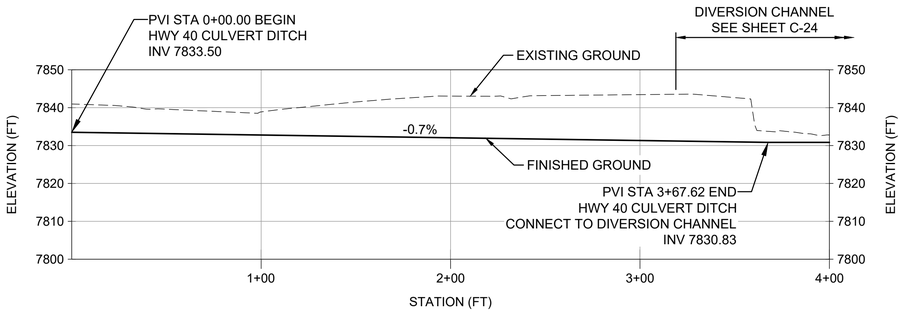
EMBANKMENT ALIGNMENT PROFILE
STA: 34+54 TO STA: 43+50

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)



EMBANKMENT ALIGNMENT PROFILE
STA: 43+50 TO STA: 50+00

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)



HWY 40 CULVERT DITCH PROFILE
STA: 0+00 TO STA: 4+00

40 0 40 80
SCALE IN FEET (HORZ)
20 0 20 40
SCALE IN FEET (VERT)

NOTES:

1. FOUNDATION EXCAVATION NOT SHOWN
2. RIPRAP NOT SHOWN
3. ROAD BASE NOT SHOWN ON THE PROFILES
4. SHEET PILE NOT SHOWN

ISSUED FOR CONSTRUCTION

AECOM

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C-1521A

PROJECT NUMBER

60619047

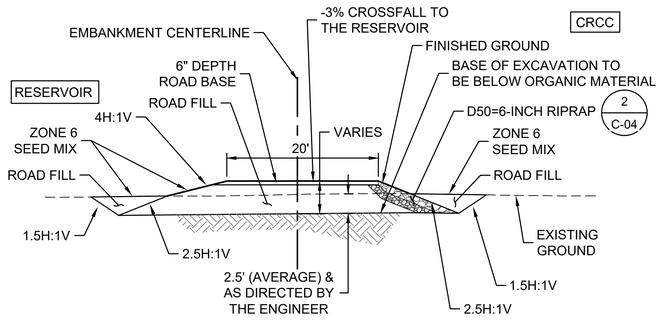
SHEET TITLE

OVERFLOW SPILLWAY, DIVERSION STRUCTURE & HWY 40 PROFILE

SHEET NUMBER

C-21

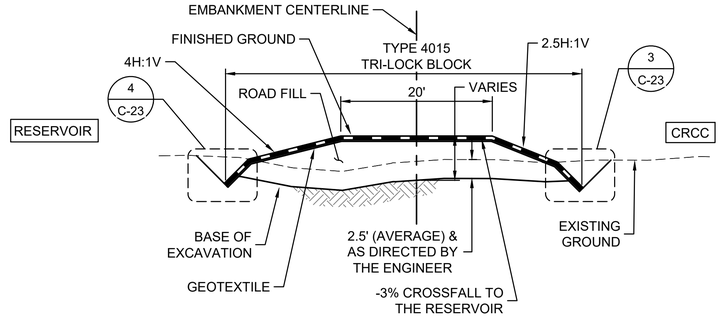
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Last saved by: CASEY.ROBERTSON(2022-05-02) Last Plotted: 2022-05-04
Filename: L:\DCS\PROJECTS\WTR\60619047_CRCC_NORTH\800_CAD_GIS\910_CAD\20-SHEETS\C-SPILLWAY OVERFLOW LAYOUT.DWG
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A C-20 TYPICAL OVERFLOW SPILLWAY WITHOUT TRI-LOCK BLOCK SECTON

1" = 10'

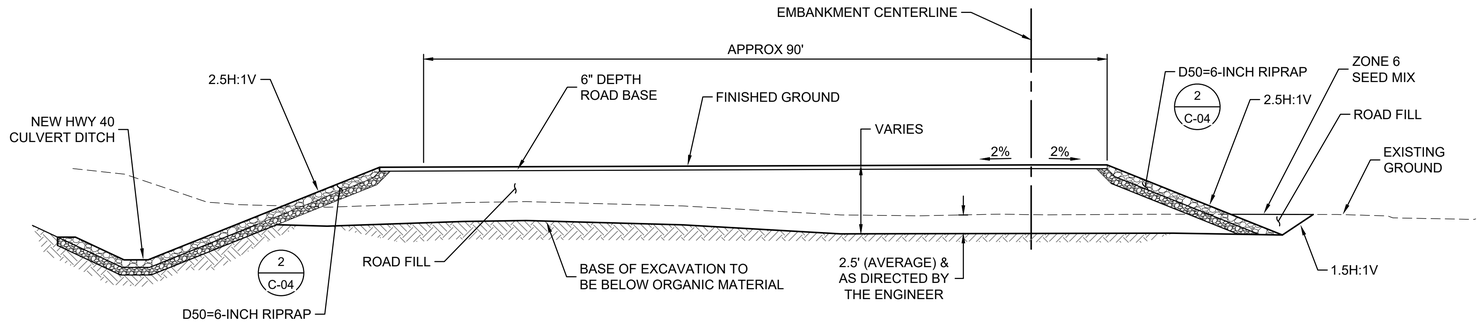
10 0 10 20
SCALE IN FEET



B C-20 TYPICAL OVERFLOW SPILLWAY WITH TRI-LOCK BLOCK SECTON

1" = 10'

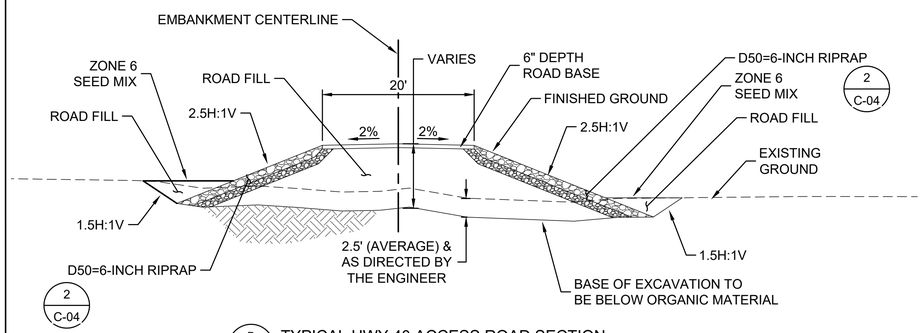
10 0 10 20
SCALE IN FEET



C C-20 TYPICAL HWY 40 ACCESS ROAD AND PARKING AREA SECTION

1" = 10'

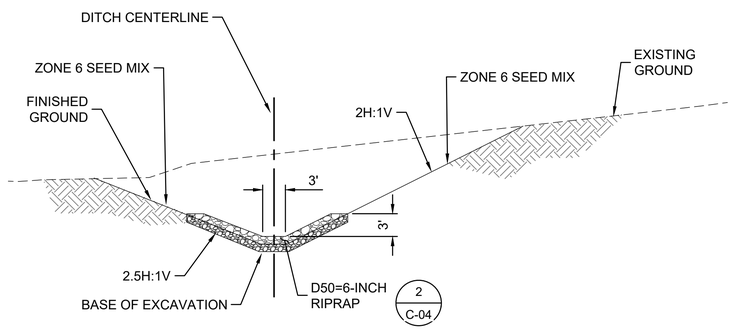
10 0 10 20
SCALE IN FEET



D C-20 TYPICAL HWY 40 ACCESS ROAD SECTION

1" = 10'

10 0 10 20
SCALE IN FEET



E C-20 TYPICAL HWY 40 CULVERT DITCH SECTION

1" = 10'

10 0 10 20
SCALE IN FEET

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
800-369-7246 • www.northernwater.org

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

www.aecom.com

CONSULTANTS

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

OVERFLOW SPILLWAY, DIVERSION STRUCTURE & HWY 40 SECTIONS

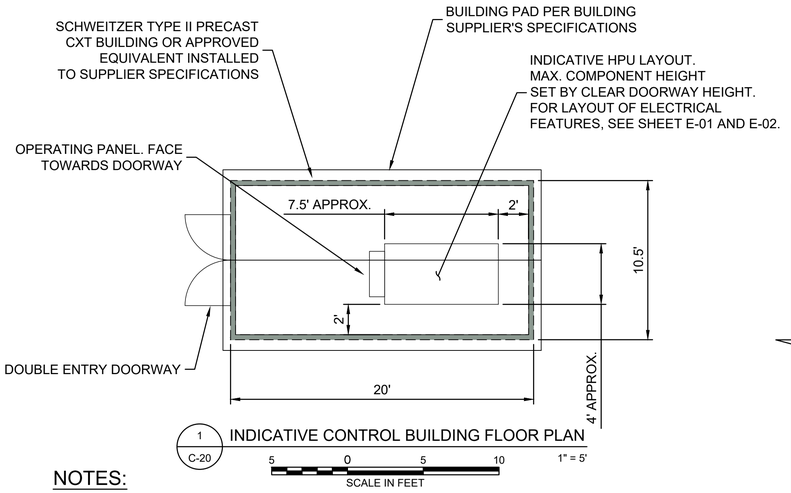
SHEET NUMBER

C-22

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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1 C-20 INDICATIVE CONTROL BUILDING FLOOR PLAN

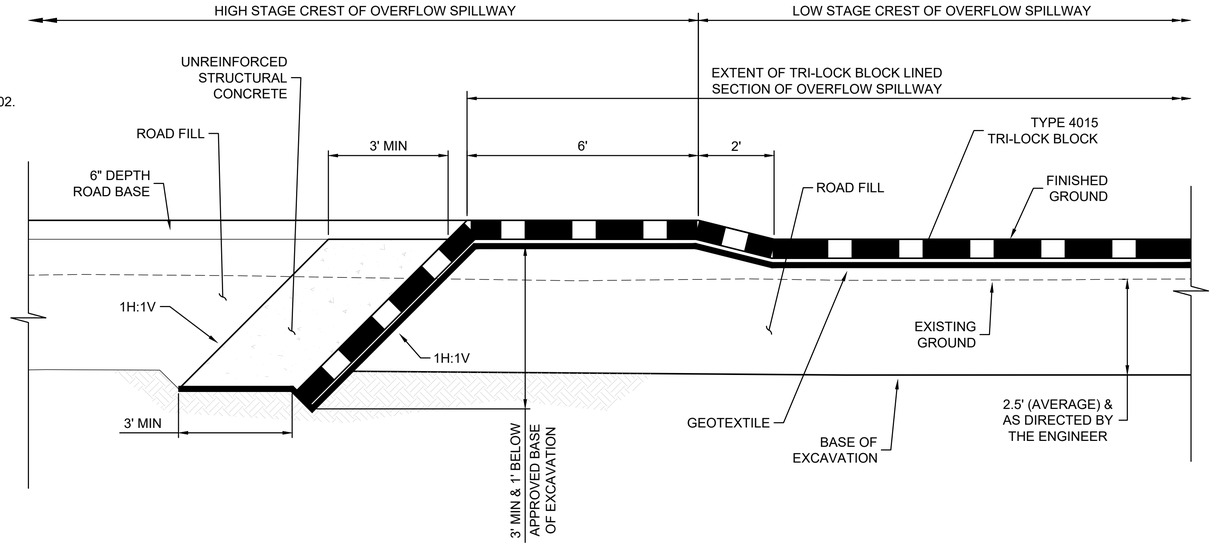
1" = 5'

5 0 5 10

SCALE IN FEET

NOTES:

1. CXT TYPE CONTROL BUILDING PARTICULARS:
   - 1.1. STONE FACING: MOUNTAIN BLEND
   - 1.2. ROOF: METAL RIBBED
   - 1.3. HEATER: TO BE PROVIDED BY BUILDING SUPPLIER. HEATER SPECIFICATION TO BE CONFIRMED WITH NORTHERN WATER PRIOR TO ORDERING BUILDING
   - 1.4. ADDED COST OPTIONS:
     - 1.4.1. ELECTRICAL PACKAGE
     - 1.4.2. BLOCKOUTS FOR ELECTRICAL, HYDRAULIC AND INSTRUMENTATION EQUIPMENT ENTRY/EXIT
     - 1.4.3. DOUBLE ACCESS DOOR
     - 1.4.4. WALL VENT
     - 1.4.5. DOOR AWNING
   - 1.5. ELECTRICAL WALL CABINET IN ADDITION TO THAT SUPPLIED WITH THE BUILDING
2. ALL OPTIONS HEREIN TO BE CONFIRMED WITH NORTHERN WATER PRIOR TO ORDERING BUILDING

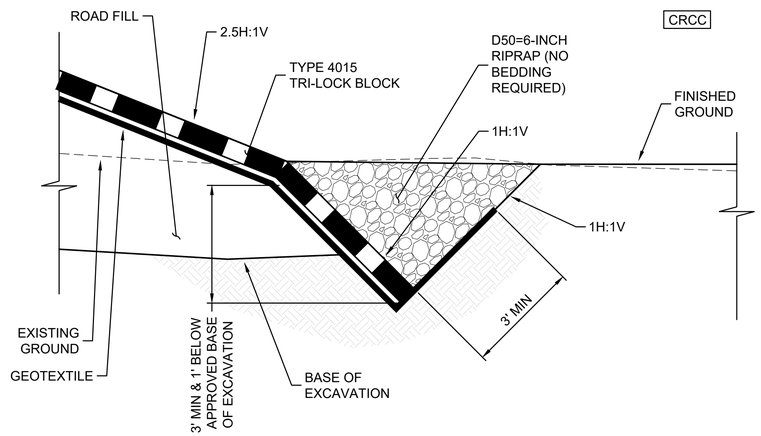


2 C-21 TYPICAL TRI-LOCK BLOCK END TERMINATION DETAIL

1" = 2'

2 0 2 4

SCALE IN FEET

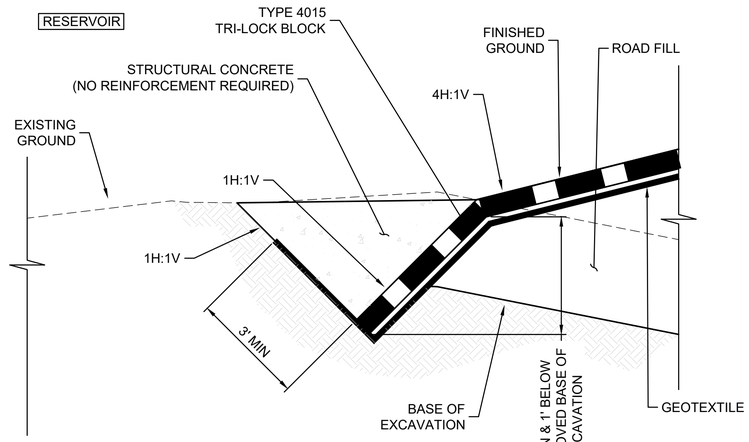


3 C-22 TYPICAL OVERFLOW SPILLWAY TRI-LOCK BLOCK TERMINATION DETAIL TOWARDS THE CRCC

1" = 2'

2 0 2 4

SCALE IN FEET



4 C-22 TYPICAL OVERFLOW SPILLWAY TRI-LOCK BLOCK TERMINATION DETAIL TOWARDS THE RESERVOIR

1" = 2'

2 0 2 4

SCALE IN FEET

ISSUED FOR CONSTRUCTION

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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800-369-7246 • www.northernwater.org

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REGISTRATION



ISSUE/REVISION

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1	12/13/2021	90% SUBMITTAL
I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

OVERFLOW SPILLWAY AND CONTROL BUILDING DETAILS

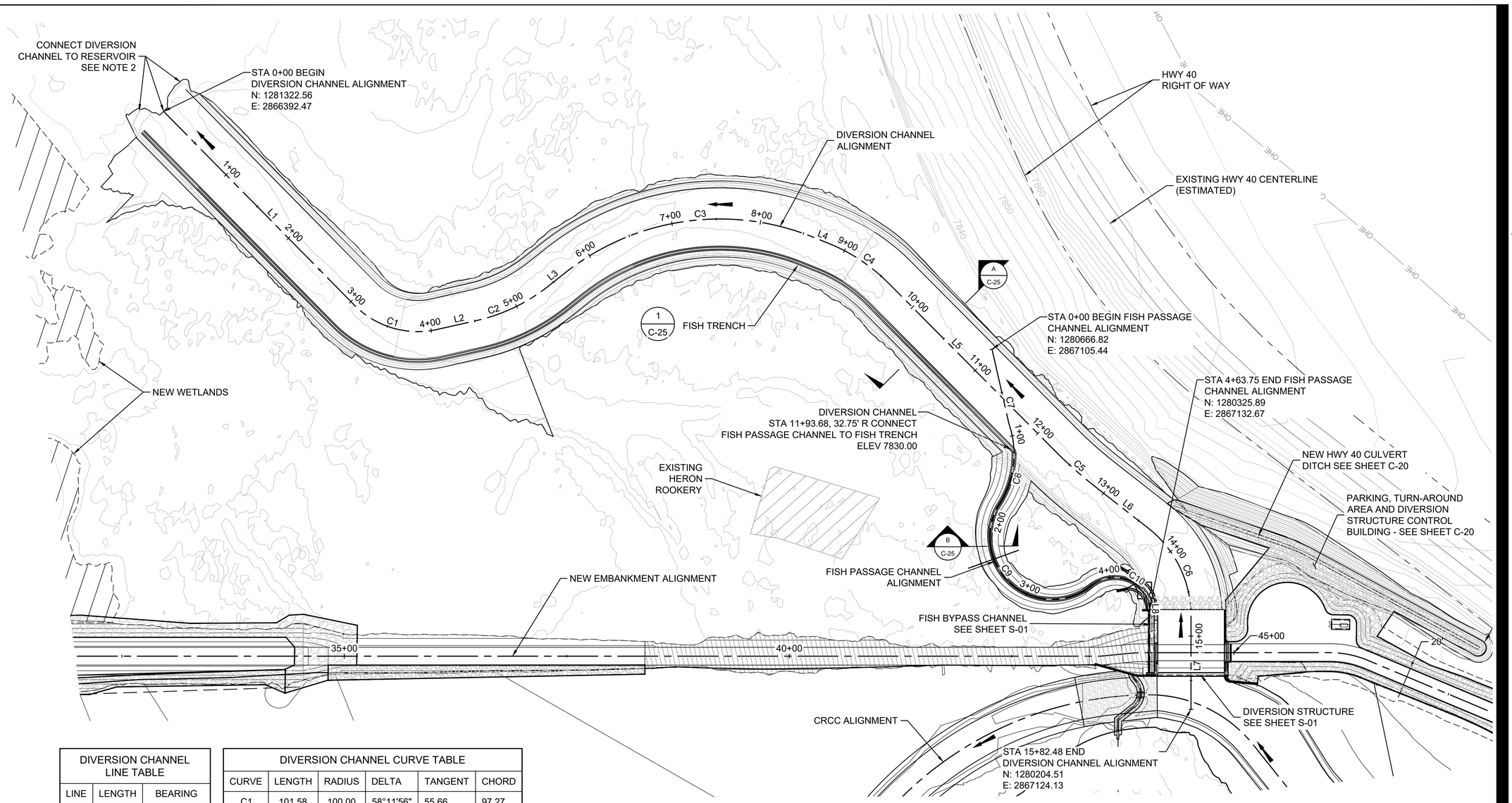
SHEET NUMBER

C-23

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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DIVERSION CHANNEL LINE TABLE		
LINE	LENGTH	BEARING
L1	305.46	S17°57'31"E
L2	45.47	S76°09'27"E
L3	24.05	N78°08'32"E
L4	19.06	S41°28'50"E
L5	265.46	S18°11'41"E
L6	73.81	S25°23'43"E
L7	105.25	S26°36'36"W

DIVERSION CHANNEL CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	101.58	100.00	58°11'56"	55.66	97.27
C2	89.71	200.00	25°42'01"	45.62	88.96
C3	295.06	280.00	60°22'38"	162.89	281.60
C4	81.28	200.00	23°17'09"	41.21	80.72
C5	62.84	500.00	7°12'02"	31.46	62.80
C6	113.46	125.00	52°00'19"	60.97	109.60

FISH PASSAGE CHANNEL LINE TABLE		
LINE	LENGTH	BEARING
L8	1.27	S26°35'09"W

FISH PASSAGE CHANNEL CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C7	86.02	267369.29	0°01'06"	43.01	86.02
C8	97.58	104.67	53°24'56"	52.66	94.08
C9	193.66	70.13	158°13'08"	364.51	137.74
C10	85.23	39.93	122°17'04"	72.46	69.95

DIVERSION CHANNEL PLAN

60 0 60 120
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

N

NOTES:

1. FOR DIVERSION CHANNEL PROFILE SEE SHEET C-25.
2. CATCH DIVERSION CHANNEL AND FISH TRENCH INTO EXISTING RESERVOIR AND GRADE AS NEEDED TO MAINTAIN POSITIVE GRADE.
3. FOR FISH PASSAGE CHANNEL PROFILE SEE SHEET C-25
4. DIVERSION CHANNEL EXCAVATION LIMITS TO BE ADJUSTED IN THE FIELD TO MINIMIZE THE IMPACT TO EXISTING WETLANDS

ISSUED FOR CONSTRUCTION

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Northern Colorado Water Conservancy District
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800-369-7246 • www.northernwater.org

CONSULTANT

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804 COLORADO AVE.
Suite 201
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www.aecom.com

CONSULTANTS

REGISTRATION

GREGORY ALAN OLSEN 37737 REGISTERED PROFESSIONAL ENGINEER 5/31/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

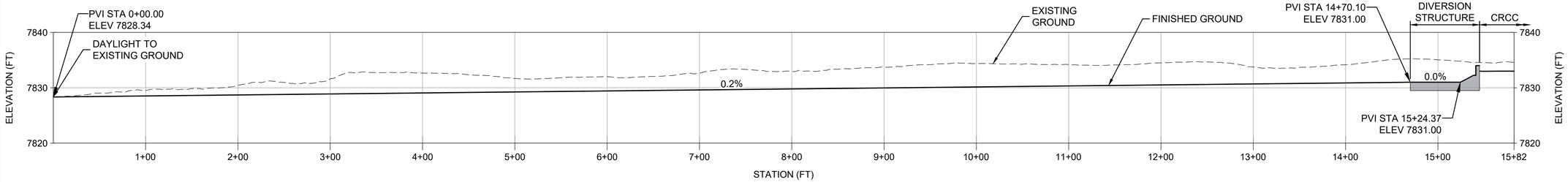
60619047

SHEET TITLE

DIVERSION CHANNEL AND FISH PASSAGE PLAN

SHEET NUMBER

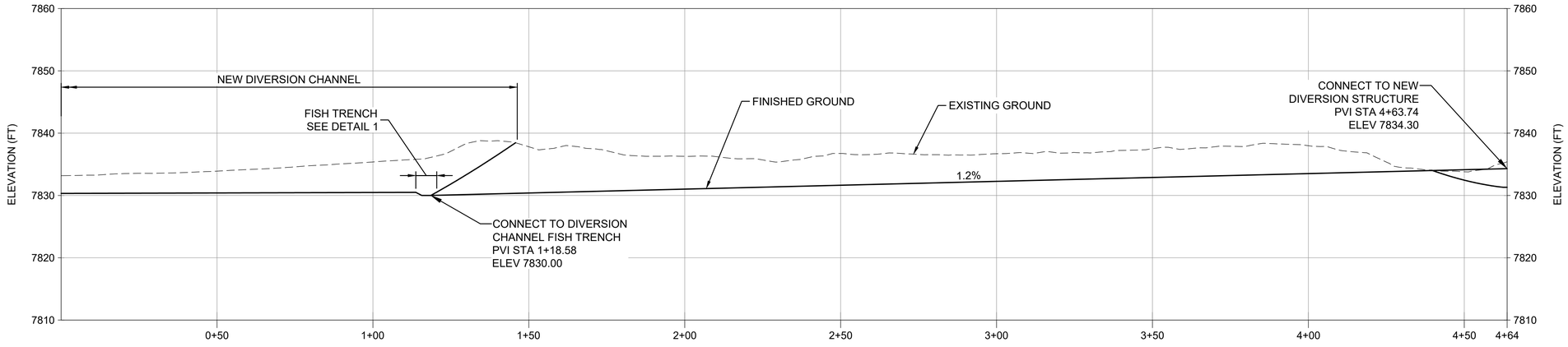
C-24



DIVERSION CHANNEL PROFILE

60 0 60 120
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

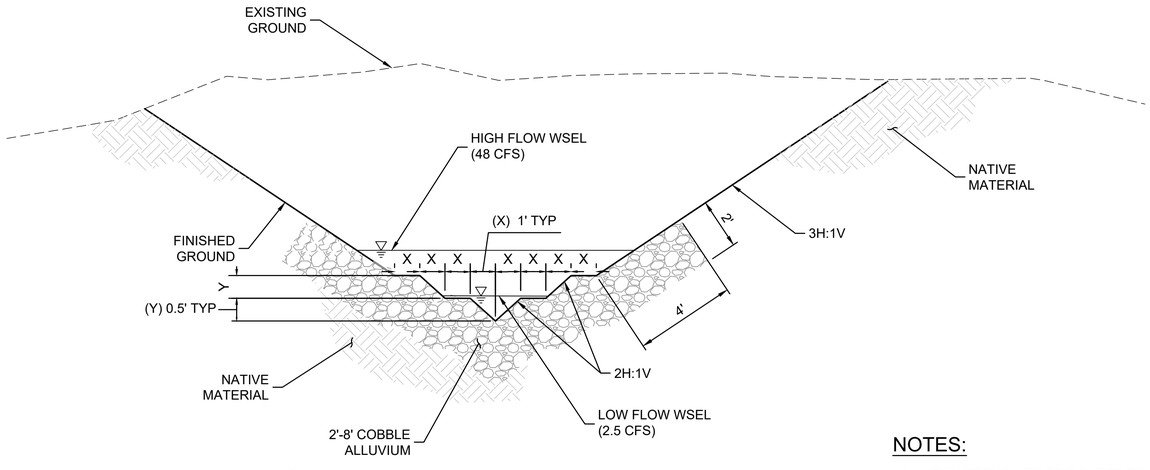


20 0 20 40
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

FISH PASSAGE CHANNEL PROFILE
STA: 0+00 TO STA: 4+64

SCALE: 1" = 60' HORZ
1" = 30' VERT



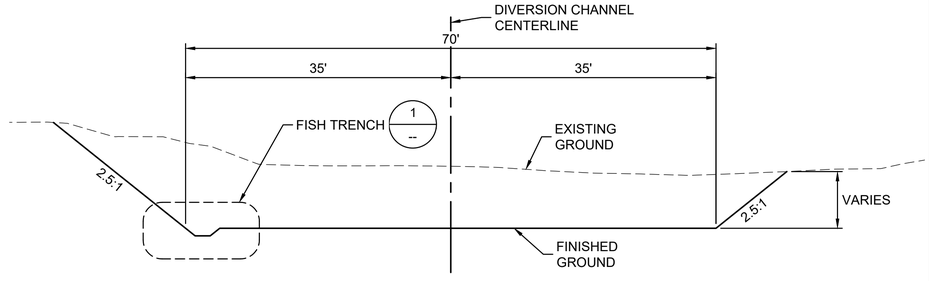
B C-24 TYPICAL FISH PASSAGE CHANNEL SECTION

3 0 3 6
SCALE IN FEET (HORZ)

1.5 0 1.5 3
SCALE IN FEET (VERT)

NOTES:

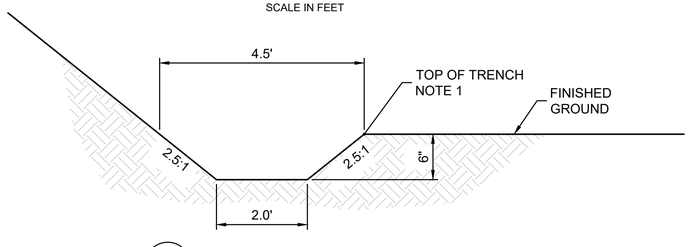
1. FISH TRENCH TO BE ROUTED TO MATCH DIVERSION STRUCTURE BYPASS. FISH TRENCH STRUCTURE TO BE CONSTRUCTED SO THAT THE TOP OF THE TRENCH (SEE DETAIL 1) IS EQUAL TO THE ADJACENT INVERT OF THE DIVERSION CHANNEL



A C-24 TYPICAL DIVERSION CHANNEL SECTION
STA 0+00 TO STA 11+93.68

1" = 10'

10 0 10 20
SCALE IN FEET



1 - TYPICAL FISH TRENCH (LOOKING DOWNSTREAM)
N.T.S.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
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CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
4	04/29/2022	ISSUED FOR CONSTRUCTION
3	04/21/2022	REISSUED FOR BID
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

DIVERSION CHANNEL PROFILE AND TYPICAL SECTIONS

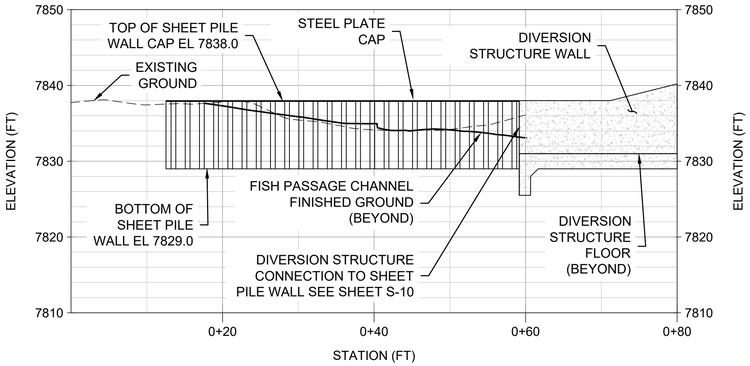
SHEET NUMBER

C-25

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"
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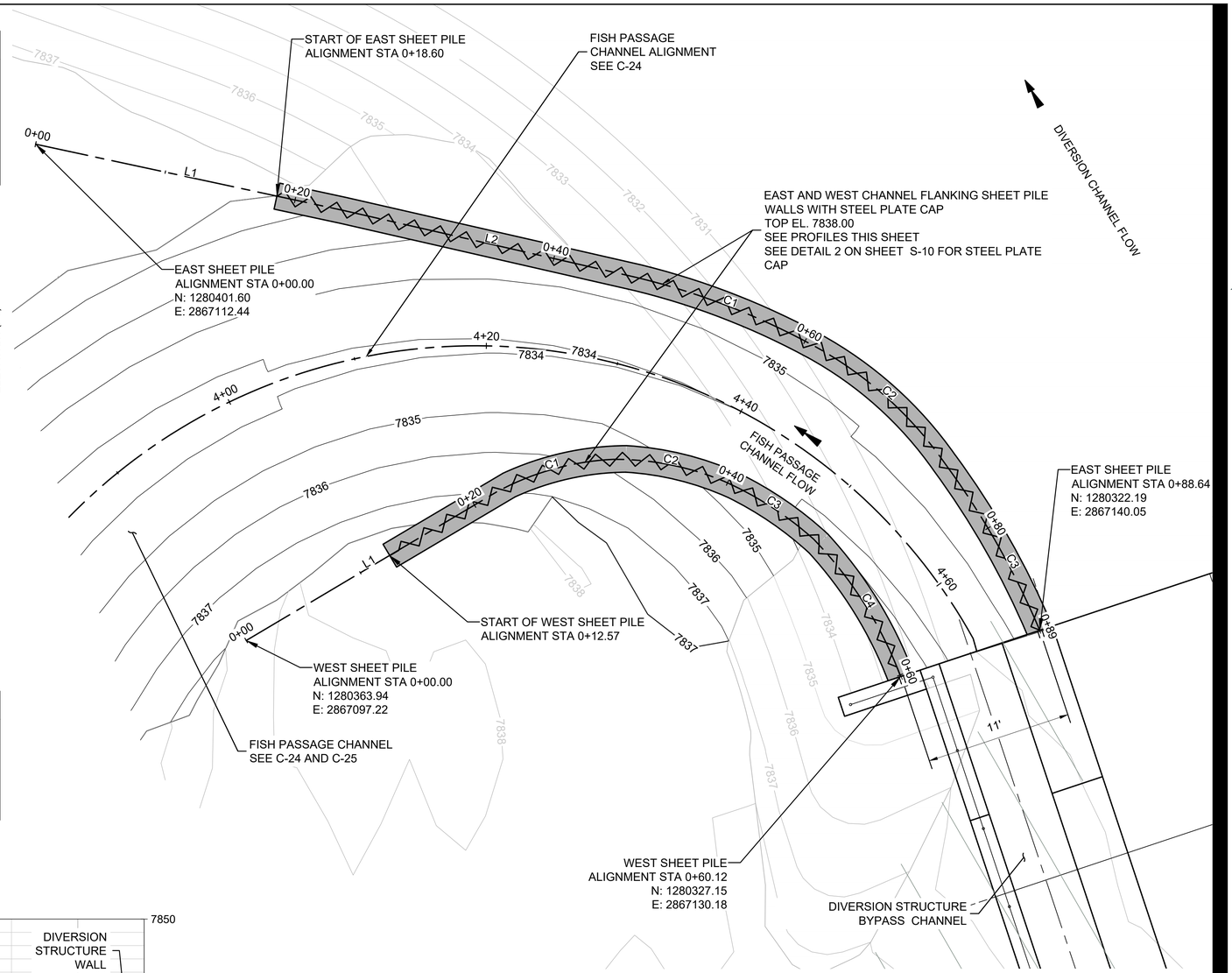
WEST SHEET PILE LINE TABLE		
LINE	LENGTH	BEARING
L1	21.90	S75°40'37"E

WEST SHEET PILE CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	9.25	20.56	25°46'25"	4.70	9.17
C2	8.58	21.15	23°14'20"	4.35	8.52
C3	8.07	25.90	17°51'34"	4.07	8.04
C4	12.32	30.32	23°17'11"	6.25	12.24



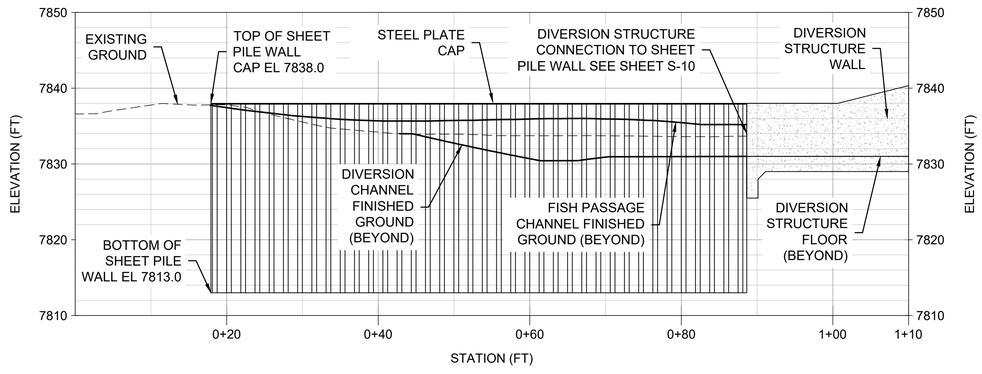
WEST SHEET PILE WALL PROFILE

10 0 10 20
SCALE IN FEET



EAST SHEET PILE LINE TABLE		
LINE	LENGTH	BEARING
L1	23.67	S32°51'42"E
L2	22.85	S32°07'38"E

EAST SHEET PILE CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	14.21	55.13	14°46'15"	7.15	14.17
C2	13.36	29.04	26°21'35"	6.80	13.24
C3	14.55	62.14	13°24'39"	7.31	14.51



EAST SHEET PILE WALL PROFILE

10 0 10 20
SCALE IN FEET

FISH PASSAGE CHANNEL PLAN

20 0 20 40
SCALE IN FEET

CONTOUR INTERVAL: MINOR 1 FOOT
MAJOR 5 FOOT

NOTES:

1. FOR FISH PASSAGE CHANNEL PROFILE SEE SHEET C-25

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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REGISTRATION

REGISTERED PROFESSIONAL ENGINEER GREGORY GENE GLINN 37737 STATE OF COLORADO
5/31/22

ISSUE/REVISION

2	04/29/2022	ISSUED FOR CONSTRUCTION
1	04/21/2022	ISSUED FOR BID
I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

FISH PASSAGE CHANNEL SHEET PILE WALLS

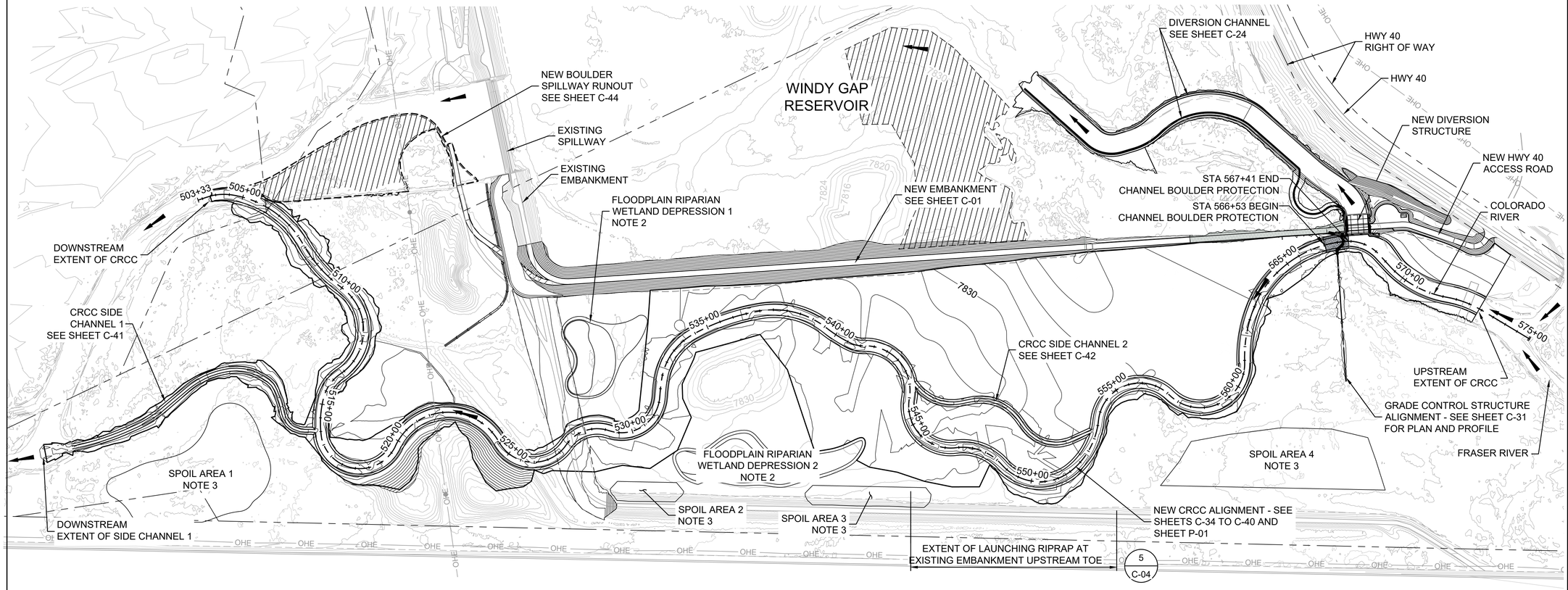
SHEET NUMBER

C-26

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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CRCC AND GRADE CONTROL STRUCTURE PLAN

200 0 200 400
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

CRCC PLAN AND PROFILE INDEX	
SHEET NO.	STATIONS
C-34	STA 503+75 TO STA 514+00
C-35	STA 514+00 TO STA 524+00
C-36	STA 524+00 TO STA 534+00
C-37	STA 534+00 TO STA 544+00
C-38	STA 544+00 TO STA 554+00
C-39	STA 554+00 TO STA 564+00
C-40	STA 564+00 TO STA 575+00

NOTES:

1. RIPRAP AND EXISTING WETLANDS NOT SHOWN FOR CLARITY.
2. FLOODPLAIN RIPARIAN WETLAND DEPRESSION 1 AND 2 AREA IRREGULAR DEPRESSIONS THAT WILL BE GRADED USING THE AUTOCAD MODEL DATA PROVIDED BY AECOM TO THE CONTRACTOR AND APPROVED BY THE OWNER AND ENGINEER.
3. SPOIL AREAS SHOWN ARE FOR REFERENCE ONLY AND WILL BE USED TO ACCOMMODATE PROJECT SPOIL AS APPROVED BY THE ENGINEER.
4. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
5. NEW WETLANDS 1 AND 2 ARE TO BE BACKFILLED WITH TUBIFLEX CONTAMINATED TOPSOIL PER AUTOCAD MODEL DATED PROVIDED BY AECOM TO CONTRACTOR.

ISSUED FOR CONSTRUCTION

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PROJECT

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SEO CONSTRUCTION NUMBER

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PROJECT NUMBER

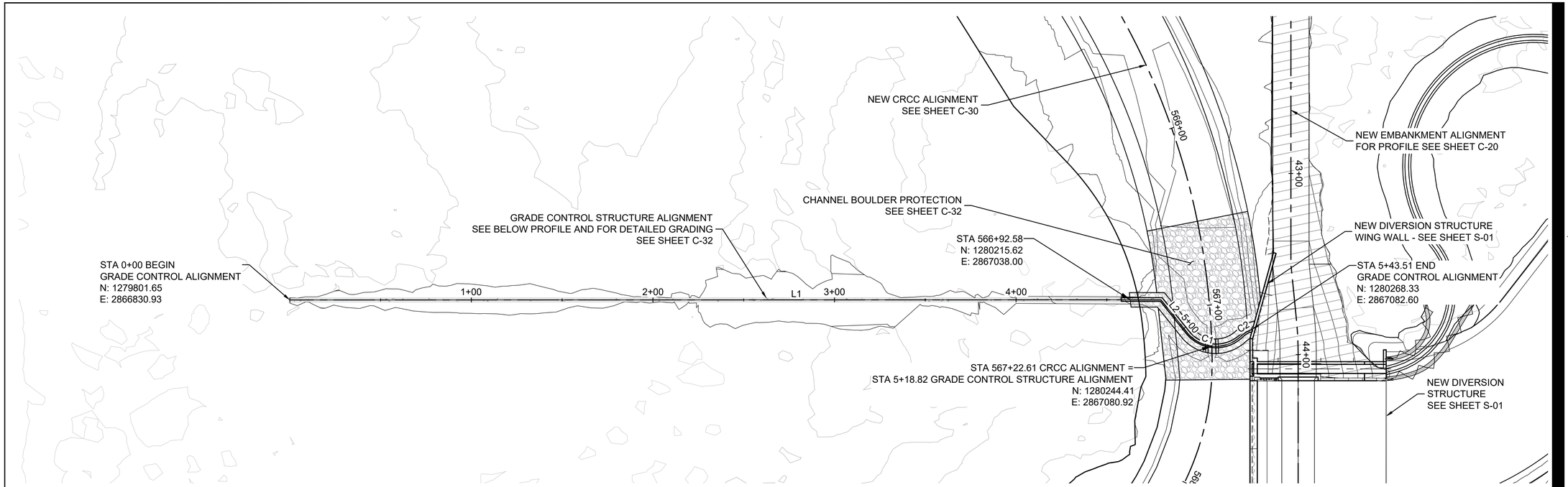
60619047

SHEET TITLE

CRCC AND GRADE CONTROL STRUCTURE PLAN

SHEET NUMBER

C-30



LINE TABLE		
LINE	LENGTH	BEARING
L1	479.77	N26°34'30"E
L2	21.71	N77°48'09"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	34.80	20.17	98°51'48"	23.56	30.64
C2	7.23	18.68	22°11'14"	3.66	7.19

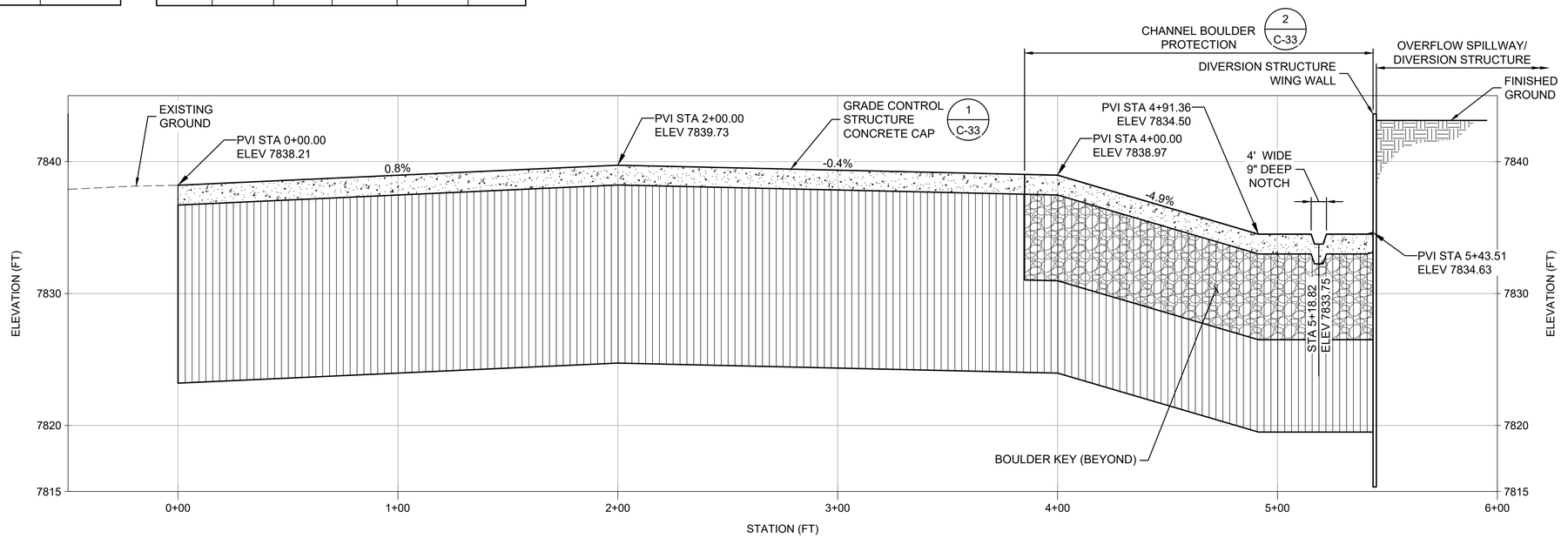
GRADE CONTROL STRUCTURE PLAN

50 0 50 100
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. WETLANDS NOT SHOWN FOR CLARITY.



