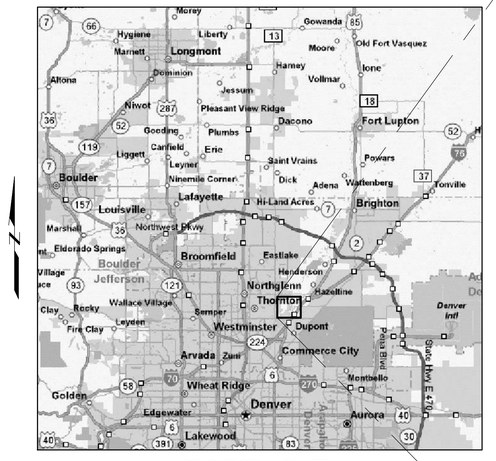
CITY OF THORNTON

WEST COOLEY RESERVOIR

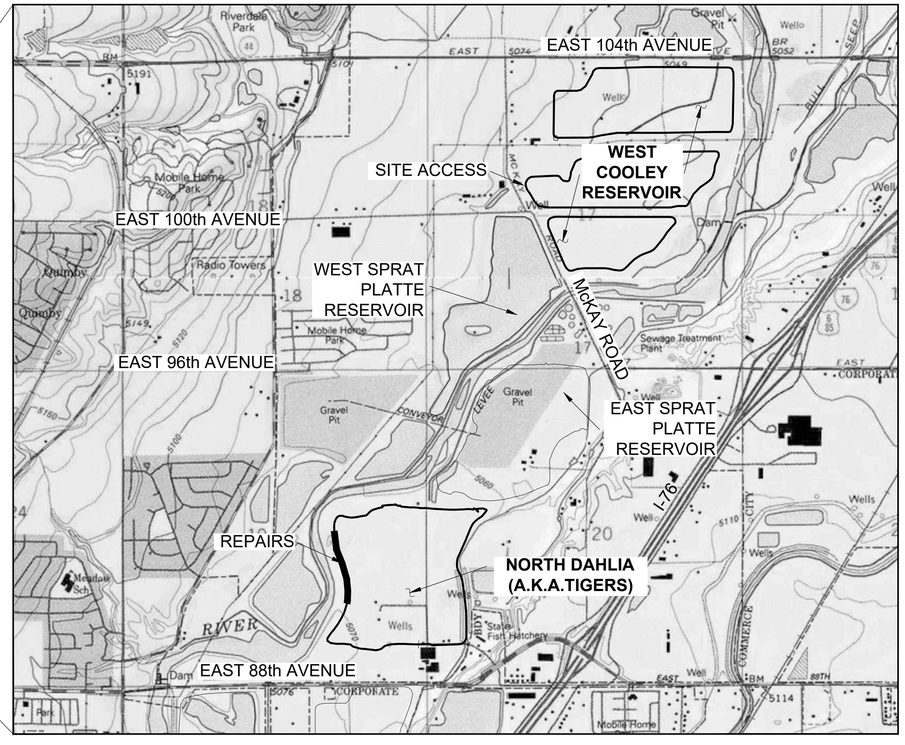
2015 FEMA FLOOD REPAIRS PROJECT

CIP NO. 16-351C
RECORD DRAWINGS



PROJECT VICINITY MAP

(NOT TO SCALE)



SITE LOCATION MAP

(NOT TO SCALE)

GENERAL PROJECT INFORMATION

AS OWNERS THEREOF WE HEREBY ACCEPT AND APPROVE THESE PLANS FOR CONSTRUCTION OF THE WEST COOLEY RESERVOIR – 2015 FLOOD REPAIRS PROJECT.

CITY OF THORNTON, COLORADO
OWNER

AMERICAN WEST CONSTRUCTION, LLC
CONTRACTOR

RJH CONSULTANTS, INC., ENGLEWOOD, COLORADO
ENGINEER

APRIL 25, 2019
CONSTRUCTION STARTED

AUGUST 29, 2020
CONSTRUCTION COMPLETED

CITY OF THORNTON APPROVALS

PROJECT MANAGER – EDUARDO MORENO	DATE
WATER RESOURCES SENIOR MANAGER – EDWARD LANYON	DATE
WATER RESOURCES MANAGER – EMILY HUNT	DATE
SENIOR CIVIL ENGINEER – DAN SHILTZ, P.E.	DATE
SENIOR CIVIL ENGINEER – JAMES KAISER, P.E., C.F.M.	DATE
EMERGENCY AND SAFETY ADMINISTRATOR – RYAN DOYLE	DATE

PREPARED FOR:

City of Thornton

PREPARED BY:

RJH CONSULTANTS, INC.

ENGLEWOOD • COLORADO

www.rjh-consultants.com

I HEREBY CERTIFY THAT THESE PLANS FOR THE WEST COOLEY RESERVOIR – 2015 FLOOD REPAIRS PROJECT WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) FOR THE OWNERS THEREOF.

ROBERT J. HUZJAK, P.E. COLORADO P.E. NO.25734

REGISTERED ENGINEER
RJH CONSULTANTS, INC.

THESE PLANS REPRESENT THE AS-CONSTRUCTED CONDITIONS OF THE WEST COOLEY RESERVOIR – 2015 FLOOD REPAIRS PROJECT TO THE BEST OF MY KNOWLEDGE AND JUDGMENT, BASED IN PART ON INFORMATION FURNISHED BY OTHERS, AS OF THE 25 DAY OF JUNE, 2021

ROBERT J HUZJAK 06/25/21
(ENGINEER'S PRINTED NAME) (SIGNATURE)

DWG. NO.
A-01

SHEET NO.
1 of 77

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUZJAK 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

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GENERAL NOTES

1. BASIS OF TOPOGRAPHIC MAPPING IS A COMPOSITE OF THE FOLLOWING SOURCES:
   A. PROJECT TOPOGRAPHIC MAPPING (2016 SURVEY DATA) WAS DEVELOPED BY HCL ENGINEERING AND SURVEYING IN OCTOBER 2016 AND JANUARY 2017. THE SURVEY WAS AMENDED WITH ADDITIONAL INFORMATION DEVELOPED BY J.R. ENGINEERING (FEBRUARY, 2016).
   B. TOPOGRAPHIC SURVEY AT WEST COOLEY NORTH CELL FROM "2012 SLOPE PROTECTION PROJECTS WEST COOLEY – NORTH CELL" RECORD DRAWINGS (THORNTON CIP NO. 09–793B) (RJH CONSULTANTS, 2013).
   C. TOPOGRAPHIC SURVEY WITHIN WEST COOLEY SOUTH CELL FROM "CONSTRUCTION PLANS FOR CITY OF ARVADA SOUTH PLATTE RESERVOIR PROJECT" RECORD DRAWINGS (APPLEGATE, 2003).
   D. TOPOGRAPHIC SURVEY AT OTHER LOCATIONS FROM 2–FOOT TOPOGRAPHIC MAPPING PROVIDED BY CITY OF THORNTON (2008).
2. ACTUAL SITE CONDITION MAY DEVIATE FROM TOPOGRAPHY SHOWN. CONTRACTOR TO CONFIRM SITE TOPOGRAPHY PRIOR TO STARTING EARTHWORK.
3. RIGHTS–OF–WAY AND EASEMENTS ARE APPROXIMATE. BASIS OF RIGHTS–OF–WAY AND EASEMENTS IS FROM "2012 SLOPE PROTECTION PROJECTS WEST COOLEY – NORTH CELL" RECORD DRAWINGS (THORNTON CIP NO. 09–793B) (RJH CONSULTANTS, 2013) AND FROM OCTOBER 27, 2006 ALTA/ACSM LAND TITLE SURVEY PREPARED BY J.R. ENGINEERING.
4. BASIS OF PROPERTY BOUNDARIES IS FROM HARRIS KOCHER SMITH (HKS) SURVEY (SEPTEMBER 2014).
5. LOCATION AND NATURE OF EXISTING UTILITIES AND EXISTING FACILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE. FIELD LOCATE ALL UTILITIES AND FACILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, PRIOR TO EXCAVATION AND DEMOLITION. PROTECT ALL UTILITIES AND FACILITIES IN PLACE UNLESS DESIGNATED FOR REMOVAL, DEMOLITION, OR REPLACEMENT.
6. UNLESS SHOWN OR SPECIFIED OTHERWISE. PAYLINES FOR UNIT PRICE PAY ITEMS ARE BASED ON THE DESIGN LINES (NEAT LINES) SHOWN ON THE PLANS.