GRADE CONTROL STRUCTURE PROFILE

30 0 30 60
SCALE IN FEET (HORZ)

5 0 5 10
SCALE IN FEET (VERT)

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PROJECT

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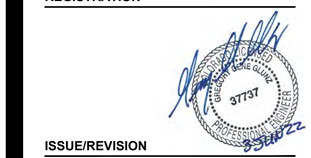
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ISSUE/REVISION

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3	04/29/2022	ISSUED FOR CONSTRUCTION
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1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

GRADE CONTROL STRUCTURE PLAN AND PROFILE

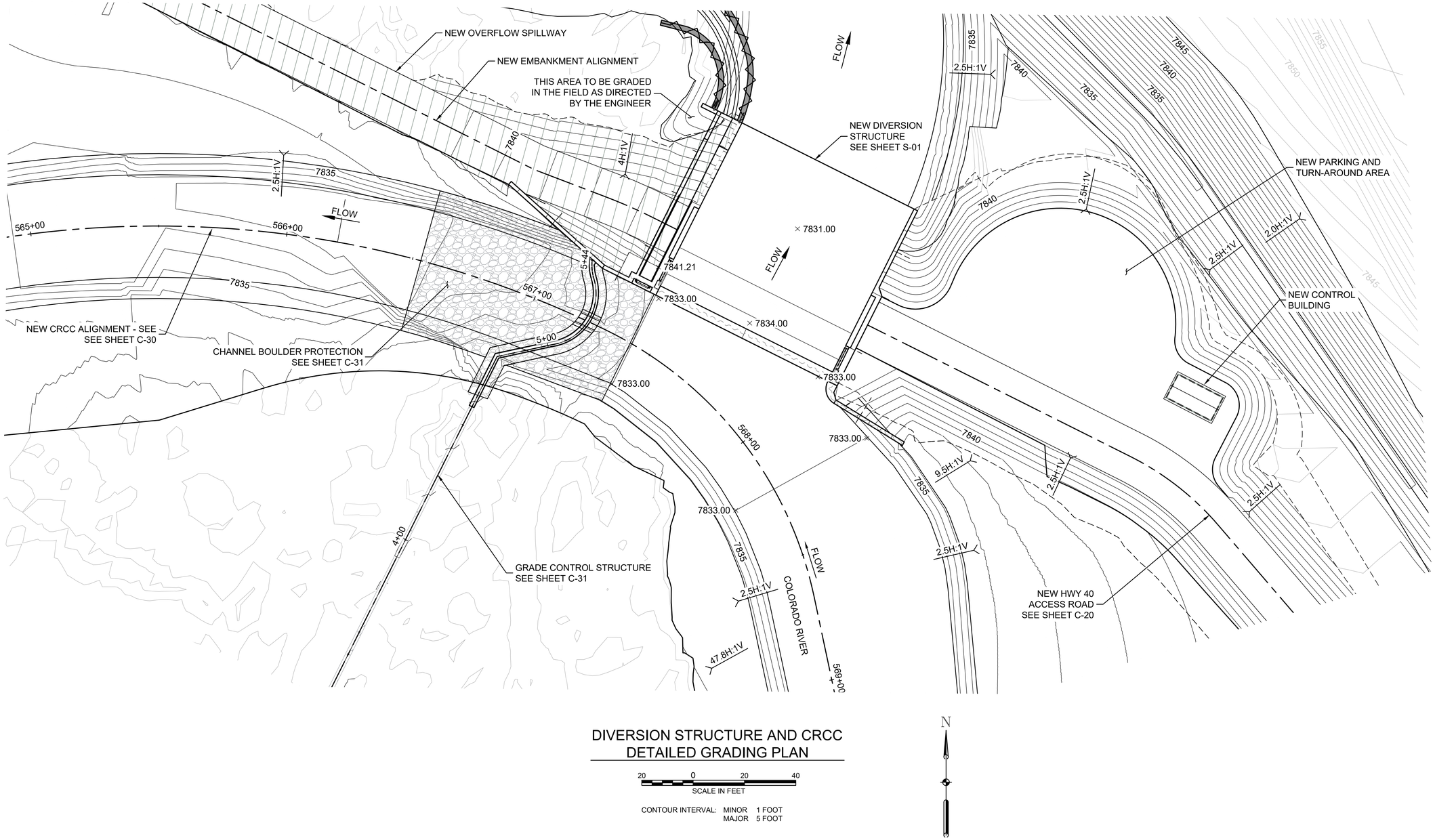
SHEET NUMBER

C-31

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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DIVERSION STRUCTURE AND CRCC DETAILED GRADING PLAN

20 0 20 40
SCALE IN FEET

CONTOUR INTERVAL: MINOR 1 FOOT
MAJOR 5 FOOT

N

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PROJECT

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GREGORY RENE GUNKEL 37737 PROFESSIONAL ENGINEER 5/31/22

ISSUE/REVISION

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3	04/29/2022	ISSUED FOR CONSTRUCTION
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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

DIVERSION STRUCTURE AND CRCC DETAILED GRADING

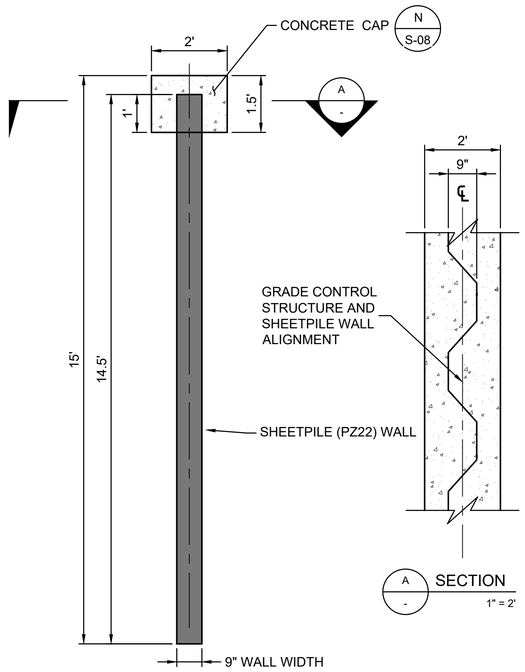
SHEET NUMBER

C-32

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

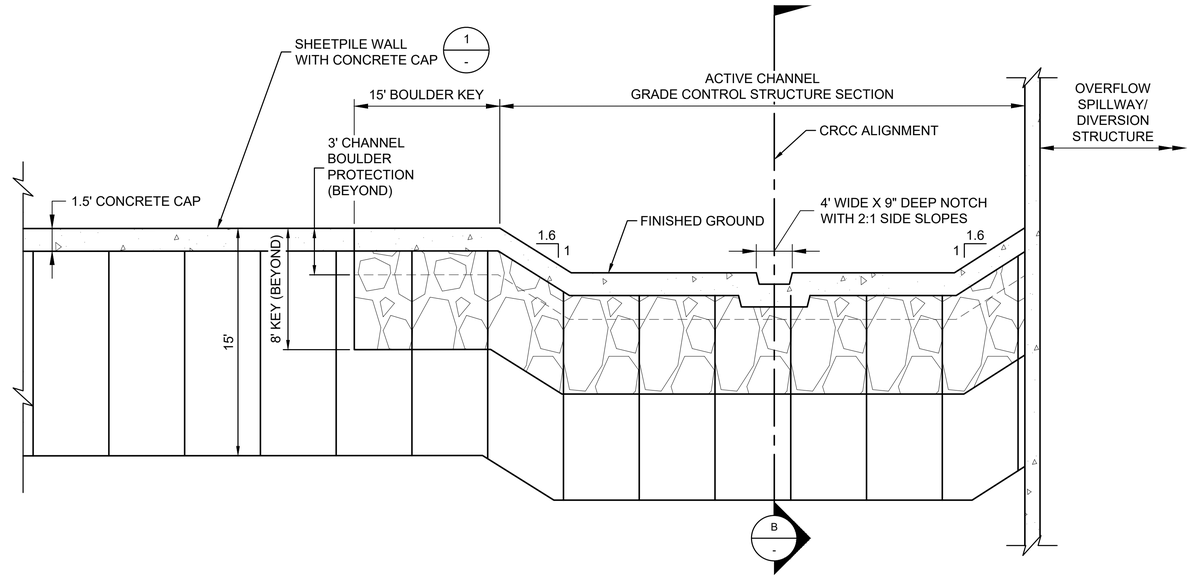
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1 - SHEETPILE WALL AND CONCRETE CAP
1" = 2'

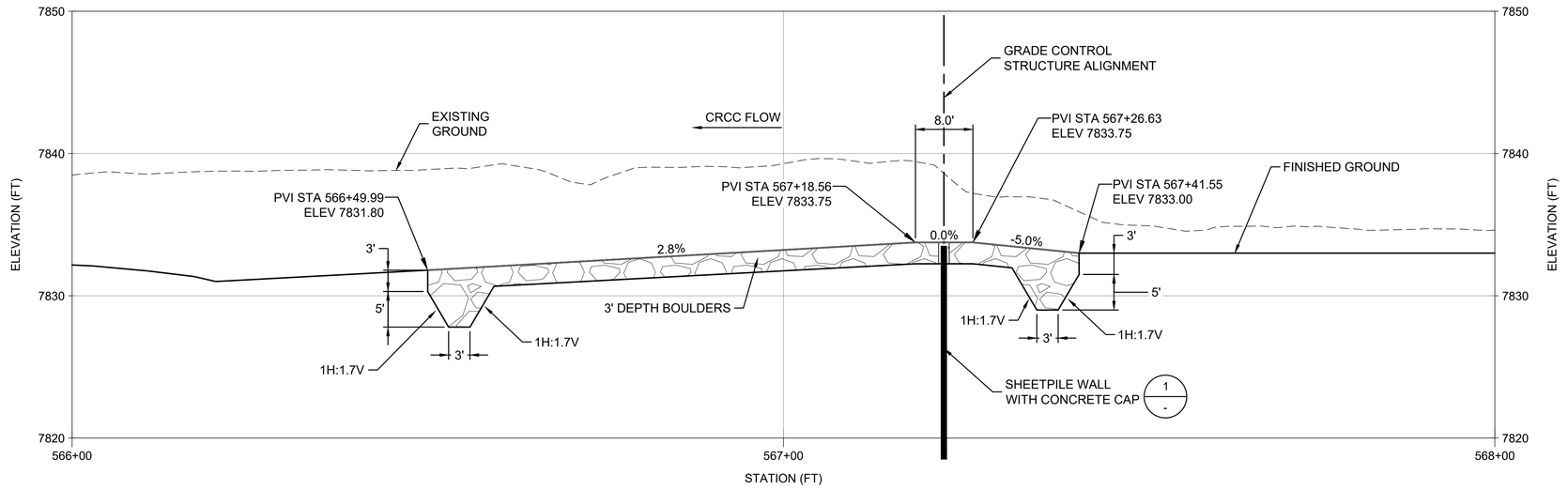
SCALE IN FEET: 2 0 2 4



2 - CHANNEL BOULDER PROTECTION DETAIL
C-31

SCALE IN FEET: 10 0 10 20

SCALE IN FEET: 5 0 5 10



B - CHANNEL BOULDER PROTECTION PROFILE

SCALE IN FEET: 10 0 10 20

SCALE IN FEET: 5 0 5 10

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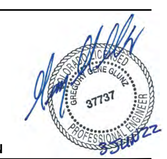
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PROJECT NUMBER

60619047

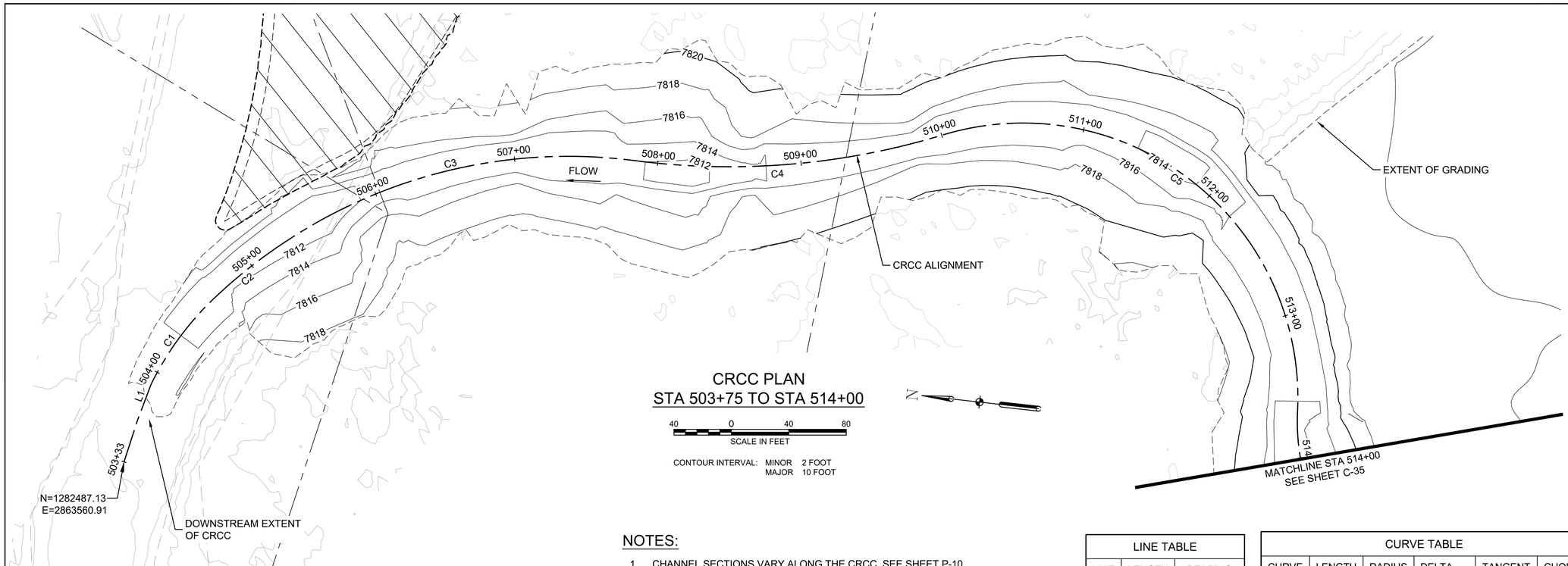
SHEET TITLE

GRADE CONTROL STRUCTURE PROFILE AND SECTION

SHEET NUMBER

C-33

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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CRCC PLAN
STA 503+75 TO STA 514+00

40 0 40 80
SCALE IN FEET

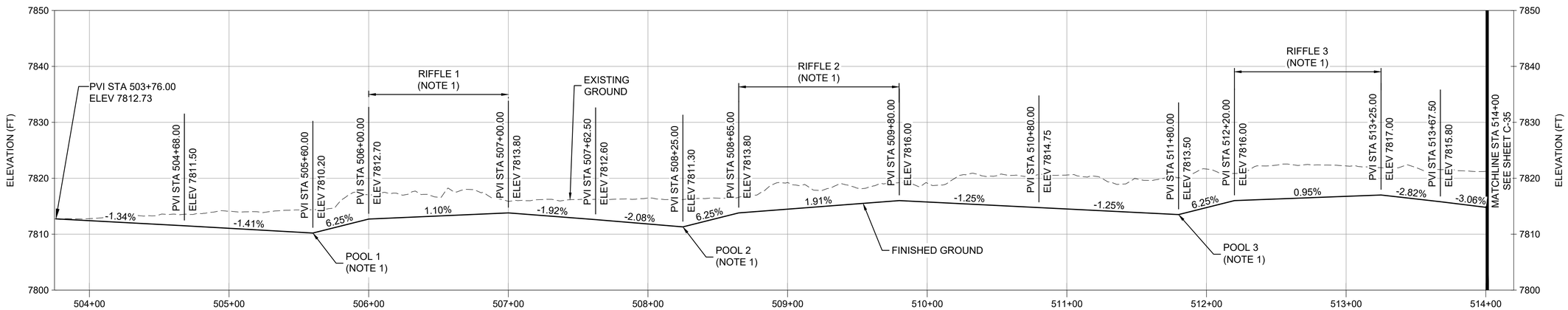
CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.

LINE TABLE		
LINE	LENGTH	BEARING
L1	14.35	S75°46'32"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	68.28	213.18	18°21'01"	34.43	67.98
C2	68.68	353.61	11°07'40"	34.45	68.57
C3	256.06	356.05	41°12'18"	133.85	250.57
C4	216.85	509.31	24°23'44"	110.09	215.22
C5	366.77	191.48	109°44'38"	272.17	313.22



CRCC PROFILE
STA: 503+75 TO STA: 514+00

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

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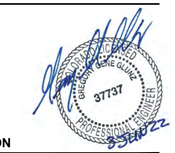
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I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

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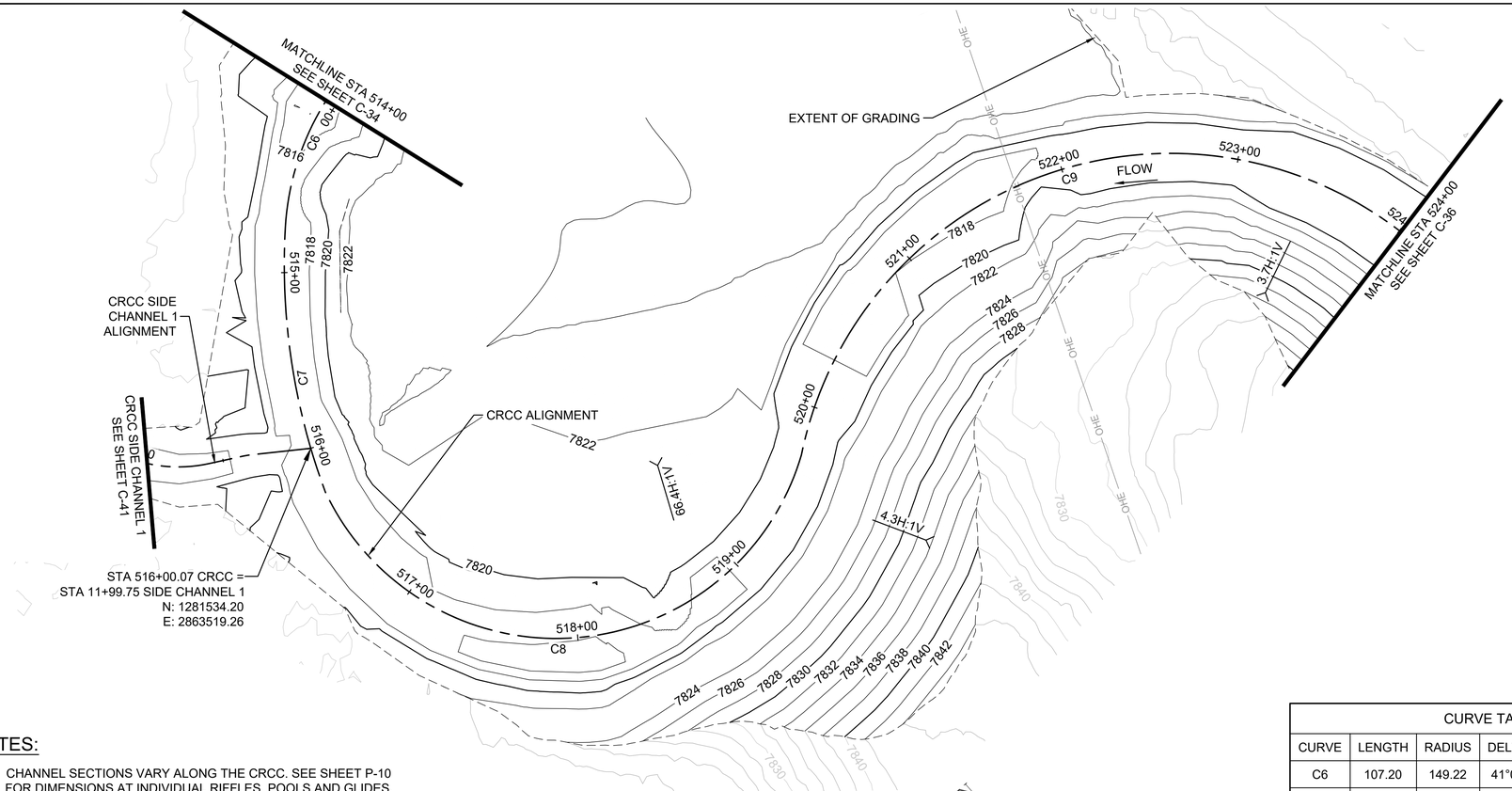
SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 1 OF 7

SHEET NUMBER

C-34

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CRCC PLAN
STA 514+00 TO STA 524+00

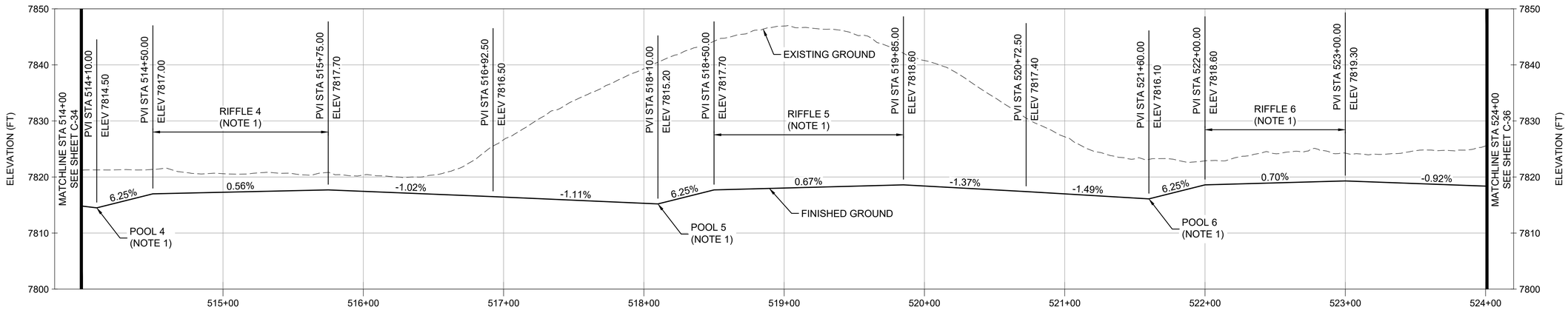
40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C6	107.20	149.22	41°09'37"	56.03	104.91
C7	151.21	364.63	23°45'36"	76.71	150.13
C8	346.28	143.40	138°21'27"	377.08	268.07
C9	472.80	211.66	127°59'08"	433.83	380.46



CRCC PROFILE
STA: 514+00 TO STA: 524+00

40 0 40 80
SCALE IN FEET (HORIZ)

10 0 10 20
SCALE IN FEET (VERT)

ISSUED FOR CONSTRUCTION

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1	12/13/2021	90% SUBMITTAL
I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

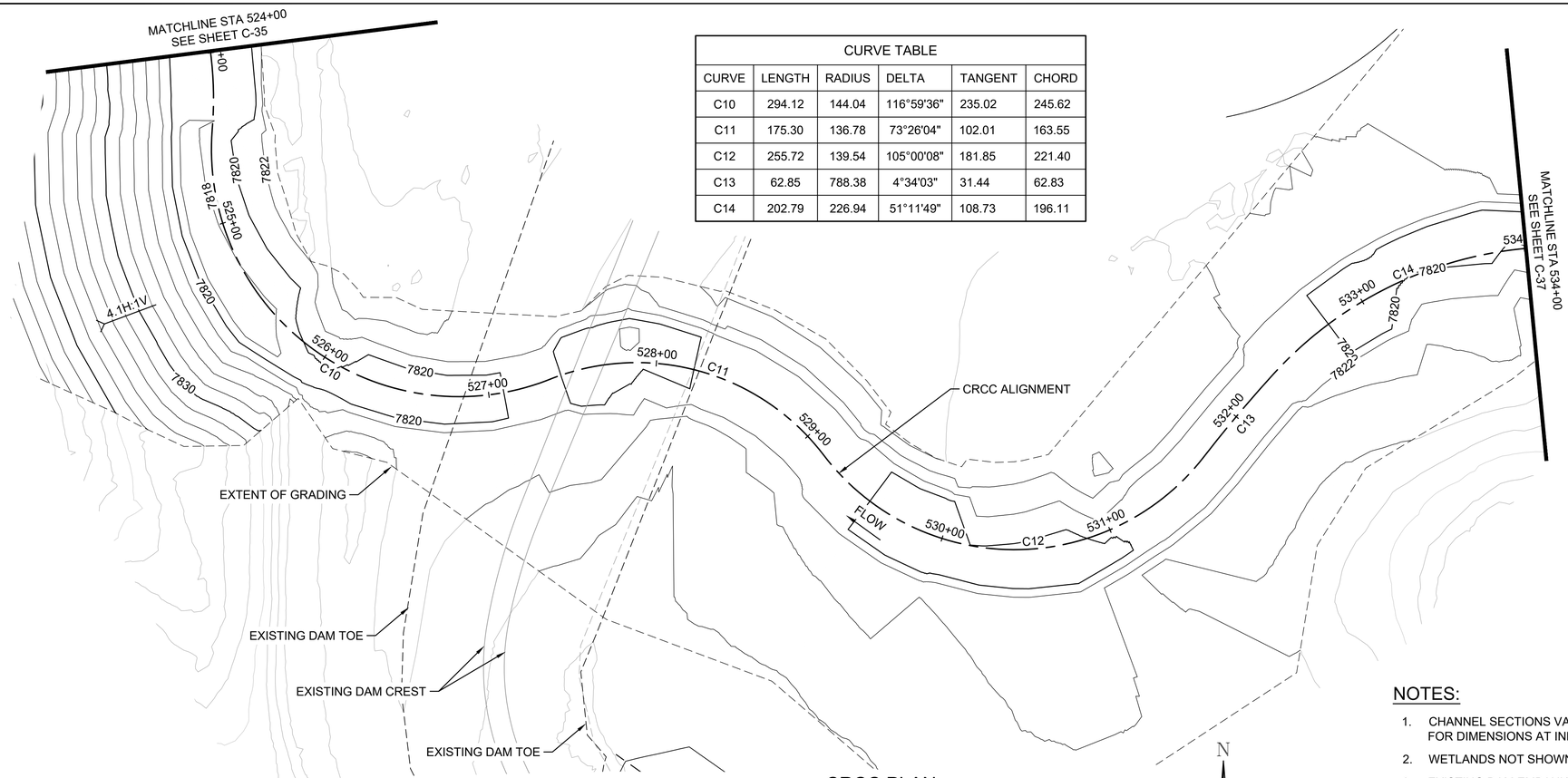
CRCC PLAN AND PROFILE
SHEET 2 OF 7

SHEET NUMBER

C-35

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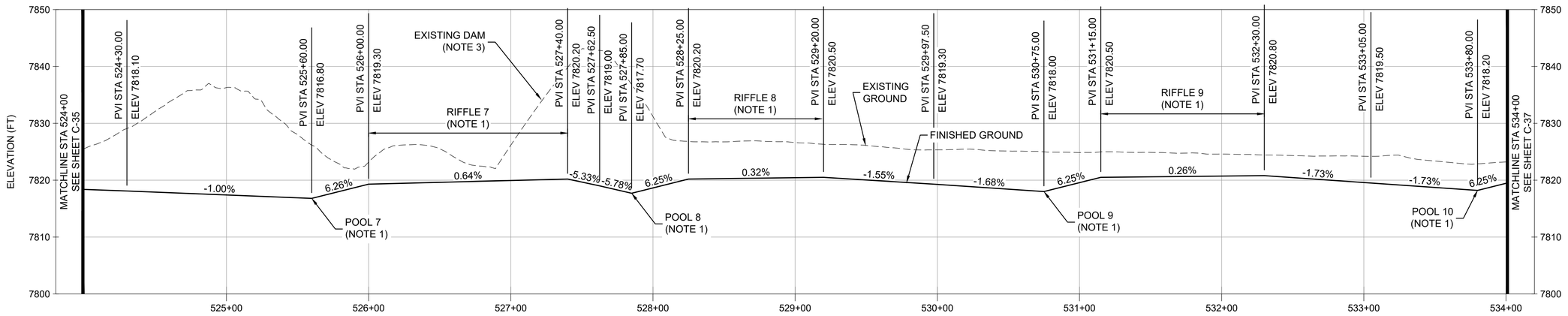
CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C10	294.12	144.04	116°59'36"	235.02	245.62
C11	175.30	136.78	73°26'04"	102.01	163.55
C12	255.72	139.54	105°00'08"	181.85	221.40
C13	62.85	788.38	4°34'03"	31.44	62.83
C14	202.79	226.94	51°11'49"	108.73	196.11



CRCC PLAN
STA 524+00 TO STA 534+00

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT



CRCC PROFILE
STA: 524+00 TO STA: 534+00

40 0 40 80
SCALE IN FEET (HORIZ)

10 0 10 20
SCALE IN FEET (VERT)

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.
3. EXISTING DAM EMBANKMENT INTERNAL ZONING NOT SHOWN.

ISSUED FOR CONSTRUCTION

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

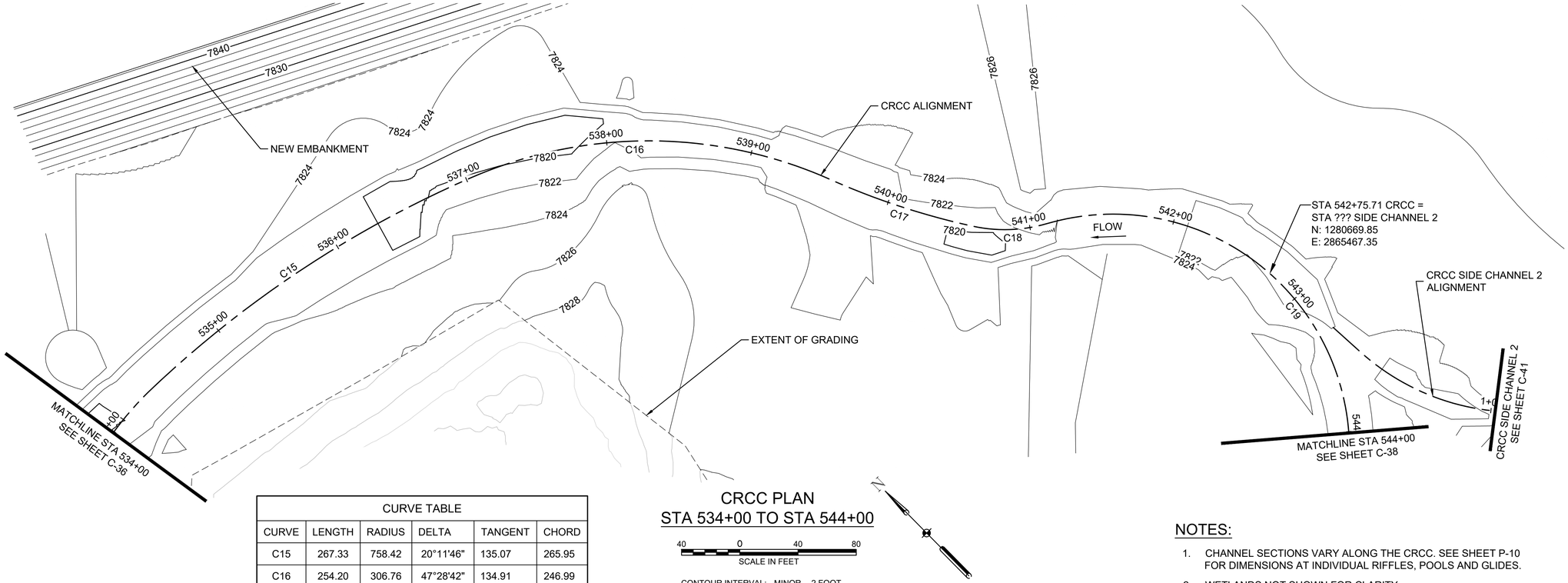
60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 3 OF 7

SHEET NUMBER

C-36



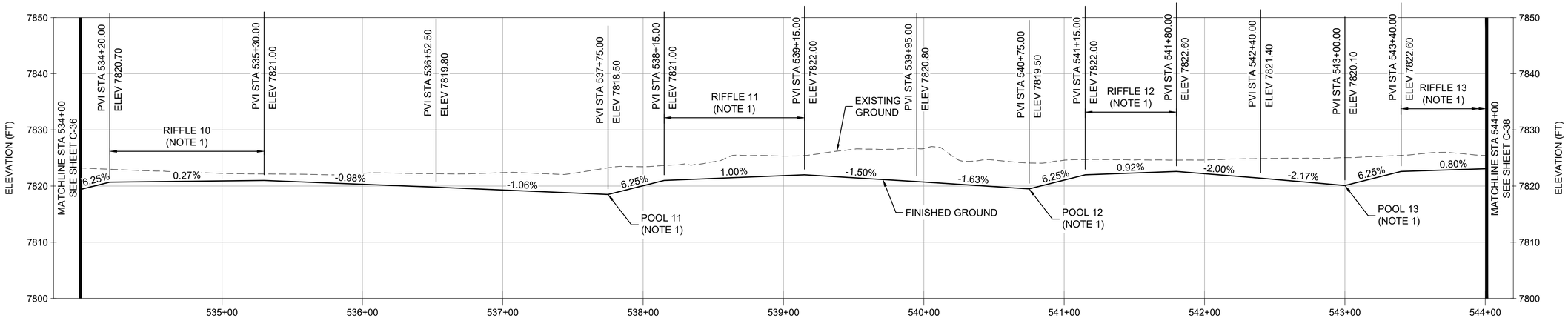
CRCC PLAN
STA 534+00 TO STA 544+00

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C15	267.33	758.42	20°11'46"	135.07	265.95
C16	254.20	306.76	47°28'42"	134.91	246.99
C17	103.17	506.09	11°40'50"	51.77	103.00
C18	51.65	103.56	28°34'30"	26.37	51.11
C19	289.35	162.27	102°09'48"	200.97	252.51

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.



CRCC PROFILE
STA: 534+00 TO STA: 544+00

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

ISSUED FOR CONSTRUCTION

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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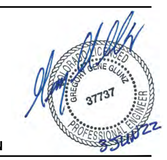
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SEO CONSTRUCTION NUMBER

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PROJECT NUMBER

60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 4 OF 7

SHEET NUMBER

C-37

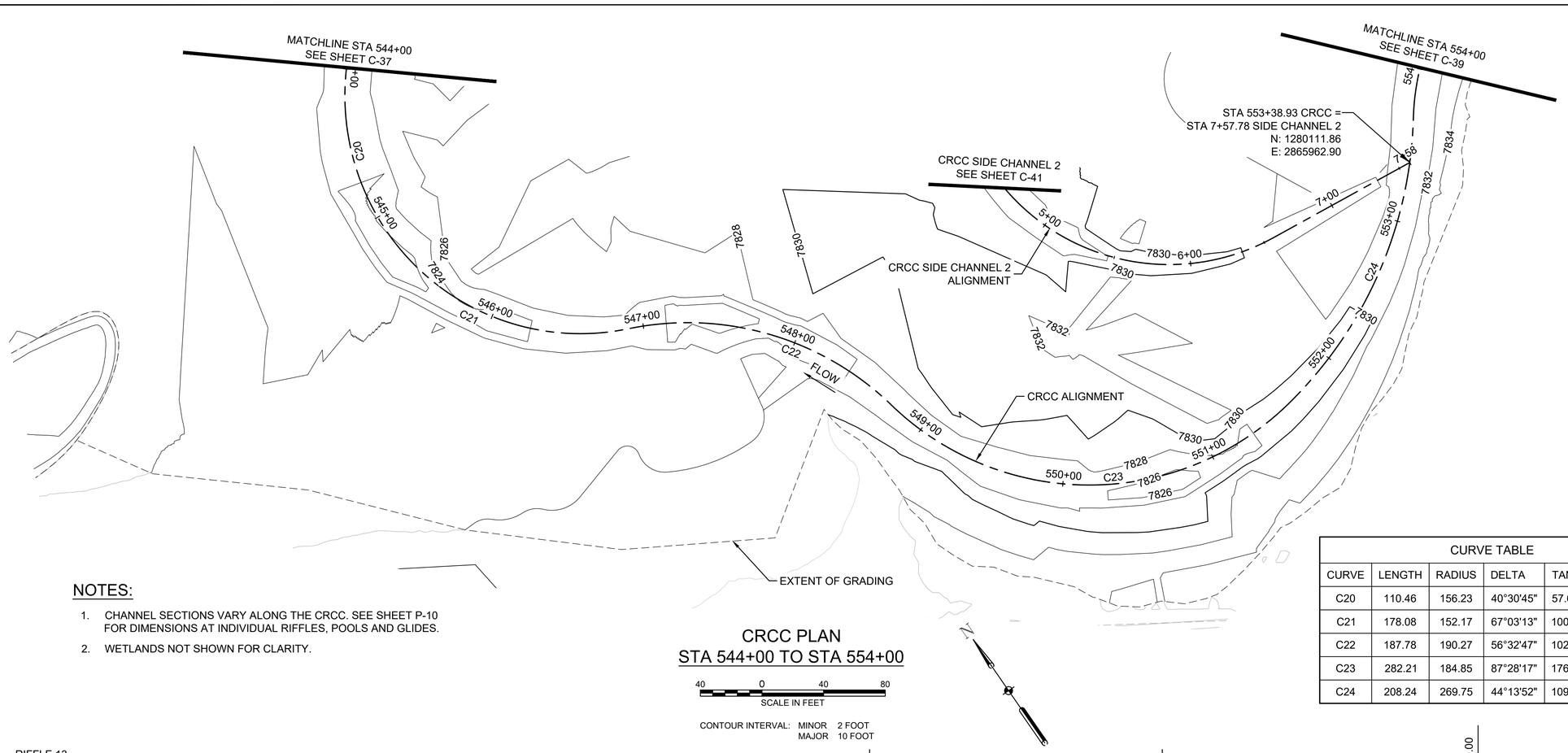
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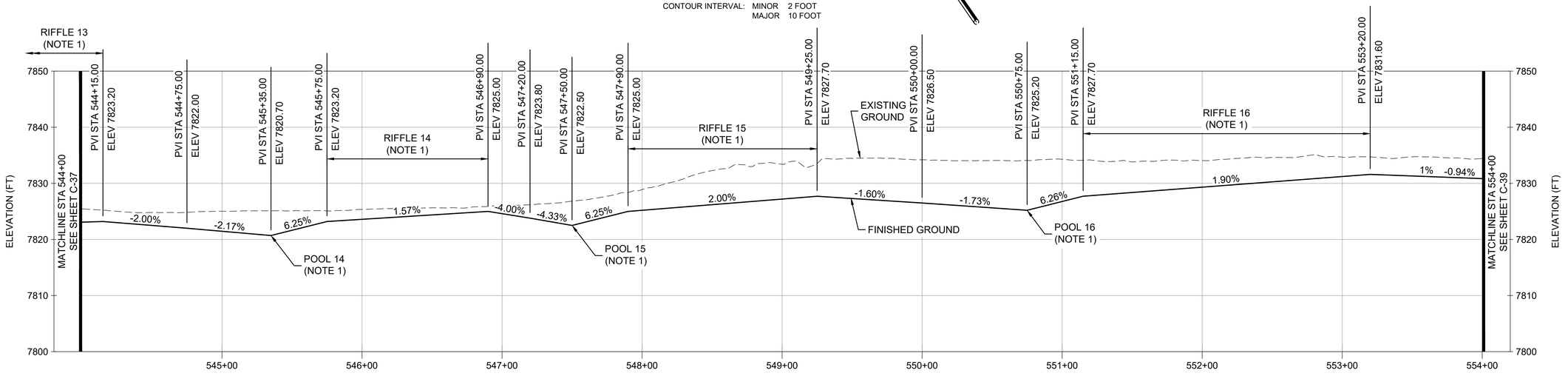
1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C20	110.46	156.23	40°30'45"	57.65	108.18
C21	178.08	152.17	67°03'13"	100.82	168.09
C22	187.78	190.27	56°32'47"	102.33	180.25
C23	282.21	184.85	87°28'17"	176.87	255.59
C24	208.24	269.75	44°13'52"	109.62	203.11

CRCC PLAN
STA 544+00 TO STA 554+00

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT



CRCC PROFILE
STA: 544+00 TO STA: 554+00

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

ISSUED FOR CONSTRUCTION

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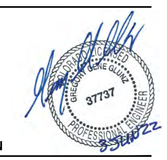
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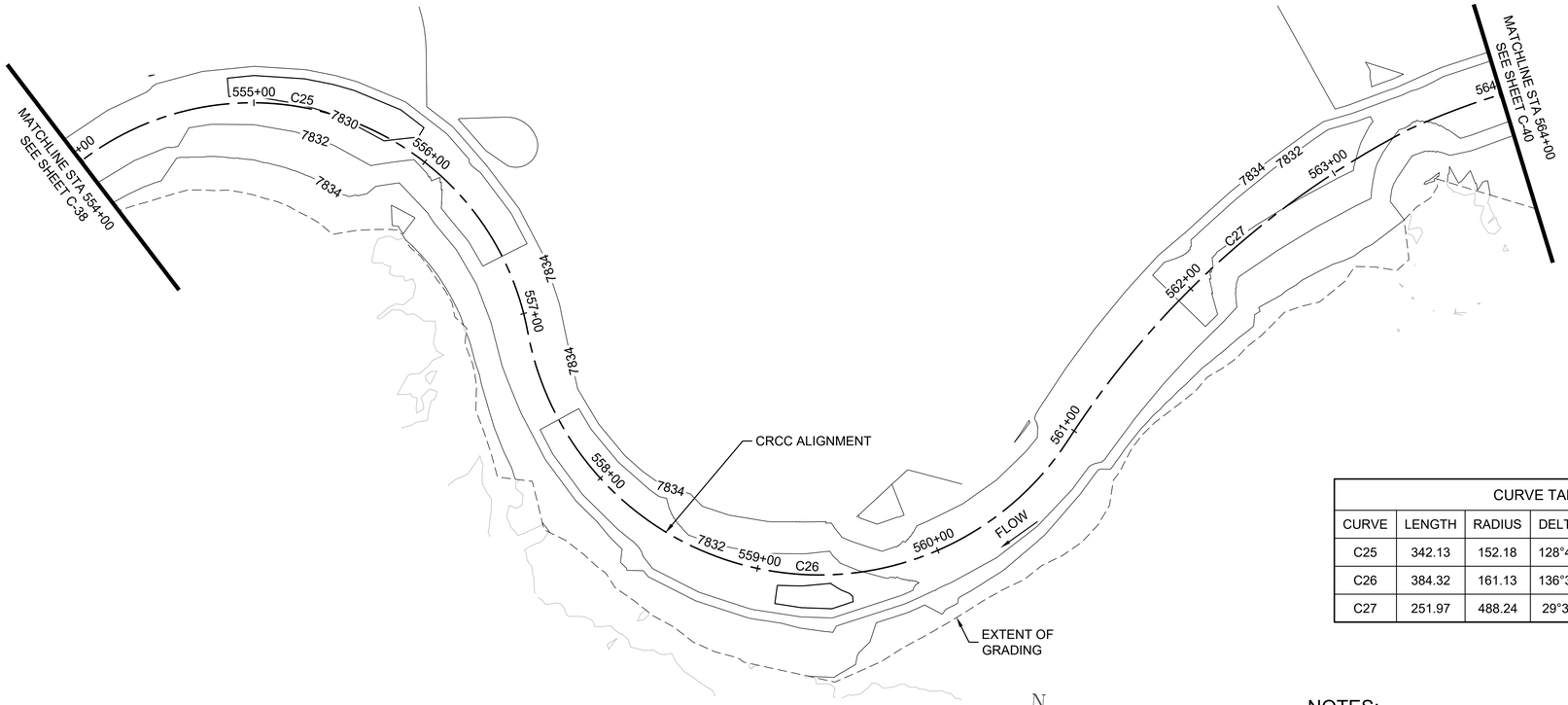
CRCC PLAN AND PROFILE
SHEET 5 OF 7

SHEET NUMBER

C-38

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CRCC PLAN
STA 554+00 TO STA 564+00

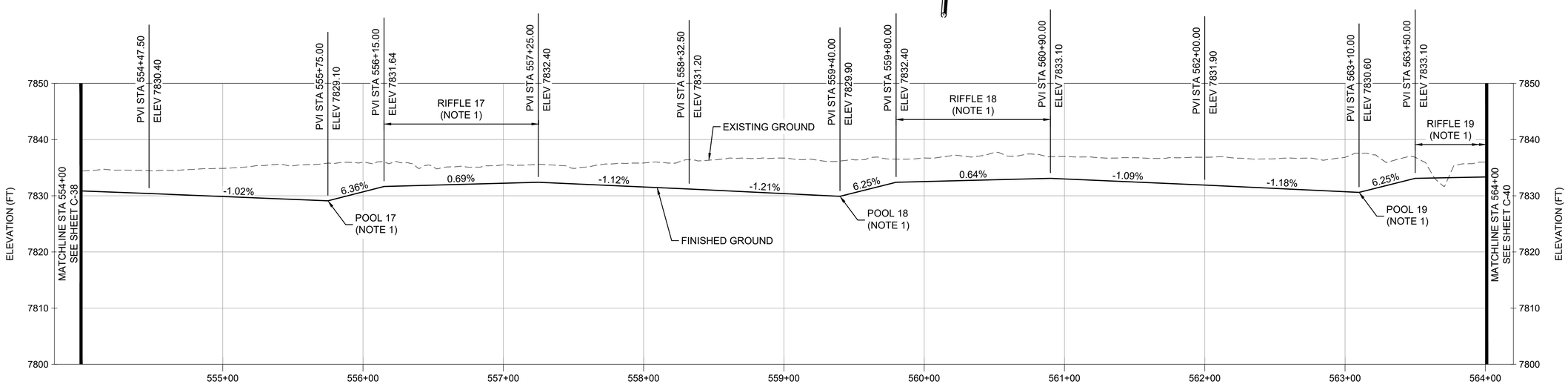
40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C25	342.13	152.18	128°48'36"	317.70	274.50
C26	384.32	161.13	136°39'43"	405.53	299.48
C27	251.97	488.24	29°34'07"	128.86	249.18

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.



CRCC PROFILE
STA: 554+00 TO STA: 564+00

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
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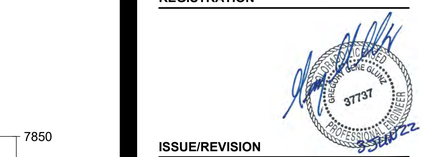
CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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CONSULTANTS

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 6 OF 7

SHEET NUMBER

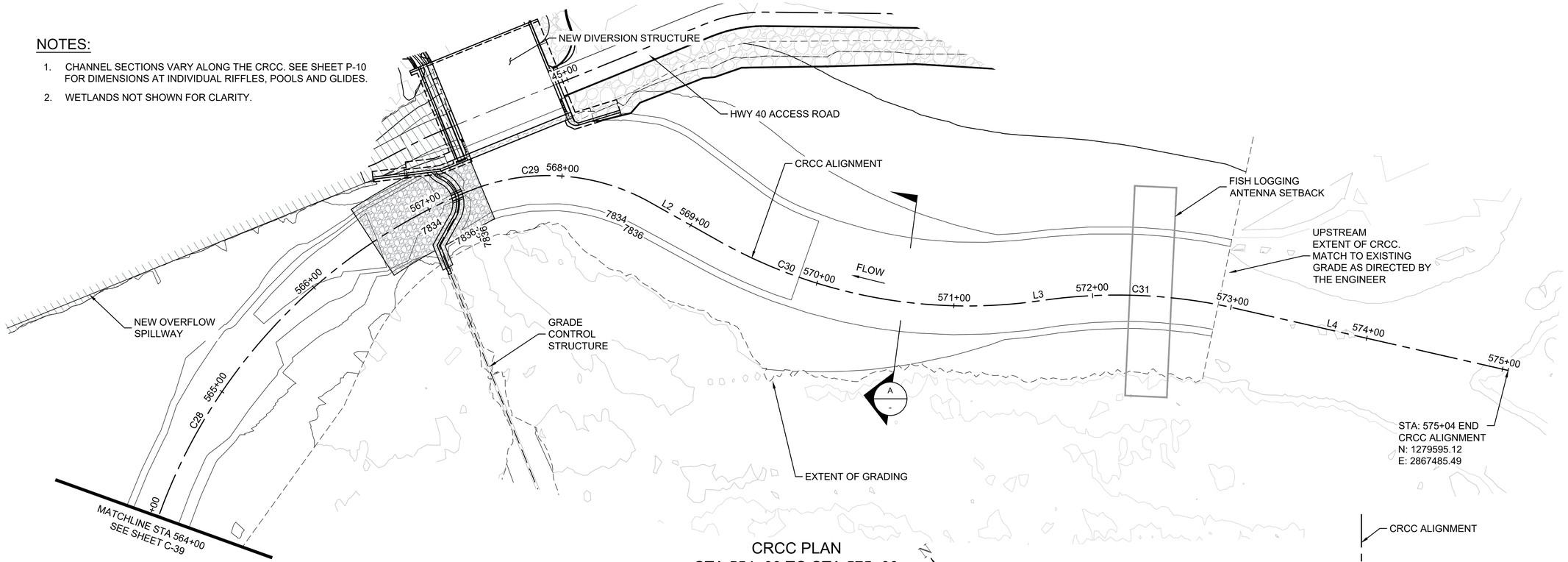
C-39

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.



CRCC PLAN
STA 554+00 TO STA 575+00

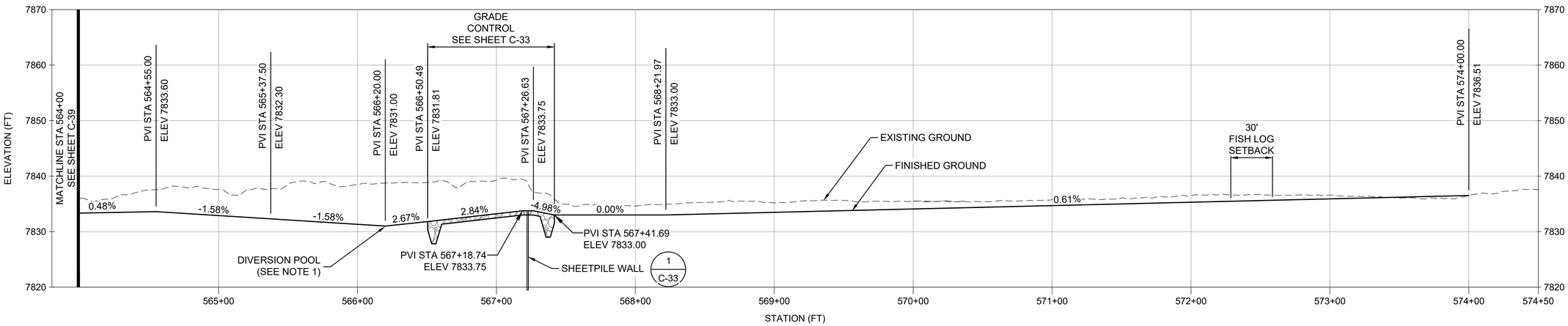
40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

TYPICAL CRCC SECTION
STA 569+00 TO STA 572+90
A
-
N.T.S.