ABBREVIATIONS:

AB	= ANCHOR BOLT	INV	= INVERT
ABT	= ABOUT	JT	= JOINT
ADAS	= AUTOMATIC DATA ACQUISITION SYSTEM	LG	= LONG
ADDL	= ADDITIONAL	LP	= LOW POINT
ALUM	= ALUMINUM	LPBO	= LOW POINT BLOW–OFF
ALT	= ALTERNATE	MAX	= MAXIMUM
APPROX	= APPROXIMATE	MIN	= MINIMUM
AS	= AUXILIARY SPILLWAY	MH	= MANHOLE
ASCP	= AUXILIARY SPILLWAY CONTROL POINT	MFR	= MANUFACTURER
BF	= BOTTOM FACE	MSE	= MECHANICALLY STABILIZED EARTH
BLDG	= BUILDING	NAD	= NORTH AMERICAN DATUM
BM	= BENCHMARK	NAVD	= NORTH AMERICAN VERTICAL DATUM
BOC	= BOTTOM OF CONCRETE	N	= NORTH OR NORTHING
BOH	= BOTTOM OF HOLE	NF	= NEAR FACE
BOT	= BOTTOM	NGS	= NATIONAL GEODETIC SURVEY
BR	= BOTTOM ROW	NGVD	= NATIONAL GEODETIC VERTICAL DATUM
BRG	= BEARING	NO.	= NUMBER
BTWN	= BETWEEN	NR	= NEAR ROW
CCM	= CELLULAR CONCRETE MAT	NTS	= NOT TO SCALE
CDOT	= COLORADO DEPT OF TRANSPORTATION	NWL	= NORMAL WATER LEVEL
CFS	= CUBIC FEET PER SECOND	OC	= ON CENTER
CJ	= CONSTRUCTION JOINT	OD	= OUTSIDE DIAMETER
CL, ℄	= CENTERLINE	O.F.	= OUTSIDE FACE
CLR	= CLEAR	OH	= OVERHEAD
CMP	= CORRUGATED METAL PIPE	OPNG	= OPENING
CMU	= CONCRETE MASONRY UNIT	OPP	= OPPOSITE
COL	= COLUMN	O.R.	= OUTSIDE ROW
CONC	= CONCRETE	OW	= OUTLET WORKS
CONN	= CONNECTION	OWC	= OUTLET WORKS CONDUIT
CONT	= CONTINUOUS	OWCP	= OUTLET WORKS CONTROL POINT
CP	= CONTROL POINT	PC	= POINT OF CURVATURE
CTJ	= CONTRACTION JOINT	PD	= PLAIN DOWELS
CTR	= CENTER	PE	= POLYETHYLENE
DIA	= DIAMETER	PEN.	= PENETRATION
DIAG	= DIAGONAL	PI	= POINT OF INTERSECTION
DWG, DWGS	= DRAWING OR DRAWINGS	PJF	= PREFORMED JOINT FILER
DWL	= DOWEL	PL, P	= PLATE
DWLS	= DOWELS	PMF	= PROBABLE MAXIMUM FLOOD
E	= EAST OR EASTING	PT	= POINT OF TANGENCY
EA	= EACH	PVC	= POLYVINYL CHLORIDE
EC	= EACH CORNER	RB	= ROOF BEAM
ECP	= EMBANKMENT CONTROL POINT	RCP	= REINFORCED CONCRETE PIPE
EF	= EACH FACE	REINF	= REINFORCEMENT
EJ	= EXPANSION JOINT	REQ'D	= REQUIRED
EL, ELEV	= ELEVATION	ROW	= RIGHT OF WAY
EQ	= EQUAL	S	= SLOPE
ER	= EACH ROW	SC	= SOIL–CEMENT
ES	= EACH SIDE	SCH	= SCHEDULE
EW	= EACH WAY	SEO	= STATE ENGINEER'S OFFICE
EXST	= EXISTING	SIM	= SIMILAR
EXT	= EXTENSION	SPC, SPCS	= SPACE OR SPACES
EXP	= EXPANSION	SPY	= SPILLWAY
F	= FAHRENHEIT	SS	= STAINLESS STEEL
FB	= FLAT BAR	STA	= STATION
FD	= FLOOR DRAIN	STL	= STEEL
FDN	= FOUNDATION	SQ	= SQUARE
FF	= FAR FACE, FINISHED FLOOR	SYM	= SYMMETRICAL
FIN	= FINISH	T&B	= TOP & BOTTOM
FLG	= FLANGE	TF	= TOP FACE
FO	= FACE OF	THK	= THICK
FR	= FAR ROW	TL	= TOP LAYER
FS	= FAR SIDE	T.O.	= TOP OF
FT	= FEET OR FOOT	TOC	= TOP OF CONCRETE
FES	= FLARED END SECTION	TOW	= TOP OF WALL
FTG	= FOOTING	TR	= TOP ROW
GALV	= GALVANIZED	TW	= TAILWATER
GR	= GRADE	TYP	= TYPICAL
H	= HORIZONTAL	UCP	= UTILITY CARRIER PIPE
H.A.S.	= HEADED ANCHOR STUD	UDP	= UNDERDRAIN PIPE
HDPE	= HIGH DENSITY POLYETHYLENE	UNC	= UNIFIED NATIONAL COARSE THREAD
HGT	= HEIGHT	UNO	= UNLESS NOTED OTHERWISE
HK	= HOOK	USGS	= UNITED STATES GEOLOGICAL SURVEY
HORZ	= HORIZONTAL	V	= VERTICAL
HR	= HANDRAIL	VERT	= VERTICAL
HS	= HIGH STRENGTH	WS	= WATER SURFACE
HSS	= HOLLOW STRUCTURAL SECTION	WSA	= WATERSTOP
HYD	= HYDRAULIC	WWF	= WELDED WIRE FABRIC
ID	= INSIDE DIAMETER		
IE	= INVERT ELEVATION		
I.F.	= INSIDE FACE		