LINE TABLE		
LINE	LENGTH	BEARING
L2	56.13	S12°00'05"E
L3	3.64	S49°23'17"E
L4	201.24	S28°31'41"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C28	384.44	397.18	55°27'29"	208.78	369.61
C29	135.60	150.00	51°47'41"	72.83	131.03
C30	238.17	365.00	37°23'12"	123.50	233.97
C31	138.35	380.00	20°51'36"	69.95	137.59



CRCC PROFILE
STA: 564+00 TO STA: 574+50

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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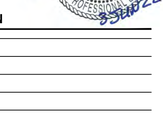
CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

www.aecom.com

CONSULTANTS

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 7 OF 7

SHEET NUMBER

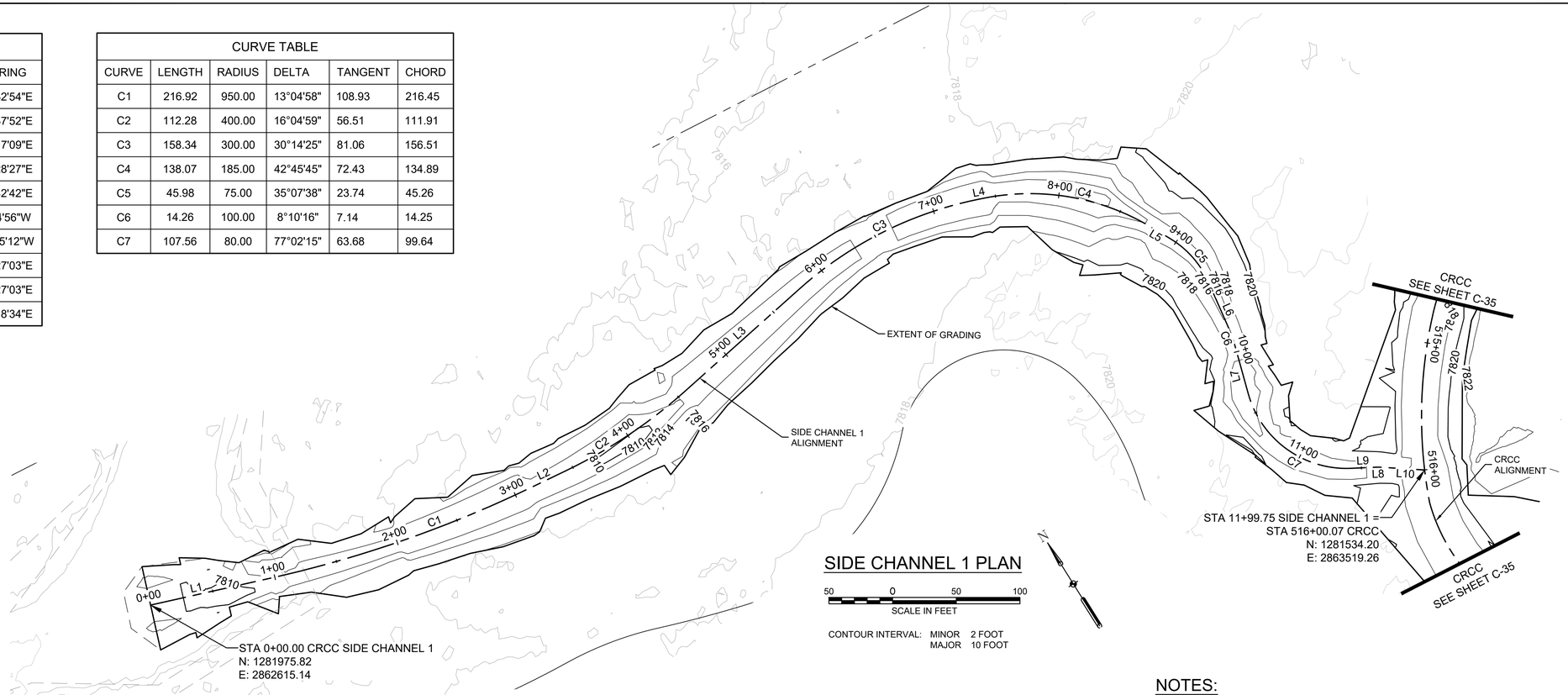
C-40

Last saved by: CASEY.ROBERTSON (2022-05-02) Last Plotted: 2022-05-04
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LINE TABLE		
LINE	LENGTH	BEARING
L1	96.45	S70°32'54"E
L2	31.23	S83°37'52"E
L3	120.40	N80°17'09"E
L4	4.42	S69°28'27"E
L5	16.94	S26°42'42"E
L6	39.60	S8°24'56"W
L7	39.32	S16°35'12"W
L8	19.30	S60°27'03"E
L9	19.30	S60°27'03"E
L10	33.32	S54°18'34"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C1	216.92	950.00	13°04'58"	108.93	216.45
C2	112.28	400.00	16°04'59"	56.51	111.91
C3	158.34	300.00	30°14'25"	81.06	156.51
C4	138.07	185.00	42°45'45"	72.43	134.89
C5	45.98	75.00	35°07'38"	23.74	45.26
C6	14.26	100.00	8°10'16"	7.14	14.25
C7	107.56	80.00	77°02'15"	63.68	99.64



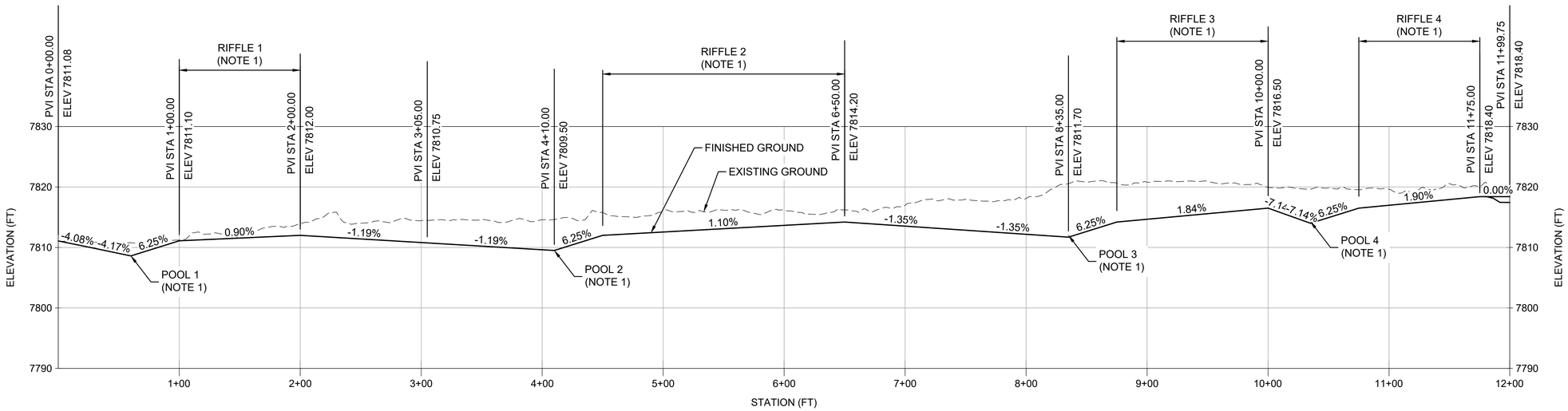
SIDE CHANNEL 1 PLAN

50 0 50 100
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. CHANNEL SECTIONS VARY. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.



SIDE CHANNEL 1 PROFILE
STA: 0+00 TO STA: 12+00

SCALE: 1" = 50' HORZ
1" = 10' VERT

50 0 50 100
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
800-369-7246 • www.northernwater.org

CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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CONSULTANTS

REGISTRATION

GREGORY GENE GLUTH 37737 REGISTERED PROFESSIONAL ENGINEER STATE OF COLORADO
5/31/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC SIDE CHANNEL 1 PLAN AND PROFILE

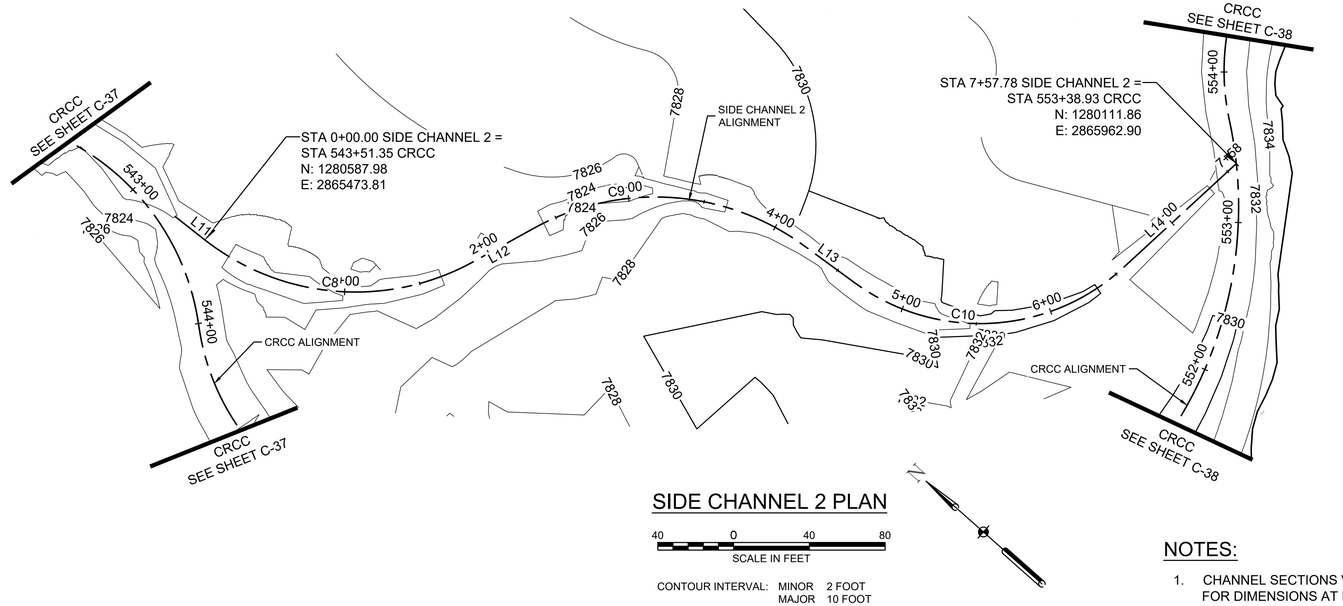
SHEET NUMBER

C-41

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
Last saved by: HAMBUCHG (2022-04-29) Last Plotted: 2022-05-04
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LINE TABLE		
LINE	LENGTH	BEARING
L11	25.00	S3°22'36"E
L12	44.86	S70°31'48"E
L13	41.41	S5°20'14"E
L14	101.21	S84°11'00"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C8	188.72	161.02	67°09'12"	106.88	178.10
C9	188.93	166.05	65°11'34"	106.18	178.90
C10	192.66	140.00	78°50'46"	115.09	177.81



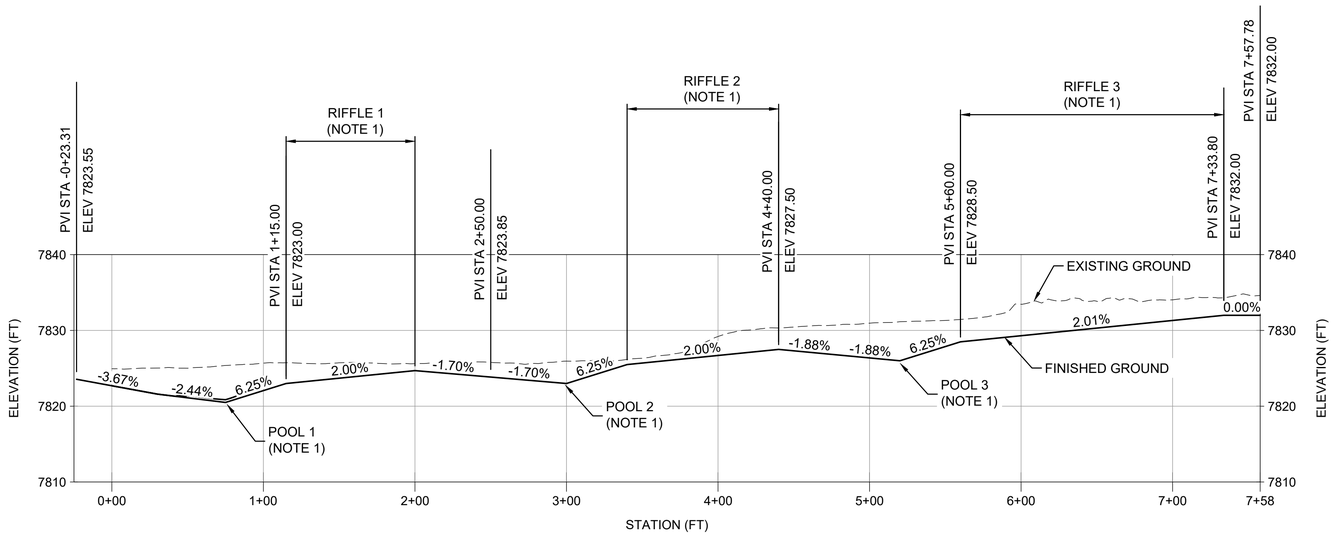
SIDE CHANNEL 2 PLAN

40 0 40 80
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

NOTES:

1. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.
2. WETLANDS NOT SHOWN FOR CLARITY.



SIDE CHANNEL 2 PROFILE
STA: -0+25 TO STA: 7+58

SCALE: 1" = 50' HORZ
1" = 10' VERT

40 0 40 80
SCALE IN FEET

10 0 10 20
SCALE IN FEET

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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CONSULTANT

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REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC SIDE CHANNEL 2 PLAN AND PROFILE

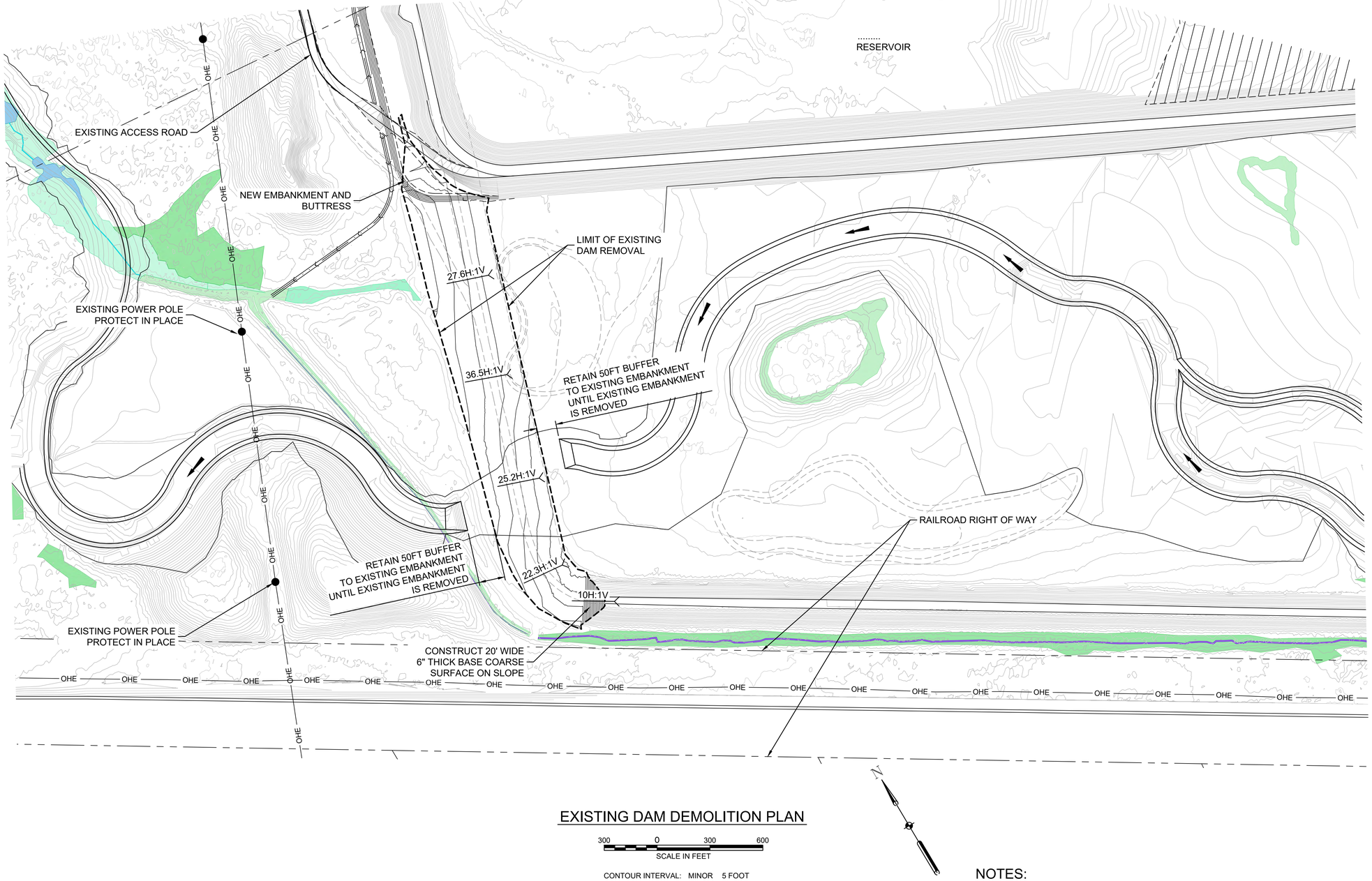
SHEET NUMBER

C-42

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

Last saved by: HAMBUCHG (2022-04-29) Last Plotted: 2022-05-04
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EXISTING DAM DEMOLITION PLAN

300 0 300 600
SCALE IN FEET

CONTOUR INTERVAL: MINOR 5 FOOT
MAJOR 25 FOOT

NOTES:

1. FOR FINAL CRCC GRADING, SEE SHEET C-30.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Northern Colorado Water Conservancy District
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CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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CONSULTANTS

REGISTRATION

REGISTERED GROUNDWATER ENGINEER GLENN A. HAMBLUCH 37737 PROFESSIONAL 5/31/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

EXISTING DAM DEMO

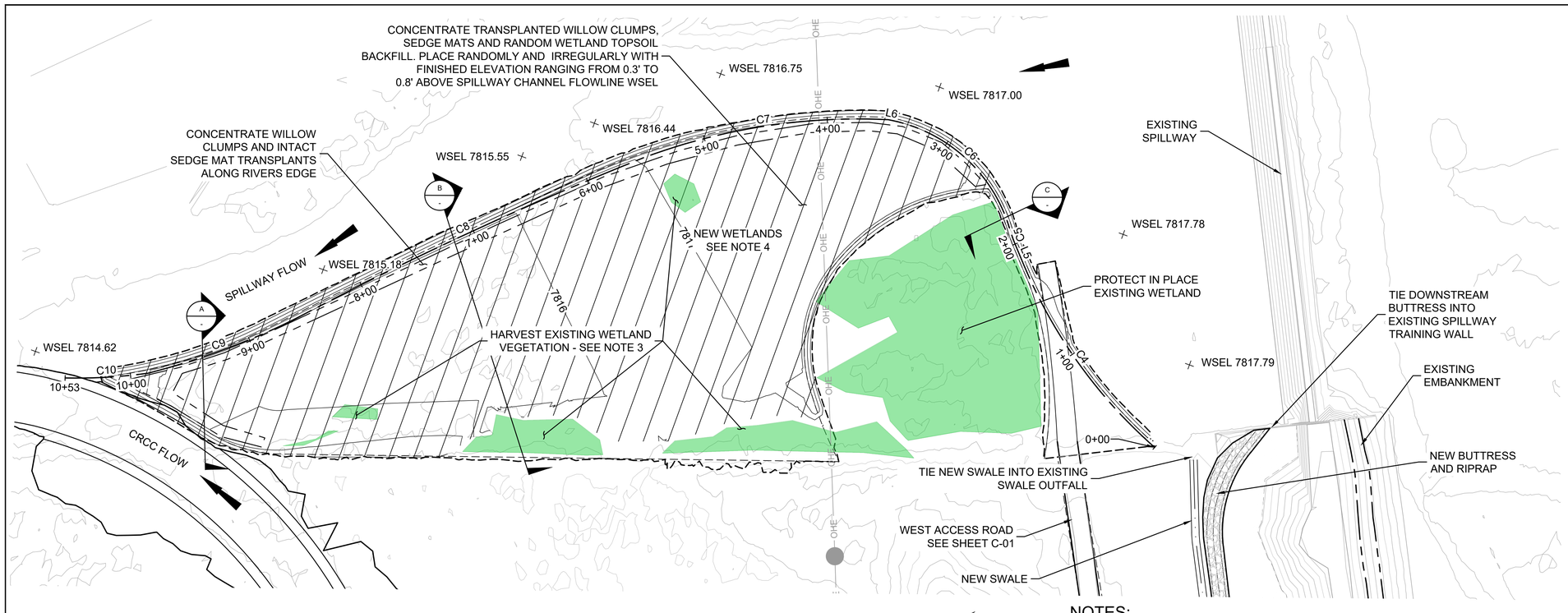
SHEET NUMBER

C-43

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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CHANNEL NARROWING PLAN

50 0 50 100

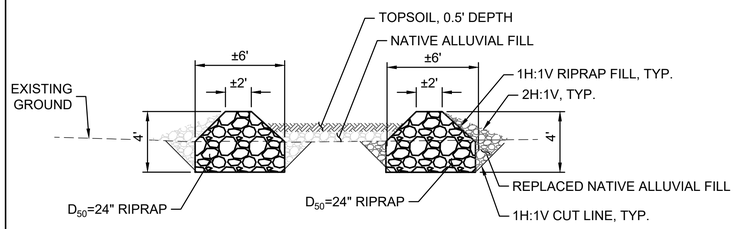
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

N

NOTES:

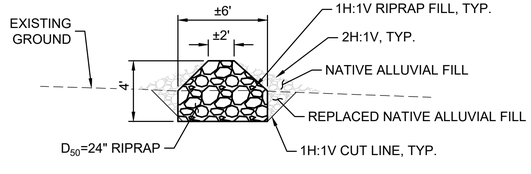
1. SEE SPECIFICATIONS FOR MATERIAL GRADATION AND RIPRAP SIZING
2. WSELS ARE FOR Q = 50 CFS
3. NEW WETLANDS FINISHED SURFACE ELEVATION TO BE APPROXIMATELY 0.3' TO 0.8' ABOVE WESL OF CHANNEL
4. WILLOW CLUMPS ABOVE GROUND BRANCHES SHALL BE TRIMMED TO 2' PRIOR TO SALVAGE AND TRANSPLANT
5. ALL TRANSPLANTED MATS AND TOPSOIL SHOULD BE PLACED WITH ROOTS DOWN AND PLANT PARTS UP AS FEASIBLE
6. ALL WETLAND TRANSPLANT AREAS SHALL BE BROADCASTED SEEDED WITH ZONE 5 FLOODPLAIN WETLAND SEED MIX



A
-

SPILLWAY RUNOUT CRCC CONFLUENCE
STA 9+00.00 TO STA 10+17.00

1" = 5'



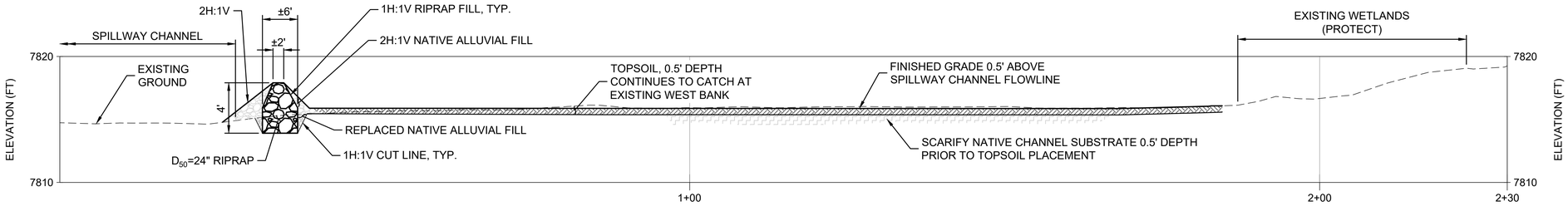
C
-

TYPICAL SPILLWAY RUNOUT
STA 0+00.00 TO STA 2+50.00

1" = 5'

LINE TABLE		
LINE	LENGTH	BEARING
L4	6.57	N22°44'37"W
L5	17.93	N2°15'21"E
L6	3.47	N53°06'15"W

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C4	174.53	400.00	24°59'58"	88.68	173.15
C5	13.85	125.01	6°20'55"	6.93	13.85
C6	134.63	125.00	61°42'30"	74.68	128.22
C7	199.45	493.11	23°10'30"	101.11	198.09
C8	312.72	2865.57	6°15'10"	156.52	312.57
C9	122.54	625.44	11°13'33"	61.47	122.35
C10	66.88	419.37	9°08'17"	33.51	66.81



B
-

TYPICAL SPILLWAY RUNOUT
STA 2+50.00 TO STA 9+00.00

1" = 10' HORZ / 1" = 5' VERT

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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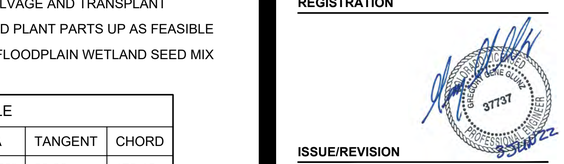
CONSULTANT

AECOM
804 COLORADO AVE.
Suite 201
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CONSULTANTS

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

BOULDER CHANNEL NARROWING AND NEW WETLAND PLAN

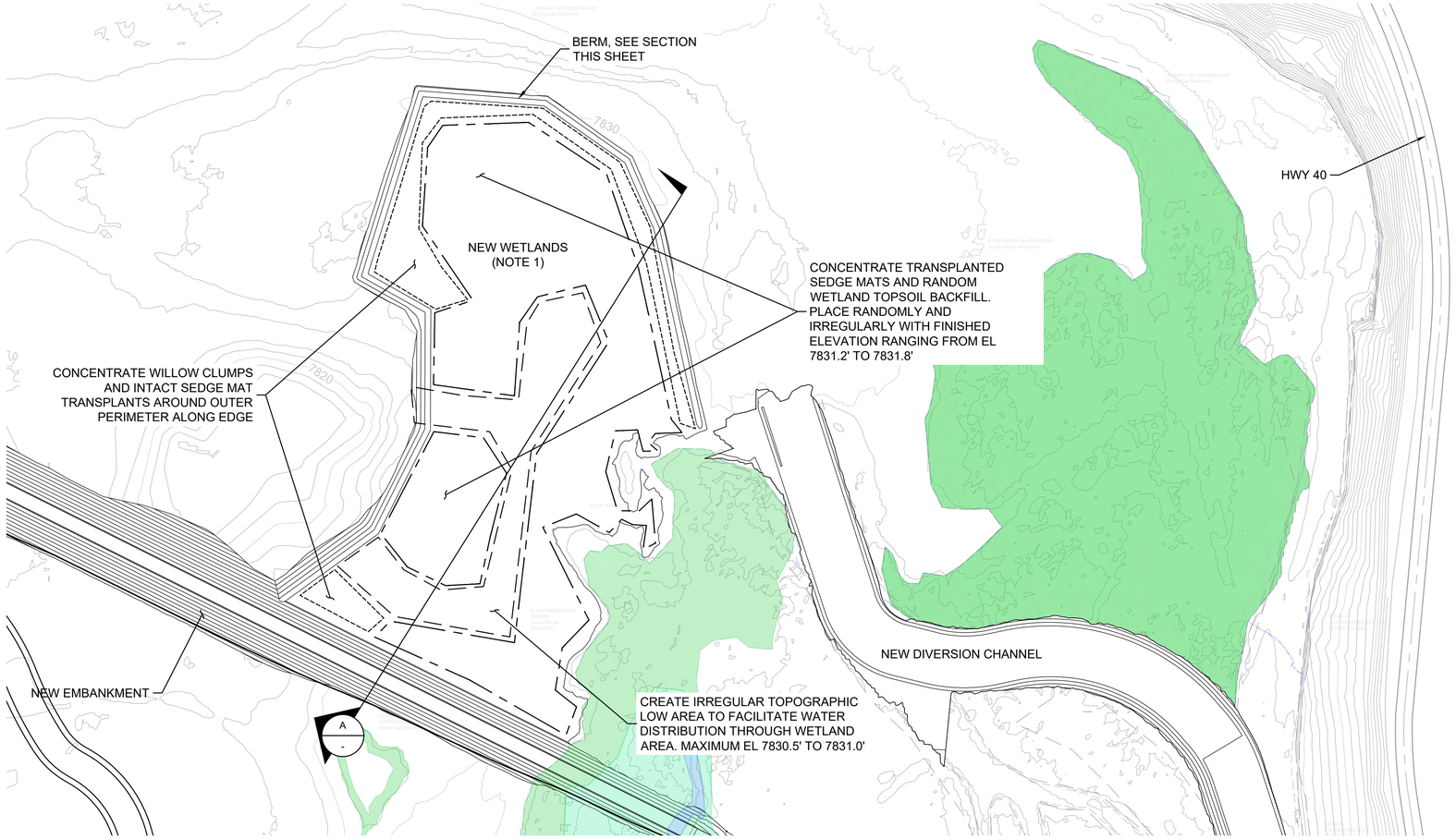
SHEET NUMBER

C-44

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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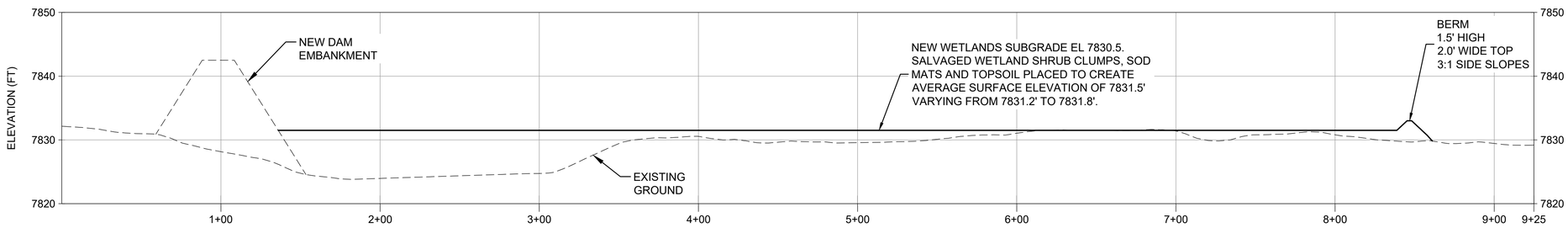
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NEW WETLANDS PLAN

100 0 100 200
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT



A - NEW WETLANDS TYPICAL SECTION

40 0 40 80
SCALE IN FEET (HORZ)

10 0 10 20
SCALE IN FEET (VERT)

NOTES:

1. FILL EXISTING AREA SHOWN TO AVERAGE SUBGRADE ELEVATION 7830.5 WITH TUBIFEX CONTAMINATED TOPSOIL AND FORM WETLANDS AREA PER ENGINEER'S DIRECTION AND IN ACCORDANCE WITH THE SPECIFICATIONS (31 14 13, 1.3, D).
2. NEW WETLANDS SHOWN IS 7.0 ACRES AND 30,000 CY FILL.
3. WETLAND IS BASED ON RESERVOIR FULL POOL MAXIMUM WATER SURFACE ELEVATION OF 7831.5'.
4. WILLOW CLUMPS ABOVE GROUND BRANCHES SHALL BE TRIMMED TO 2' PRIOR TO SALVAGE AND TRANSPLANT.
5. ALL TRANSPLANTED MATS AND TOPSOIL SHOULD BE PLACED WITH ROOTS DOWN AND PLANT PARTS UP AS FEASIBLE.
6. ALL WETLAND TRANSPLANT AREAS SHALL BE BROADCAST SEEDED WITH ZONE 5 FLOODPLAIN WETLAND SEED MIX.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
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CONSULTANT

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804 COLORADO AVE.
Suite 201
GLENWOOD SPRINGS, CO. 81601

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CONSULTANTS

REGISTRATION

GREGORY EUGENE CLINE 37737 REGISTERED PROFESSIONAL ENGINEER 5/24/22

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

NEW WETLANDS GRADING PLAN

SHEET NUMBER

C-45

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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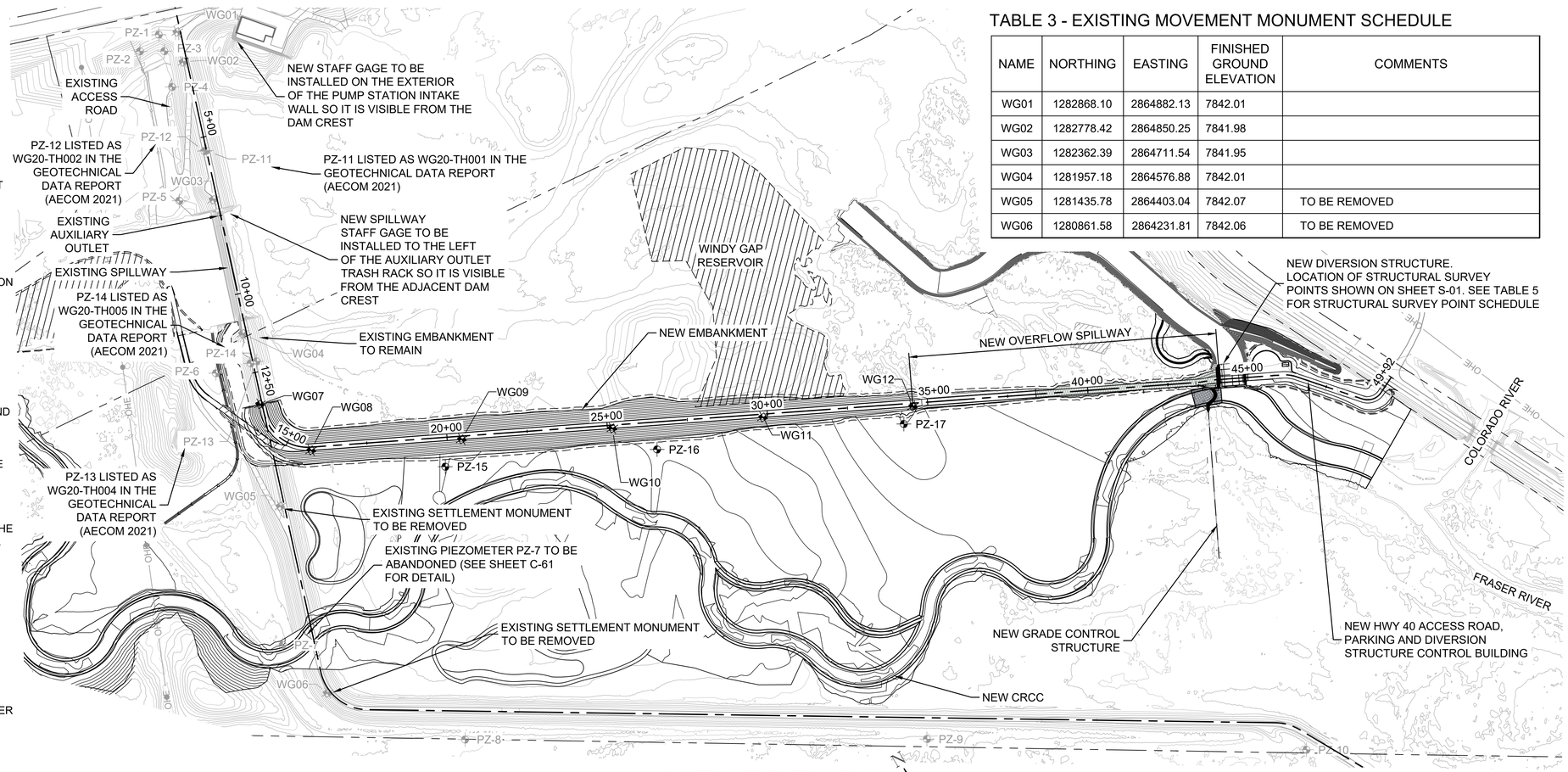
Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

LEGEND:

- EXISTING PIEZOMETER (SEE TABLE 1)
- EXISTING MOVEMENT MONUMENT (SEE TABLE 3)
- NEW PIEZOMETER (SEE TABLES 2)
- NEW MOVEMENT MONUMENT (SEE TABLE 4)

NOTES:

1. ALL EXISTING INSTRUMENTATION TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
2. SEE SHEET C-61 FOR TYPICAL DETAILS OF PIEZOMETER, MOVEMENT MONUMENT, STRUCTURAL SURVEY POINTS AND STAFF GAGES.
3. ALL NORTHINGS, EASTINGS, AND ELEVATIONS IN TABLES 1 THROUGH 5 TO BE SURVEYED AND RECORDED AFTER INSTALLATION IN ACCORDANCE WITH A FIRST ORDER, CLASS 1 SURVEY.
4. EXISTING PIEZOMETER LOCATIONS OBTAINED FROM THE GEOTECHNICAL DATA REPORT. ACTUAL LOCATIONS TO BE CONFIRMED BY THE CONTRACTOR AT THE COMMENCEMENT OF CONSTRUCTION.
5. STRUCTURAL SURVEY POINT LOCATIONS SHOWN ON SHEET S-01.
6. THE EXACT LOCATION FOR NEW STAFF GAGES TO BE CONFIRMED WITH THE ENGINEER PRIOR TO FABRICATION AND INSTALLATION



INSTRUMENTATION PLAN

300 0 300 600
SCALE IN FEET

TABLE 1 - EXISTING PIEZOMETER SCHEDULE

NAME	NORTHING	EASTING	FINISHED GROUND ELEVATION	COMMENTS
PZ-0	1282940.62	2865210.30	7856.36	NOT SHOWN ON PLAN
PZ-1	1282890.42	2864828.54	7839.32	
PZ-2	1282875.89	2864751.73	7834.00	
PZ-3	1282837.48	2864817.21	7827.42	
PZ-4	1282729.60	2864780.83	7825.11	
PZ-5	1282413.70	2864619.04	7822.45	
PZ-6	1281894.36	2864442.51	7821.52	
PZ-7	1281061.23	2864188.26	7827.19	TO BE ABANDONED
PZ-8	1280518.16	2864525.88	7828.80	
PZ-9	1279784.15	2865761.87	7835.45	
PZ-10	1279151.41	2866760.24	7842.23	
PZ-11	1282505.00	2864771.00	7842.50	
PZ-12	1282506.56	2864765.21	7842.49	
PZ-13	1281861.50	2864570.03	7840.92	
PZ-14	1281865.51	2864550.62	7842.05	

TABLE 2 - NEW PIEZOMETER SCHEDULE

NAME	NORTHING	EASTING	FINISHED GROUND ELEVATION	TIP ELEVATION
PZ-15	1281279.11	2864907.27	7825.34	
PZ-16	1280988.17	2865501.12	7825.97	
PZ-17	1280663.33	2866201.71	7837.91	

TABLE 3 - EXISTING MOVEMENT MONUMENT SCHEDULE

NAME	NORTHING	EASTING	FINISHED GROUND ELEVATION	COMMENTS
WG01	1282868.10	2864882.13	7842.01	
WG02	1282778.42	2864850.25	7841.98	
WG03	1282362.39	2864711.54	7841.95	
WG04	1281957.18	2864576.88	7842.01	
WG05	1281435.78	2864403.04	7842.07	TO BE REMOVED
WG06	1280861.58	2864231.81	7842.06	TO BE REMOVED

TABLE 4 - NEW MOVEMENT MONUMENT SCHEDULE

NAME	NORTHING	EASTING	FINISHED GROUND ELEVATION	COMMENTS
WG07	1281741.11	2864511.03	7842.80	
WG08	1281536.44	2864574.59	7842.80	
WG09	1281326.07	2864994.88	7842.50	
WG10	1281115.69	2865415.17	7842.80	
WG11	1280905.32	2865835.46	7842.80	
WG12	1280695.69	2866254.27	7842.80	

TABLE 5 - NEW STRUCTURAL SURVEY POINT SCHEDULE

NAME	NORTHING	EASTING	ELEVATION	COMMENTS
SSP-01				
SSP-02				
SSP-03				
SSP-04				
SSP-05				
SSP-06				
SSP-07				
SSP-08				

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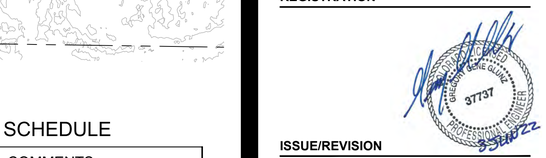
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3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

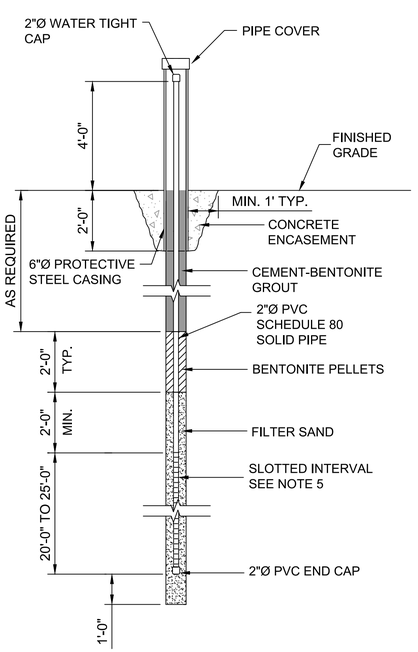
CIVIL STRUCTURES INSTRUMENTATION PLAN

SHEET NUMBER

C-60

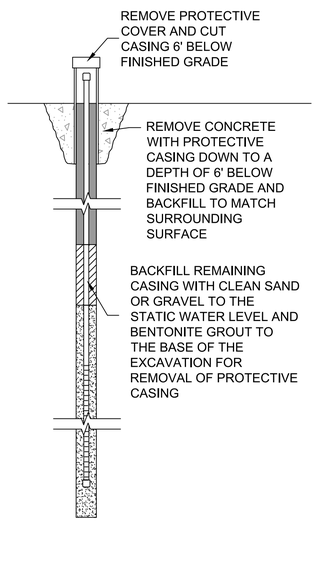
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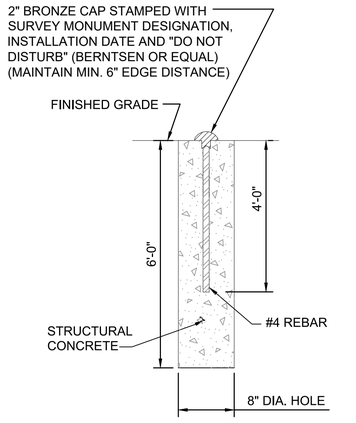
1 C-60 TYPICAL PIEZOMETER DETAIL

NOT TO SCALE



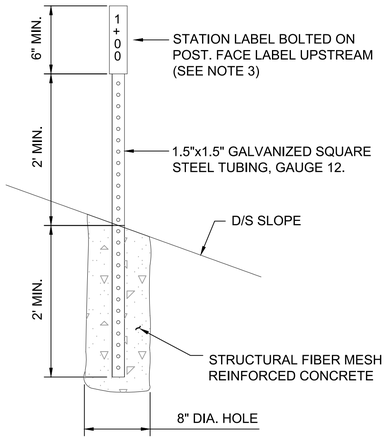
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NOT TO SCALE



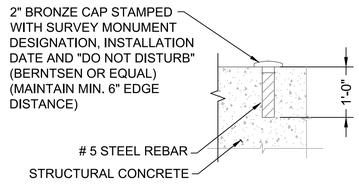
3 C-60 TYPICAL MOVEMENT MONUMENT AND BENCH MARK DETAIL

NOT TO SCALE



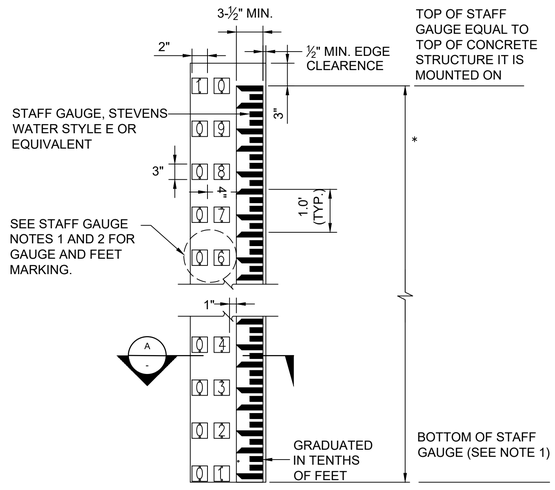
4 C-60 TYPICAL STATION MARKER DETAIL

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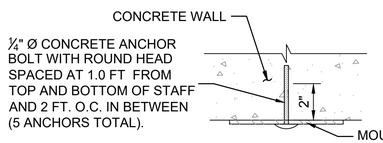
5 C-60 STRUCTURAL SURVEY POINT

NOT TO SCALE



6 C-60 TYPICAL STAFF GAUGE DETAIL

NOT TO SCALE



MOUNT SPILLWAY STAFF GAUGE ON UPSTREAM FACE OF THE AUXILIARY OUTLET ON THE RIGHT SIDE (LOOKING DOWNSTREAM) OF THE EXISTING TRASH RACK.

MOUNT DIVERSION STRUCTURE STAFF GAUGE ON THE RIGHT TRAINING WALL ABOVE THE DIVERSION STRUCTURE SILL AT EL 7834.0 FT (SEE SHEET S-05).

A - STAFF GAUGE WALL MOUNT

NOT TO SCALE

NOTES:

1. STAFF GAUGES FOR THE EXISTING SPILLWAY AND PUMP STATION BUILDING SHALL BE VERTICAL GAUGE ELEVATION IN FEET STARTING AT ELEVATION 7796.0 FT. THE STAFF GAUGE FOR THE DIVERSION STRUCTURE SHALL BE VERTICAL GAUGE ELEVATION IN FEET STARTING AT ZERO AND FROM THE DIVERSION STRUCTURE INTAKE CREST AT EL 7834.0 FT (SEE SHEET S-05)
2. INSTALL NUMBER PLATES FOR EACH FOOT VERTICAL ELEVATION AND AT TOP OF GAUGE AND BOTTOM OF GAUGE (SEE DETAIL 6)
3. STATION MARKERS TO BE LOCATED EVERY 100 FT (STARTING AT STA 1+00) ALONG THE FULL LENGTH OF THE EXISTING AND NEW DAM EMBANKMENTS. MARKER NUMBERS TO BE WELDED BEFORE GALVANIZING
4. INSTALL MOVEMENT MONUMENTS ON DOWNSTREAM SIDE OF DAM CREST (SEE DETAIL 3) APPROXIMATELY 3 FT DOWNSTREAM FROM THE DOWNSTREAM DAM SHOULDER (SEE SHEET C-60 FOR LOCATIONS)
5. SLOTTED INTERVAL FOR NEW PIEZOMETERS TO BE DETERMINED DURING DRILLING

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REGISTRATION

GREGORY GENE OLSEN 37737 REGISTERED PROFESSIONAL ENGINEER 5/24/22

ISSUE/REVISION

4	05/24/2022	REISSUED FOR CONST'N
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL
I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

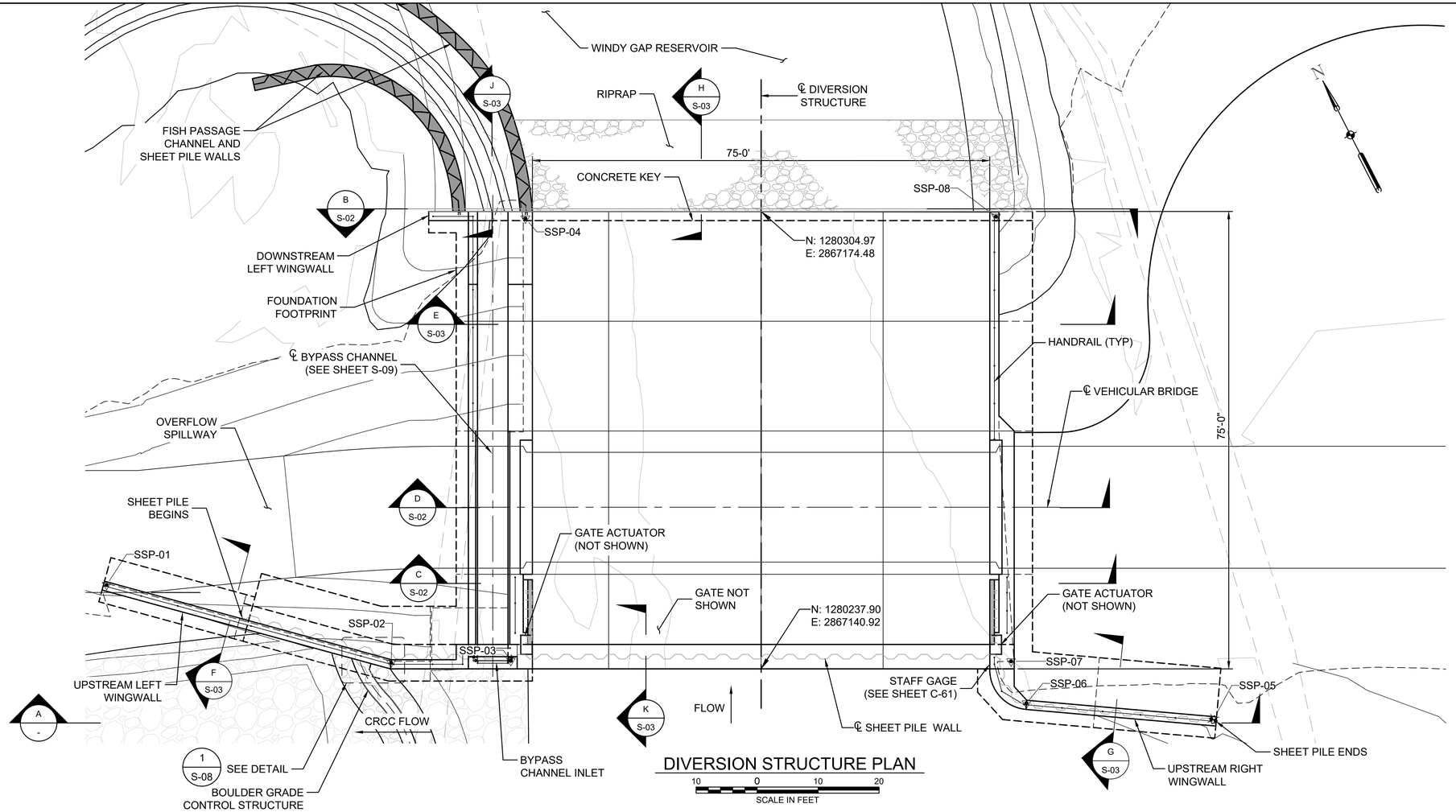
CIVIL STRUCTURES INTRUMENTATION DETAILS

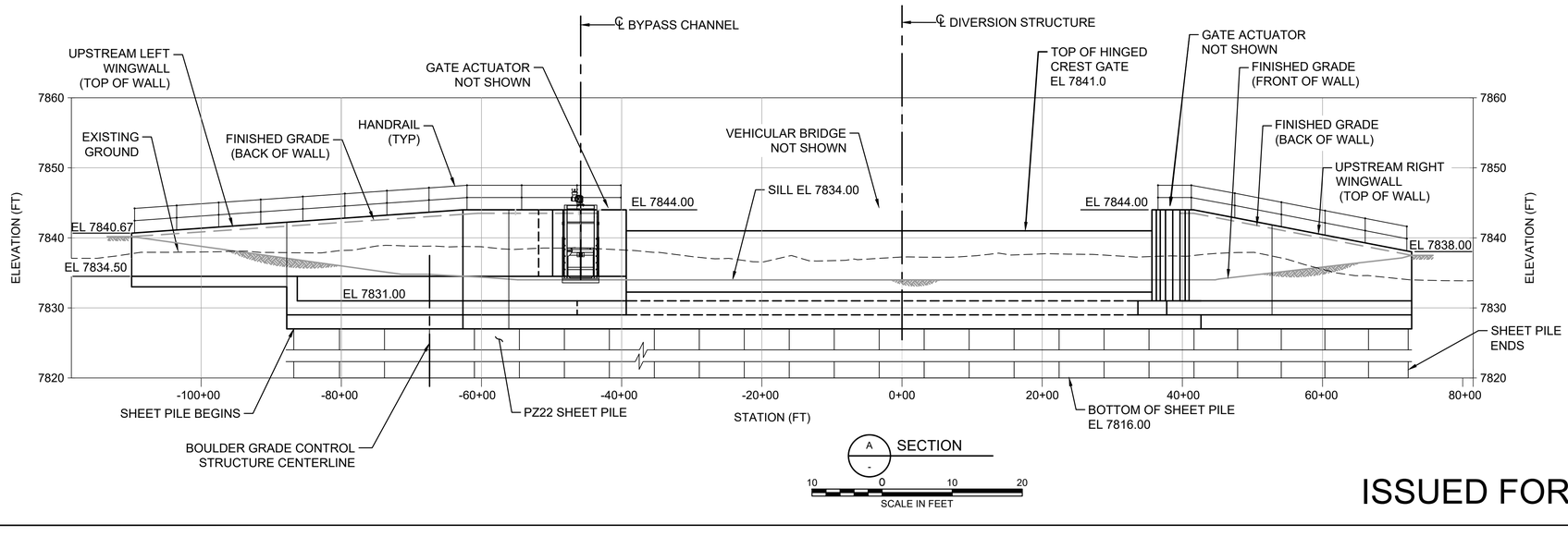
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C-61

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NOTES:

1. STRUCTURAL SURVEY POINT (SSP-01 TO SSP-09) SCHEDULE SHOWN ON SHEET C-60.
2. STRUCTURAL SURVEY POINT TO BE LOCATED SUCH THAT HANDRAIL DOES NOT LIMIT ACCESS FOR SURVEY ROD OR EQUIPMENT.
3. FOR ELECTRICAL AND INSTRUMENTATION DETAILS ASSOCIATED WITH THE DIVERSION STRUCTURE SEE SHEET E-01.

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REGISTERED PROFESSIONAL ENGINEER GREGORY GENE GLINSKI 37737 STATE OF COLORADO
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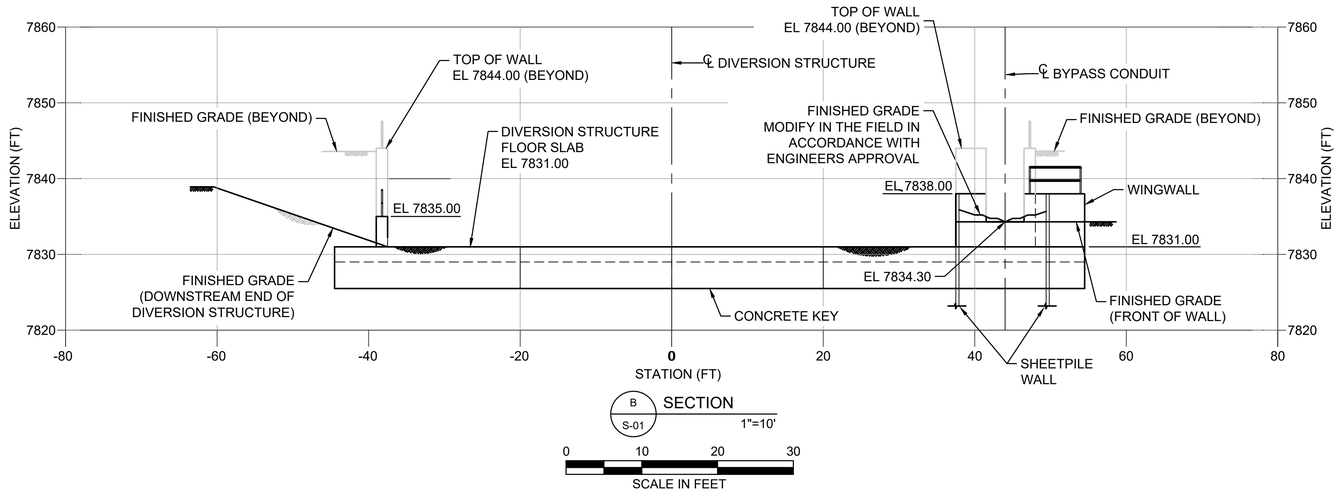
DIVERSION STRUCTURE CIVIL PLAN AND SECTION

SHEET NUMBER

S-01

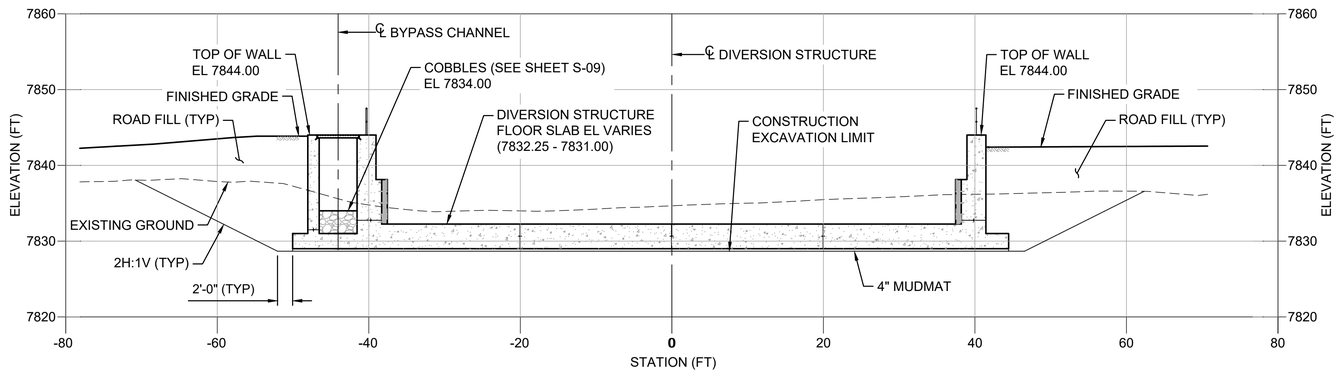
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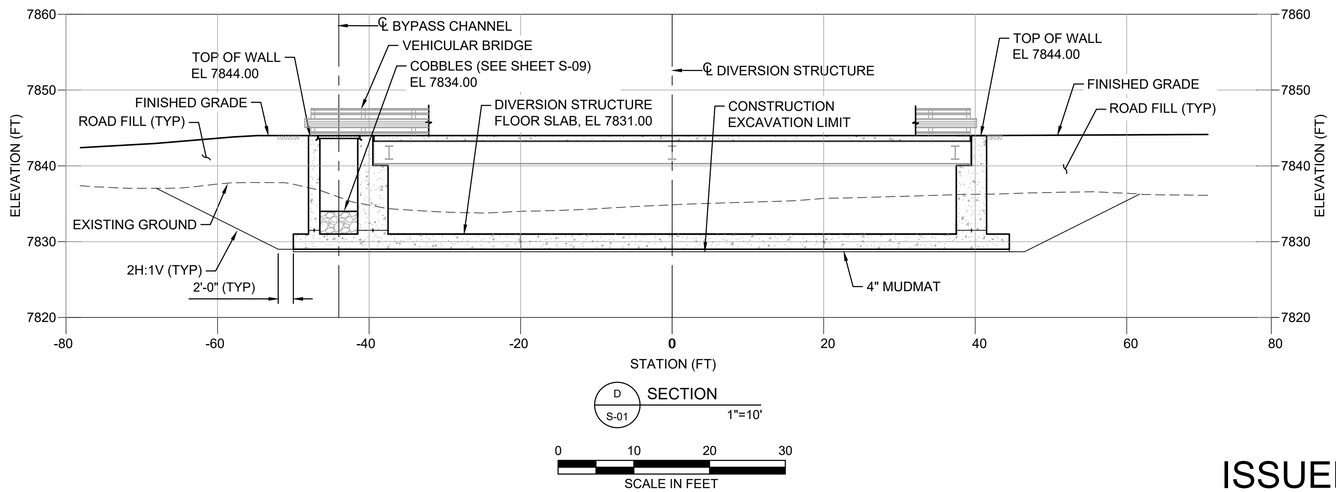
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SCALE IN FEET



C S-01 SECTION 1"=10'

0 10 20 30
SCALE IN FEET



D S-01 SECTION 1"=10'

0 10 20 30
SCALE IN FEET

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SEO CONSTRUCTION NUMBER

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PROJECT NUMBER

60619047

SHEET TITLE

DIVERSION STRUCTURE CIVIL SECTIONS (1 OF 2)

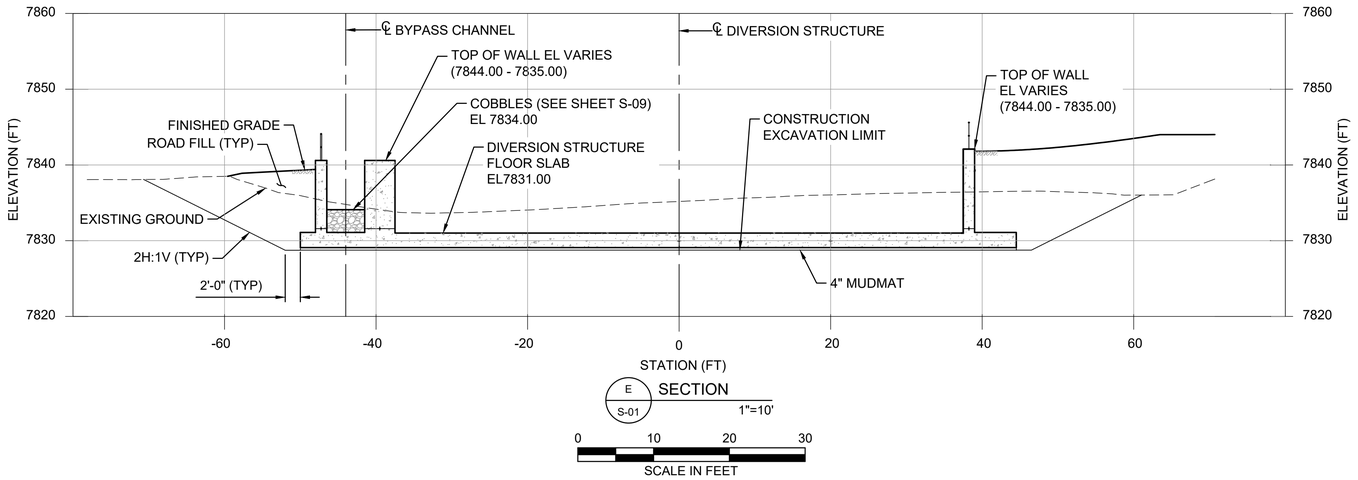
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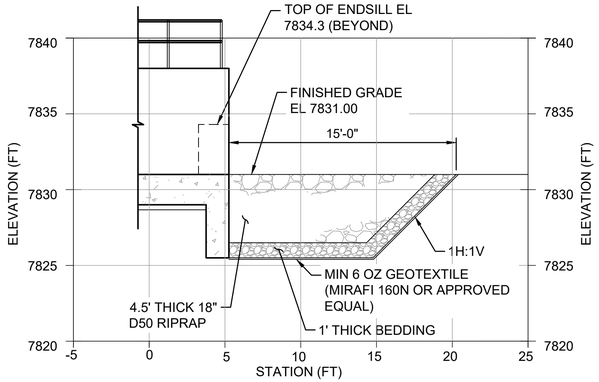
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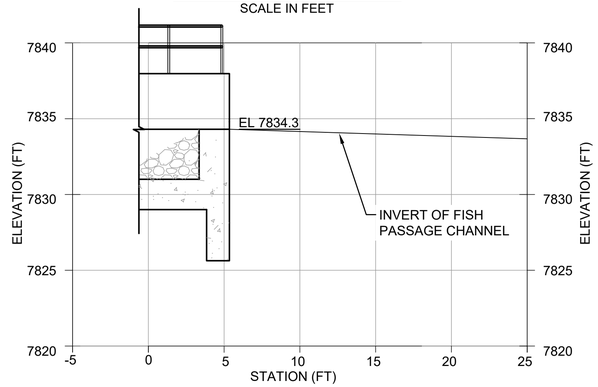
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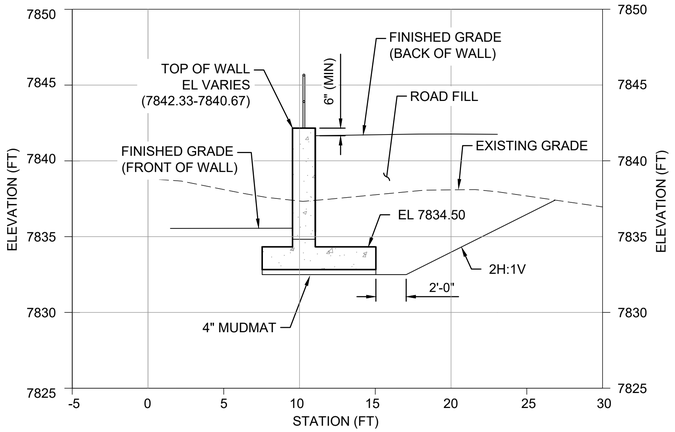
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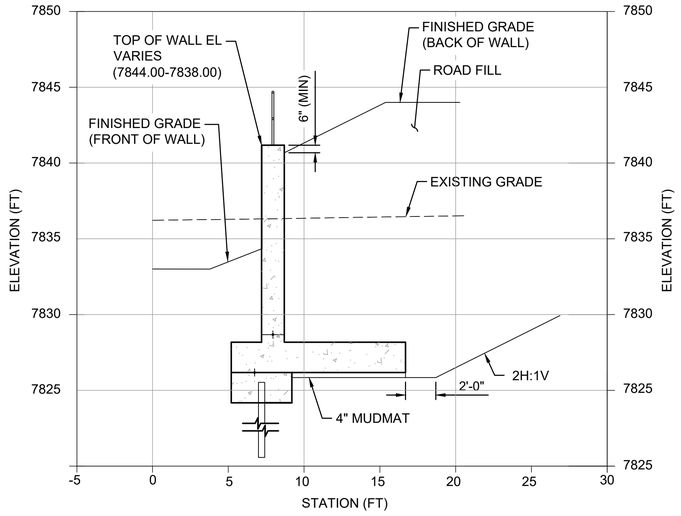
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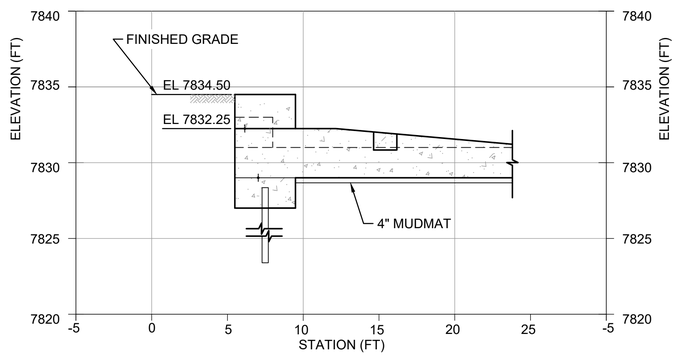
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SCALE IN FEET



G S-01 SECTION 1"=5'

0 5 10 15
SCALE IN FEET



K S-01 SECTION 1"=5'

0 5 10 15
SCALE IN FEET

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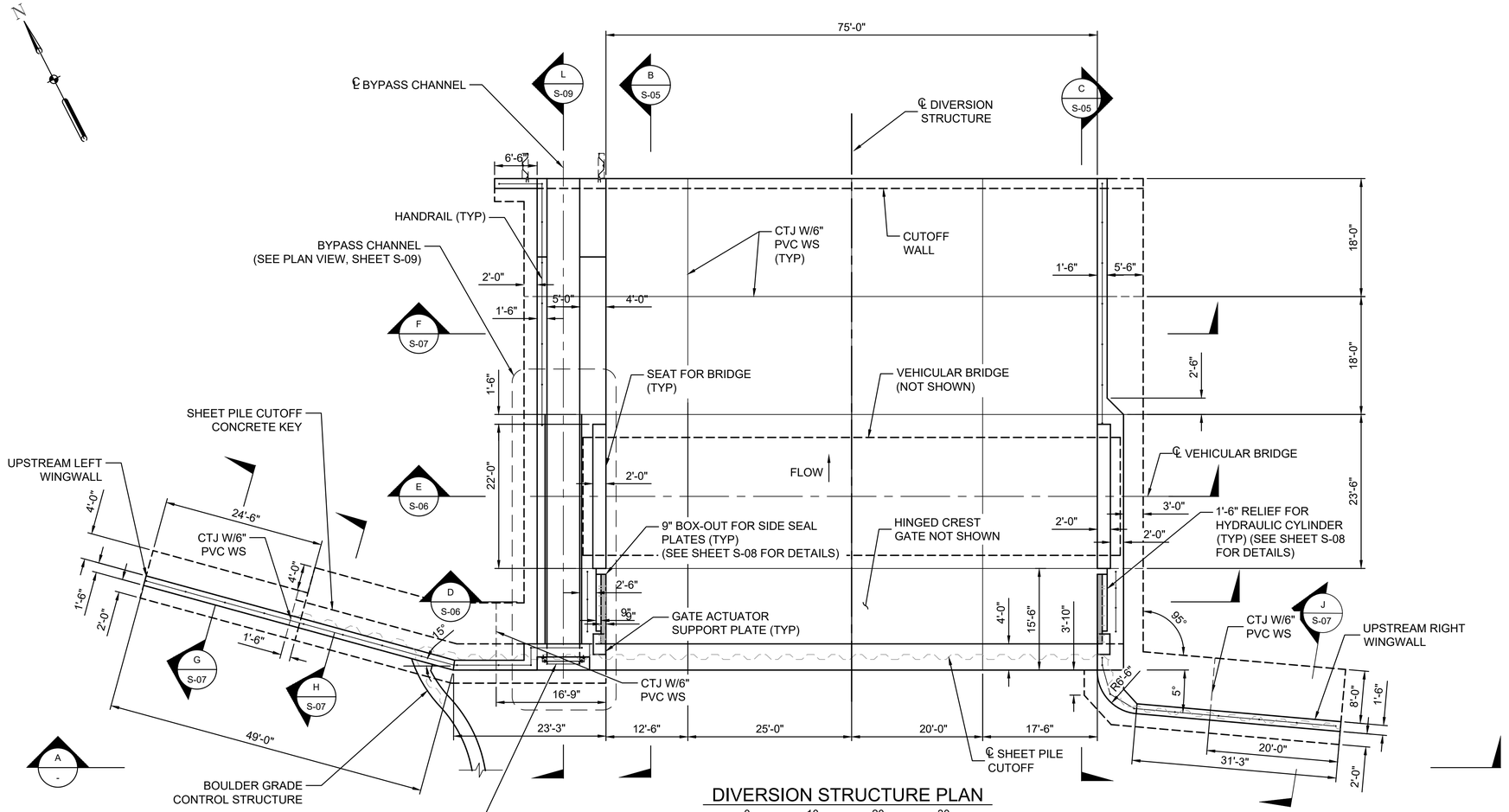
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DIVERSION STRUCTURE CIVIL SECTIONS (2 OF 2)

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S-03

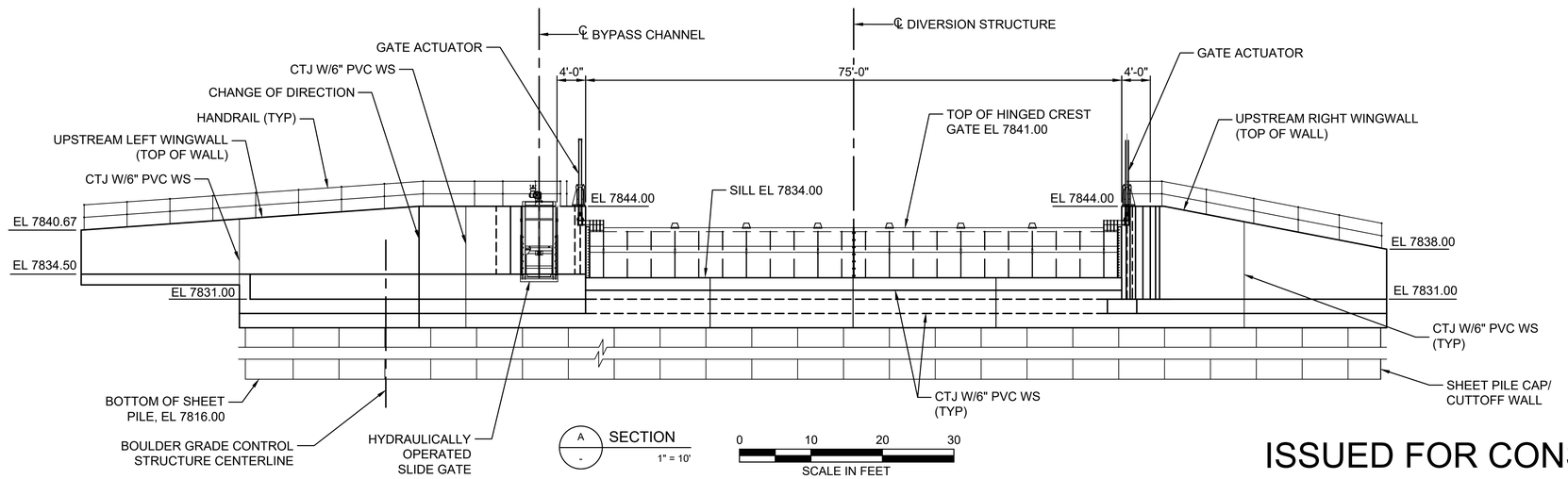
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DIVERSION STRUCTURE PLAN

0 10 20 30

SCALE IN FEET



A -

SECTION

1" = 10'

0 10 20 30

SCALE IN FEET

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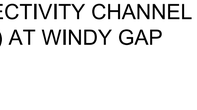
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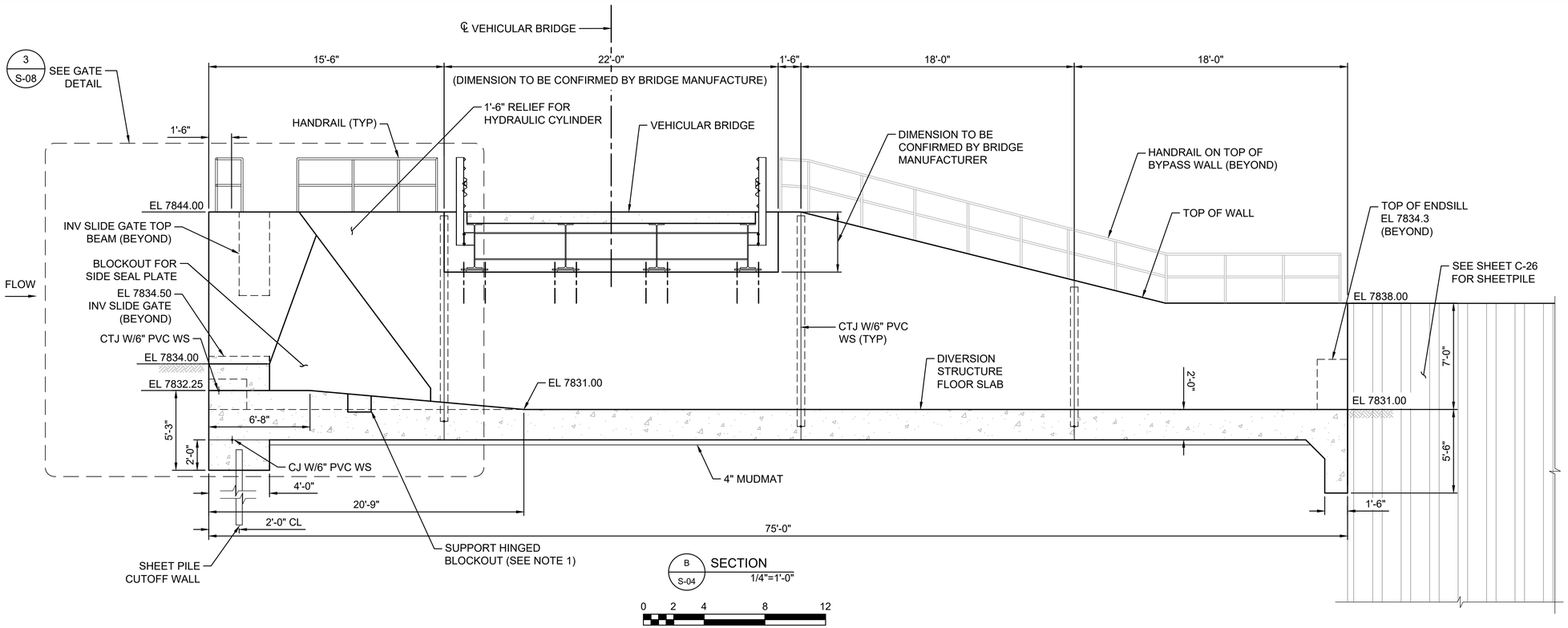
DIVERSION STRUCTURE STRUCTURAL PLAN AND PROFILE

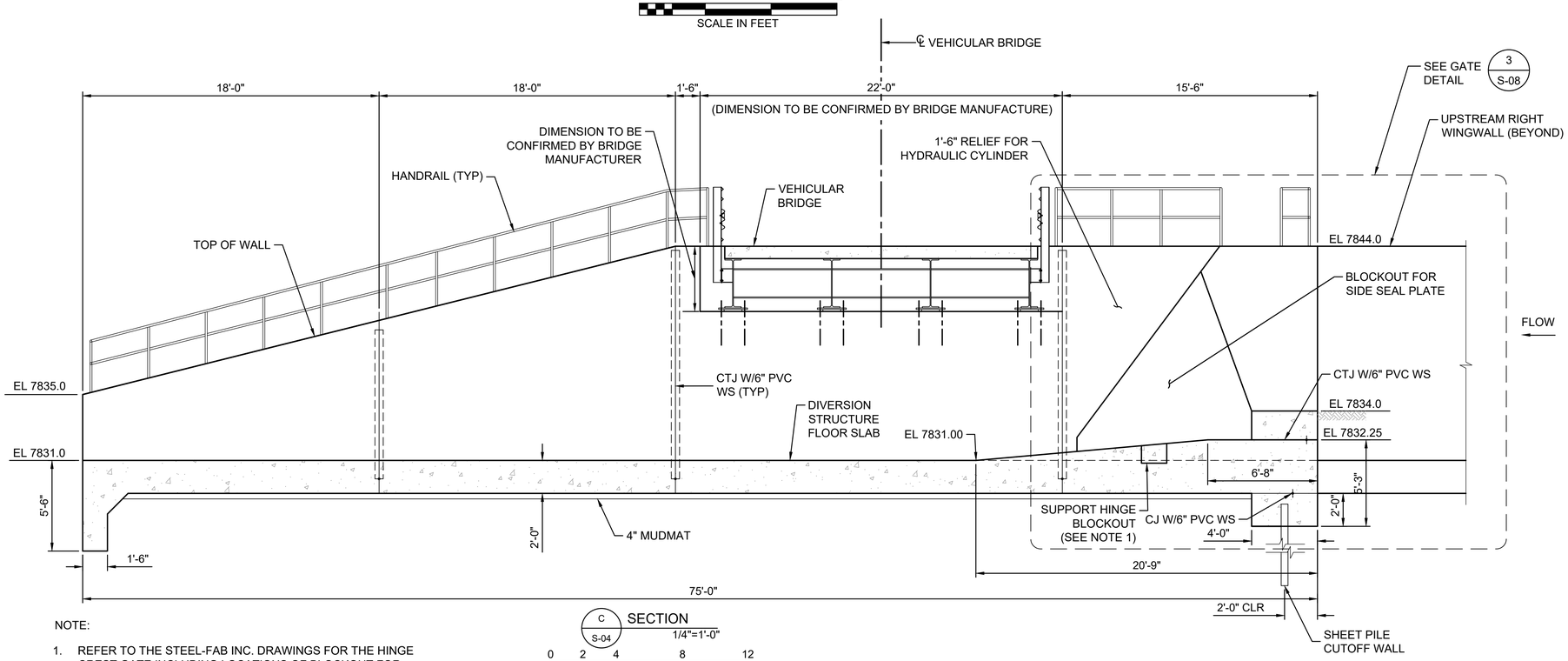
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S-04

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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NOTE:

1. REFER TO THE STEEL-FAB INC. DRAWINGS FOR THE HINGE CREST GATE INCLUDING LOCATIONS OF BLOCKOUT FOR THE HINGE ANCHOR AND SIDE SEAL PLATES.

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PROJECT

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800-369-7246 • www.northernwater.org

CONSULTANT

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804 COLORADO AVE.
Suite 201
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REGISTRATION



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I/R	DATE	DESCRIPTION
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1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

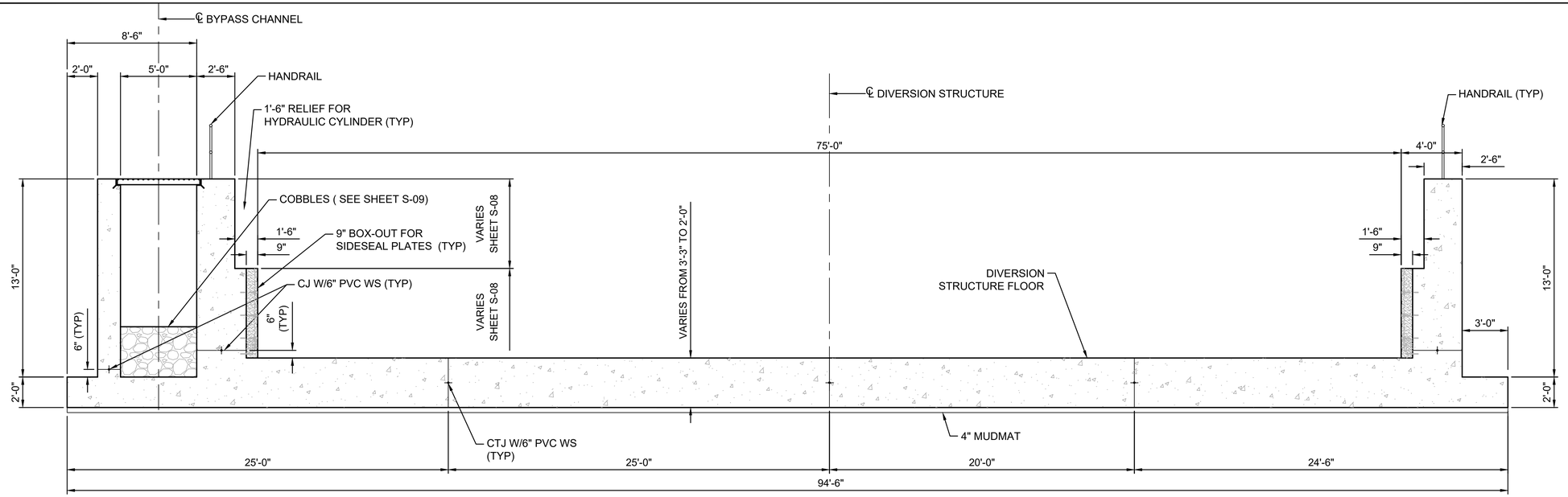
SHEET TITLE

DIVERSION STRUCTURE SECTIONS
SHEET 1 OF 4

SHEET NUMBER

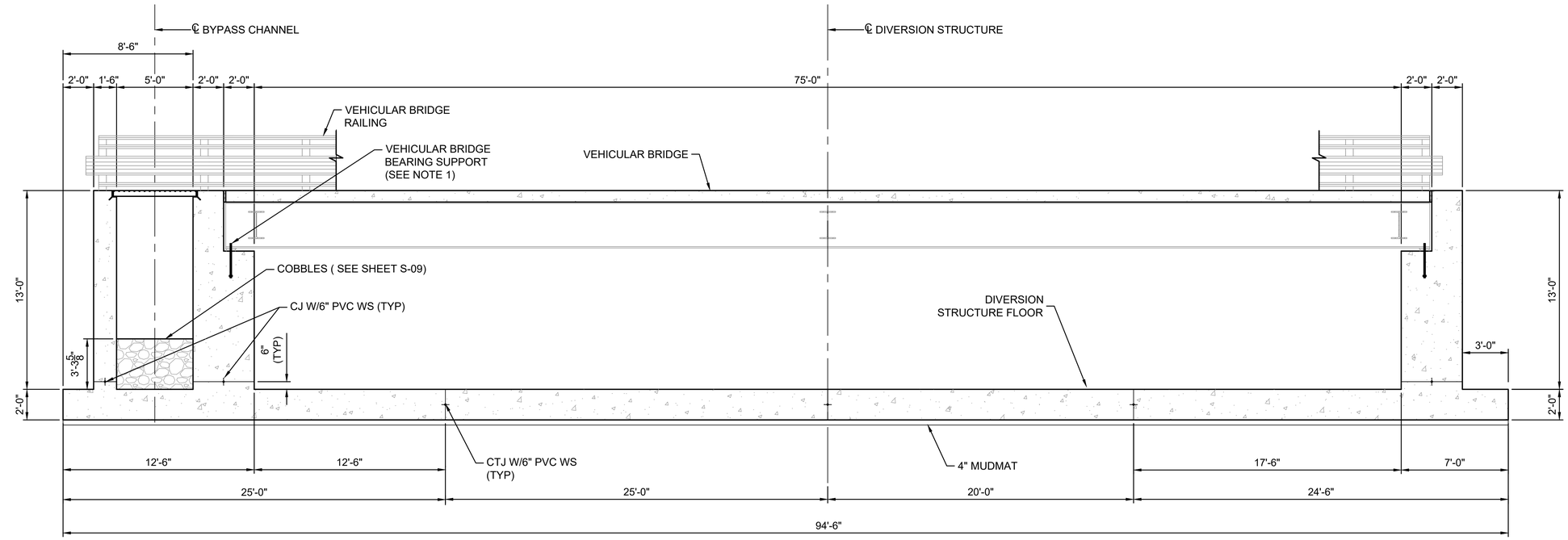
S-05

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"



D S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



E S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET

NOTES:

1. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR PREFABRICATED STEEL BRIDGE, IN ADDITION, ALL DIMENSIONS SHOWN ON THIS DRAWING THAT ARE CONTINGENT ON THE BRIDGE SHALL BE VERIFIED AND ADJUSTED IF NECESSARY.

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SEO CONSTRUCTION NUMBER

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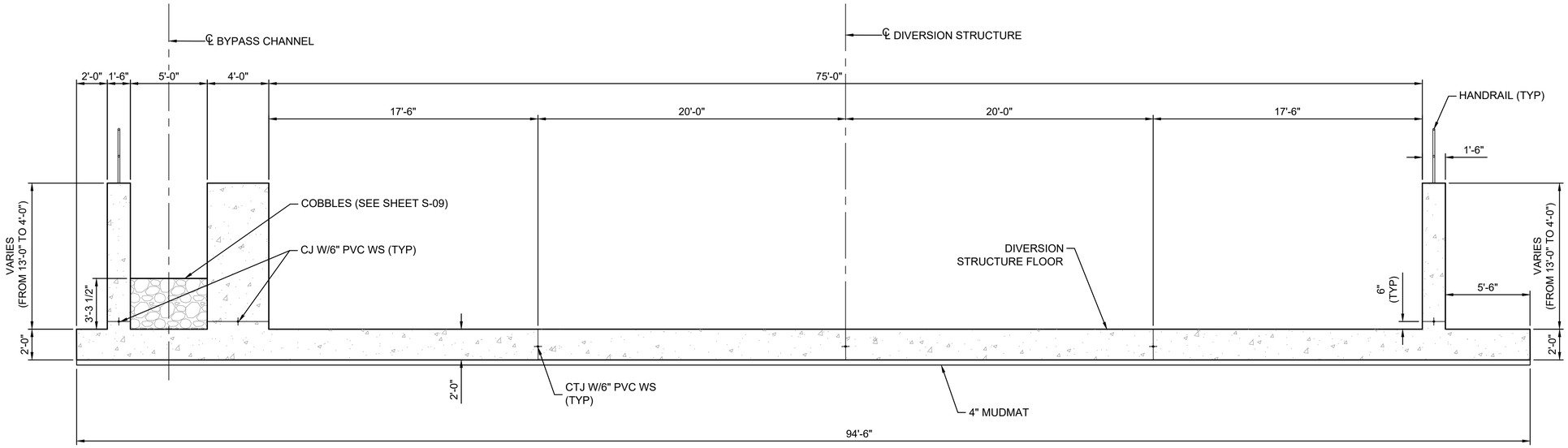
60619047

SHEET TITLE

DIVERSION STRUCTURE SECTIONS
SHEET 2 OF 4

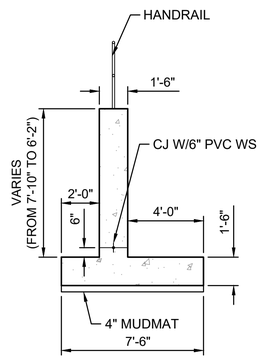
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S-06



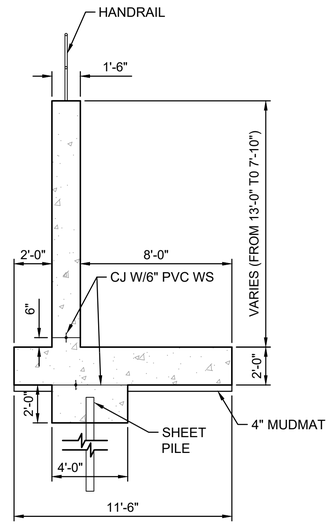
F S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



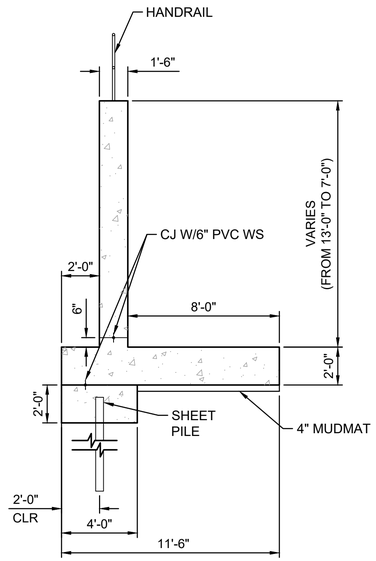
G S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



H S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



J S-04 SECTION
1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

DIVERSION STRUCTURE SECTIONS
SHEET 3 OF 4

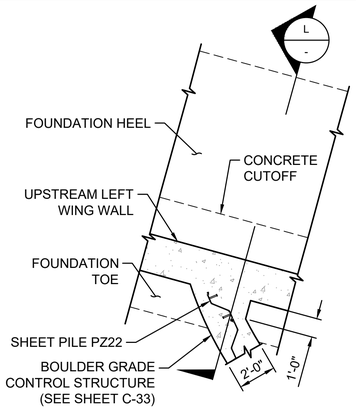
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S-07

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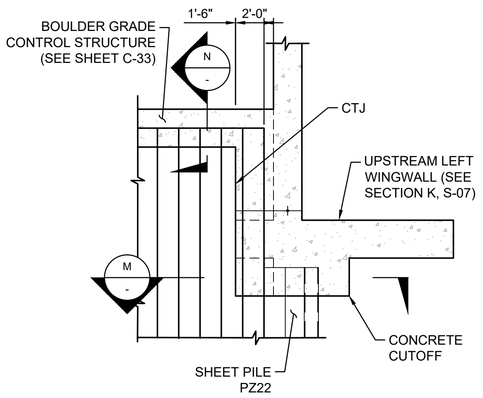
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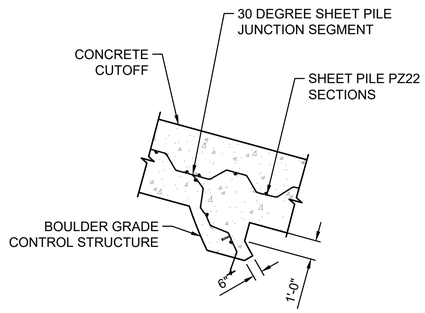
1 S-01 DETAIL 1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



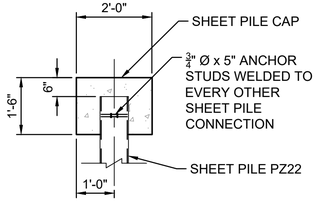
L SECTION 1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



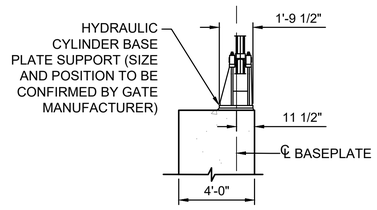
M SECTION 1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



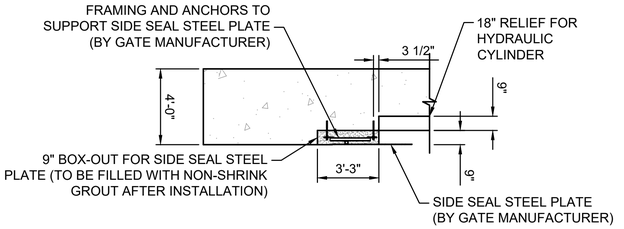
N SECTION 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



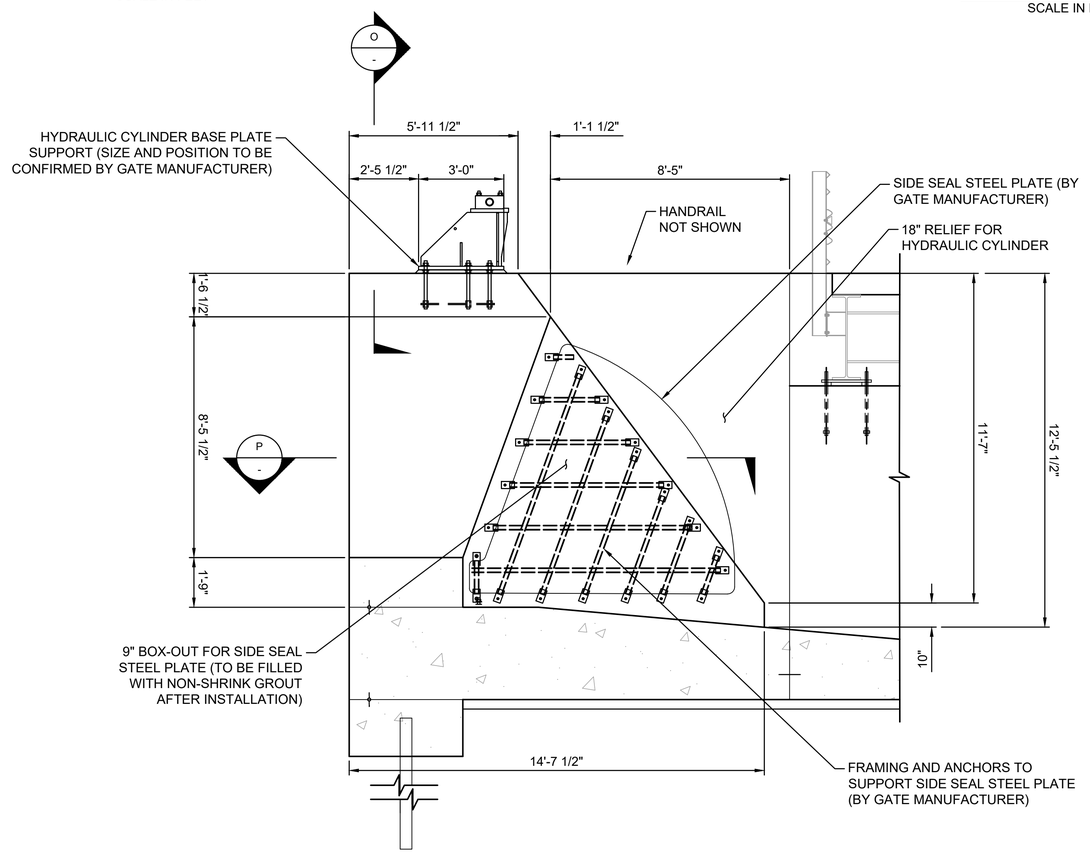
O SECTION 1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



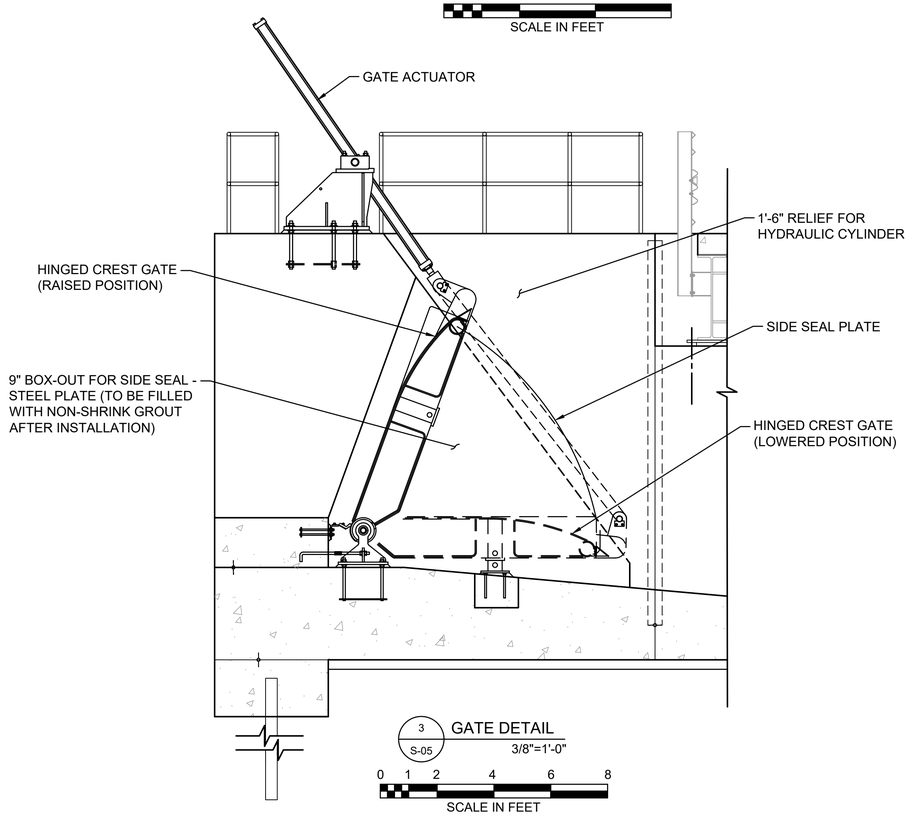
P SECTION 1/4"=1'-0"

0 2 4 8 12
SCALE IN FEET



2 GATE SIDE SEAL PLATE DETAIL 3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET



3 S-05 GATE DETAIL 3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET

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REGISTRATION

GREGORY ALAN OLSEN 37737 REGISTERED PROFESSIONAL ENGINEER 5/31/22

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

DIVERSION STRUCTURE SECTIONS
SHEET 4 OF 4

SHEET NUMBER

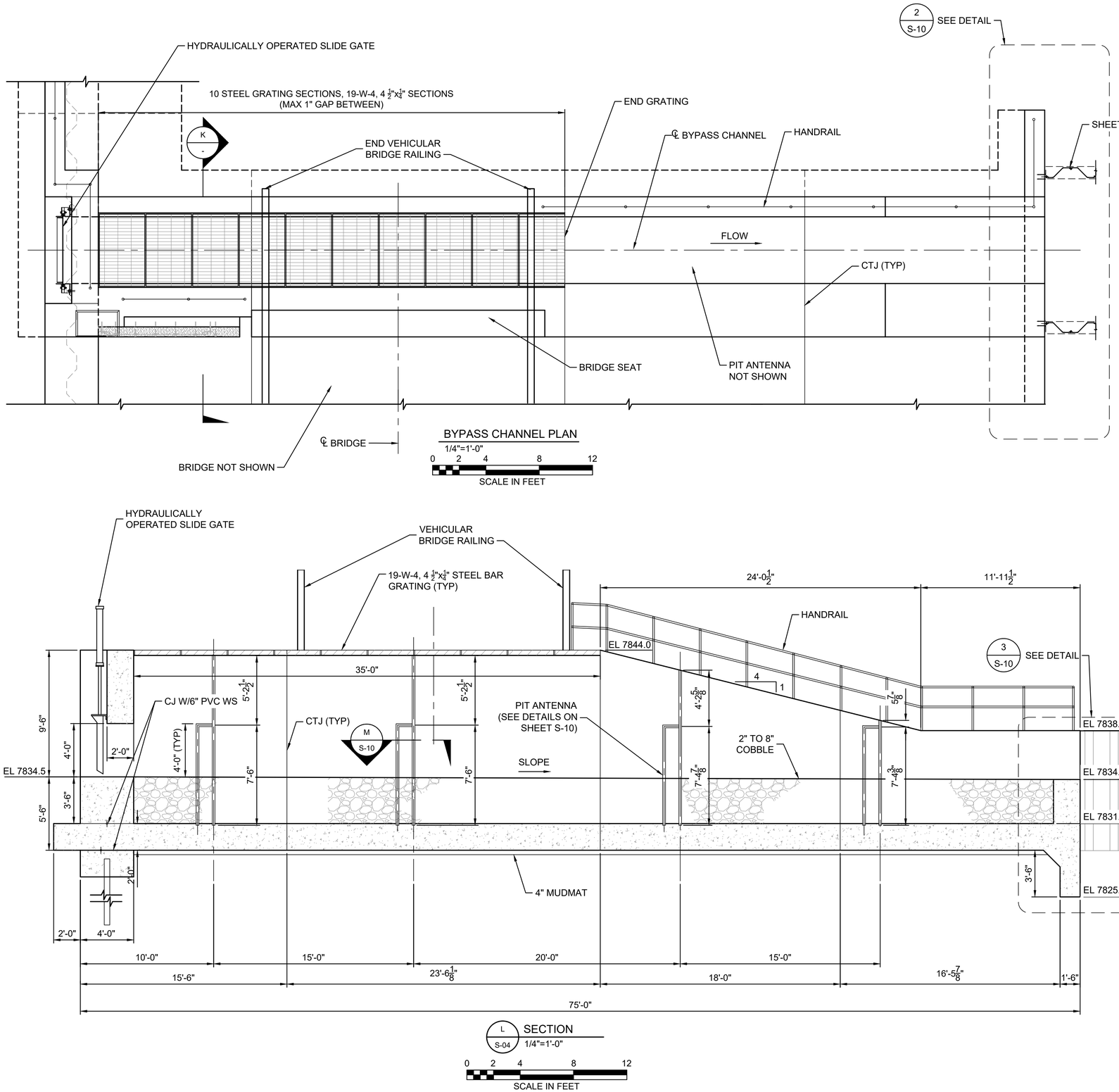
S-08

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PROJECT NUMBER

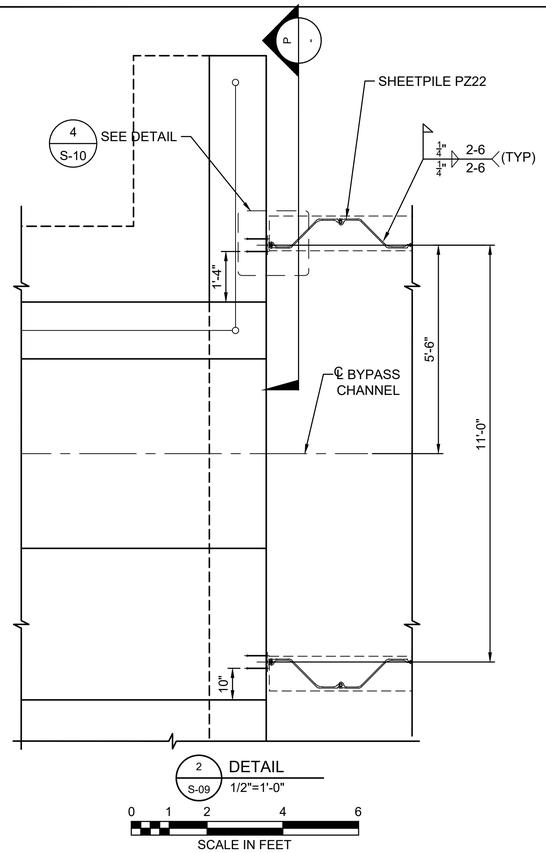
60619047

SHEET TITLE

BYPASS (SHEET 1 OF 2)