LEGEND

DETAIL A / A-03 — DETAIL TITLE. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "A–03" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS CALLED OUT.

SECTION 1 / A-03 **STA 0+00** — SECTION TITLE. THE NUMBER "1" REFERS TO THE SECTION DESIGNATION. THE NUMBER "A–03" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS CALLED OUT.

1 / A-03 — SECTION LOCATION. THE NUMBER "1" REFERS TO THE SECTION DESIGNATION. THE NUMBER "A–03" REFERS TO THE DRAWING NUMBER WHERE THE SECTION IS SHOWN.

A / A-03 — DETAIL LOCATION. THE LETTER "A" REFERS TO THE DETAIL DESIGNATION. THE NUMBER "A–03" REFERS TO THE DRAWING NUMBER WHERE THE DETAIL IS SHOWN.

APPROXIMATE TREE AND SHRUB LIMITS

INDIVIDUAL SHRUB OR TREE

EARTH SLOPE

CUT SLOPE

HORIZONTAL COORDINATE GRID MARK

SCP-02 SURVEY CONTROL POINT

CCP-02 CONSTRUCTION CONTROL POINT

EXISTING MONITORING WELL OR PIEZOMETER

EXISTING PRODUCTION WELL

EXISTING ALLUVIAL WELL

EXISTING VALVE

BLOW–OFF VALVE

ELECTRICAL TRANSMISSION TOWER

3630 EXISTING INDEX TOPOGRAPHIC CONTOUR WITH ELEVATION IN FEET

EXISTING INTERMEDIATE TOPOGRAPHIC CONTOUR

PAVED ROAD

GRAVEL OR UNIMPROVED ROAD

PROPERTY LINE

LIMIT OF SITE DISTURBANCE (PROJECT LIMITS)

CENTERLINE

LIMIT OF CONTRACTOR STAGING AND STOCKPILING

SURFACE WATERWAY

RIGHT–OF–WAY

EASEMENT

APPROXIMATE WATER LEVEL

FENCE

TRAIL SAFETY FENCE

FLOODPLAIN LIMITS

FLOODWAY LIMITS

WATERLINE

SILT FENCE

SOIL–BENTONITE BARRIER WALL

GEOTEXTILE

APPROXIMATE GEOLOGIC CONTACT

OHE OHE OVERHEAD ELECTRIC

UE UE UNDERGROUND ELECTRIC

UC UC UNDERGROUND COMMUNICATION

EARTH

CONCRETE

EROSION REPAIRS

STOCKPILE AREA

LOW–PERMEABLE FILL

SOIL–BENTONITE BACKFILL

EXISTING SOIL–BENTONITE BARRIER WALL

DRAIN MATERIAL

WETLANDS

RIPRAP

AGGREGATE SURFACING AND RIPRAP BEDDING

GROUTED RIPRAP

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COLORADO LICENSED ROBERT J. HUMAN 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

GENERAL NOTES, ABBREVIATIONS, AND LEGEND

DWG. NO. A-03

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STRUCTURAL NOTES:

1) REINFORCEMENT SYMBOLS

BARS SHOWN THUS —#8 @ 1'–0" OR —# 8 @ 1'–0" INDICATE A GROUP OF IDENTICAL #8 BARS SPACED AT 1'–0" (12") CENTERS.

○— 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.

○ INDICATES A DOWEL

SPLICES SHOWN THUS —═— INDICATES A LAPPED SPLICE, NOT A BEND IN THE BAR.

2) DIMENSIONS

DIMENSIONS ARE TO THE CENTERLINES OF THE BARS UNLESS OTHERWISE SHOWN. CLEAR COVER DIMENSIONS ARE MARKED "CLR." ALL DIMENSIONS TO A JOINT ARE TO THE CENTERLINE OF THE JOINT. BEAMS, COLUMNS, AND WALLS ARE CENTERED ON REFERENCED LINES.

THICKNESS SHOWN FOR WALLS AND SLABS ADJACENT TO UNDISTURBED SOIL OR ROCK ARE MINIMUM DIMENSIONS.

3) COVER

UNLESS OTHERWISE INDICATED ON THE DRAWING, PLACE THE REINFORCEMENT SO THAT THE CLEAR DISTANCE BETWEEN THE FACE OF CONCRETE AND NEAREST REINFORCEMENT IS 3 INCHES FOR #5 BARS OR LARGER. FOR CONCRETE PLACED DIRECTLY AGAINST EARTH OR ROCK, MINIMUM CLEAR CONCRETE COVER OVER REINFORCEMENT SHALL BE 3 INCHES.

4) REINFORCEMENT DOWELS

DOWELS INDICATED ON THE DRAWING SUCH AS #8(DWL), SHALL HAVE A MINIMUM STRAIGHT EMBEDMENT AND PROJECTION EQUAL TO THAT REQUIRED FOR LAP SPLICING A BAR OF THE SAME DIAMETER.