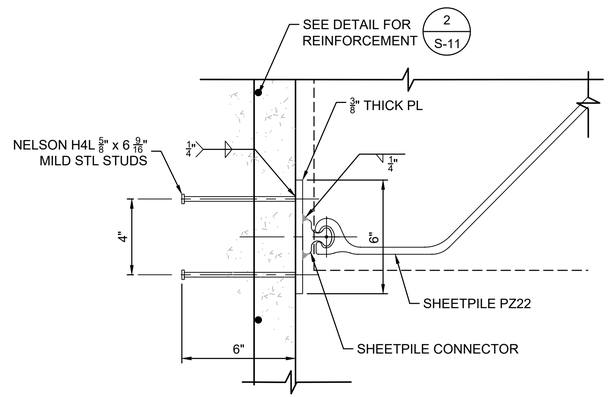
SHEET NUMBER

S-09



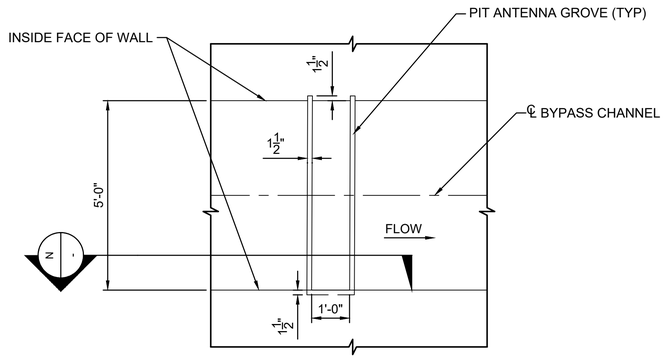
2 S-09 DETAIL
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0 1 2 4 6
SCALE IN FEET



4 S-09 DETAIL
3"=1'-0"

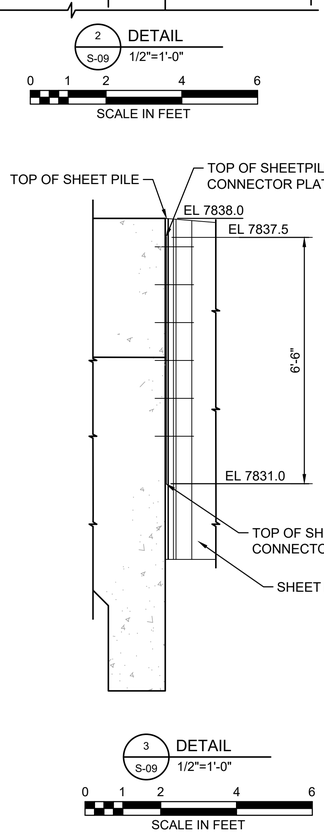
0 .25 .5 .75 1
SCALE IN FEET



TYPICAL PIT ANTENNA PLAN

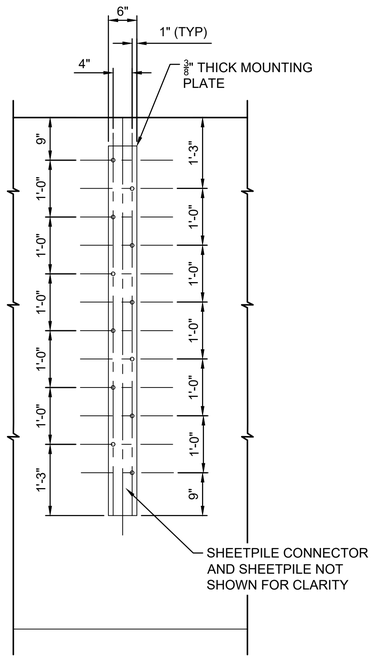
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1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



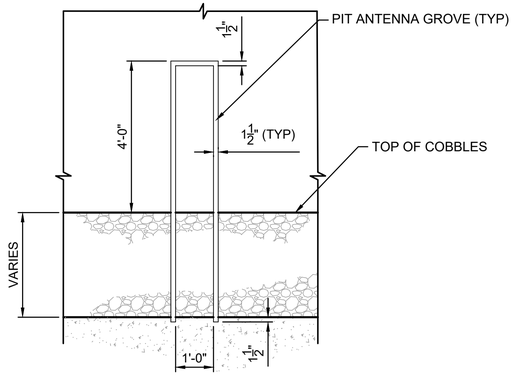
3 S-09 DETAIL
1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



P - SECTION
3/4"=1'-0"

0 .5 1 2 3 4
SCALE IN FEET



N - SECTION
1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET

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37737
PROFESSIONAL ENGINEER
STATE OF COLORADO
5/31/22

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

BYPASS (SHEET 2 OF 2)

SHEET NUMBER

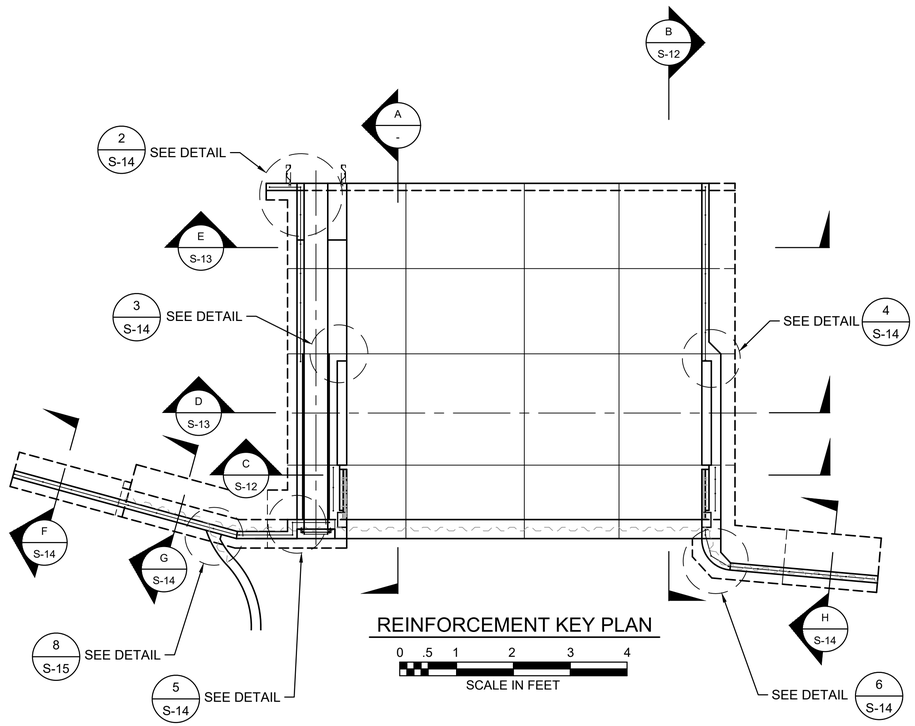
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51 OF 89

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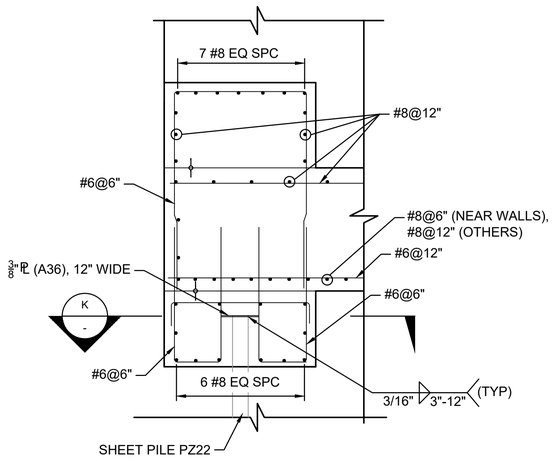
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REINFORCEMENT KEY PLAN

0 .5 1 2 3 4

SCALE IN FEET

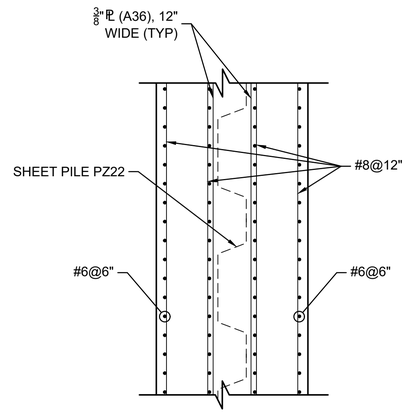


1 DETAIL

1/2"=1'-0"

0 1 2 4 6

SCALE IN FEET

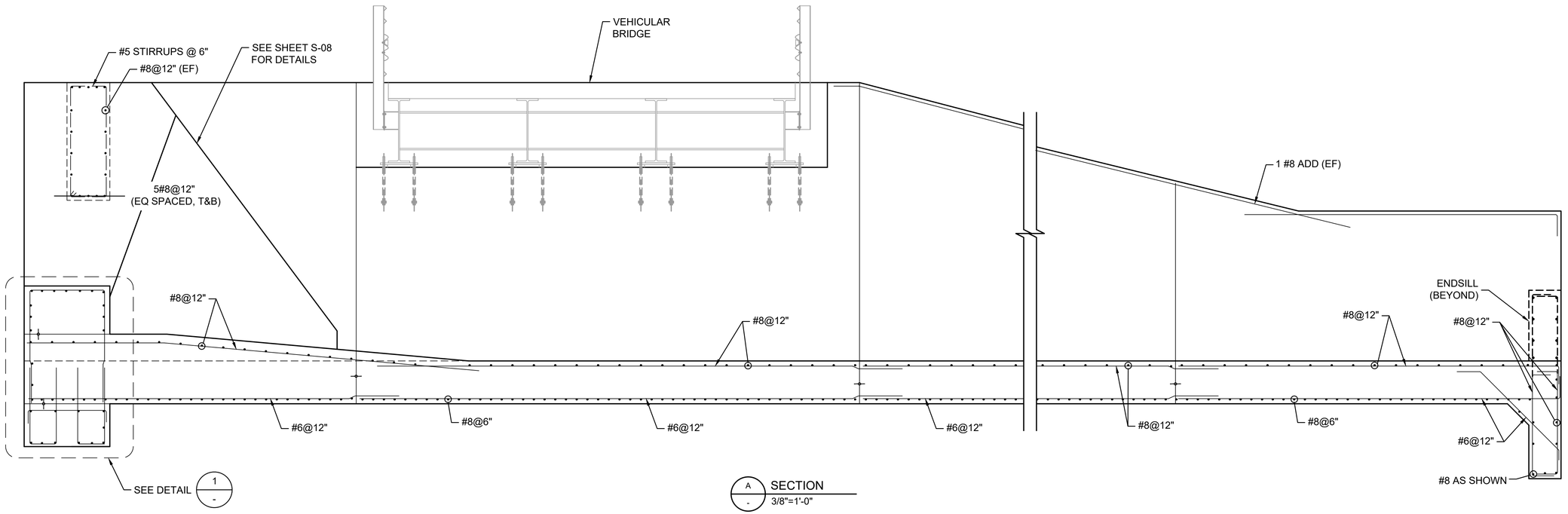


K SECTION

1/2"=1'-0"

0 1 2 4 6

SCALE IN FEET



A SECTION

3/8"=1'-0"

0 1 2 4 6 8

SCALE IN FEET

ISSUED FOR CONSTRUCTION

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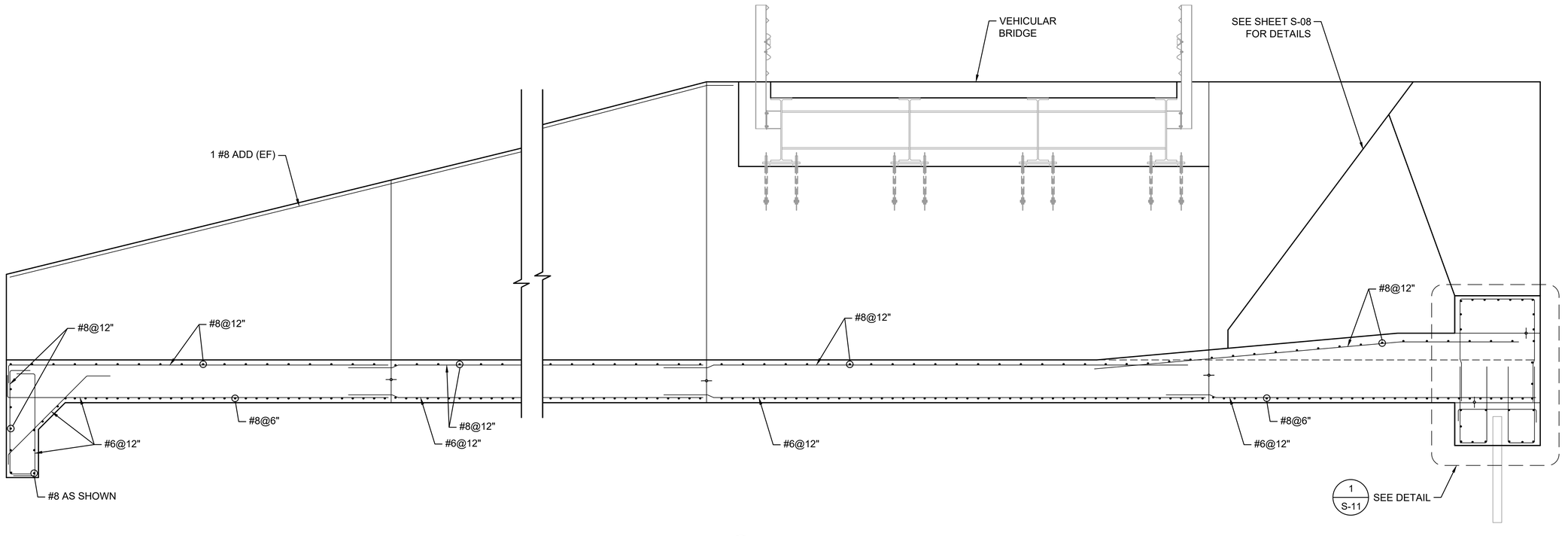
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DIVERSION STRUCTURE REINFORCEMENT SHEET 1 OF 5

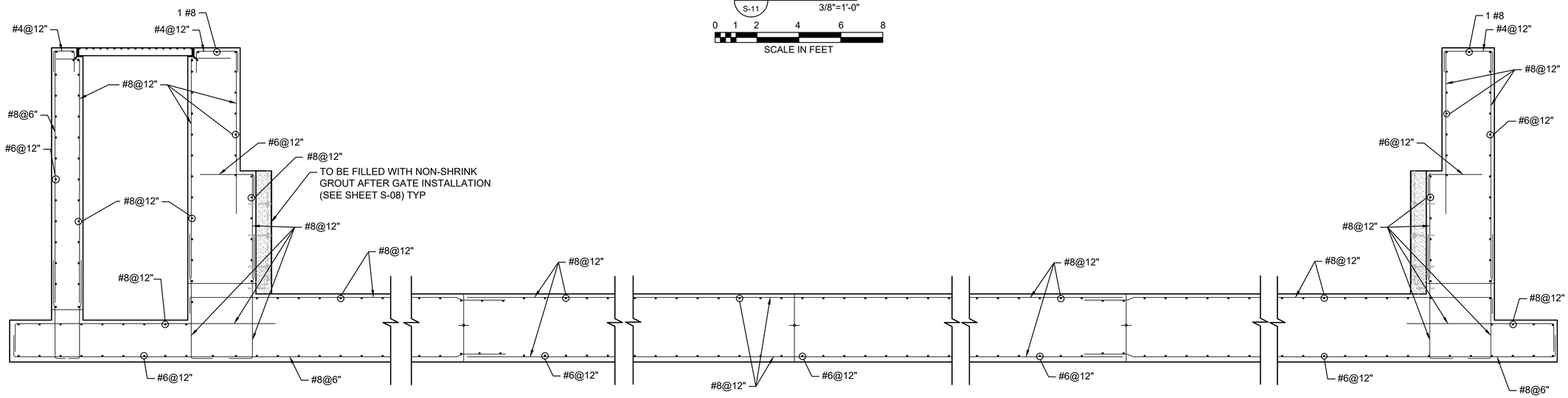
SHEET NUMBER

S-11

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B S-11 SECTION
3/8"=1'-0"
0 1 2 4 6 8
SCALE IN FEET



C S-11 SECTION
3/8"=1'-0"
0 1 2 4 6 8
SCALE IN FEET

ISSUED FOR CONSTRUCTION

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3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
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I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

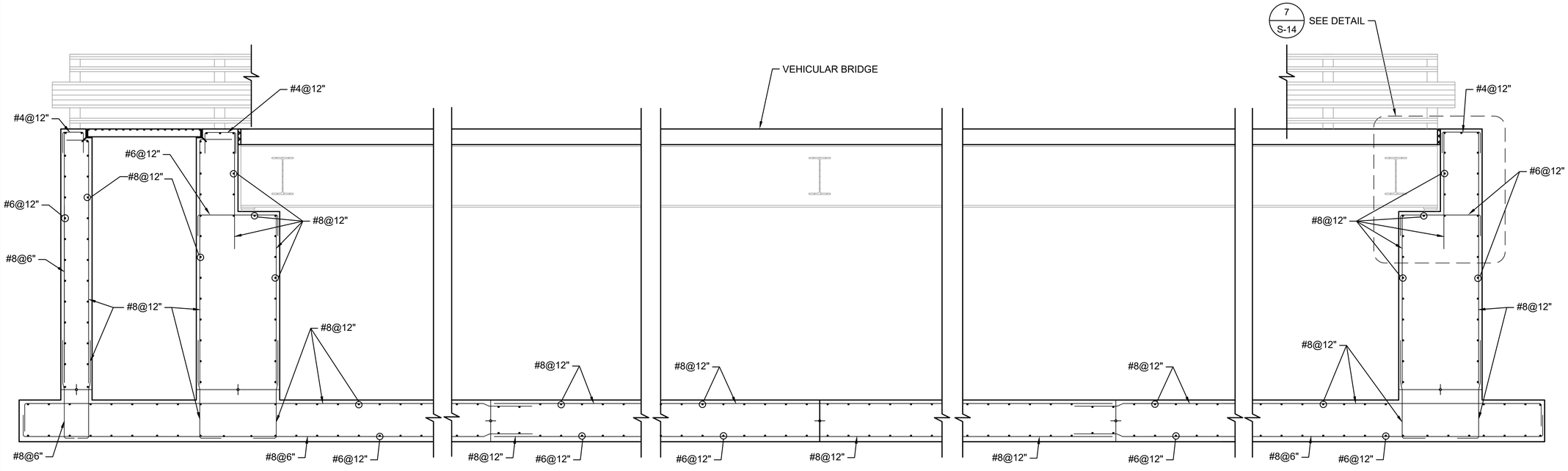
SHEET TITLE

DIVERSION STRUCTURE REINFORCEMENT SHEET 2 OF 5

SHEET NUMBER

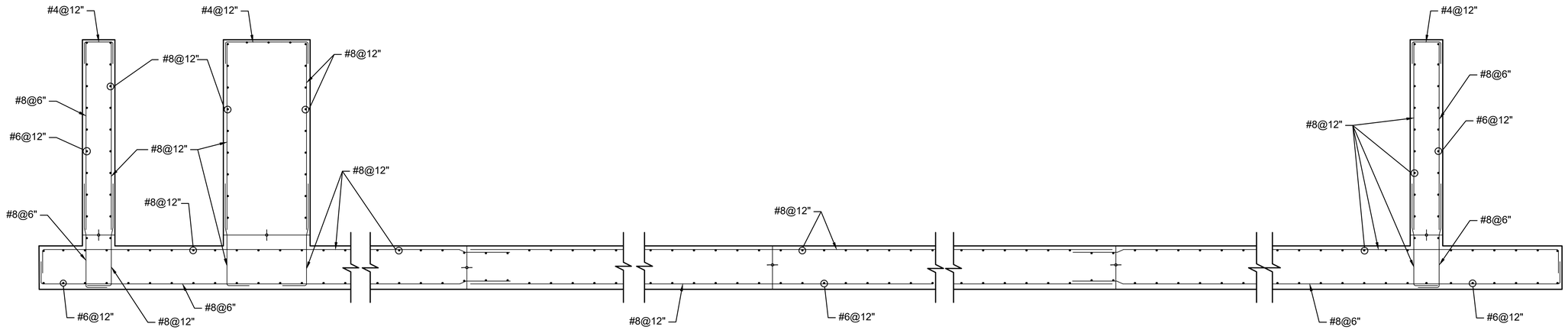
S-12

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
Last saved by: HAMBUCHC(2022-04-29) Last Plotted: 2022-05-04
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D S-11 SECTION
3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET



E S-11 SECTION
3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET

ISSUED FOR CONSTRUCTION

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GREGORY GENE CLINE 37737 PROFESSIONAL ENGINEER 5/31/22

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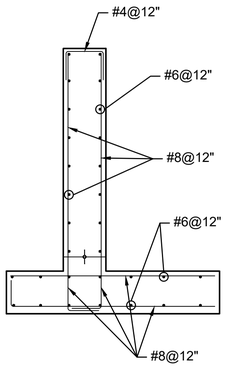
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DIVERSION STRUCTURE REINFORCEMENT SHEET 3 OF 5

SHEET NUMBER

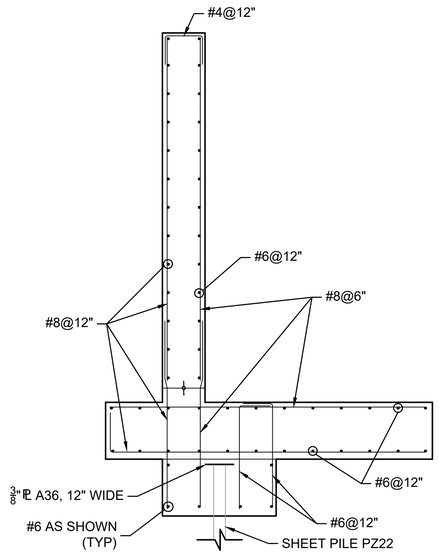
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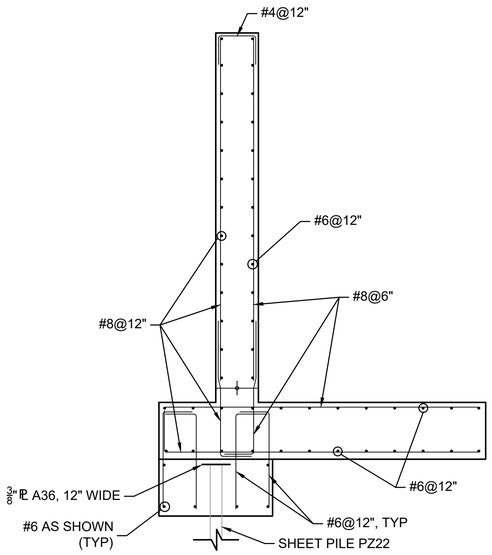
F S-11 SECTION 3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET



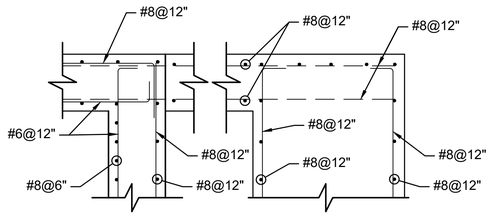
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0 1 2 4 6 8
SCALE IN FEET



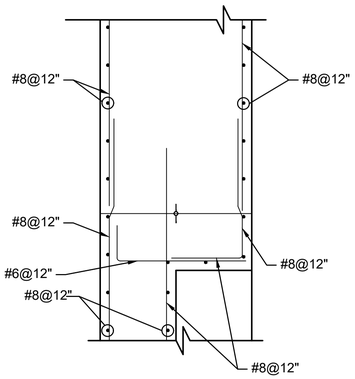
H S-11 SECTION 3/8"=1'-0"

0 1 2 4 6 8
SCALE IN FEET



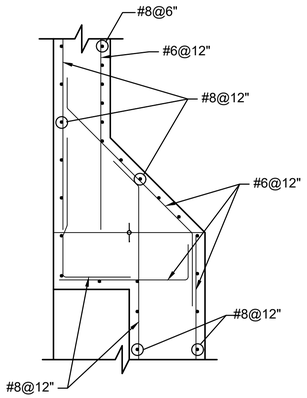
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0 1 2 4 6
SCALE IN FEET



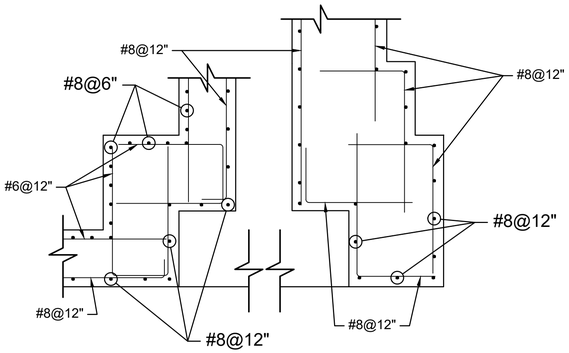
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SCALE IN FEET



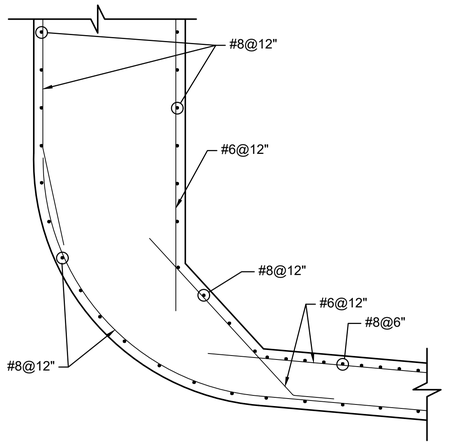
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0 1 2 4 6
SCALE IN FEET



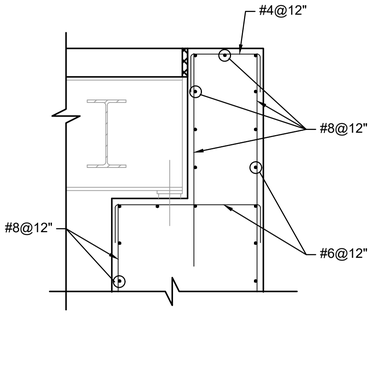
5 S-11 DETAIL 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



6 S-11 DETAIL 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



7 S-13 DETAIL 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET

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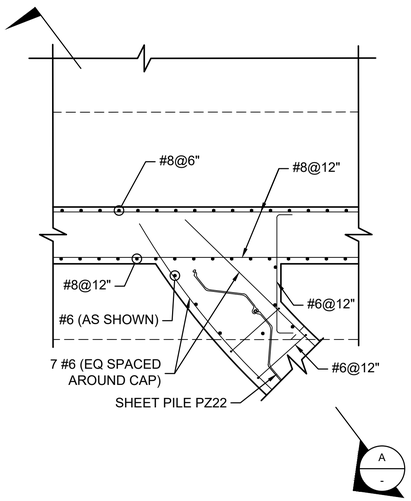
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DIVERSION STRUCTURE REINFORCEMENT SHEET 4 OF 5

SHEET NUMBER

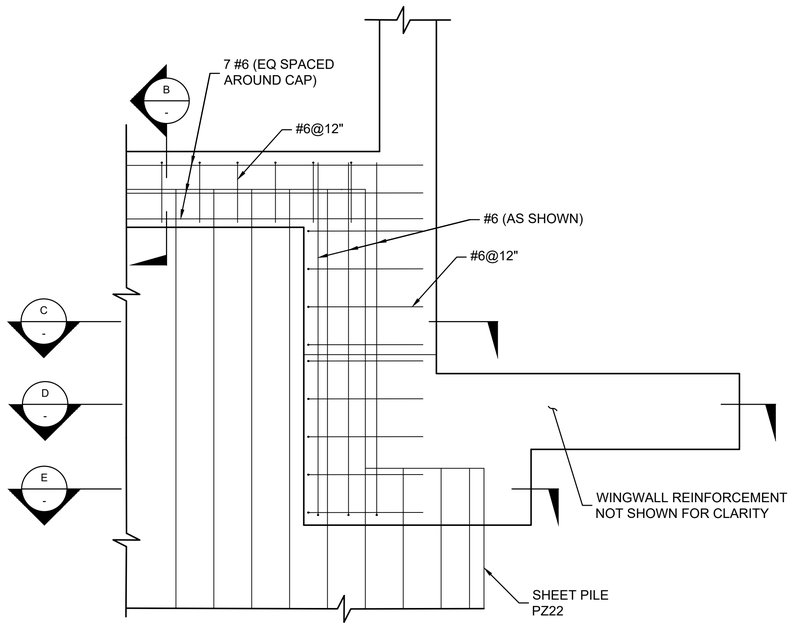
S-14

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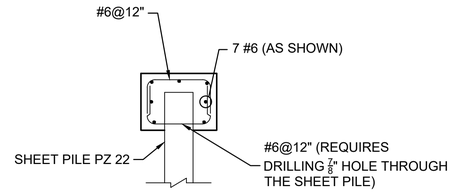
8 / S-11 DETAIL 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



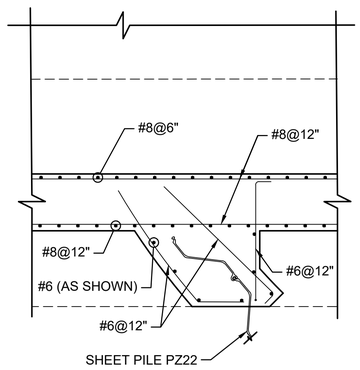
A / - SECTION 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



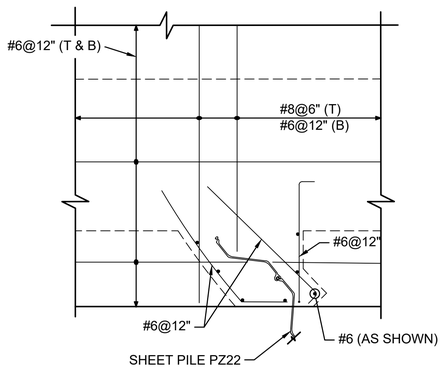
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SCALE IN FEET



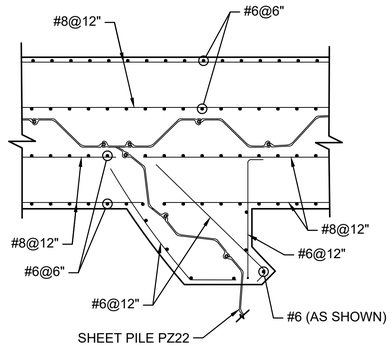
C / - SECTION 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



D / - SECTION 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET



E / - SECTION 1/2"=1'-0"

0 1 2 4 6
SCALE IN FEET

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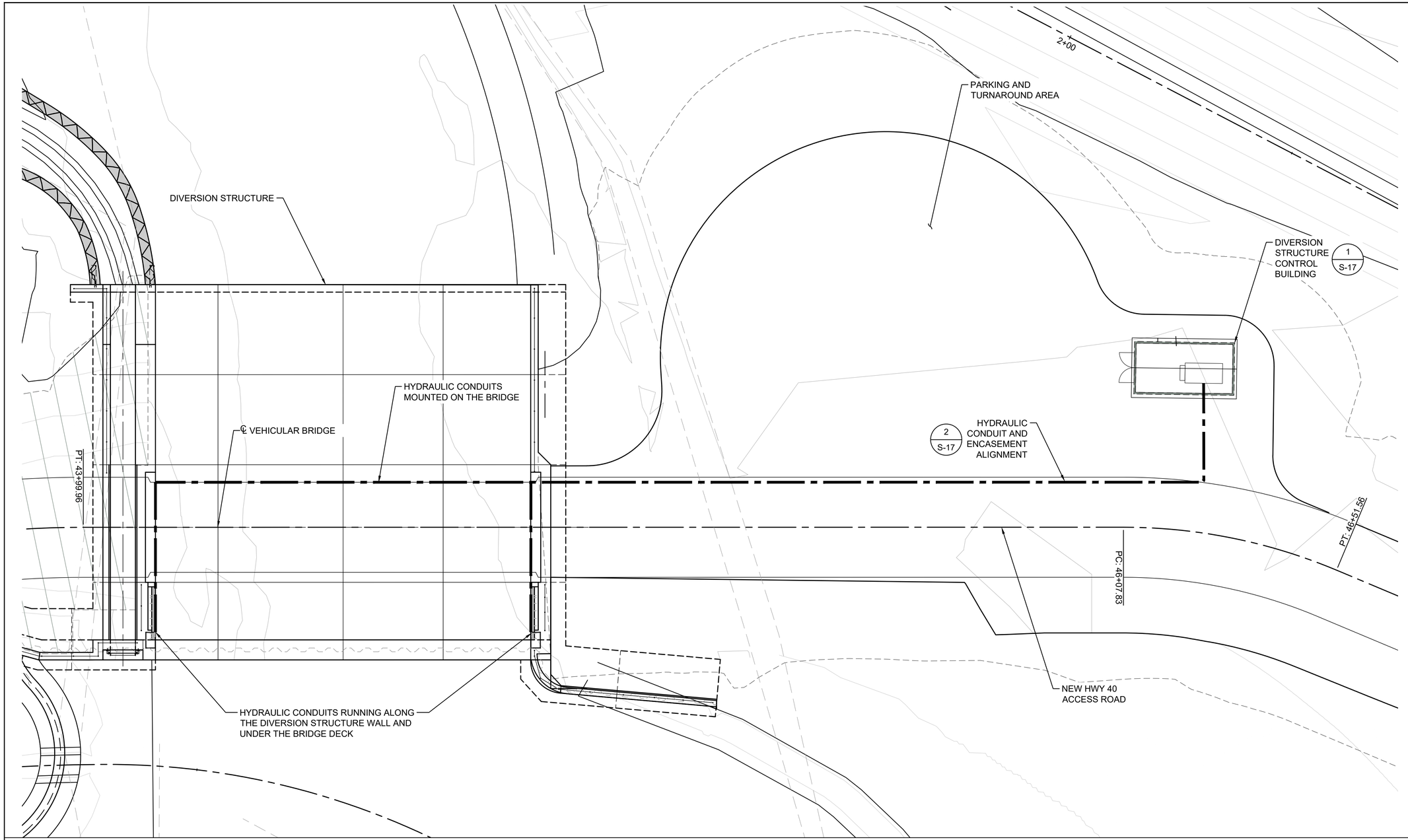
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DIVERSION STRUCTURE REINFORCEMENT SHEET 5 OF 5

SHEET NUMBER

S-15

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"



HYDRAULIC CONDUIT AND ENCASEMENT

10 0 10 20
SCALE IN FEET

CONTOUR INTERVAL: MINOR 2 FOOT
MAJOR 10 FOOT

N

ISSUED FOR CONSTRUCTION

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PROJECT NUMBER

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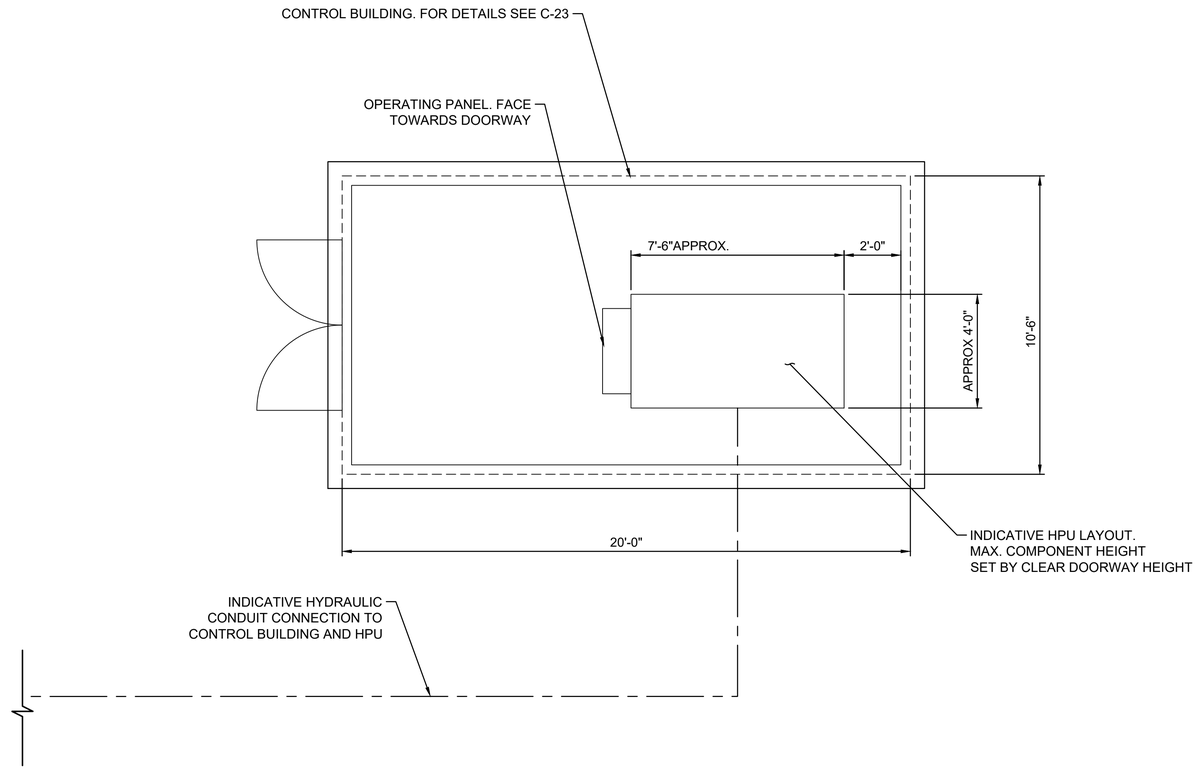
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HYDRAULIC CONDUIT ENCASEMENT AND CONTROL BUILDING

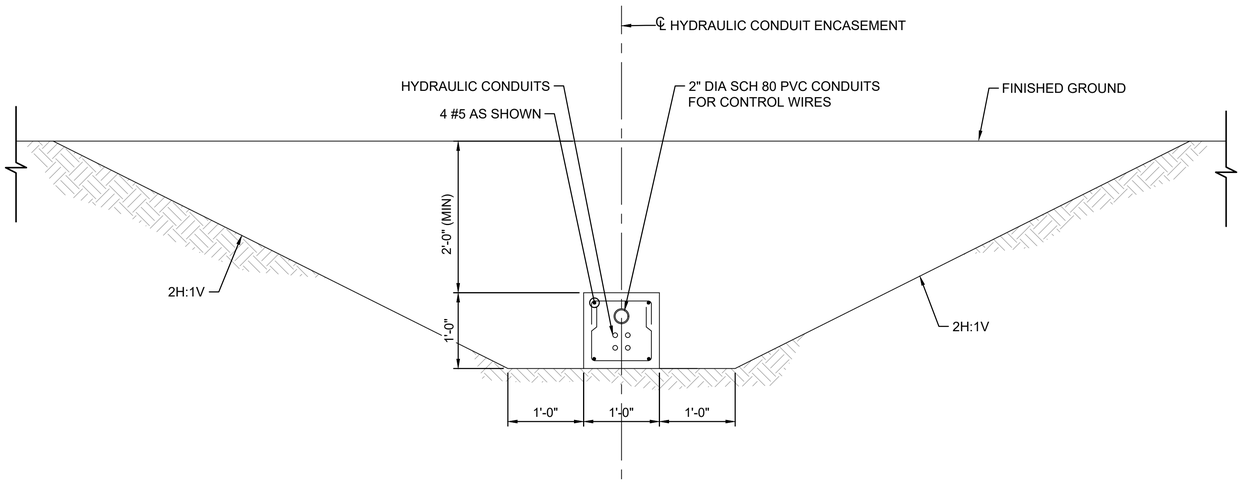
SHEET NUMBER

S-16

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"



1 S-16 INDICATIVE CONTROL BUILDING FLOOR
NOT TO SCALE



2 S-16 TYPICAL HYDRAULIC CONDUIT ENCASEMENT
NOT TO SCALE

NOTES:

1. CONDUITS/WIRES FOR ELECTRICAL SERVICES AND INSTRUMENTATION (ADDITIONAL TO THOSE REQUIRED FOR THE HINGED CREST GATE) TO BE LAID IN THE SAME TRENCH AS THE HPU HYDRAULIC CONDUITS

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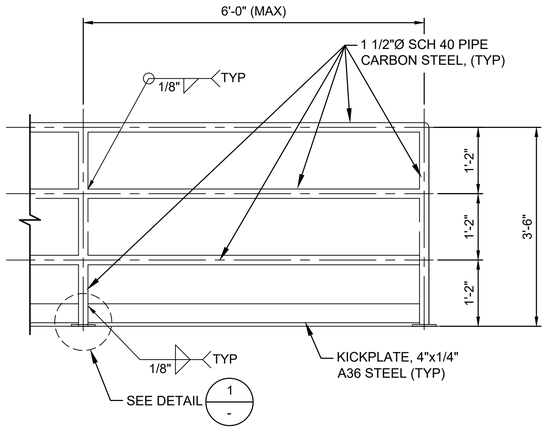
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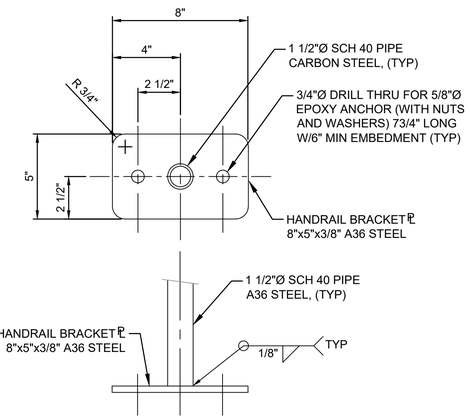
GATE CONTROL AND CONDUIT DETAILS

SHEET NUMBER

S-17

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TYPICAL HANDRAIL DETAIL

NOT TO SCALE

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PROJECT NUMBER

60619047

SHEET TITLE

MISCELLANEOUS DETAILS

SHEET NUMBER

S-18

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

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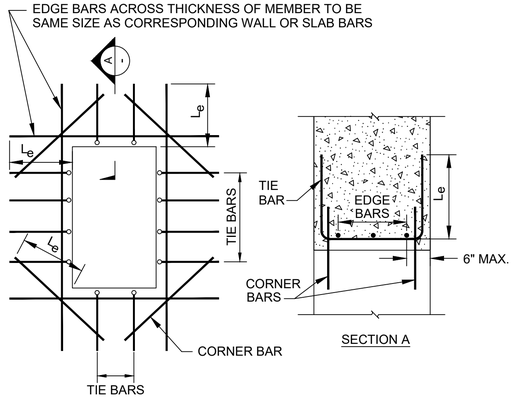
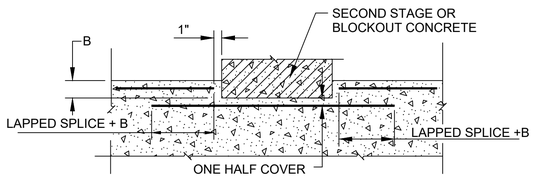


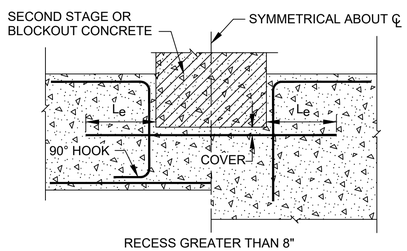
TABLE FOR REINFORCEMENT AROUND OPENINGS			
MEMBER THICKNESS	TIE BAR	EDGE BARS	CORNER BARS
LESS THAN 10"	NONE	1-CTR.	1-#4 CTR.
10" THRU 1'-6"	NONE	2-(1-EF)	2-#4 (1EF)
1'-7" THRU 3'-0"	#4 @1'-0"	3-EQ. SPC.	2-#6 (1EF)
OVER 3'-0"	#6 @1'-0"	SPC.@1'-0"	2-#8 (1EF)

1. OMIT EDGE BARS AND TIE BARS ALONG SIDES OF OPENINGS WHERE DIMENSION IS LESS THAN 18".
2. OMIT CORNER BARS AT SIDES OF OPENINGS ADJACENT TO FLOORS, WALLS, OR BEAMS.
3. CORNER BARS REQUIRED IF EITHER DIMENSION OF OPENING IS GREATER THAN 18".
4. USE CORNER BARS IN FACE OF RECESSES DEEPER THAN 4" IF EITHER DIMENSION OF RECESS IS GREATER THAN 18".

ADDITIONAL REINFORCEMENT AROUND OPENINGS



RECESS 3" TO 8" DEEP

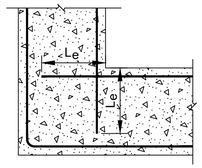


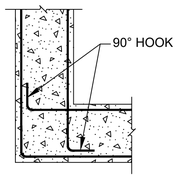
RECESS GREATER THAN 8"

TYPICAL BLOCKOUT RECESS OR OFFSET DETAILS

GENERAL NOTE

1. UNLESS OTHERWISE SHOWN ON THE REINFORCEMENT DESIGN DRAWINGS, THE DETAILS AND NOTES SHOWN ON THIS DRAWING ARE TYPICAL FOR ALL REINFORCEMENT DRAWINGS.





TYPICAL CORNER DETAILS

ABBREVIATIONS

BF = BOTTOM FACE
TF = TOP FACE
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
IF = INSIDE FACE
OF = OUTSIDE FACE
CJ = CONSTRUCTION JOINT
OCJ = OPTIONAL CONSTRUCTION JOINT
CTJ = CONTROL JOINT

CRJ = CONTRACTION JOINT
EJ = EXPANSION JOINT
BR = BOTTOM ROW
TR = TOP ROW
NR = NEAR ROW
FR = FAR ROW
ER = EACH ROW
IR = INSIDE ROW
IJ = ISOLATION JOINT
OR = OUTSIDE ROW
MR = MIDDLE ROW

BL = BOTTOM LAYER
TL = TOP LAYER
ML = MIDDLE LAYER
NS = NEAR SIDE
FS = FAR SIDE
ES = EACH SIDE
EW = EACH WAY
EC = EACH CORNER
L_e = EMBEDMENT LENGTH
d_b = NOMINAL DIAMETER OF REINFORCING BAR

SPC. = SPACE OR SPACES
EQ. SPC. = EQUALLY SPACED, EQUAL SPACES
D = NORMAL DIAMETER OF REINFORCING BAR
UV = UNIFORMLY VARYING LENGTHS OF BARS BETWEEN LENGTHS SHOWN
CL. = CLEAR
CTR. = CENTER OR CENTERS

SYMBOLS

○——— AN OPEN CIRCLE AT THE END OF A BAR INDICATES A BEND WITH THE BAR TURNED AWAY FROM THE OBSERVER.

●——— A CLOSED CIRCLE AT THE END OF A BAR INDICATES A BEND WITH THE BAR TURNED TOWARDS THE OBSERVER.

SPLICES SHOWN THUS ═╲═ INDICATE A LAPPED SPLICE, NOT A BEND IN THE BAR.

DIMENSIONS

DIMENSIONS ARE TO THE CENTERLINE OF THE BARS UNLESS OTHERWISE SHOWN. CLEAR COVER DIMENSIONS ARE MARKED "CL".

COVER

PLACE THE REINFORCEMENT SO THAT THE CLEAR DISTANCE BETWEEN FACE OF CONCRETE AND NEAREST REINFORCEMENT IS 1 1/2" FOR #5 BARS AND SMALLER, 2" FOR #6 BARS AND LARGER. PROVIDE 3" CLEAR DISTANCE FROM FACE OF CONCRETE FOR ALL BARS WHEN THE CONCRETE IS PLACED AGAINST EARTH OR ROCK. CLEAR DISTANCE IS THE DESIGN DIMENSION LINE. REINFORCEMENT PARALLELING CONSTRUCTION JOINTS SHALL HAVE A MINIMUM OF 2" CLEAR COVER.

BENT BARS:

UNLESS OTHER RADIUS BENDS ARE INDICATED ON THE DRAWINGS, ALL REINFORCEMENT REQUIRING BENDING SHALL BE BENT AROUND A PIN HAVING THE FOLLOWING DIAMETER:

TABLE 1
PIN DIAMETER IN INCHES

BAR NO.	3	4	5	6	7	8	9	10	11
STANDARD BENDS	2 1/4	3	3 3/4	4 1/2	5 1/4	6	9 1/2	10 3/4	12
STIRRUP AND TIE BENDS	1 1/2	2	2 1/2	4 1/2	5 1/4	6	-	-	-

REINFORCEMENT DOWELS:

DOWELS INDICATED ON THE DRAWING, SUCH AS #8 (d), SHALL BE EMBEDDED A LENGTH EQUAL TO L AND SHALL HAVE A PROJECTION EQUAL TO THAT REQUIRED FOR TOP SPLICING TO A BAR OF THE SAME DIAMETER.

PLAIN DOWELS:

PLAIN DOWELS ACROSS CONTRACTION JOINTS SHALL BE SMOOTH BARS UNIFORMLY COATED WITH A FILM OF OIL BEFORE CONCRETE PLACEMENT. VISCOSITY OF THE OIL SHALL HAVE A SAE RATING OF NOT LESS THAN 250.

ACCESSORIES:

BAR SUPPORTS, SPACERS, AND OTHER ACCESSORIES ARE NOT SHOWN ON THE DRAWINGS. THE RECOMMENDATIONS OF THE VACANT ACI DETAILING

REFERENCE CODE:

UNLESS OTHERWISE SHOWN FOLLOW THE RECOMMENDATIONS ESTABLISHED BY THE AMERICAN CONCRETE INSTITUTE'S "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, ACI 315".

NOTES TO DETAILERS:

SPLICE LENGTHS SHOWN IN THE TABLES ON THIS DRAWING ARE FOR CLASS B SPLICES IN ACCORDANCE WITH ACI 318-99. SPLICES OR DEVELOPMENT LENGTHS OTHER THAN THOSE SHOWN IN THE TABLES MUST BE DETAILED ON THE REINFORCEMENT DESIGN DRAWINGS.

SPLICES:

THE MINIMUM LENGTH OF LAP FOR SPLICING PARALLEL BARS SHALL BE GIVEN IN THE APPLICABLE TABLE (TABLE 2). SPLICES SHALL BE STAGGERED TO GIVE 12 INCHES CLEAR BETWEEN ENDS OF ADJACENT SPLICES. BARS SPLICED BY NONCONTACT LAP SPLICES SHALL NOT BE SPACED TRANSVERSELY FARTHER APART THAN ONE-FIFTH THE REQUIRED LAP SPLICE LENGTH, NOR 6 IN. WHEN REINFORCING BARS OF DIFFERENT SIZE ARE TO BE SPLICED, THE LENGTHS OF LAP SHALL BE GOVERNED BY THE SMALLER DIAMETER BAR. SPLICES ARE TO BE MADE SO THAT THE REQUIRED CLEAR DISTANCES TO FACE OF CONCRETE WILL BE MAINTAINED.

PLACING:

REINFORCEMENT AT SMALL OPENINGS (MAX. 1'-5") IN WALLS AND SLABS MAY BE SPREAD APART NOT MORE THAN 1.5 TIMES THE BAR SPACING. REINFORCEMENT MAY BE ADJUSTED LATERALLY TO MAINTAIN A CLEAR DISTANCE OF AT LEAST 1" BETWEEN THE REINFORCEMENT AND KEYS, WATERSTOPS, ANCHOR BOLTS, FORM TIES, CONDUITS AND OTHER EMBEDDED MATERIALS. IN HEAVILY REINFORCED AREAS, RELOCATION OF THE EMBEDDED MATERIAL MUST BE CONSIDERED. WHEN BARS ARE BENT DUE TO OFFSETS LESS THAN 3" DEEP, THE SLOPE OF THE INCLINED PORTION MUST NOT EXCEED 6 TO 1. REINFORCEMENT PARALLEL TO ANCHOR BOLTS OR OTHER EMBEDDED MATERIAL SHALL BE PLACED TO MAINTAIN A CLEAR DISTANCE OF AT LEAST 1.33 TIMES THE MAXIMUM SIZE AGGREGATES.

SPACING:

THE FIRST AND LAST BARS IN WALLS AND SLABS, STIRRUPS IN BEAMS, AND TIES IN COLUMNS ARE TO START AND END AT A MAXIMUM OF ONE HALF OF THE ADJACENT BAR SPACING. A MINIMUM OF 2.5d CLEAR FROM THE EDGE IS REQUIRED FOR #9, #10, AND #11 BARS IF SPLICE LENGTHS OR REDUCED DEVELOPMENT LENGTHS GIVEN IN TABLE 2 ARE TO BE USED.

STANDARD HOOKS:

HOOKS SHALL HAVE 180° BENDS AND EXTENSIONS OF 4-BAR DIAMETERS BUT NOT LESS THAN 2 1/2" PARALLEL TO THE MAIN LEG OF THE BAR, OR 90° BENDS AND EXTENSIONS OF AT LEAST 12-BAR DIAMETERS. HOOKS FOR STIRRUP AND TIE ANCHORAGE ONLY SHALL HAVE EITHER A 90° OR 135° BEND PLUS AN EXTENSION OF AT LEAST 6-BAR DIAMETERS BUT NOT LESS THAN 2 1/2" AT THE FREE END OF THE BAR. RADIUS OF BEND TO BE AS SPECIFIED IN THE TABLE OF PIN DIAMETERS.

f'_c=4,500 psi — TABLE 2 — f_y=60,000 psi

BAR SIZE #	MINIMUM CLEAR BAR SPACING (INCHES)	EMBEDMENT LENGTH, L_e		CLASS B SPLICE LENGTH	
		OTHER BARS (INCHES)	TOP BAR* (INCHES)	OTHER BARS (INCHES)	TOP BAR* (INCHES)
3	3	12	12	16	16
4	3	12	15	16	20
5	4	15	19	19	25
6	5	18	23	23	30
7	5	25	33	33	43
8	6	29	37	38	49
9	7	36	46	47	61
10	8	44	57	58	75
11	9	53	68	69	90

* TOP BARS ARE HORIZONTAL BARS IN BEAMS AND SLABS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

NOTE:

1. THESE LENGTHS ARE BASED ON THE PROVISIONS OF ACI 318, 2019 SECTIONS 25.4 AND 25.5 ASSUMING UNCOATED REINFORCEMENT, NORMAL WEIGHT CONCRETE, CONCRETE COVER CONSISTENT WITH THE REQUIREMENTS OF THIS DRAWING, AND A MINIMUM CLEAR BAR SPACING OF 2 D . CONDITIONS THAT ARE DIFFERENT FROM THOSE ASSUMED REQUIRE LONGER LAP LENGTHS CONSISTENT WITH ACI 318.

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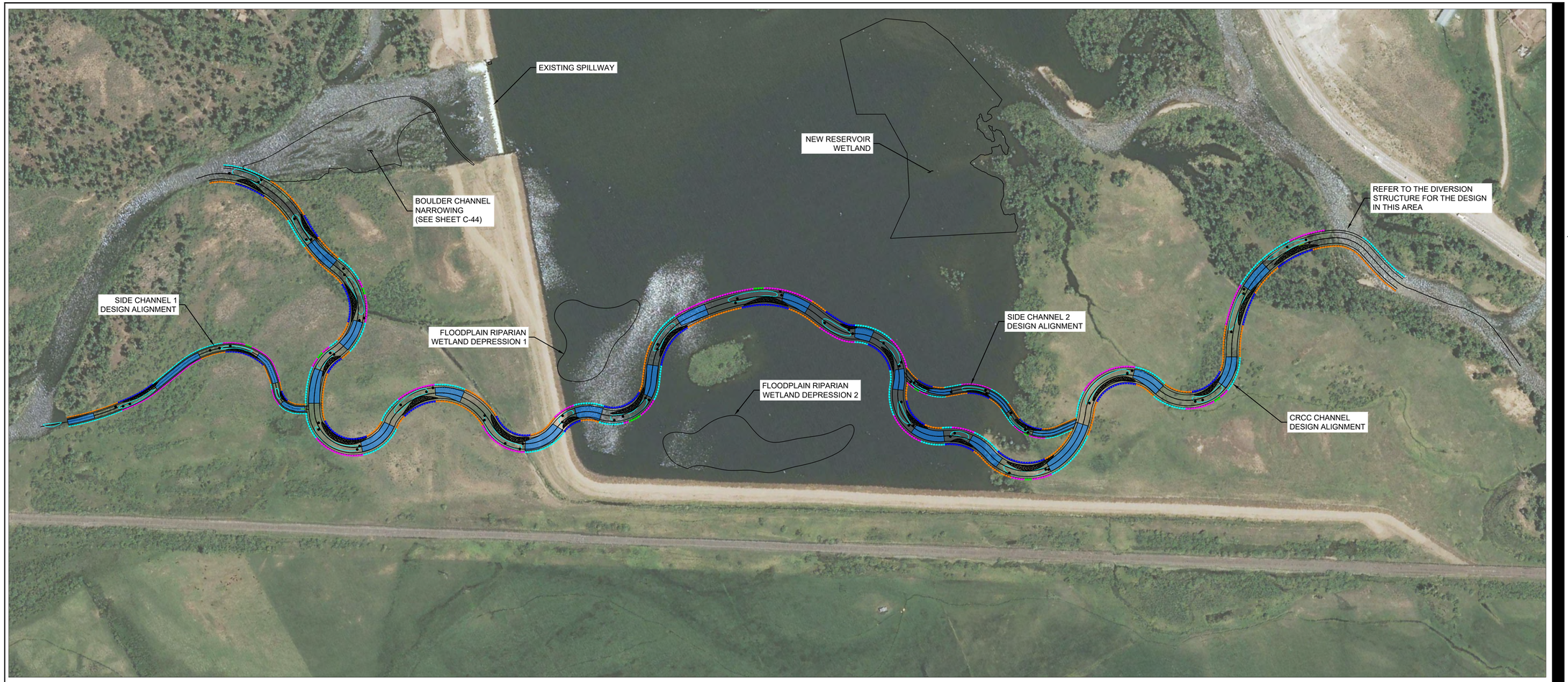
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PROJECT NUMBER
60619047

SHEET TITLE
GENERAL STRUCTURAL NOTES

SHEET NUMBER
S-19

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LEGEND:

- RIFFLE
- POINT BAR
- POOL
- HABITAT CLUSTERS
- TYPE A BANK STABILIZATION
- TYPE B BANK STABILIZATION
- TYPE C BANK STABILIZATION
- TYPE D BANK STABILIZATION
- TYPE E BANK STABILIZATION

NOTE: HABITAT CLUSTERS TO BE LOCATED IN THE FIELD.

CRCC GENERAL PLAN

200 0 200 400
SCALE IN FEET

N

NOTES:

1. FOR FEATURE STATIONING, FEATURE TYPE AND ELEVATION TABLES SEE SHEET P-10.
2. FOR POINT BAR AND HABITAT CLUSTER DETAILS SEE SHEET P-14.
3. FOR BANK STABILIZATION TYPICAL SECTIONS SEE SHEETS P-15 THROUGH P-17. FOR BANK STABILIZATION SETOUT TABLES SEE SHEET P-18.
4. FOR GRADING AND PROFILE DATA SEE SHEETS C-34 THROUGH C-42.
5. PLANTING OF TREES BENEATH POWER LINES NOT PERMITTED. PLANTING OF TREES NEAR TRI-STATE OWNED POWER LINES ONLY TO BE DONE IN ACCORDANCE WITH TRI-STATE PERMIT CONDITIONS.

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PROJECT NUMBER

60619047

SHEET TITLE

CRCC GENERAL PLAN

SHEET NUMBER

P-01

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CRCC PLAN

50 0 50 100

SCALE IN FEET

N

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C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 1 OF 6

SHEET NUMBER

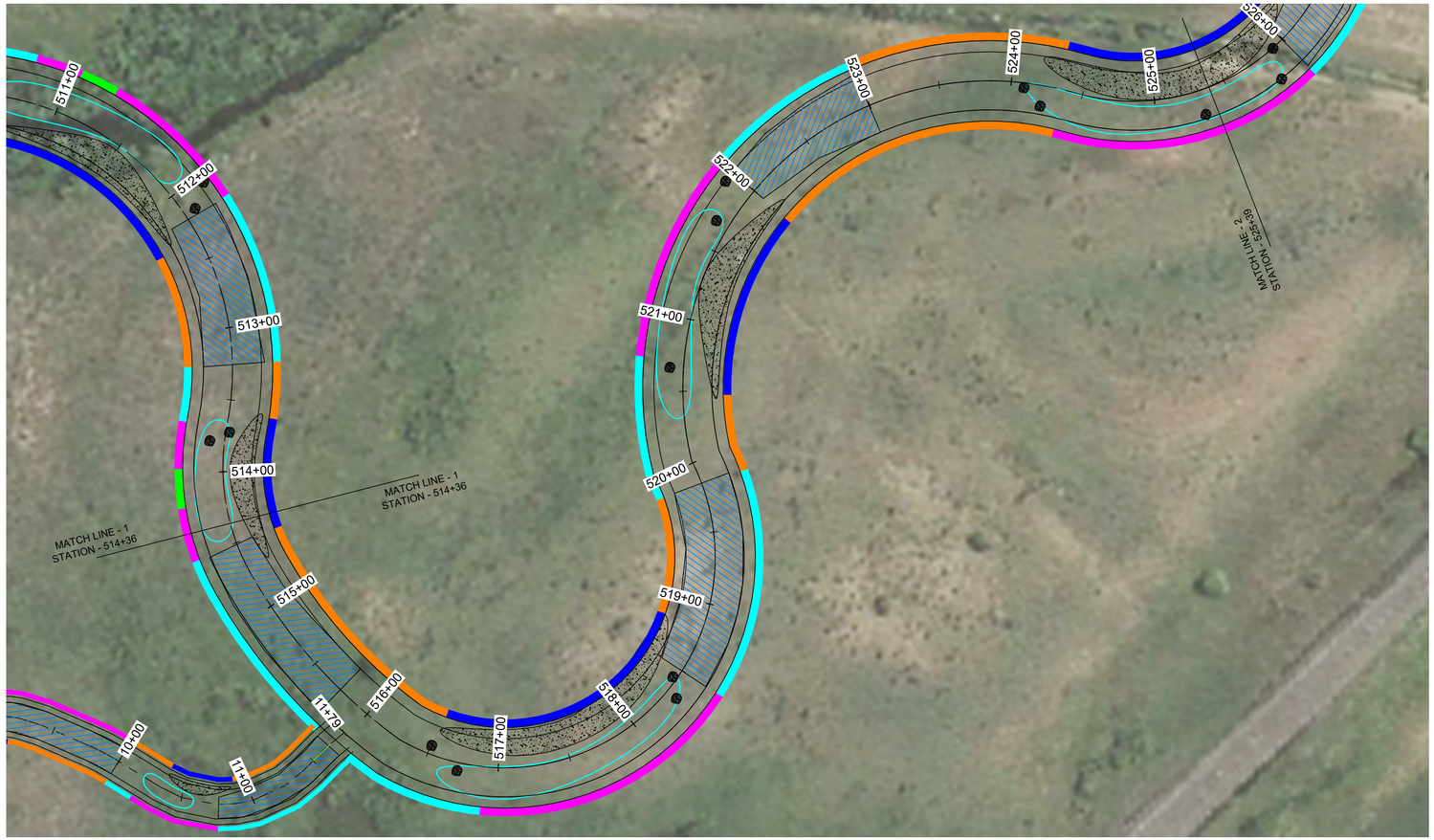
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CRCC PLAN

50 0 50 100
SCALE IN FEET

N

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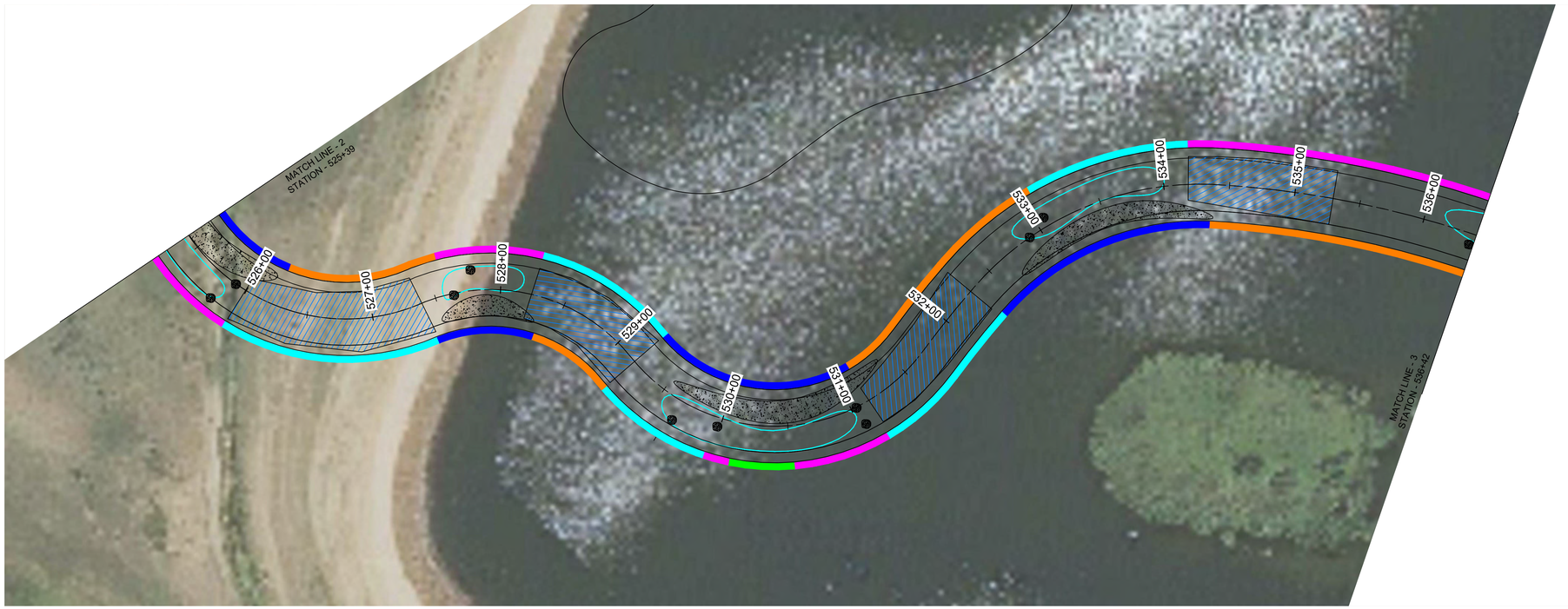
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CRCC PLAN AND PROFILE
SHEET 2 OF 6

SHEET NUMBER

P-03

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CRCC PLAN

50 0 50 100
SCALE IN FEET

N

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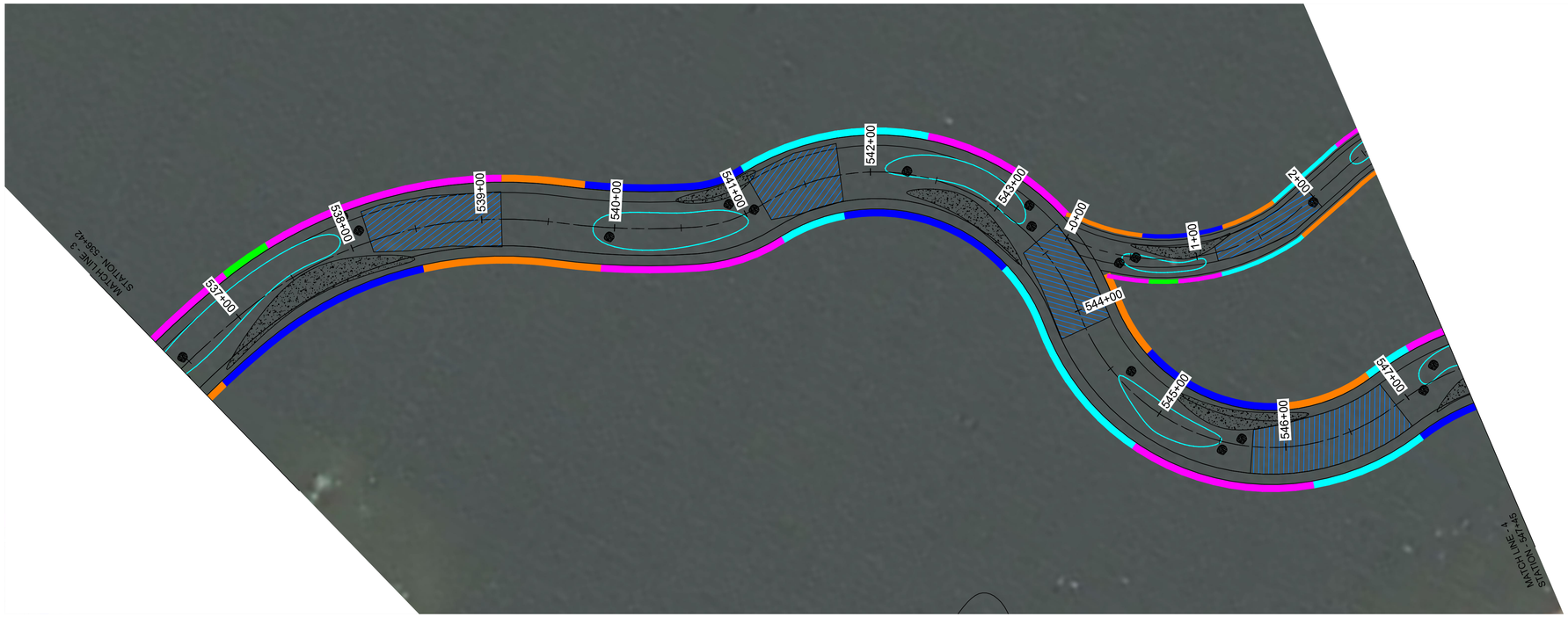
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50 0 50 100
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N

LEGEND:

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- HABITAT CLUSTERS
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NOTE: HABITAT CLUSTERS TO BE LOCATED IN THE FIELD.

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4. FOR GRADING AND PROFILE DATA SEE SHEETS C-34 THROUGH C-42.
5. PLANTING OF TREES BENEATH POWER LINES NOT PERMITTED.

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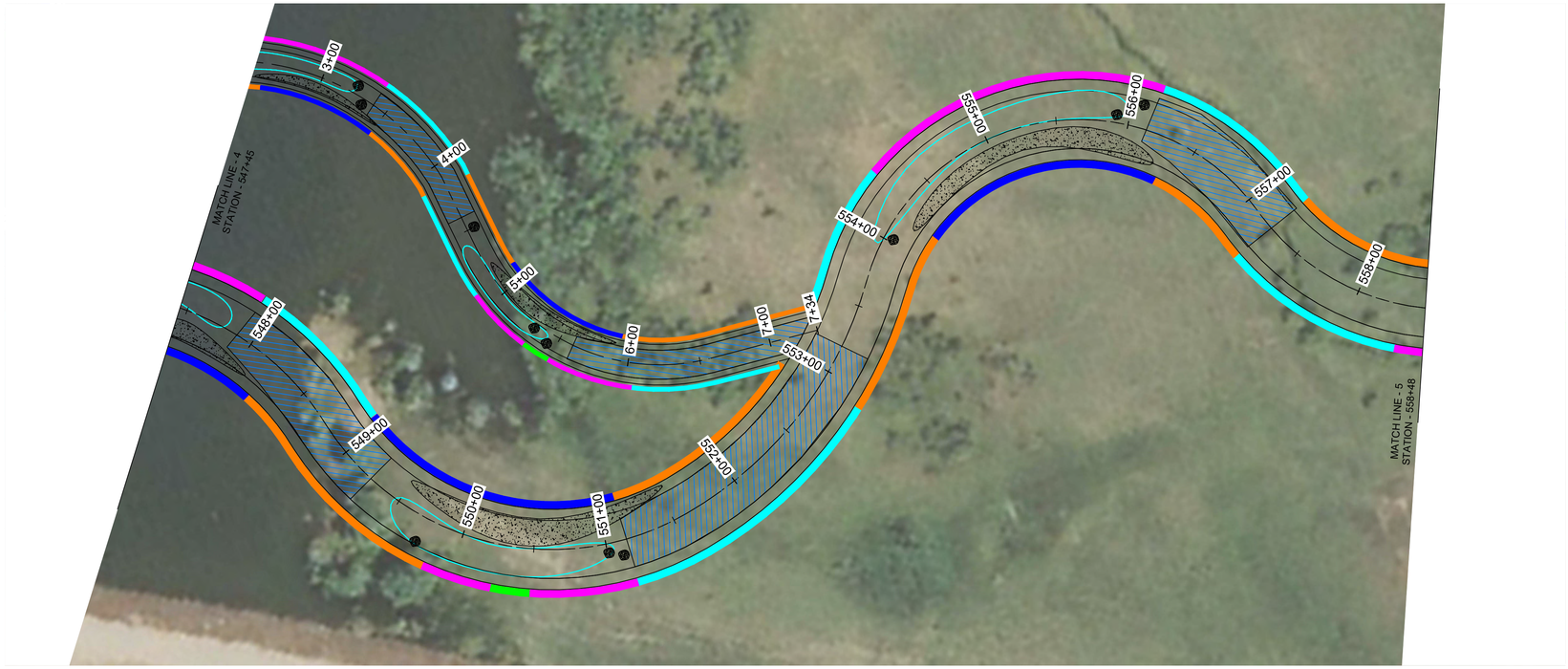
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- TYPE E BANK STABILIZATION

NOTE: HABITAT CLUSTERS TO BE LOCATED IN THE FIELD.

CRCC PLAN

50 0 50 100
SCALE IN FEET

N

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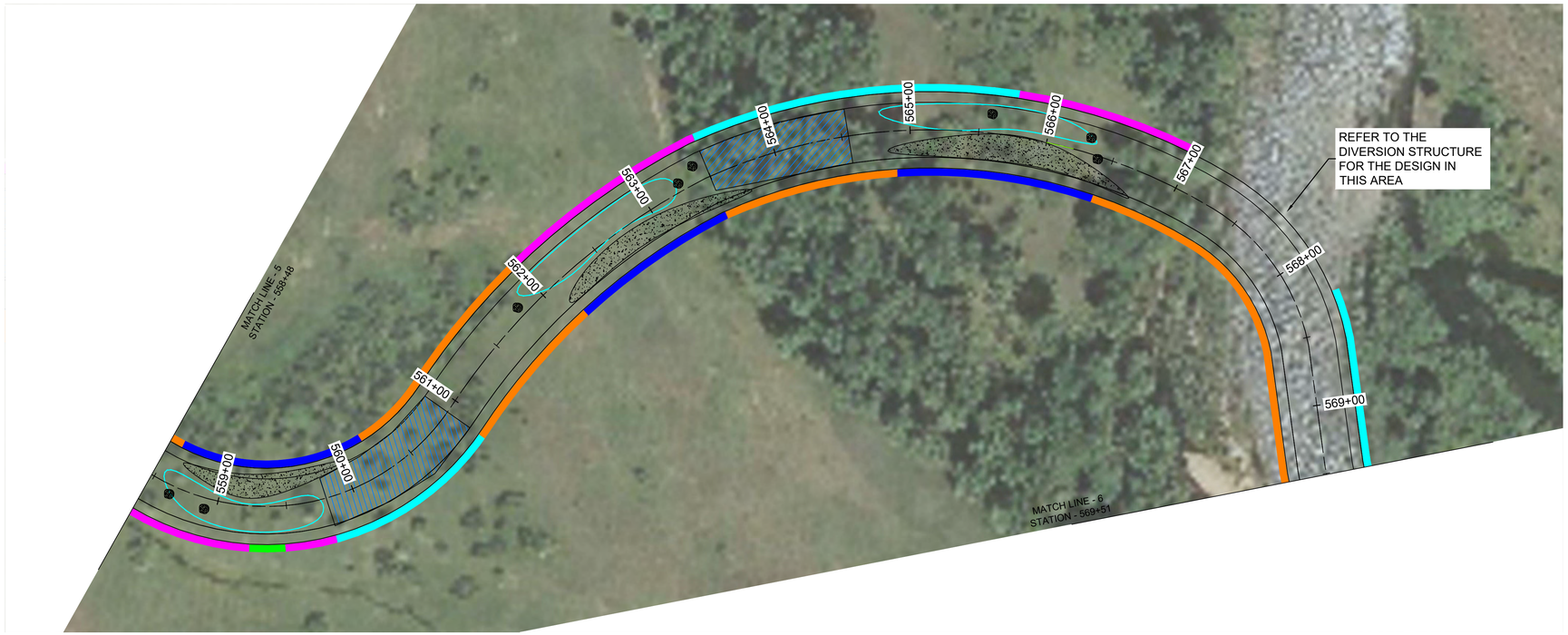
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SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 5 OF 6

SHEET NUMBER

P-06



CRCC PLAN

50 0 50 100
SCALE IN FEET

N

LEGEND:

- RIFFLE
- POINT BAR
- POOL
- HABITAT CLUSTERS
- TYPE A BANK STABILIZATION
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32913
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ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CRCC PLAN AND PROFILE
SHEET 6 OF 6

SHEET NUMBER

P-07

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"
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LEGEND:

- RIFFLE
- POINT BAR
- POOL
- HABITAT CLUSTERS
- TYPE A BANK STABILIZATION
- TYPE B BANK STABILIZATION
- TYPE C BANK STABILIZATION
- TYPE D BANK STABILIZATION
- TYPE E BANK STABILIZATION

NOTE: HABITAT CLUSTERS TO BE LOCATED IN THE FIELD.

CRCC PLAN

50 0 50 100
SCALE IN FEET

N

NOTES:

1. FOR FEATURE STATIONING, FEATURE TYPE AND ELEVATION TABLES SEE SHEET P-10.
2. FOR POINT BAR AND HABITAT CLUSTER DETAILS SEE SHEET P-14.
3. FOR BANK STABILIZATION TYPICAL SECTIONS SEE SHEETS P-15 THROUGH P-17. FOR BANK STABILIZATION SETOUT TABLES SEE SHEET P-18.
4. FOR GRADING AND PROFILE DATA SEE SHEETS C-34 THROUGH C-42.
5. PLANTING OF TREES BENEATH POWER LINES NOT PERMITTED.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
220 Water Avenue • Berthoud, Colorado 80513
800-369-7246 • www.northernwater.org

CONSULTANT

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804 COLORADO AVE.
Suite 201
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REGISTRATION

COLORADO LICENSED TROY T. THOMPSON 32913 PROFESSIONAL ENGINEER
06-07-22

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60619047

SHEET TITLE

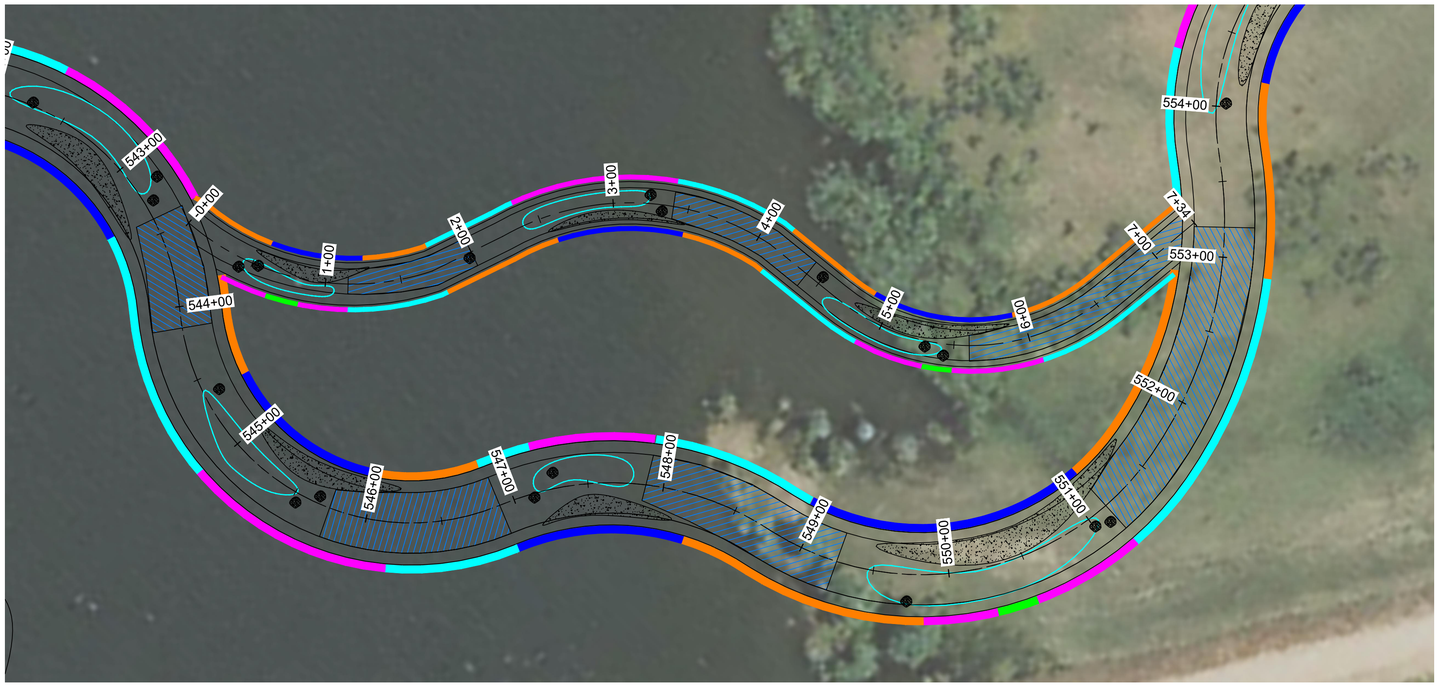
SIDE CHANNEL 1
PLAN AND PROFILE

SHEET NUMBER

P-08

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CRCC PLAN

50 0 50 100

SCALE IN FEET

N

LEGEND:

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- POINT BAR
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- TYPE A BANK STABILIZATION
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NOTE: HABITAT CLUSTERS TO BE LOCATED IN THE FIELD.

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SHEET TITLE

SIDE CHANNEL 2
PLAN AND PROFILE

SHEET NUMBER

P-09

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Channel Layout - Main Channel

Station	Sequence	Feature	Thalweg El (ft)	Bankfull El (ft)	Thalweg Side	Bottom Width (ft)	Top Width (ft)	Outside Bank Slope(x:1)	Inside Bank Slope(x:1)	Depth (ft)
57400	NA	See Sheet C-40								
56900	NA	See Sheet C-40								
See Div Dwgs	Diversion	Crest	See Diversion Drawings							
		End	See Diversion Drawings							
56620		Pool	7831.0	7836.7	R	3	55	2.5	6.6	5.7
56537.5		Glide	7832.3	7836.6	R	10	55	2.5	8.1	4.3
56455	19	Riffle Beginning	7833.6	7836.4	M	41	55	2.5	2.5	2.8
56350		Riffle End	7833.1	7836.2	R	30	50	2.5	4.0	3.1
56310		Pool	7830.6	7836.1	R	3	60	2.5	7.9	5.5
56200		Glide	7831.9	7835.9	R	10	57	2.5	9.0	4.0
56090	18	Riffle Beginning	7833.1	7835.7	M	40	53	2.5	2.5	2.6
55980		Riffle End	7832.4	7835.4	L	26	45	2.5	4.0	3.0
55940		Pool	7829.9	7835.3	L	3	58	2.5	7.7	5.4
55832.5		Glide	7831.2	7835.2	L	10	56	2.5	8.7	4.1
55725	17	Riffle Beginning	7832.4	7835.0	M	40	53	2.5	2.5	2.6
55615		Riffle End	7831.6	7834.5	R	27	46	2.5	4.0	2.9
55575		Pool	7829.1	7834.4	R	3	59	2.5	8.1	5.3
55447.5		Glide	7830.4	7834.0	R	10	47	2.5	7.6	3.6
55320	16	Riffle Beginning	7831.6	7833.7	M	24	35	2.5	2.5	2.1
55115		Riffle End	7827.7	7830.0	L	17	32	2.5	4.0	2.3
55075		Pool	7825.2	7830.0	L	3	42	2.5	5.6	4.8
55000		Glide	7826.5	7829.9	L	6	38	2.5	6.8	3.4
54925	15	Riffle Beginning	7827.7	7829.8	M	24	34	2.5	2.5	2.1
54790		Riffle End	7825.0	7827.3	R	16	31	2.5	4.0	2.3
54750		Pool	7822.5	7827.3	R	3	40	2.5	5.2	4.8
54720		Glide	7823.8	7827.2	R	6	38	2.5	6.6	3.4
54690	14	Riffle Beginning	7825.0	7827.2	M	24	35	2.5	2.5	2.2
54575		Riffle End	7823.2	7825.7	L	14	30	2.5	4.0	2.5
54535		Pool	7820.7	7825.7	L	3	42	2.5	5.3	5.0
54475		Glide	7822.0	7825.6	L	6	43	2.5	7.6	3.7
54415	13	Riffle Beginning	7823.2	7825.5	M	32	44	2.5	2.5	2.3
54340		Riffle End	7822.6	7825.1	R	25	41	2.5	4.0	2.5
54300		Pool	7820.1	7825.1	R	3	50	2.5	6.9	5.0
54240		Glide	7821.4	7825.0	R	6	50	2.5	9.6	3.6
54180	12	Riffle Beginning	7822.6	7825.0	M	38	50	2.5	2.5	2.4
54115		Riffle End	7822.0	7824.6	L	29	46	2.5	4.0	2.6
54075		Pool	7819.5	7824.6	L	3	53	2.5	7.3	5.1
53995		Glide	7820.8	7824.5	L	10	52	2.5	8.6	3.8
53915	11	Riffle Beginning	7822.0	7824.4	M	38	50	2.5	2.5	2.4
53815		Riffle End	7821.0	7823.9	R	20	39	2.5	4.0	2.9
53775		Pool	7818.5	7823.9	R	3	60	2.5	8.1	5.4
53652.5		Glide	7819.8	7824.1	R	10	59	2.5	8.8	4.4

Channel Layout - Main Channel

Station	Sequence	Feature	Thalweg El (ft)	Bankfull El (ft)	Thalweg Side	Bottom Width (ft)	Top Width (ft)	Outside Bank Slope(x:1)	Inside Bank Slope(x:1)	Depth (ft)
53530	10	Riffle Beginning	7821.0	7824.2	M	42	58	2.5	2.5	3.2
53420		Riffle End	7820.7	7824.2	R	30	53	2.5	4.0	3.5
53380		Pool	7818.2	7824.2	R	3	70	2.5	8.7	6.0
53305		Glide	7819.5	7824.1	R	10	65	2.5	9.5	4.6
53230	9	Riffle Beginning	7820.8	7824.1	M	42	60	2.5	2.5	3.3
53115		Riffle End	7820.5	7824.2	L	28	52	2.5	4.0	3.7
53075		Pool	7818.0	7824.1	L	3	64	2.5	7.5	6.1
52997.5		Glide	7819.3	7823.8	L	10	61	2.5	8.6	4.6
52920	8	Riffle Beginning	7820.5	7823.6	M	42	57	2.5	2.5	3.1
52825		Riffle End	7820.2	7823.5	R	32	53	2.5	4.0	3.3
52785		Pool	7817.7	7823.2	R	3	67	2.5	9.1	5.5
52762.5		Glide	7819.0	7823.0	R	10	60	2.5	9.8	4.1
52740	7	Riffle Beginning	7820.2	7822.8	M	40	53	2.5	2.5	2.6
52600		Riffle End	7819.3	7822.2	L	27	46	2.5	4.0	2.9
52560		Pool	7816.8	7822.2	L	3	60	2.5	8.1	5.4
52430		Glide	7818.1	7822.0	L	10	57	2.5	9.3	3.9
52300	6	Riffle Beginning	7819.3	7821.9	M	40	53	2.5	2.5	2.6
52200		Riffle End	7818.6	7821.5	R	27	46	2.5	4.0	2.9
52160		Pool	7816.1	7821.4	R	3	59	2.5	8.1	5.3
52072.5		Glide	7817.4	7821.3	R	10	56	2.5	9.1	3.9
51985	5	Riffle Beginning	7818.6	7821.2	M	40	53	2.5	2.5	2.6
51850		Riffle End	7817.7	7820.7	L	25	44	2.5	4.0	3.0
51810		Pool	7815.2	7820.6	L	3	63	2.5	8.6	5.4
51692.5		Glide	7816.5	7820.3	L	10	55	2.5	9.1	3.9
51575	4	Riffle Beginning	7817.7	7820.0	M	34	46	2.5	2.5	2.3
51450		Riffle End	7817.0	7819.5	L	26	42	2.5	4.0	2.5
51410		Pool	7814.5	7819.4	L	3	50	2.5	7.1	4.9
51367.5		Glide	7815.8	7819.2	L	10	46	2.5	7.8	3.4
51325	3	Riffle Beginning	7817.0	7819.1	M	31	41	2.5	2.5	2.1
51220		Riffle End	7816.0	7818.1	R	27	41	2.5	4.0	2.1
51180		Pool	7813.5	7818.1	R	3	53	2.5	8.4	4.6
51080		Glide	7814.8	7818.0	R	6	44	2.5	9.2	3.3
50980	2	Riffle Beginning	7816.0	7817.9	M	26	35	2.5	2.5	1.9
50865		Riffle End	7813.8	7815.9	L	18	32	2.5	4.0	2.1
50825		Pool	7811.3	7815.9	L	3	42	2.5	6.0	4.6
50762.5		Glide	7812.6	7815.8	L	6	41	2.5	8.3	3.3
50700	1	Riffle Beginning	7813.8	7815.8	M	30	40	2.5	2.5	2.0
50600		Riffle End	7812.7	7815.0	R	20	35	2.5	4.0	2.3
50560		Pool	7810.2	7814.9	R	3	46	2.5	6.6	4.7
50468		Glide	7811.5	7814.8	R	6	43	2.5	8.5	3.4
50376		Match	7812.7	7814.7	M	30	40	Match	Match	2.0

Channel Layout - Side Channel 1 (Downstream)

Station	Sequence	Feature	Thalweg El (ft)	Bankfull El (ft)	Thalweg Side	Bottom Width (ft)	Top Width (ft)	Outside Bank Slope(x:1)	Inside Bank Slope(x:1)	Depth (ft)
1176		Match	7818.4	Match	M	24	33	2.5	2.5	1.9
1175	SC-1 4	Riffle Beginning	7818.4	7820.3	M	24	33	2.5	2.5	1.9
1075		Riffle End	7816.5	7818.7	L	13	27	2.5	4.0	2.2
1035		Pool	7814.0	7818.4	L	3	39	2.5	5.7	4.4
1017.5		Glide	7815.3	7818.3	L	6	32	2.5	6.0	3.1
1000	SC-1 3	Riffle Beginning	7816.5	7818.2	M	16	25	2.5	2.5	1.7
875		Riffle End	7814.2	7816.3	R	5	19	2.5	4.0	2.1
835		Pool	7811.7	7816.2	R	3	30	2.5	3.5	4.5
742.5		Glide	7813.0	7816.1	R	6	31	2.5	5.3	3.2
650	SC-1 2	Riffle Beginning	7814.2	7815.9	M	22	31	2.5	2.5	1.7
450		Riffle End	7812.0	7813.8	L	17	29	2.5	4.0	1.8
410		Pool	7809.5	7813.8	L	3	35	2.5	4.9	4.3
305		Glide	7810.8	7813.8	L	6	33	2.5	6.4	3.1
200	SC-1 1	Riffle Beginning	7812.0	7813.8	M	22	31	2.5	2.5	1.8
100		Riffle End	7811.1	7813.2	L	12	26	2.5	4.0	2.1
60		Pool	7808.6	7813.0	L	3	38	2.5	5.5	4.4
30		Glide	7809.9	7812.9	L	6	35	2.5	6.8	3.0
0		Match	7811.1	7812.7	M	22	31	2.5	Match	1.8

Channel Layout - Side Channel 2 (Upstream)

Station	Sequence	Feature	Thalweg El (ft)	Bankfull El (ft)	Thalweg Side	Bottom Width (ft)	Top Width (ft)	Outside Bank Slope(x:1)	Inside Bank Slope(x:1)	Depth (ft)
734		Match	7832.0	Match	M	16	22	2.5	Match	1.3
733.8	SC-2 3	Riffle Beginning	7832.0	7833.3	M	16	22	2.5	2.5	1.3
560		Riffle End	7828.5	7830.1	L	7	17	2.5	4.0	1.6
520		Pool	7826.0	7829.7	L	3	26	2.5	3.7	3.7
480		Glide	7826.8	7829.2	L	5	24	2.5	5.3	2.4
440	SC-2 2	Riffle Beginning	7827.5	7828.8	M	16	22	2.5	2.5	1.3
340		Riffle End	7825.5	7827.0	R	8	18	2.5	4.0	1.5
300		Pool	7823.0	7826.7	R	3	28	2.5	4.3	3.7
250		Glide	7823.9	7826.3	R	5	26	2.5	6.1	2.4
200	SC-2 1	Riffle Beginning	7824.7	7825.9	M	18	24	2.5	2.5	1.2
115		Riffle End	7823.0	7824.4	L	11	20	2.5	4.0	1.4
75		Pool	7820.5	7824.2	L	3	30	2.5	4.8	3.7
37.5		Glide	7821.6	7824.1	L	5	27	2.5	6.3	2.5
0		Match	7822.7	7823.9	M	18	24	2.5	Match	1.2

NOTES:

1. ADDITIONAL CHANNEL CROSS SECTION VARIABILITY TO BE ADDED AS DIRECTED BY FIELD ENGINEER.
2. THALWEG LEGEND (WHEN FACING DOWNSTREAM):
   -- L = LEFT
   -- M = MIDDLE
   -- R = RIGHT
3. REFER TO SHEET P-11 FOR TYPICAL PROFILES AND SHEET P-12 FOR TYPICAL CROSS SECTIONS.

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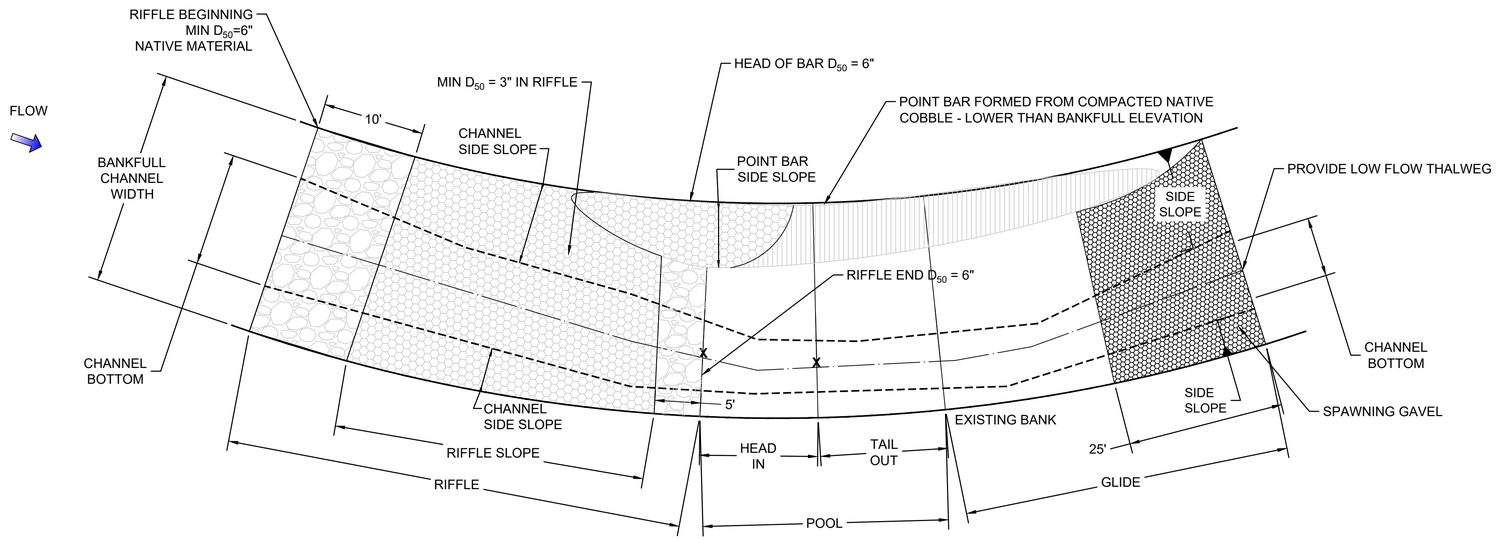
SHEET TITLE

FEATURE STATION AND ELEVATION TABLES

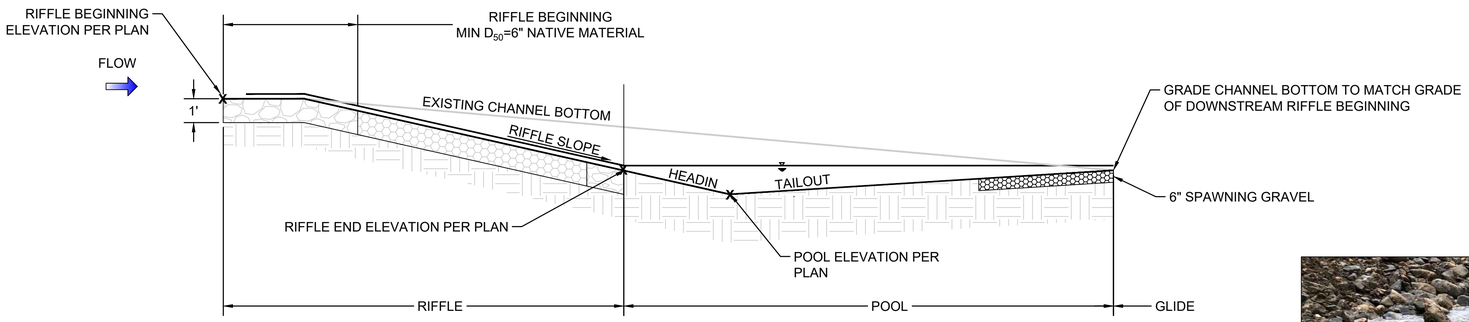
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P-10

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RIFFLE-POOL-GLIDE PLAN



RIFFLE-POOL-GLIDE PROFILE

NOTES:

1. PLAN AND PROFILE NOT TO SCALE
2. MEANDERING LOW FLOW THALWEG TO BE CONSTRUCTED IN ALL AREAS
3. RIFFLES TO BE A MINIMUM OF 1' DEEP OF SPECIFIED ROCK SIZES
4. TRACK ROLL FOUNDATION OF RIFFLES. TOP SURFACE OF RIFFLES TO BE PLACED WITH MINIMAL COMPACTION ENSURING A NON-UNIFORM SURFACE FORMED BY SPECIFIED MATERIAL AND LARGER MATERIAL ENCOUNTERED DURING EXCAVATION AND GRADING
5. FOR RIFFLE-POOL-GLIDE TYPICAL SECTIONS SEE SHEET P-12
6. WHERE UNSUITABLE MATERIAL ENCOUNTERED IN RIFFLE EXCAVATION, OVEREXCAVATE BY 2' AND FILL WITH GRAVEL AND COBBLE MATERIAL MATCHING RIFFLE GRADATIONS
7. LARGER GRAVELS, COBBLES, AND BOULDERS ENCOUNTERED WHILE EXCAVATING THE POOL AND GLIDE SHALL BE PLACED IN THE COMPLETED POOL AND GLIDE SECTIONS IN ALL AREAS EXCEPT THOSE DESIGNATED FOR SPAWNING GRAVEL
8. EXTENTS OF POINT BAR TO BE VARIED IN FIELD BASED ON DIRECTION OF FIELD ENGINEER

ROCK SIZING TABLE			
FEATURE	MIN D_{15}	MIN D_{50}	MIN D_{85}
RIFFLE BEGINNING	2"	6"	8"
MAIN RIFFLE	1"	3"	5"
RIFFLE END	2"	6"	8"
POOL AND GLIDE	SUPPLEMENT IN-SITU SOILS WITH GRAVEL AND COBBLE		
SPAWNING GRAVELS	$\frac{1}{4}$"	$\frac{3}{4}$"	2"

EXAMPLE PHOTOGRAPH OF RIFFLE ROCK



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SHEET TITLE

RIFFLE-POOL-GLIDE PLAN AND PROFILE

SHEET NUMBER

P-11

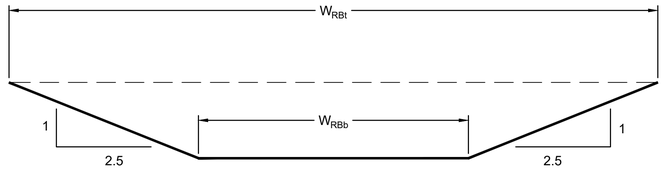
FEATURE DIMENSION DENOTATION		
FEATURE	BOTTOM WIDTH	TOP WIDTH
RIFFLE BEGINNING	W_{RBb}	W_{RBt}
RIFFLE END	W_{REb}	W_{REt}
POOL	W_{Pb}	W_{Pt}
GLIDE	W_{Gb}	W_{Gt}

NOTES:

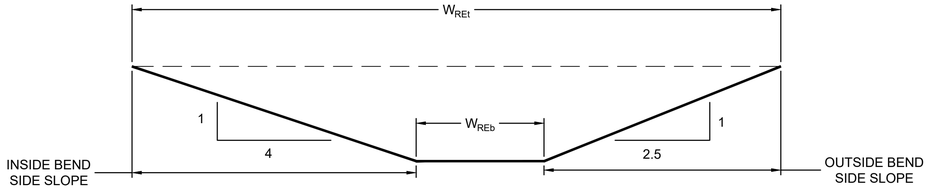
1. ADDITIONAL CHANNEL CROSS SECTION VARIABILITY TO BE ADDED AS DIRECTED BY FIELD ENGINEER.
2. MEANDERING LOW FLOW THALWEG TO BE CONSTRUCTED IN ALL AREAS.
3. REFER SHEET P-11 FOR TYPICAL PROFILES.
4. CHANNEL SECTIONS VARY ALONG THE CRCC. SEE SHEET P-10 FOR DIMENSIONS AT INDIVIDUAL RIFFLES, POOLS AND GLIDES.