5) PLAIN DOWELS

PLAIN DOWELS, INDICATED ON THE DRAWINGS SUCH AS 3/4" (PD), ACROSS CONTRACTION JOINTS SHALL BE PLAIN REINFORCING BARS OF THE BAR DIAMETER INDICATED. PLAIN DOWELS SHALL BE A MINIMUM OF 36 INCHES LONG, WITH EQUAL LENGTH EXTENDING ON EITHER SIDE OF THE CONTRACTION JOINT. IMMEDIATELY BEFORE THE SECOND CONCRETE PLACEMENT, THE PROJECTING HALF LENGTH OF DOWEL SHALL BE GREASED TO PREVENT BOND TO THE CONCRETE.

6) STANDARD HOOKS AND BENDS

HOOKS AND BENDS SHALL CONFORM TO ACI 318, SECTIONS 7.1, 7.2. AND 7.3.

7) PLACING REINFORCEMENT

PLACE REINFORCEMENT IN ACCORDANCE WITH APPROVED REINFORCEMENT SHOP DRAWINGS. IN THE EVENT OF A CONFLICT BETWEEN THESE DRAWINGS AND THE APPROVED SHOP DRAWINGS, THE APPROVED SHOP DRAWINGS SHALL GOVERN.

SEE ACI 318, SECTION 7.5 AND ACI 301, SECTION 5.3 FOR PLACING TOLERANCES.

REINFORCEMENT MAY BE ADJUSTED IN THE FIELD TO CLEAR FORM TIES AND ANCHOR BARS. IN SUCH CASES, RELOCATION OF THE EMBEDDED MATERIALS MUST BE CONSIDERED. IN NO CASE SHALL BARS BE BENT IN THE FIELD.

REINFORCEMENT SHALL BE PLACED TO MAINTAIN A CLEAR DISTANCE OF AT LEAST 1 INCH BETWEEN OTHER REINFORCEMENT, ANCHOR BOLTS, FORM TIES, OR OTHER EMBEDDED METALWORK.

REINFORCEMENT PARALLEL TO ANCHOR BOLTS OR OTHER EMBEDDED METALWORK SHALL BE PLACED TO MAINTAIN A CLEAR DISTANCE OF AT LEAST 1–1/3 TIMES THE MAXIMUM SIZE AGGREGATE TO BE USED.

8) SPACING

THE FIRST AND LAST BARS IN SLABS AND WALLS, STIRRUPS IN BEAMS, AND TIES IN COLUMNS ARE TO START AND END AT A MAXIMUM OF ONE HALF OF THE ADJACENT BAR SPACING. ALL REINFORCING TO BE EQUALLY SPACED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

9) ACCESSORIES

BAR SUPPORTS, SPACERS, AND OTHER ACCESSORIES ARE NOT SHOWN ON THE DRAWINGS. THE RECOMMENDATIONS OF ACI 315 (DETAILING MANUAL) SHALL BE USED IN SELECTING ACCESSORIES.

10) DETAILING

UNLESS OTHERWISE SHOWN, FOLLOW THE RECOMMENDATIONS OF ACI 315. NO CHANGES SHALL BE MADE WITHOUT PRIOR APPROVAL.

11) CONCRETE PLACEMENT

BEFORE PLACING CONCRETE, CHECK ALL APPLICABLE DRAWINGS RELEASED AS SUITABLE FOR CONSTRUCTION INCLUDING MANUFACTURER'S DRAWINGS TO VERIFY THE PRESENCE OF ALL EMBEDDED MATERIAL REQUIRED IN THE PLACEMENT.

12) EMBEDMENT AND LAP SPLICE LENGTH REQUIREMENTS

EMBEDMENT LENGTHS AND LAP SPLICE LENGTHS ARE SHOWN IN THE TABLE BELOW.

BASIC EMBEDMENT LENGTHS ARE BASED ON ACI 318, SECTION 12.2. AND THE REQUIRED fc'.