EXAMPLE PHOTOGRAPH OF RIFFLE-POOL-GLIDE PROFILE

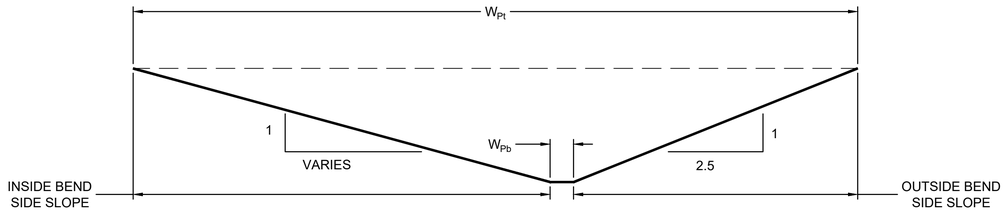




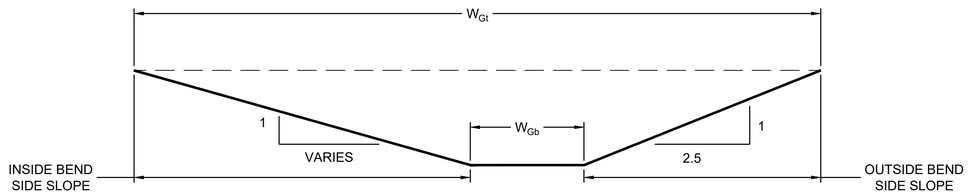
1 / P-11 TYPICAL CHANNEL - RIFFLE BEGINNING SECTION
N.T.S.



2 / P-11 TYPICAL CHANNEL - RIFFLE END SECTION
N.T.S.



3 / P-11 TYPICAL CHANNEL - POOL SECTION
N.T.S.



4 / P-11 TYPICAL CHANNEL - MIDDLE OF GLIDE SECTION
N.T.S.

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TROY E. THOMPSON
32913
06-07-22

ISSUE/REVISION

3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
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I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

RIFFLE-POOL-GLIDE TYPICAL SECTIONS

SHEET NUMBER

P-12

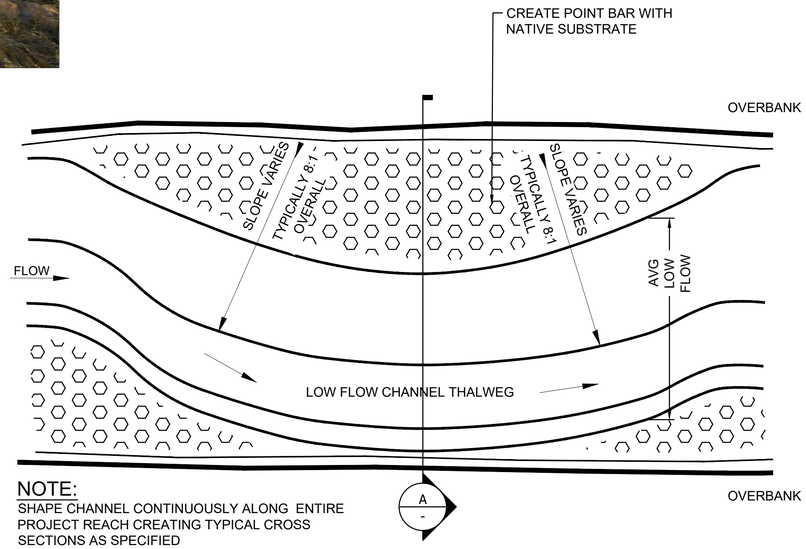
Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"
Last saved by: HAMBUCHG(2022-04-29) Last Plotted: 2022-05-04
Filename: L:\DCS\PROJECTS\WTR\60619047_CRCC_NORTH\900_CAD_GIS\910_CAD\20-SHEETS\ERC - PLANTING\12 RIFFLE-POOL-GLIDE SECTION.DWG
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EXAMPLE PHOTOGRAPH OF
BOULDER HABITAT CLUSTER

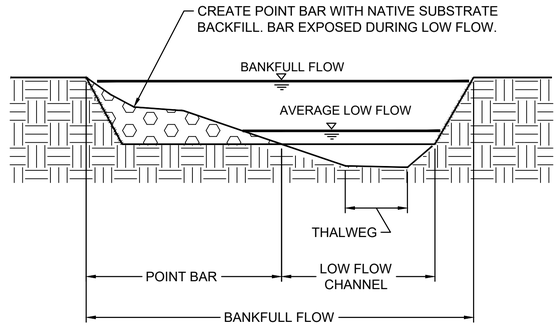


EXAMPLE PHOTOGRAPH OF
GENERAL CHANNEL SHAPPING

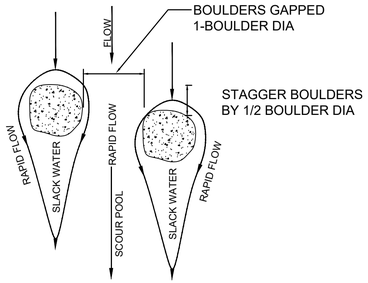


NOTE:
SHAPE CHANNEL CONTINUOUSLY ALONG ENTIRE PROJECT REACH CREATING TYPICAL CROSS SECTIONS AS SPECIFIED

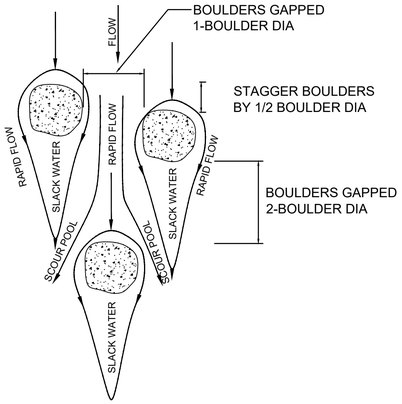
GENERAL CHANNEL SHAPING PLAN
N.T.S.



A
-
GENERAL CHANNEL SHAPING
N.T.S.



BOULDER HABITAT CLUSTER (BHC)
2-BOULDER CONFIGURATION



BOULDER HABITAT CLUSTER
3-BOULDER CONFIGURATION

NOTES:

1. ENGINEER TO DETERMINE SPECIFIC LOCATION FOR FEATURES, NUMBER OF BOULDERS AND CONFIGURATION IN THE FIELD.
2. USE 2-FOOT MINIMUM DIAMETER BOULDERS.
3. EXCAVATE HOLE IN RAPID FLOW PATH AREAS TO ACCOMODATE BOULDER INSTALLATION.
4. BOULDER HEIGHT TO VARY. GENERALLY EACH TOP OF BOULDER SHOULD BE BELOW BANKFULL ELEVATION.
5. BOULDER FEATURES TO BE CONSTRUCTED TO APPEAR NATURAL; EXACT PLACEMENT OF BOULDERS TO BE VARIABLE THROUGHOUT AND SHALL INCLUDE DIFFERENT SIZES, SPACING, NUMBERS OF BOULDERS, AND DEPTHS.

ISSUED FOR CONSTRUCTION

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"
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Filename: L:\DOS\PROJECTS\WTR\60619047_CRCC_NORTH\800_CAD_GIS\910_CAD\20-SHEETS\ERC - PLANTING\BLDR CLUSTER-POINT BAR.DWG
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CLIENT

Municipal Subdistrict
Northern Colorado Water Conservancy District
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TROY T. THOMPSON
32913
PROFESSIONAL ENGINEER
07-27

ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
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1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

BOULDER CLUSTERS AND POINT BAR DETAILS

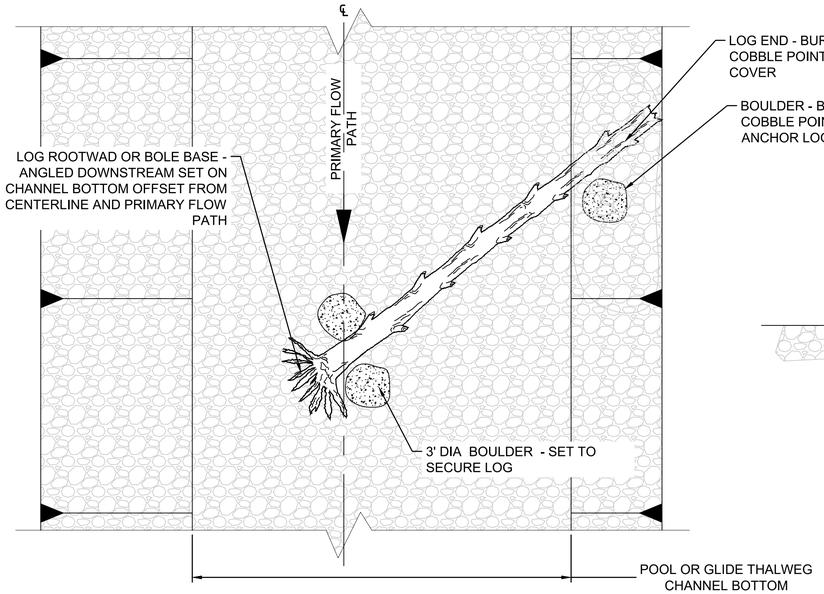
SHEET NUMBER

P-13

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

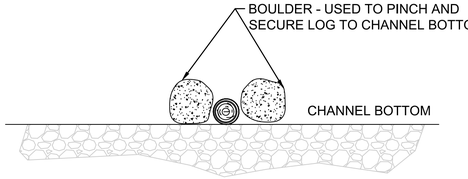






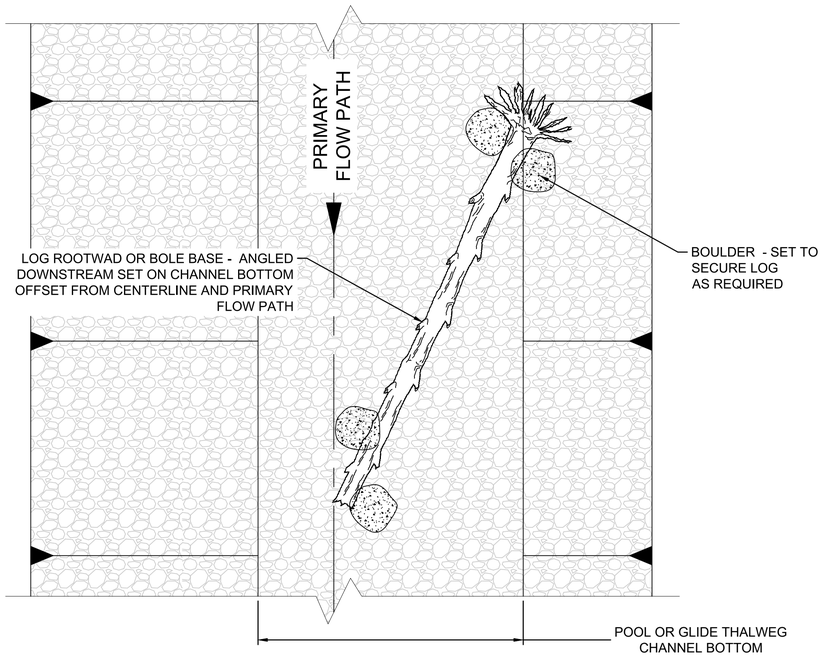
1 - LARGE WOODY DEBRIS (LWD) HABITAT CLUSTER ANCHORED IN BANK

N.T.S.



3 - BOULDER ANCHOR DETAIL

N.T.S.



2 - LARGE WOODY DEBRIS (LWD) HABITAT CLUSTER ANCHORED IN CHANNEL

N.T.S.

NOTES:

1. LOGS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.
2. LOGS WITH INTACT ROOT MASS ARE PREFERRED
3. LOGS WITH ROOT MASS MAY BE LIMBED TO 18" MAXIMUM LENGTH FROM TRUNK FOR TRANSPORT, HANDLING, AND INSTALLATION.
4. LOGS SHOULD BE APPROXIMATELY 15 FEET LONG. LENGTH TO BE MEASURED FROM TOP OF LOG TO BOTTOM OF LOG, WHICH IS TO INCLUDE THE ROOT WAD.
5. LOGS SHALL HAVE A DIAMETER OF 9" TO 15" MEASURED 4.5 FEET ABOVE THE ROOT MASS.
6. ANCHOR BOULDERS USED IN LOG HABITAT CLUSTER CONSTRUCTION SHALL HAVE A MINIMUM DIMENSION OF 36".

ISSUED FOR CONSTRUCTION

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Filename: L:\DGS\PROJECTS\WTR\60619047_CRCC_NORTH\90_CAD_GIS\910_CAD\20-SHEETS\ERC - PLANTINGLARGE WOODY DEBRIS HABITAT FEATURES.DWG
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COLORADO LICENSED TROY T. THOMPSON 32913 PROFESSIONAL ENGINEER 04-27-22

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C-1521A

PROJECT NUMBER

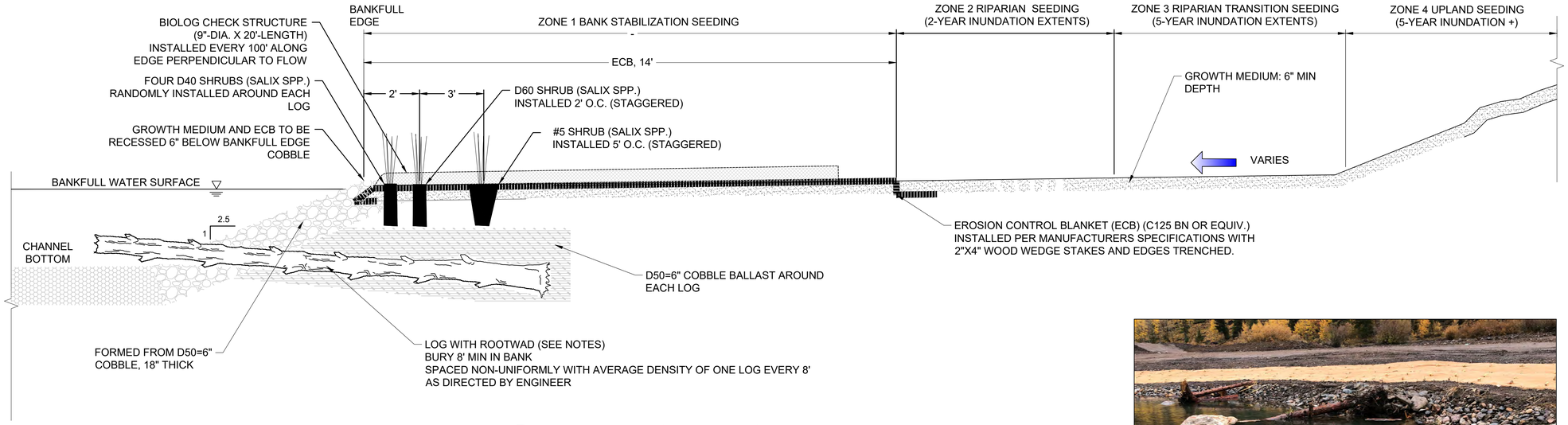
60619047

SHEET TITLE

LARGE WOODY DEBRIS HABITAT FEATURES

SHEET NUMBER

P-14



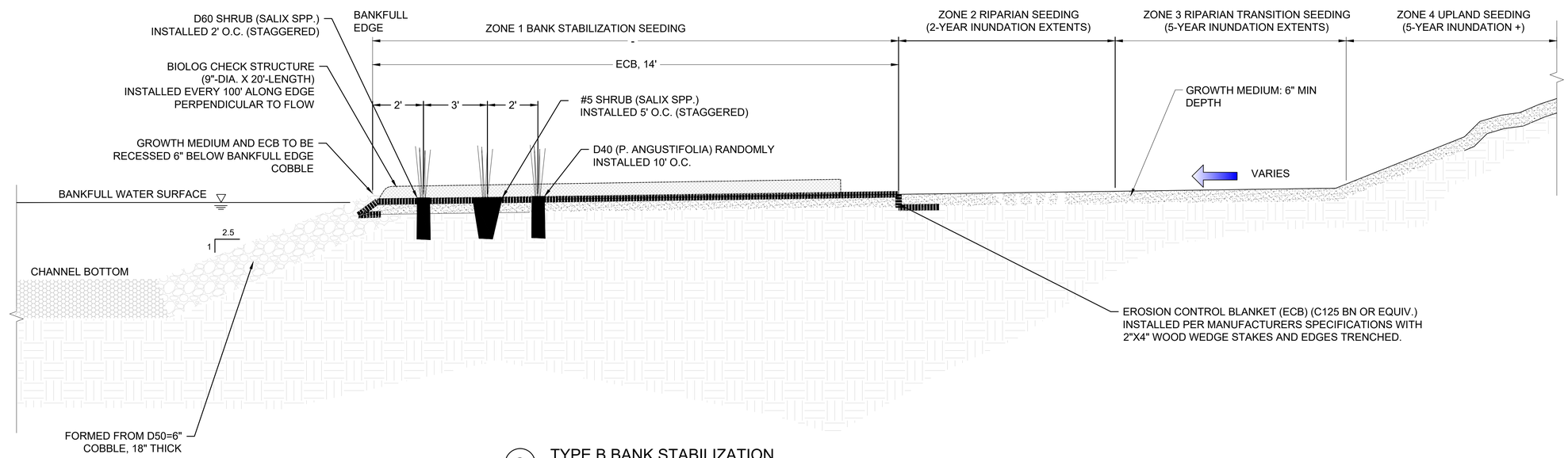
1 TYPE A BANK STABILIZATION
N.T.S.

NOTES:

1. LOGS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.
2. LOGS WITH INTACT ROOT MASS ARE PREFERRED
3. LOGS WITH ROOT MASS MAY BE LIMBED TO 18" MAXIMUM LENGTH FROM TRUNK FOR TRANSPORT, HANDLING, AND INSTALLATION.
4. LOGS SHOULD BE APPROXIMATELY 15 FEET LONG. LENGTH TO BE MEASURED FROM TOP OF LOG TO BOTTOM OF LOG, WHICH IS TO INCLUDE THE ROOT WAD.
5. LOGS SHALL HAVE A DIAMETER OF 9" TO 15" MEASURED 4.5 FEET ABOVE THE ROOT MASS.
6. ANCHOR BOULDERS USED IN LOG HABITAT CLUSTER CONSTRUCTION SHALL HAVE A MINIMUM DIMENSION OF 36".



EXAMPLE OF TYPE A BANK STABILIZATON



2 TYPE B BANK STABILIZATION
N.T.S

ISSUED FOR CONSTRUCTION

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COLORADO LICENSED TROY E. THOMPSON 32913 PROFESSIONAL ENGINEER
10-07-22

ISSUE/REVISION

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I/R	DATE	DESCRIPTION

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

BANK STABILIZATION DETAILS 1

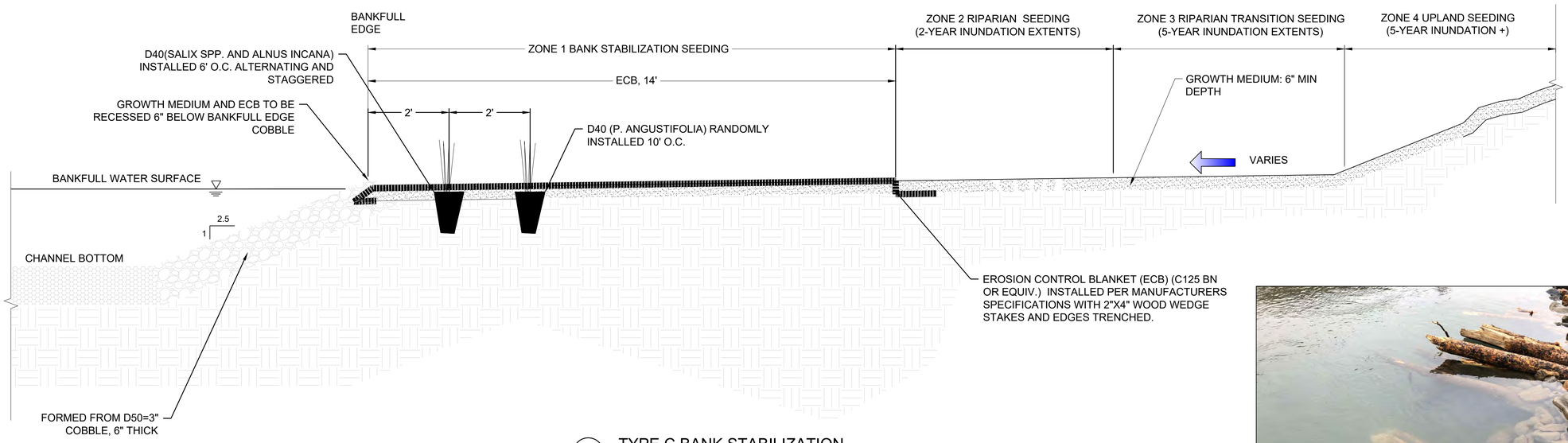
SHEET NUMBER

P-15

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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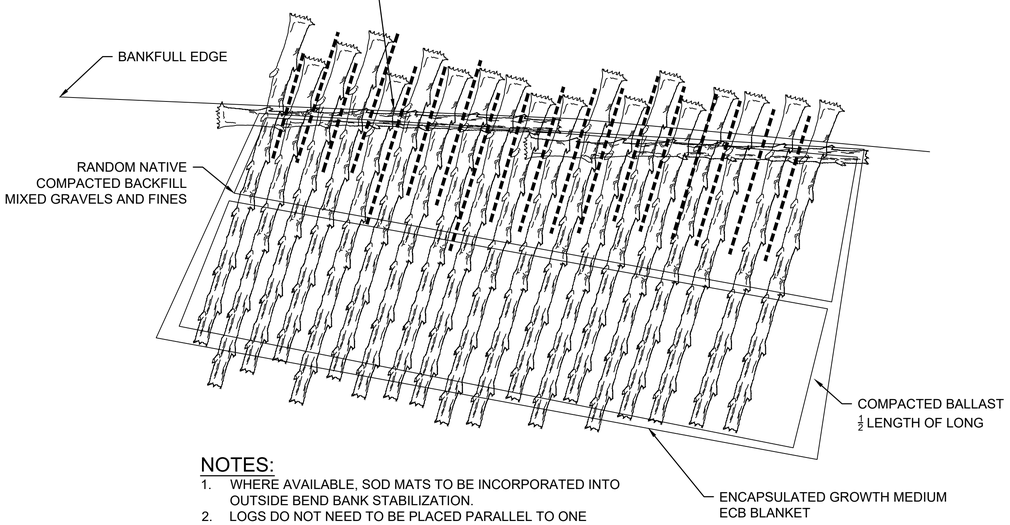
3 TYPE C BANK STABILIZATION
N.T.S.

NOTES:

1. WHERE AVAILABLE, SOD MATS TO BE INCORPORATED INTO OUTSIDE BEND BANK STABILIZATION.

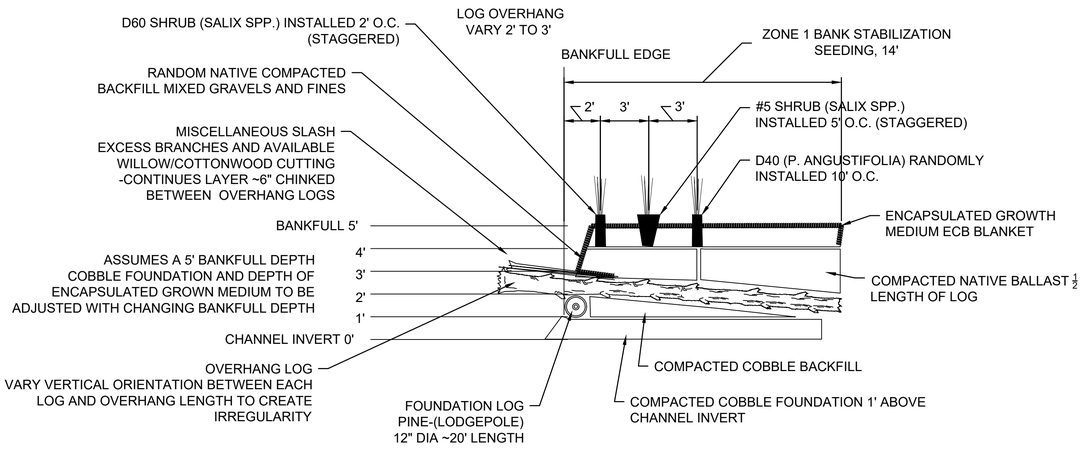


EXAMPLE OF TYPE D BANK STABILIZATON



NOTES:

1. WHERE AVAILABLE, SOD MATS TO BE INCORPORATED INTO OUTSIDE BEND BANK STABILIZATION.
2. LOGS DO NOT NEED TO BE PLACED PARALLEL TO ONE ANOTHER; VARIATION IN DEPTHS AND ANGLES PREFERRED. TO BE INSTALLED AS DIRECTED BY FIELD ENGINEER.



4 TYPE D BANK STABILIZATION
Scale: NTS

NOTES:

1. FOUNDATION LOGS MAY BE EXCLUDED BY FIELD ENGINEER BASED ON SITE CONDITIONS.
2. LOGS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.
3. LOGS WITH INTACT ROOT MASS ARE PREFERRED
4. LOGS WITH ROOT MASS MAY BE LIMBED TO 18" MAXIMUM LENGTH FROM TRUNK FOR TRANSPORT, HANDLING, AND INSTALLATION.
5. LOGS SHOULD BE APPROXIMATELY 15 FEET LONG. LENGTH TO BE MEASURED FROM TOP OF LOG TO BOTTOM OF LOG, WHICH IS TO INCLUDE THE ROOT WAD.
6. LOGS SHALL HAVE A DIAMETER OF 9" TO 15" MEASURED 4.5 FEET ABOVE THE ROOT MASS.
7. ANCHOR BOULDERS USED IN LOG HABITAT CLUSTER CONSTRUCTION SHALL HAVE A MINIMUM DIMENSION OF 36".

ISSUED FOR CONSTRUCTION

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REGISTRATION

COLORADO LICENSED TROY T. THOMPSON 32913 PROFESSIONAL ENGINEER
07-27

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C-1521A

PROJECT NUMBER

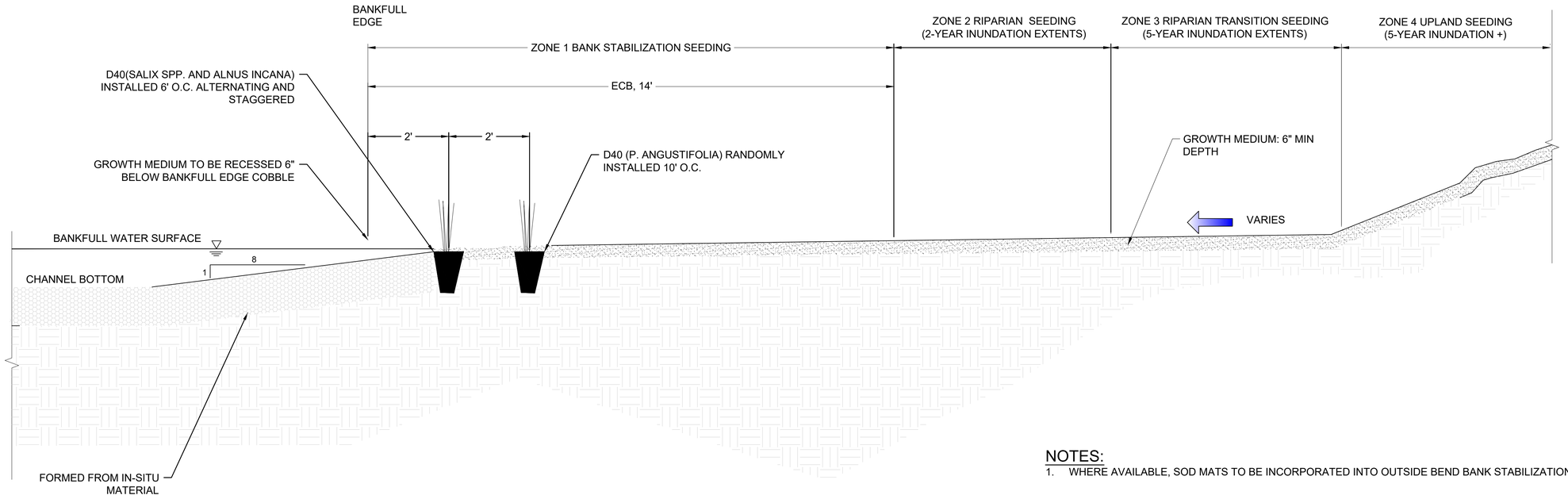
60619047

SHEET TITLE

BANK STABILIZATION DETAILS 2

SHEET NUMBER

P-16



5 TYPE E BANK STABILIZATION
N.T.S.

NOTES:
1. WHERE AVAILABLE, SOD MATS TO BE INCORPORATED INTO OUTSIDE BEND BANK STABILIZATION.

ISSUED FOR CONSTRUCTION

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TRAVIS T. THOMPSON
32913
05-07-22

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

BANK STABILIZATION DETAILS 3

SHEET NUMBER

P-17

MAIN CHANNEL-LEFT BANK STABILIZATION				
ID	STATION		OFFSET LENGTH	Type
	START	END	FT	
112	56645	57037	368	C
110	56490	56645	144	E
108	56350	56490	129	C
106	56215	56350	125	E
104	56090	56215	118	C
102	55980	56090	132	B
100	55950	55980	38	A
98	55930	55950	26	D
96	55835	55930	111	A
94	55725	55835	129	B
92	55640	55725	78	C
90	55420	55640	169	E
88	55290	55420	130	C
86	55115	55290	198	B
84	55050	55115	76	A
82	55030	55050	27	D
80	54985	55030	50	A
78	54825	54985	170	C
76	54690	54825	111	E
74	54575	54690	90	B
72	54475	54575	142	A
70	54340	54475	167	B
68	54180	54340	132	E
66	54115	54180	50	B
64	53995	54115	141	A
62	53850	53995	134	C
60	53655	53850	175	E
58	53435	53655	212	C
56	53230	53435	175	E
54	53115	53230	129	B
52	53050	53115	75	A
50	53010	53050	50	D
48	53000	53010	20	A
46	52920	53000	92	B
44	52835	52920	68	C
42	52740	52835	73	E
40	52600	52740	170	B
38	52430	52600	194	A
36	52200	52430	203	C
34	52050	52200	130	E
32	51985	52050	54	C
30	51850	51985	162	B
28	51690	51850	193	A
26	51605	51690	100	B
0	51450	51580	143	B
22	51420	51450	38	A
20	51400	51420	28	D
18	51370	51400	33	A
16	51325	51370	38	B
14	51235	51325	78	C
12	51060	51235	147	E
10	50865	51060	194	C
8	50750	50865	116	B
6	50620	50750	123	C
4	50490	50620	118	E
2	50376	50490	94	C
		TOTAL	6610	

MAIN CHANNEL-RIGHT BANK STABILIZATION				
ID	STATION		OFFSET LENGTH	Type
	START	END	FT	
99	56825	57037	211	B
97	56575	56700	135	A
95	56350	56575	243	B
93	56200	56350	160	A
91	56030	56200	170	C
89	55860	56030	134	E
87	55725	55860	107	C
85	55615	55725	126	B
83	55435	55615	222	A
81	55340	55435	105	B
79	55115	55285	151	C
77	54890	55115	185	E
75	54790	54890	111	B
73	54720	54790	84	A
71	54690	54720	36	B
69	54600	54690	65	C
67	54460	54600	115	E
65	54385	54460	67	C
63	54240	54340	121	A
61	54115	54240	145	B
59	53975	54115	120	E
57	53915	53975	63	C
55	53750	53915	185	A
53	53710	53750	38	D
51	53420	53710	306	A
49	53305	53420	127	B
47	53115	53305	193	C
45	52920	53115	152	E
43	52825	52920	113	B
41	52765	52825	83	A
39	52625	52765	114	C
37	52435	52625	154	E
35	52300	52435	153	C
33	52200	52300	114	B
31	52070	52200	147	A
29	51985	52070	101	B
27	51885	51985	80	C
25	51655	51885	181	E
23	51450	51655	177	C
21	51360	51450	76	E
19	51325	51360	40	C
17	51220	51325	121	B
15	51125	51220	105	A
13	51105	51125	27	D
11	51080	51105	32	A
9	50980	51080	109	B
7	50865	50980	108	C
5	50765	50865	95	E
3	50600	50765	179	C
1	50435	50600	183	B
		TOTAL	6369	

SIDE CHANNEL 1 BANK STABILIZATION (Downstream)				
ID	STATION		OFFSET LENGTH	Type
	START	END	FT	
LEFT BANK				
16a	1075	1165	107	B
14a	1020	1075	65	A
12a	1000	1020	20	B
10a	920	1000	74	C
8a	750	875	152	E
6a	650	835	93	C
4a	305	650	348	A
2a	0	305	205	B
RIGHT BANK				
17a	1090	1165	68	C
15a	1035	1090	43	E
13a	1000	1035	34	C
11a	845	1000	172	A
9a	825	845	25	D
7a	745	825	85	A
5a	450	745	302	B
3a	300	450	145	E
1a	0	300	195	C
		TOTAL	2133	

SIDE CHANNEL 2 BANK STABILIZATION (Upstream)				
ID	STATION		OUTER LENGTH	Type
	START	END	FT	
LEFT BANK				
24b	605	700	104	B
22b	550	605	62	A
20b	530	550	20	D
18b	490	530	47	A
16b	415	490	77	B
14b	350	415	58	C
12b	255	350	83	E
10b	175	255	81	C
8b	115	175	68	B
6b	85	115	33	A
4b	65	85	22	D
2b	35	65	31	A
RIGHT BANK				
17b	595	734	133	C
15b	485	595	94	E
13b	415	485	68	C
11b	340	415	84	B
9b	240	340	112	A
7b	175	240	63	B
5b	125	175	43	C
3b	55	125	61	E
1b	0	55	59	C
		TOTAL	1403	

NOTES:

1. FOR BANK STABILIZATION DETAILS SEE SHEETS P-15 TO P-17.

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PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

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TROY R. THOMPSON
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06-07-22

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SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

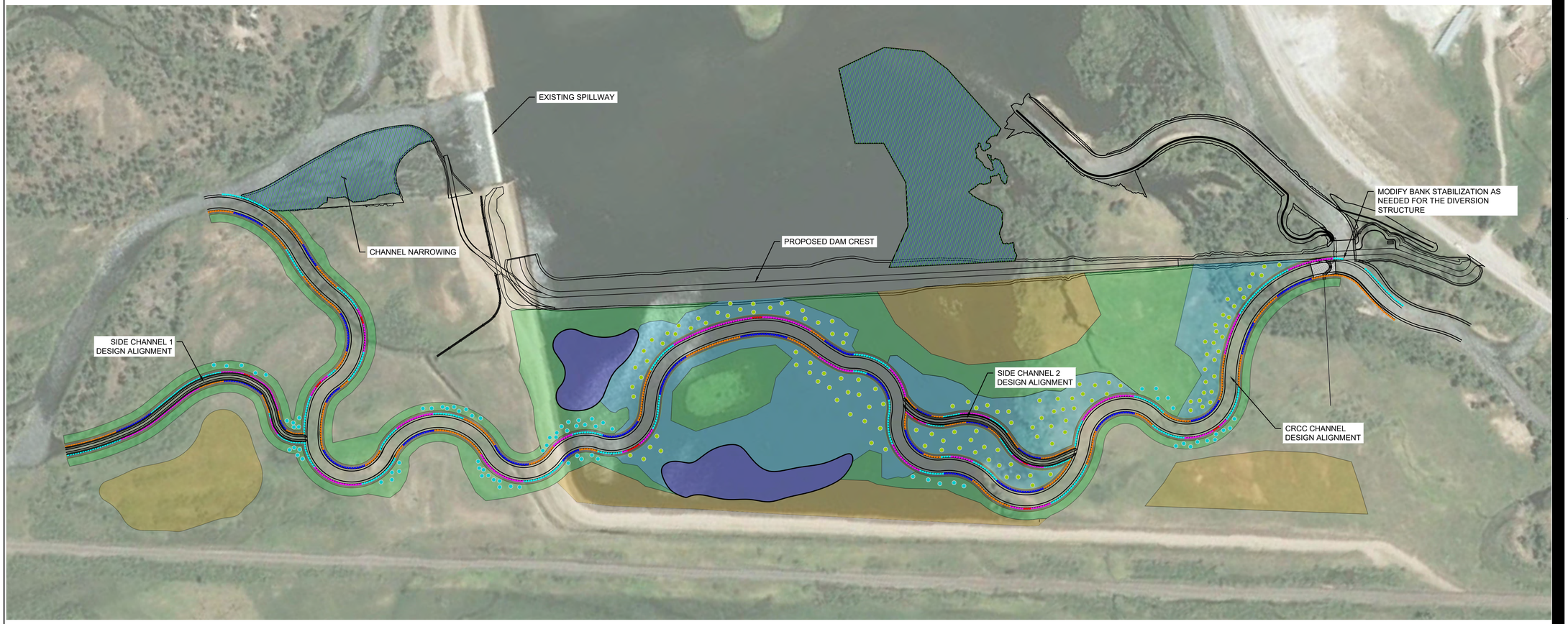
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BANK STABILIZATION TABLES

SHEET NUMBER

P-18

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"
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VEGETATION PLAN

200 0 200 400
SCALE IN FEET

LEGEND:

- ZONE 1 BANK STABILIZATION SEED MIX [5.1 ACRES]
- ZONE 2 RIPARIAN SEED MIX [13.7 ACRES]
- ZONE 3 RIPARIAN TRANSITION SEED MIX [20.9 ACRES]
- ZONE 4 UPLAND SEED MIX [14.8 ACRES]
- ZONE 5 WETLAND SEED MIX [3.4 ACRES]
- PLACE SALVAGED WETLAND MATS AND TOPSOIL [9.4 ACRES]
- RIPARIAN PLANTING POCKET - ZONE 2 (132)
- RIPARIAN PLANTING POCKET - ZONE 3 (80)

NOTES:

1. FOR SEEDING MIX TABLES SEE SHEET P-21.
2. SEED MIX ZONE 6 AND SEED MIX ZONE FOR FINE GRAINED BORROW AREA NOT SHOWN HEREON.
3. SEED MIX ZONES NECESSARY FOR RECLAMATION OF EXTENT OF DISTURBANCE NOT SHOWN HEREON AND SHALL BE DETERMINED BY THE CONTRACTOR.

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VEGETATION PLAN

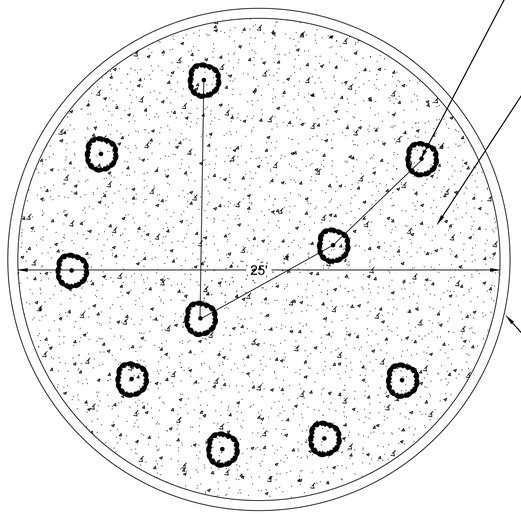
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2 #5 AND 8 D40 SHRUBS (10 TOTAL) PLANTED RANDOMLY APPROXIMATELY 7' O.C. SPACING

BACKFILL PLANTING POCKET WITH 12' MINIMUM UNCONSOLIDATED TOPSOIL 28 CYDS PER POCKET

25' DIAMETER PLANTING POCKET APPROXIMATELY 500 SQUARE FEET EACH. EACH PLANTING POCKET TO BE RANDOMLY AND IRREGULARLY SHAPED. DO NOT CREATE AS A UNIFORM REGULAR SHAPE. POCKET TO BE DUG 2' DEEP CREATED BY EXCAVATOR. FINAL SURFACE OF PLANTING POCKET SHALL BE RECESSED 0.5' LOWER THAN SURROUNDING SURFACE

ENTIRE PLANTING POCKET TO BE COVERED WITH 3" DEPTH OF WOOD CHIPS

1 PLANTING POCKET
N.T.S.

Table 1. Total Bank Stabilization Lengths (ft)

Bank Stabilization Types	Main Channel	Side Channel 1	Side Channel 2	Total Length
A	2691	670	285	3650
B	3561	634	396	4600
C	3820	464	442	4730
D	196	25	42	270
E	2711	340	238	3290
			Total	16540

Table 2. CRCC Bank Stabilizations Shrubs Species and Sizes

Common Name	Scientific Name	Sizes		
		D40	D60	#5
Park willow (SS)	*Salix monticola*	1143	2104	815
Geyer's willow (SS)	*Salix geyeriana*	1143	2104	815
Thin-leaf alder (AI)	*Alnus incana*	758	0	0
Narrowleaf cottonwood (PA)	*Populus angustifolia*	1745	0	0
	Total	4789	4208	1630

Note: Assumes 16,390 linear feet of Type A, B, C, D, and E Bank Stabilization Types.

Table 3. Floodplain Riparian Wetland Depression Plantings

Common Name	Scientific Name	Sizes		
		D40	D60	#5
Park willow (SS)	*Salix monticola*	111	306	0
Geyer's willow (SS)	*Salix geyeriana*	111	306	0
Thin-leaf alder (AI)	*Alnus incana*	625	0	0
Narrowleaf cottonwood (PA)	*Populus angustifolia*	625	0	61
	Total	1472	612	61

Note: *Assumes 3.4 acres*

Table 4. Riparian Planting Pockets

Common Name	Scientific Name	D40/Pocket	D40 Total*	#5/Pocket*	#5 Total
	Spacing (ft on center)	**7**	**7**	**7**	**7**
Park willow (SS)	*Salix monticola*	1	212	0	0
Geyer's willow (SS)	*Salix geyeriana*	1	212	1	212
Thin-leaf alder (AI)	*Alnus incana*	3	636	0	0
Narrowleaf cottonwood (PA)	*Populus angustifolia*	3	636	1	212
	Total	8	1696	2	424

Note: **Quantity assumes 212 Total Planting Pockets .*
Zone 2 (132 Pockets) Zone 3 (80 Pockets)
Average random spacing of approximately 7' on center within each pocket

Table 5. Extra Shrubs Areas To Be Determined-Individual Plantings

Common Name	Scientific Name	Sizes		
		D40	D60	#5
Park willow (SS)	*Salix monticola*	93	514	5
Geyer's willow (SS)	*Salix geyeriana*	93	514	5
Thin-leaf alder (AI)	*Alnus incana*	343	0	0
Narrowleaf cottonwood (PA)	*Populus angustifolia*	517	0	151
	Total	**1046**	**1028**	**161**

Note: Extra shrubs to be planted in Wetland 1 &2 and Floodplain Riparian Wetland Depression 1 & 2.
To be field determined.

Table 6. Total Project Shrubs Species and Sizes

Common Name	Scientific Name	Sizes		
		D40	D60	#5
Park willow (SS)	*Salix monticola*	1559	2924	820
Geyer's willow (SS)	*Salix geyeriana*	1559	2924	1032
Thin-leaf alder (AI)	*Alnus incana*	2362	0	0
Narrowleaf cottonwood (PA)	*Populus angustifolia*	3523	0	424
	Total	**9003**	**5848**	**2276**

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SHEET TITLE

VEGETATION DETAILS AND TABLES

SHEET NUMBER

P-20

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Zone 1 - Bank Stabilization - Nearbank Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Beckmannia syzigachne	American sloughgrass	Cool	15	0.85	4.35
Bromus marginatus	Mountain brome	Cool	5	5.10	26.03
Calamagrostis canadensis	Bluejoint reedgrass	Cool	5	0.14	0.73
Carex nebrascensis	Nebraska sedge	Cool	2	0.24	1.25
Carex praegracilis	Clustered field sedge	Cool	2	0.20	1.00
Carex utriculata	Northern territory sedge	Cool	2	0.29	1.50
Deschampsia caespitosa	Tufted hairgrass	Cool	20	0.87	4.44
Eleocharis palustris	Common spikerush	Cool	5	0.53	2.69
Elymus trachycaulus	Slender wheatgrass	Cool	10	4.11	20.96
Geum macrophyllum	Largeleaf avens	N/A	1	0.22	1.11
Glyceria grandis	American mannagrass	Cool	16	0.82	4.17
Hordeum brachyantherum	Meadow barley	Cool	10	7.69	39.20
Hymenoxys hoopesii	Orange sneezeweed	N/A	1	0.36	1.83
Juncus arcticus ssp. littoralis	Mountain rush	Cool	3	0.02	0.09
Juncus torreyi	Torrey's rush	Cool	2	0.01	0.05
Mimulus guttatus	Yellow monkeyflower	N/A	1	0.02	0.08
		Total:	**100**	**21.45**	**109.42**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on 5.1 acres of Zone 1 seeding.

Zone 2 - Riparian (2-Year Inundation) Outside of Bank Stabilization Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Asclepias speciosa	Showy milkweed	N/A	1	1.13	15.43
Beckmannia syzigachne	American sloughgrass	Cool	5	0.28	3.89
Bromus marginatus	Mountain brome	Cool	5	5.10	69.93
Calamagrostis canadensis	Bluejoint reedgrass	Cool	5	0.14	1.97
Deschampsia caespitosa	Tufted hairgrass	Cool	10	0.44	5.97
Elymus laceolatus ssp. lanceolatus	Streambank wheatgrass	Cool	10	4.24	58.13
Elymus trachycaulus	Slender wheatgrass	Cool	15	6.16	84.45
Glyceria grandis	American mannagrass	Cool	10	0.51	6.99
Hordeum brachyantherum	Meadow barley	Cool	15	11.53	157.97
Iris missouriensis	Rocky Mountain iris	N/A	2	6.22	85.25
Juncus arcticus ssp. littoralis	Mountain rush	Cool	3	0.02	0.25
Juncus tenuis	Poverty rush	Cool	2	0.01	0.14
Juncus torreyi	Torrey's rush	Cool	2	0.01	0.15
Pascopyrum smithii	Western wheatgrass	Cool	15	8.91	122.07
Verbena hastata	Swamp verbena	N/A	1	0.04	0.50
		Total:	**100**	**43.59**	**597.15**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on 13.7 acres of Zone 2 seeding.

Zone 3 - Riparian (5-Year Inundation) Transition Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Achnatherum hymenoides	Indian ricegrass	Cool	5	2.32	48.43
Bromus marginatus	Mountain brome	Cool	15	15.31	320.06
Chamerion angustifolium	Fireweed	N/A	2	0.02	0.32
Deschampsia caespitosa	Tufted hairgrass	Cool	10	0.44	9.10
Elymus lanceolatus ssp. lanceolatus	Streambank wheatgrass	Cool	20	8.49	177.35
Elymus trachycaulus	Slender wheatgrass	Cool	15	6.16	128.83
Hordeum brachyantherum	Meadow barley	Cool	10	7.69	160.66
Juncus arcticus ssp. littoralis	Mountain rush	Cool	1	0.01	0.13
Pascopyrum smithii	Western wheatgrass	Cool	20	11.88	248.29
Solidago canadensis	Canada goldenrod	N/A	1	0.09	1.95
Thermopsos montana	Mountain goldenbanner	N/A	1	4.36	91.04
		Total:	**100**	**56.75**	**1186.17**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on 20.9 acres of Zone 3 seeding.

Zone 4 - Upland (10 Year Inundation) Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Achillea millefolium	Western yarrow	N/A	1	0.02	0.35
Achnatherum hymenoides	Indian ricegrass	Cool	10	4.63	68.58
Bouteloua gracilis	Blue grama	Warm	10	0.79	11.72
Bromus marginatus	Mountain brome	Cool	10	10.21	151.10
Festuca saximontana	Rocky mountain fescue	Cool	9	0.49	7.24
Koeleria macrantha	Junegrass	Cool	9	0.25	3.76
Muhlenbergia montana	Mountain muhly	Warm	20	0.87	12.89
Pascopyrum smithii	Western wheatgrass	Cool	20	11.88	175.82
Penstemon strictus	Rocky Mountain penstemon	N/A	1	0.11	1.63
Poa secunda	Sandberg bluegrass	Cool	10	0.62	9.24
		Total:	**100**	**29.89**	**442.34**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on a total of 14.8 acres of Zone 4 seeding.

Zone 5 - Wetland Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Beckmannia syzigachne	American sloughgrass	Cool	20	1.136	14.55
Calamagrostis canadensis	Bluejoint reedgrass	Cool	15	0.432	5.53
Carex aquatilis	Water sedge	Cool	2	0.269	3.45
Carex nebrascensis	Nebraska sedge	Cool	2	0.245	3.13
Deschampsia caespitosa	Tufted hairgrass	Cool	15	0.653	8.36
Glyceria grandis	American mannagrass	Cool	20	1.021	13.07
Hordeum brachyantherum	Meadow barley	Cool	5	3.844	49.20
Juncus arcticus ssp. littoralis	Mountain rush	Cool	2	0.012	0.15
Juncus ensifolius	Three-stamen rush	Cool	2	0.045	0.57
Iris missouriensis	Rocky Mountain iris	N/A	1	3.111	39.83
Mimulus guttatus	Yellow monkeyflower	N/A	2	0.033	0.42
Scirpus microcarpus	Smallfruit bulrush	Cool	14	0.203	2.60
		Total:	**100**	**11.00**	**140.86**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on 12.8 acres of wetland seeding.

Zone 6 - Seed Mix					
Scientific Name	**Common Name**	**Seasonality**	**% of Mix**	**LBS/PLS per Acre**	**LBS/PLS Required**
Bouteloua gracilis	Blue grama	Warm	10	0.79	15.84
Bromus marginatus	Mountain brome	Cool	20	20.42	408.38
Elymus elymoides	Squirreltail bottlebrush	Cool	20	6.81	136.13
Koeleria macrantha	Junegrass	Cool	5	0.14	2.82
Pascopyrum smithii	Western wheatgrass	Cool	20	11.88	237.60
Poa fendleriana	Muttongrass	Cool	15	1.10	22.02
Poa secunda	Sandberg bluegrass	Cool	10	0.62	12.48
		Total:	**100**	**41.76**	**835.27**

Notes:
Quantity assumes 150 seeds per square foot drill seeded. Increase by 50% for broadcast seeding.
Quantity based on a total of 20.0 acres of Zone 6 seeding. Exact zone location has not been determined.

NOTES:

1. FOR SEEDING ZONE DELINEATION SEE SHEET P-19
2. ZONE 4 SEED MIX TO BE UTILIZED FOR FINE GRAINED BORROW AREA RECLAMATION WITH THE FOLLOWING MODIFICATIONS:
   - REDUCE MUHLENBERGIA MONTANA (MOUNTAIN MUHLY) TO 10%
   - REDUCE PASCOPYRUN SMITHII (WESTERN WHEATGRASS) TO 15%
   - ADD 5% PURSHIA TRIDENTATA (ANTELOPE BITTERBRUSH)
   - ADD 10% ARTEMSIA TRIDENTATAT VASSEYENA (MOUNTAIN BIG SAGEBRUSH)
3. THE MODIFIED ZONE 4 SEED MIX TO BE UTILIZED FOR FINE GRAINED BORROW AREA RECLAMATION IS IN ADDITION TO THAT SHOWN ON THE ZONE 4 SEED MIX TABLE AND THE REQUIRED QUANTITY SHALL BE ESTIMATED BY THE CONTRACTOR

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SEED MIX TABLES

SHEET NUMBER
P-21



PLAN VIEW

50 0 50 100

SCALE IN FEET

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MAJOR 5 FOOT

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C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

FRASER RIVER WEIR
EXISTING SITE CONDITIONS

SHEET NUMBER

F-01

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SPECIFICATIONS AND MATERIAL QUANTITIES

RIVERBED FILL

1. FILL SHALL BE COMPOSED OF SORTED NATIVE ALLUVIAL MATERIAL WITH A D_{50} OF LESS THAN 6". INSTALLED MATERIAL SHALL BE TRACK ROLLED WITH A MINIMUM OF 4 PASSES.
2. ESTIMATED QUANTITY IMPORTED MATERIAL 1,100 CY, CONTRACTOR TO CONFIRM PRIOR TO CONSTRUCTION.
   - IF INSUFFICIENT ROUNDED RIVER ROCK IS AVAILABLE, ANY FILL 18" OR MORE BELOW THE SURFACE MAY SUBSTITUTE ANGULAR ROCK FOR THE LARGER ROUNDED RIVER ROCK.

RIPRAP

3. RIPRAP SHALL CONFORM TO SPECIFICATION SECTION 31 37 00.
4. CONTRACTOR SHALL REUSE ALL ONSITE MATERIAL.
5. BANK RIPRAP SHALL BE INCREASED AS NEEDED IN MARKED AREAS TO MEET DETAIL IN SHEET F-06.
6. ESTIMATED QUANTITY IMPORTED MATERIAL 800 CY (2,000 TONS), CONTRACTOR TO CONFIRM PRIOR TO CONSTRUCTION

GEOTEXTILE FABRIC

7. EXCEPT WHERE NOTED, GEOTEXTILE FABRIC SHALL BE CLASS 1 PER CDOT SECTION 712.08 AND AASHTO SPECIFICATION M-288.
8. FABRIC INSTALLATION PER CDOT SECTION 420.06 WITH MINIMUM OVERLAY 24" BETWEEN ADJACENT PIECES.
9. GEOTEXTILE SHALL BE INSTALLED UNDER RIPRAP WHERE EXISTING BANK IS DISTURBED DURING CONSTRUCTION.
10. GEOTEXTILE IS NOT REQUIRED ON BANK AREAS NOT DISTURBED DURING CONSTRUCTION.
11. GEOTEXTILE SHALL BE INSTALLED UNDER ARTICULATED CONCRETE BLOCK ROADWAY AS SHOWN IN SHEET F-05.
12. ESTIMATED QUANTITY 15,000 SF

HABITAT CLUSTERS

13. BOULDERS SHALL HAVE THE FOLLOWING SIZE DISTRIBUTION.
    - 70% NOMINAL 24", SMALLEST DIMENSION 20-28"
    - 30% NOMINAL 18", SMALLEST DIMENSION 14-22"
14. BOULDERS SHALL BE ANGULAR AS DESCRIBED IN RIPRAP SPECIFICATION 31 37 00.
    - MATERIAL SELECTION TO BE APPROVED BY ENGINEER.
15. ESTIMATED QUANTITY 50 TONS (80± BOULDERS WITH 80± FOOTER ROCKS), CONTRACTOR TO CONFIRM PRIOR TO CONSTRUCTION

ARTICULATED CONCRETE BLOCK ROADWAY

16. CONTECH ARMORFLEX ACB85 OR ENGINEER APPROVED EQUIVALENT.
17. INSTALLATION SHALL CONFORM WITH NATIONAL CONCRETE MASONRY ASSOCIATED DESIGN MANUAL FOR ACB REVETMENT SYSTEMS SECTION 7.
18. ESTIMATED ROADWAY LENGTH 160 LF

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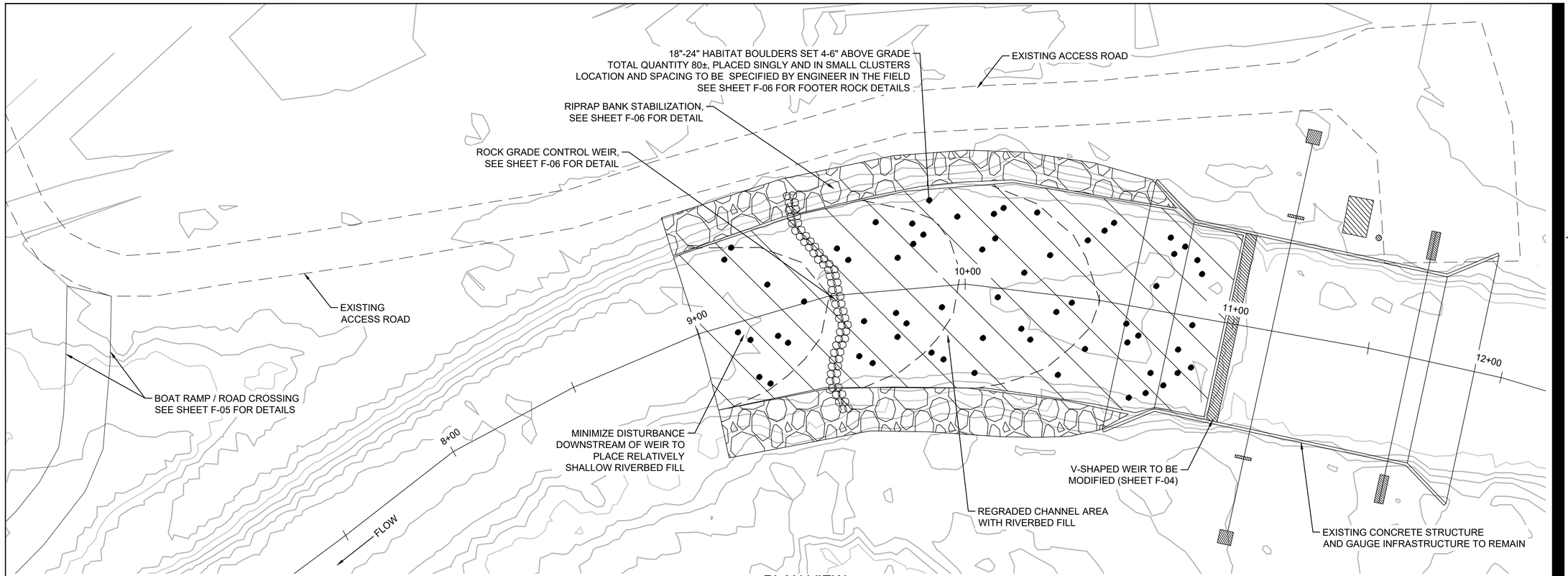
SHEET TITLE

FRASER RIVER WEIR
SPECIFICATIONS AND QUANTITIES

SHEET NUMBER

F-02

Project Management Initials: Designer: Checked: Approved: ANSI D 22" x 34"

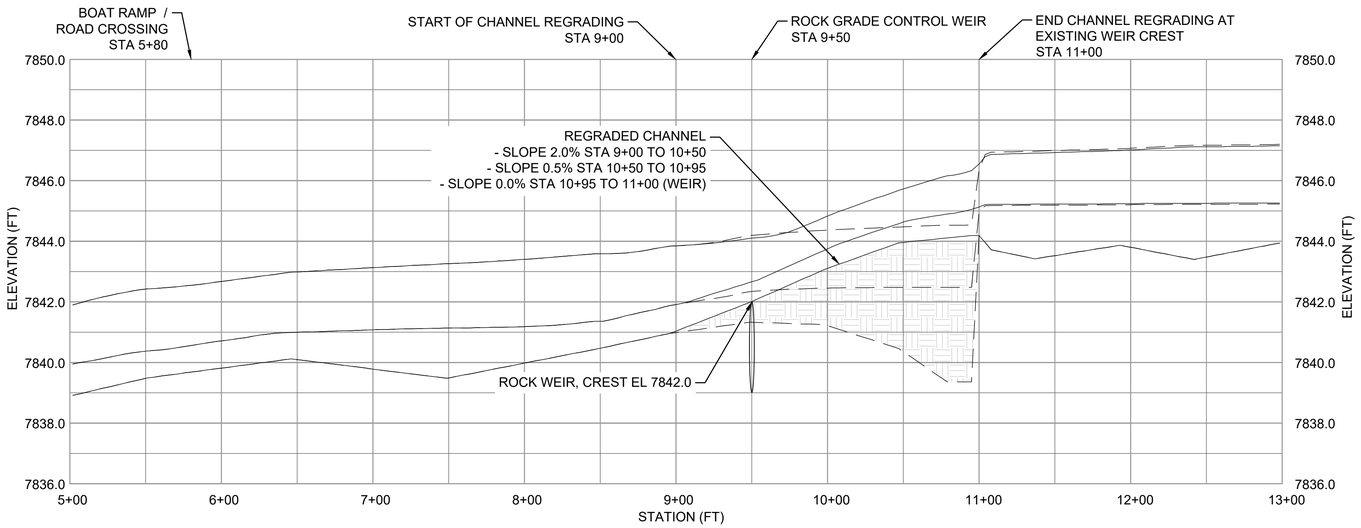


PLAN VIEW

20 0 20 40
SCALE IN FEET

N

CONTOUR INTERVAL: MINOR 1 FOOT
MAJOR 5 FOOT



CENTERLINE PROFILE

50 0 50 100
SCALE IN FEET (HORIZ)

2 0 2 4
SCALE IN FEET (VERT)

LEGEND

- PROPOSED MINOR CONTOUR (1 FT)
- PROPOSED MAJOR CONTOUR (5 FT)
- EXISTING GROUND
- PROPOSED GROUND
- EXISTING WS (40 CFS)
- PROPOSED WS (40 CFS)
- EXISTING WS (540 CFS)
- PROPOSED WS (540 CFS)
- RIVERBED FILL (SEE SHEET F-02)

NOTES:

1. 40 AND 540 CFS REPRESENT THE 5% AND 95% EXCEEDANCE VALUES FOR MEAN DAILY FLOW AT THIS SITE. THESE ARE COMMONLY USED AS THE RANGE OF FLOWS FOR WHICH UPSTREAM FISH PASSAGE SHOULD BE PROVIDED.
2. FOR CROSS SECTIONS SEE SHEET F-04.

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5/31/22

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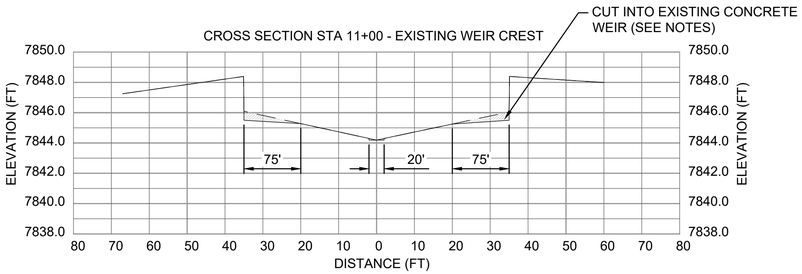
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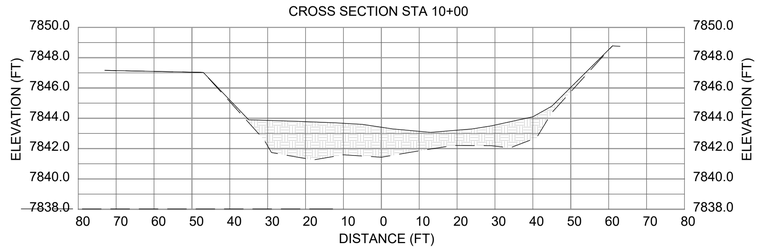
FRASER RIVER WEIR
REGRADING PLAN AND PROFILE

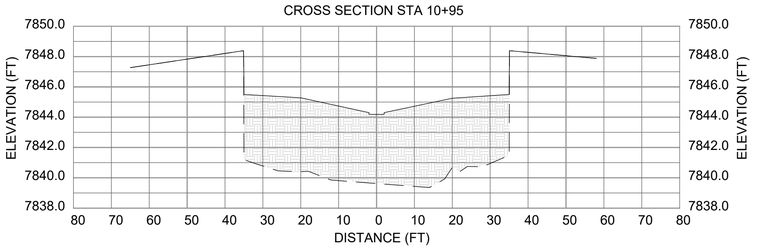
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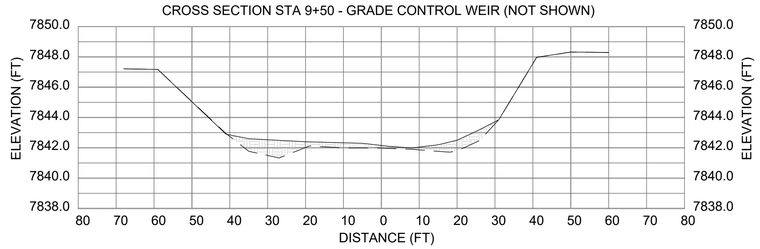
F-03

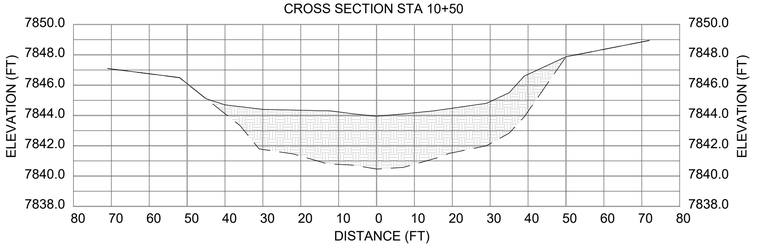
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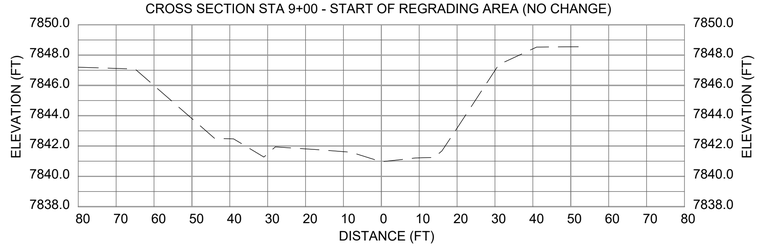












CROSS SECTIONS

20 0 20 40
SCALE IN FEET (HORIZ)

10 0 10 20
SCALE IN FEET (VERT)

CONCRETE CUTTING NOTES:

1. AT EACH EDGE OF THE WEIR:
   - CUT 0.6 FEET DOWN TO EL 7845.5' ±.
   - CUT OUT TO MEET THE EXISTING CREST 15' FROM THE WALL AT EL 7845.3' ±.
2. AT THE CENTER OF THE WEIR:
   - CUT DOWN TO CREATE A 4' WIDE SECTION AT THE EXISTING EL 7844.2' ±.
3. ANY EXPOSED REINFORCEMENT SHALL BE PAINTED WITH A PROTECTIVE EPOXY COATING TO PREVENT CORROSION:
   - COATING SHALL COVER AN AREA WITHIN 4" OF ALL EXPOSED METAL.
   - SIKA SIKAGARD-62 OR EQUIVALENT AS APPROVED BY ENGINEER.
   - APPLY PER MANUFACTURER APPLICATION INSTRUCTIONS.
4. ESTIMATED CUT 65' LENGTH, MAX DEPTH 1.5'.

LEGEND

- EXISTING GROUND
- PROPOSED GROUND
- RIVERBED FILL (SEE SHEET F-02)
- CONCRETE REMOVAL

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PROJECT NUMBER

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SHEET TITLE

FRASER RIVER WEIR
CROSS SECTIONS

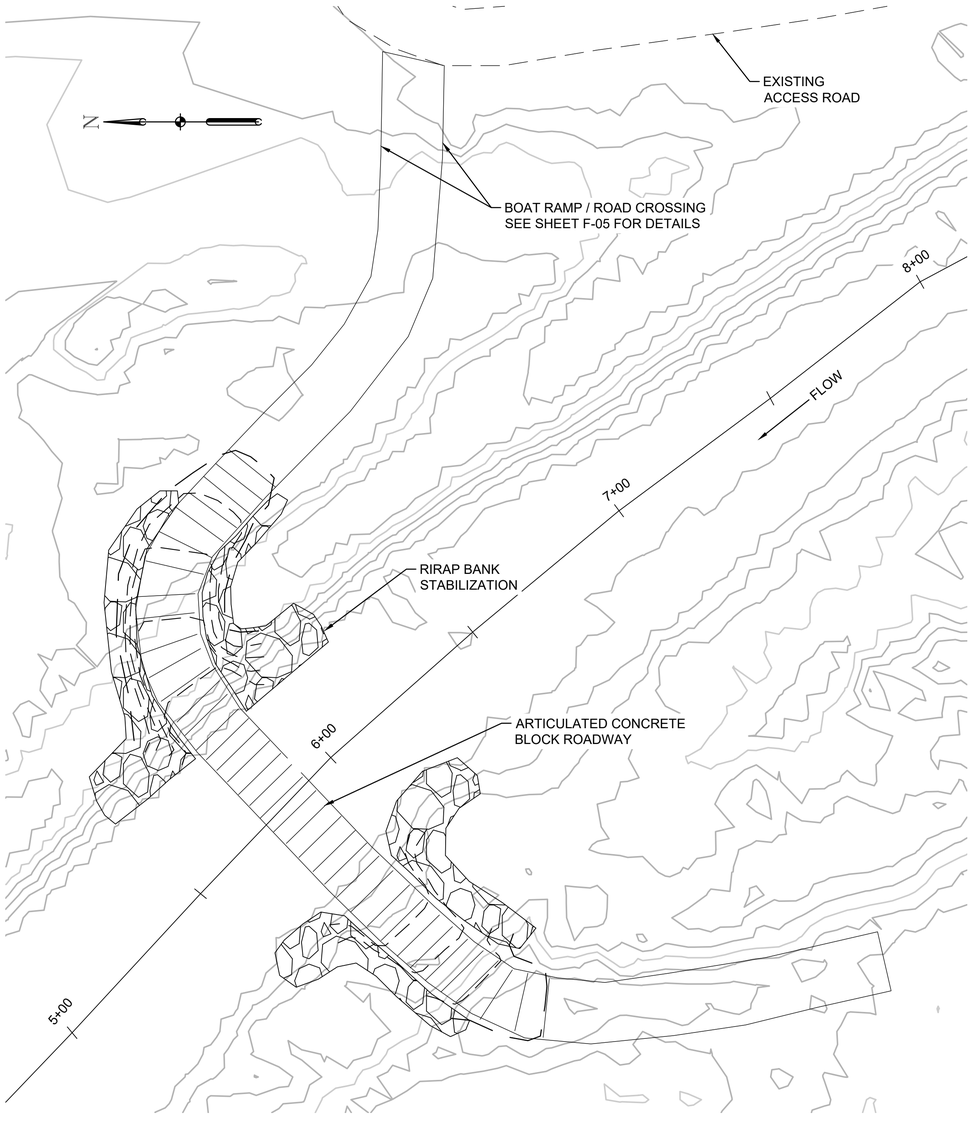
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F-04

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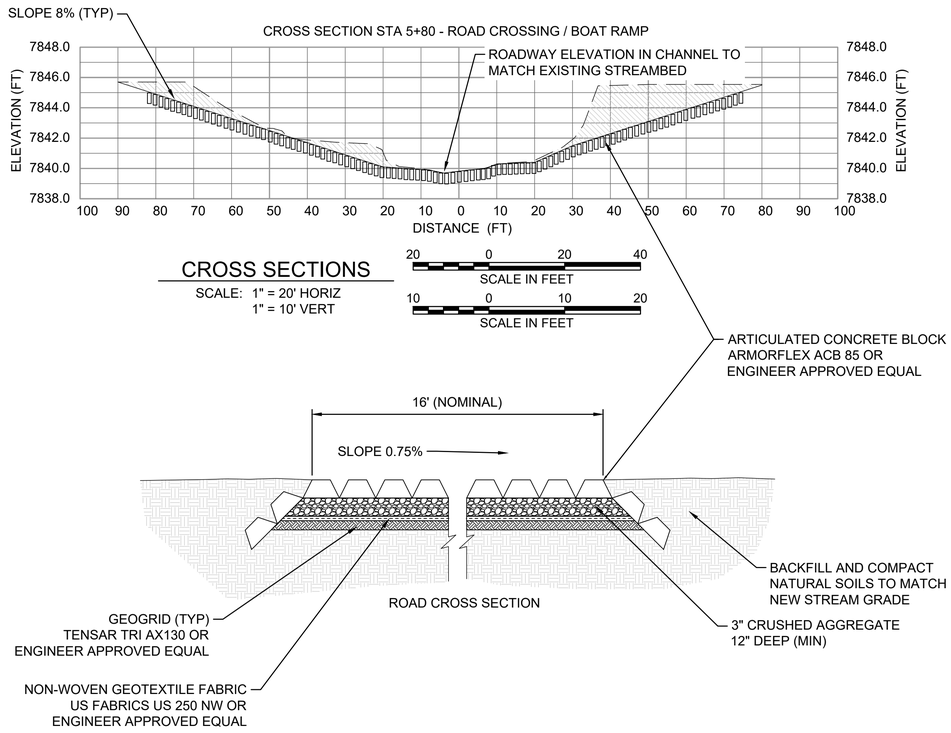
LEGEND

— — — PROPOSED MINOR CONTOUR (1 FT)
—— —— PROPOSED MAJOR CONTOUR (5 FT)

PLAN VIEW

20 0 20 40
SCALE IN FEET

CONTOUR INTERVAL: MINOR 1 FOOT
MAJOR 5 FOOT



CROSS SECTIONS

SCALE: 1" = 20' HORIZ
1" = 10' VERT

20 0 20 40
SCALE IN FEET

10 0 10 20
SCALE IN FEET

ROAD CROSSING / BOAT RAMP

N.T.S.

LEGEND

— — EXISTING GROUND
—— PROPOSED GROUND
EXCAVATION

ISSUED FOR CONSTRUCTION

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PROJECT NUMBER

60619047

SHEET TITLE

FRASER RIVER WEIR LOW WATER ROAD CROSSING AND BOAT RAMP

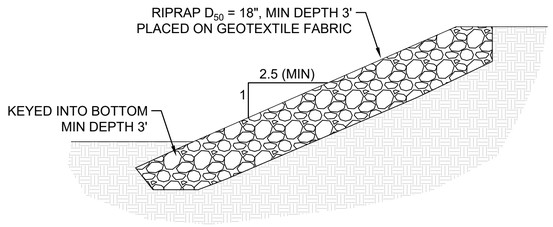
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F-05

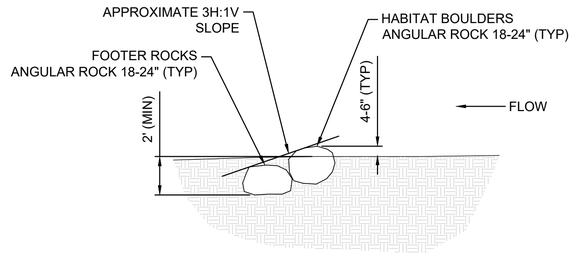
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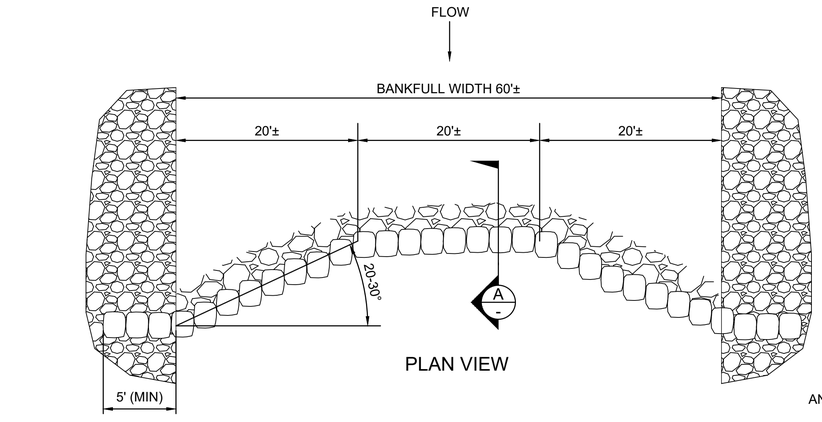
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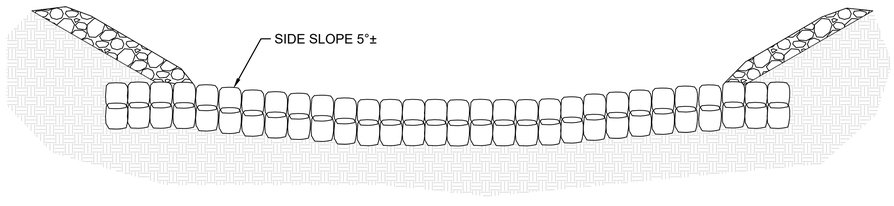
BANK STABILIZATION (TYP)
N.T.S.



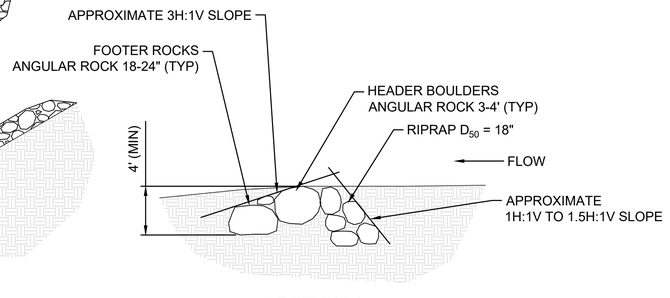
FRASER RIVER WEIR
HABITAT CLUSTERS (TYP)
N.T.S.



PLAN VIEW



ELEVATION VIEW



SECTION A

ROCK WEIR
N.T.S.

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SHEET TITLE

FRASER RIVER WEIR
DETAILS

SHEET NUMBER

F-06

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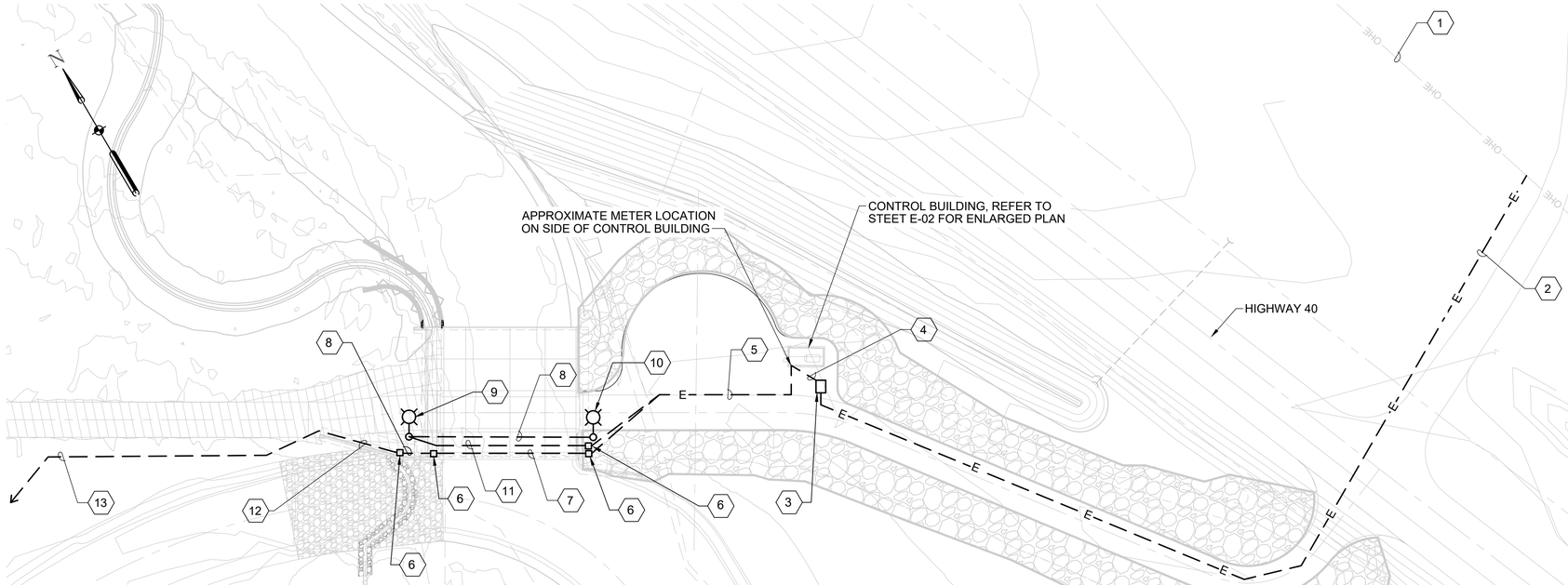
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LIGHT FIXTURE SCHEDULE

FIXTURE DESIGNATION	DESCRIPTION	VOLTAGE	LAMPS		MINIMUM EFICIENCY	SMH RATIO	REMARKS	INPUT VA
			QUANTITIY	TYPE				
⊸○	LITHONIA POLE MOUNTED LED AREA LIGHT, PART # DSX0 LED P5 40K T3M MVOLT SPA DDBXD. LITHONIA 20' SQUARE STRAIGHT ALUMINUM POLE, PARE # SSA 20 5G DM19AS DDBXD.	120	-	LED			PROVIDE 20AMP GFI RECEPTACLE IN BASE OF BOTH POLES. PROVIDE 1 POLE WITH MOUNTING FOR SECURITY CAMERA, FIELD VERIFY HEIGHT.	89



DIVERSION STRUCTURE AND CONTROL BUILDING ELECTRICAL PLAN

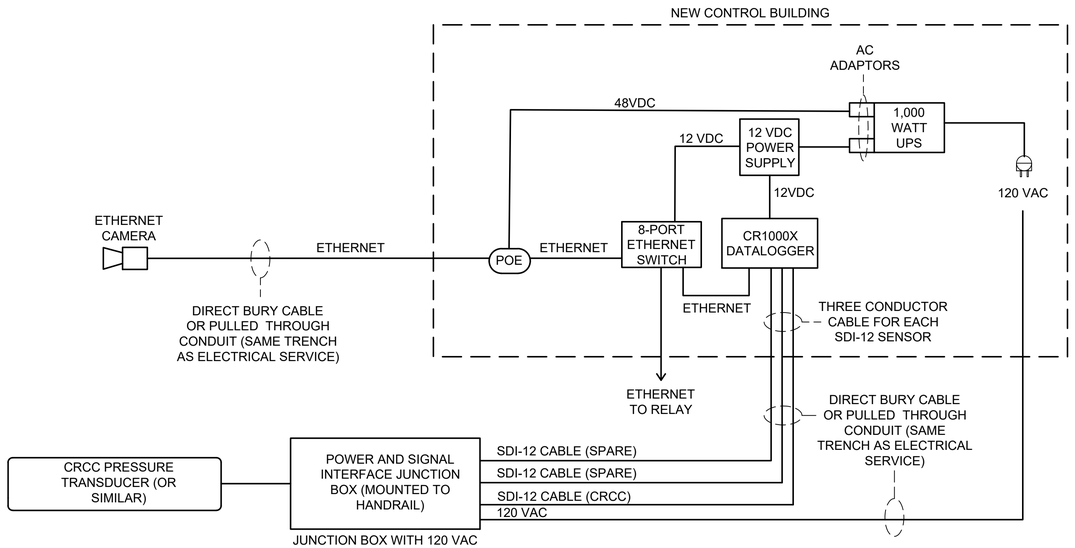
40 0 40 80
SCALE IN FEET

NOTES:

1. ONLY THE CRCC PRESSURE TRANSDUCER (OR SIMILAR) TO BE INSTALLED AS PART OF THIS PROJECT. TWO ADDITIONAL SENSOR CONDUCTOR CABLES ARE TO BE PROVIDED FROM THE CONTROL BUILDING TO THE POWER AND SIGNAL INTERFACE JUNCTION BOX FOR CONNECTION OF FUTURE SENSORS AND INSTRUMENTS THAT NORTHERN WATER MAY WISH TO INSTALL. THE WIRING ARRANGEMENT SHOWN ON THIS SHEET MAY NEED TO BE ADJUSTED DEPENDING ON THE SPECIFIC PRESSURE TRANSDUCER (OR SIMILAR) SELECTED.

2. THE CONTRACTOR IS TO INSTALL ALL ELECTRICAL RELATED FEATURES AND ALL CONDUITS NECESSARY FOR THE PRESSURE TRANSDUCER (OR SIMILAR) AND SECURITY CAMERA INSTALLATION. NORTHERN WATER WILL PURCHASE AND COMPLETE THE INSTALLATION OF THE PRESSURE TRANSDUCER, SECURITY CAMERA AND SIGNAL RELAY FEATURES FOR THE PROJECT. THIS WILL REQUIRE THE CONTRACTOR TO WORK DIRECTLY WITH THE ENGINEER AND RELEVANT NORTHERN WATER INSTRUMENTATION STAFF TO ENSURE THAT THE CONTRACTOR INSTALLED FEATURES ARE COMPATIBLE WITH THE FEATURES TO BE INSTALLED BY NORTHERN WATER.

3. AN AXIS Q6315-LE SECURITY CAMERA IS ENVISIONED TO BE SUITABLE FOR INSTALLATION AS SHOWN ON THE WESTERN MOST LIGHT POLE. NORTHERN WATER SHOULD CONFIRM IF A DIFFERENT SECURITY CAMERA IS PREFERRED.



DIVERSION STRUCTURE INSTRUMENTATION DIAGRAM (FLOW SENSORS AND CAMERA ONLY)

KEYED NOTES:

1. EXISTING OVERHEAD POWER LINE. FIELD VERIFY EXACT LOCATION OF CONNECTION POLE WITH MOUNTAIN PARKS ELECTRIC (MPE).
2. UNDERGROUND PRIMARY FEEDER. COORDINATE WITH MPE.
3. PROPOSED PAD-MOUNTED TRANSFORMER LOCATION. FIELD VERIFY EXACT LOCATION WITH MPE. PROVIDE CONCRETE PAD AND GROUND GRID, REFER TO TRANSFORMER PAD DETAIL ON SHEET E-02.
4. UNDERGROUND SERVICE ENTRANCE, REFER TO ONE-LINE ON SHEET E-02.
5. UNDERGROUND FEEDERS TO LIGHTS, RECEPTACLES, CAMERA AND FLOW SENSOR AS FOLLOWS:

   EXTEND THE FOLLOWING TO LIGHT POLE:
   LIGHT POLES - 2-#12, 1#12G, FOR POWER AND 4#12 FOR SWITCH CONTROL 1"C. FROM PANEL LL CKT 5.

   RECEPTACLES - 2-#12, 1#12G., 1"C FROM PANEL LL CKT 4.

   EXTEND THE FOLLOWING TO JUNCTION BOX FOR CAMERA CAT6, 1"C FROM ADAS EQUIPMENT.

   EXTEND THE FOLLOWING TO JUNCTION BOX:
   FLOW SENSOR - (3)SDI-12 CABLES, 2"C FROM ADAS EQUIPMENT. 2#12, 1#12G., 1"C. FROM ADAS EQUIPMENT FOR POWER
6. 12"x12"x6" NEMA 4X JUNCTION BOX WITH HINGED COVER. MOUNT TO RAILING WITH SST HARDWARE.
7. (3)SDI-12 CABLE, 2"C. ROUTE ON BRIDGE SUPPORT. FIELD SELECT BEST ROUTING.
8. LIGHT POLES - 4#12, 1#12G,. FOR POWER AND SWITCH CONTROL 1"C. FROM PANEL LL.
   RECEPTACLES - 2#12, 1#12G., 1"C FROM PANEL LL.
   ROUTE ON BRIDGE SUPPORT. FIELD SELECT BEST ROUTING.
9. TYPE A POLE MOUNTED LIGHT, REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E-02. PROVIDE 20AMP, GFI RECEPTACLE WITH LOCKING COVER AND CAMERA. MOUNT CAMERA AT HEIGHT AS DIRECTED.
10. TYPE A POLE MOUNTED LIGHT, REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E-02. PROVIDE 20AMP, GFI RECEPTACLE WITH LOCKING COVER.
11. 1"C WITH CAT6 CABLING FOR CAMERA CONNECTION. ROUTE ON BRIDGE SUPPORT. FIELD SELECT BEST ROUTING.
12. (1)SDI-12 CABLE, 2"C. MOUNT TO RAILING WITH SST HARDWARE. FIELD SELECT BEST ROUTING.
13. (1)SDI-12 CABLE, 2"C. BURY CONDUIT AS DIRECTED IN THE FIELD.

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60619047

SHEET TITLE

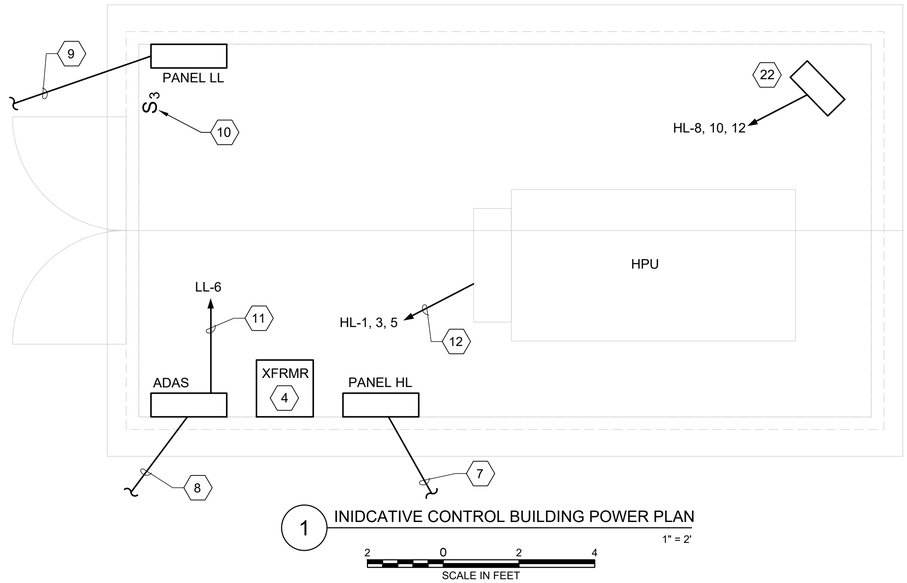
ELECTRICAL SITE PLAN AND INSTRUMENTATION DIAGRAM

SHEET NUMBER

E-01

Last saved by: HAMBUCHG(2022-04-29) Last Plotted: 2022-05-04
Filename: L:\DOS\PROJECTS\WTR\60619047_CRCC_NORTH\900_CAD_GIS\910_CAD\20-SHEETS\E-01 OVERFLOW ELECTRICAL SITE PLAN.DWG

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1 INIDCATIVE CONTROL BUILDING POWER PLAN

1" = 2'

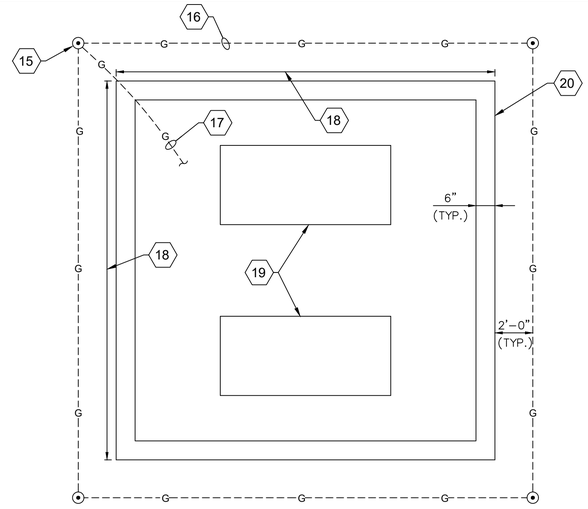
SCALE IN FEET

PANELBOARD : HL				200A MAIN BUS						200A MAIN BREAKER			
VOLTS : 277/480 VOLTS				3Ø, 4 WIRE, SURFACE MOUNTED						42 KAMPS SYM. A.I.C. MINIMUM			
POLE NO.	TRIP AMPS	NO. POLE	WIRE	LOAD SERVED	LOAD-kVA A	LOAD-kVA B	LOAD-kVA C	POLE NO.	TRIP AMPS	NO. POLE	WIRE	LOAD SERVED
1	100	3	50	HPU	12.5			2	60	2		PANEL LL VIA TRANSFORMER
3	--	--				12.5		4	--	--		
5	--	--						6				
7	30	3		SPD	1.7			8	15	3		HEATER
9	--	--				1.7		10	--	--		
11	--	--					1.7	12	--	--		
13								14				
15								16				
17								18				
19								20				
21								22				
23								24				

TOTAL CONNECTED LOAD ? -kVA ? -AMPS | TOTAL PER PH. LOAD = APH BPH CPH | DEMAND FACTOR ? EST DEMAND LOAD ? kVA ? AMPS | SERVICE ENTRANCE RATED

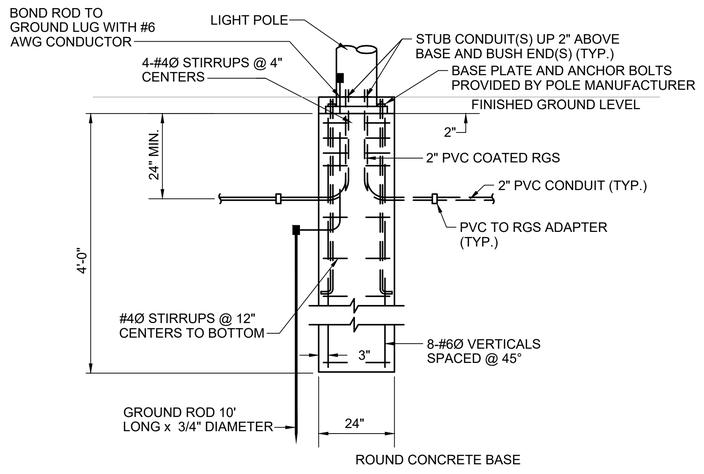
PANELBOARD : LL				100A MAIN BUS						100A MAIN BREAKER			
VOLTS : 120V/240V				1Ø, 3 WIRE, SURFACE MOUNTED						10 KAMPS SYM. A.I.C. MINIMUM			
POLE NO.	TRIP AMPS	NO. POLE	WIRE	LOAD SERVED	LOAD-kVA A	LOAD-kVA B	POLE NO.	TRIP AMPS	NO. POLE	WIRE	LOAD SERVED	
1	20	1		INTERIOR LIGHTS - CONTROL BUILDING			2	20	1		RECEPTS - CONTROL BUILDING	
3	20	1		EXTERIOR LIGHTS - CONTROL BUILDING			4	20	1		POLE LIGHT RECEPTACLES	
5	20	1		EXTERIOR POLE LIGHTS			6	20	1		ADAS EQUIPMENT	
7	20	1		SPARE			8	20	1		SPARE	
9							10					
11							12					
13							14					
15							16					
17							18					
19							20					
21							22					
23							24					

TOTAL CONNECTED LOAD ? -kVA ? -AMPS | TOTAL PER PH. LOAD = APH BPH | DEMAND FACTOR ? EST DEMAND LOAD ? kVA ? AMPS | PANEL IS PROVIDED WITH CONTROL BUILDING



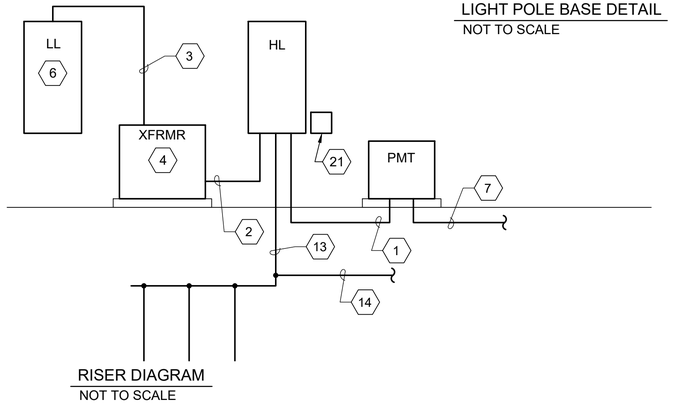
TRANSFORMER PAD DETAIL

NOT TO SCALE



LIGHT POLE BASE DETAIL

NOT TO SCALE



RISER DIAGRAM

NOT TO SCALE

KEYED NOTES:

1. 4#3/0, 3"C. SERVICE ENTRANCE.
2. 2#6, 1#10G., 1"C.
3. 3#3, 1#8G., 2"C.
4. 25 kVA, 480:120/240V, 1-PHASE TRANSFORMER.
5. ADAS EQUIPMENT. EXTEND CONDUIT AS SHOWN ON SITE PLAN. FURNISH AND INSTALL 20A RECEPTACLE ON WALL. REFER TO ADAS ARCHITECTURE DIAGRAM IN SET.
6. PANEL LL PROVIDED WITH BUILDING. LOCATION IS SHOWN FOR DESIGN ONLY. VERIFY EXACT LOCATION WITH MANUFACTURER SHOP DRAWINGS.
7. UNDERGROUND PRIMARY, REFER TO SITE PLAN.
8. FEEDERS TO ADAS EQUIPMENT, REFER TO SITE PLAN.
9. FEEDERS TO LIGHT POLES AND RECEPTACLES, REFER TO SITE PLAN.
10. 3-WAY SWITCH FOR POLE LIGHTS. LOCATE NEXT TO SWITCHES PROVIDE WITH BUILDING. LABEL AS EXTERIOR POOLE LIGHTS. CONNECT AS REQUIRED.
11. 2#12, 1#12G., 3/4"C.
12. 3#8, 1#10G., 1"C.
13. #4 GROUND IN 3/4" SCH. 40 PVC CONDUIT. BOND TO A MINIMUM OF THREE (3) 3/4"Øx10' COPPERCLAD DRIVEN GROUND RODS. (TYPICAL). SEE SPECIFICATIONS FOR REQUIREMENTS.
14. EXTEND #4 GROUND TO PAD MOUNTED TRANSFORMER AND CONNECT TO GROUND GRID.
15. 3/4" DIAMETER, 10'-0" COPPER-CLAD STEEL GROUND ROD. CONNECT GROUND CONDUCTOR TO ROD WITH EXOTHERMIC WELD APPROXIMATELY 12" BELOW FINISHED GRADE (TYP.).
16. DIRECT BURIED #4/0 GROUND CONDUCTOR APPROXIMATELY 18" BELOW FINISHED GRADE.
17. #4/0 GROUND CONDUCTOR EXTENDED OVER TO EQUIPMENT GROUNDING SYSTEM IN SCH. 40 PVC.
18. VERIFY DIMENSIONS WITH MANUFACTURER SUPPLIED SHOP DRAWINGS OR POWER COMPANY.
19. CONDUIT STUB-UP AREA. VERIFY SIZE, QUANTITY AND LOCATION WITH MANUFACTURER SUPPLIED SHOP DRAWINGS OR POWER COMPANY.
20. 8" (MIN.) THICK STRUCTURAL CONCRETE PAD. PAD SHALL EXTEND MIN. 6" ON ALL SIDES OF EQUIPMENT. REINFORCE CONCRETE WITH #4 @ 6" E.W. PROVIDE 12" (MIN.) THICKENED EDGE WITH (2) #5 CONT.
21. SPD, MOUNT ON WALL NEXT TO PANEL HL AND CONNECT. REFER TO SPECIFICATIONS FOR REQUIREMENTS.
22. 5 KW, 480V, 3-PHASE ELECTRIC UNIT HEATER WITH UNIT MOUNTED THERMOSTAT AND BUILT-IN DISCONNECT. PROVIDE WALL MOUNTED MOUNTING BRACKET. MARKEL 5100 SERIES OR APPROVED EQUAL.
23. BREAKER IS FOR BID PURPOSES ONLY. PROVIDE BREAKER SIZE AS SHOWN IN APPROVED SHOP DRAWINGS.

ISSUED FOR CONSTRUCTION

AECOM

PROJECT

COLORADO RIVER CONNECTIVITY CHANNEL (CRCC) AT WINDY GAP

CLIENT

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Northern Colorado Water Conservancy District
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800-369-7246 • www.northernwater.org

CONSULTANT

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CONSULTANTS

REGISTRATION



ISSUE/REVISION

I/R	DATE	DESCRIPTION
3	04/29/2022	ISSUED FOR CONSTRUCTION
2	04/06/2022	ISSUED FOR BID
1	12/13/2021	90% SUBMITTAL

SEO CONSTRUCTION NUMBER

C-1521A

PROJECT NUMBER

60619047

SHEET TITLE

CONTROL BUILDING ELECTRICAL PLAN AND SCHEDULES

SHEET NUMBER

E-02

89 OF 89

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI D 22" x 34"

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