ALL LAP SPLICE LENGTHS SHOWN ARE CLASS B SPLICES BASED ON ACI 318, SECTION 12.15.

UNLESS OTHERWISE SHOWN ON THE DRAWINGS, THE MINIMUM LENGTHS FOR EMBEDMENT AND LAP SPLICES FOR PARALLEL BARS SHALL BE AS GIVEN IN THE TABLE BELOW.

WHEN REINFORCING BARS OF DIFFERENT SIZE ARE TO BE SPLICED, THE LENGTH OF THE LAP SHALL BE GOVERNED BY THE SMALLER DIAMETER BAR.

SPLICES ARE TO BE MADE SO THAT THE GIVEN CLEAR DISTANCES TO THE FACE OF CONCRETE WILL BE MAINTAINED.

TABLE OF BASIC EMBEDMENT AND LAP SPLICE LENGTHS ACCORDING TO ACI 318
fc' = 4000 PSI

BAR SIZE NO.	EMBEDMENT (INCHES)		LAP SPLICE (INCHES)	
	ALL BARS EXCEPT TOP BARS	TOP BARS *	ALL BARS EXCEPT TOP BARS	TOP BARS *
3	1'–3"	1'–7"	1'–7"	2'–1"
4	1'–7"	2'–1"	2'–1"	2'–9"
5	2'–0"	2'–7"	2'–7"	3'–5"
6	2'–5"	3'–1"	3'–1"	4'–1"
7	3'–6"	4'–6"	4'–6"	5'–10"
8	4'–0"	5'–2"	5'–2"	6'–10"
9	4'–6"	5'–10"	5'–10"	7'–7"
10	5'–1"	6'–7"	6'–7"	8'–6"
11	5'–7"	7'–3"	7'–3"	9'–6"

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

TABLE OF BASIC EMBEDMENT AND LAP SPLICE LENGTHS ACCORDING TO ACI 318
fc' = 5000 PSI

BAR SIZE NO.	EMBEDMENT (INCHES)		LAP SPLICE (INCHES)	
	ALL BARS EXCEPT TOP BARS	TOP BARS *	ALL BARS EXCEPT TOP BARS	TOP BARS *
3	1'–1"	1'–5"	1'–5"	1'–10"
4	1'–5"	1'–11"	1'–11"	2'–5"
5	1'–10"	2'–4"	2'–4"	3'–0"
6	2'–2"	2'–10"	2'–10"	3'–8"
7	3'–1"	4'–1"	4'–1"	5'–3"
8	3'–7"	4'–8"	4'–8"	6'–0"
9	4'–0"	5'–3"	5'–3"	6'–9"
10	4'–6"	5'–11"	5'–11"	7'–8"
11	5'–0"	6'–6"	6'–6"	8'–6"

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

13) EMBEDDED ITEMS AND OPENINGS

BEFORE PLACING CONCRETE, CARE SHALL BE TAKEN THAT ALL EMBEDDED ITEMS ARE IN POSITION AND SECURELY FASTENED IN PLACE. ADD ADDITIONAL REINFORCING AROUND OPENINGS AS SHOWN ON DRAWINGS.

14) FINISHING SYMBOLS AND CONCRETE TOLERANCES

THE FOLLOWING FINISHING SYMBOLS HAVE BEEN USED ON THESE DRAWINGS. REFER TO THE CONSTRUCTION SPECIFICATIONS FOR DETAILED REQUIREMENTS AND CONSTRUCTION TOLERANCES FOR HYDRAULIC STRUCTURES.

F4 U3 SPECIAL FINISH WITH SPECIAL TOLERANCES FOR HIGH VELOCITY WATER FLOW.

FINISH SURFACES FOR ALL CONSTRUCTION AND CONTRACTION JOINTS SHALL BE PROVIDED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL SURFACES REQUIRING AN F4 OR U3 FINISH ARE SHOWN ON THE DRAWINGS.

15) CHAMFER

UNLESS OTHERWISE INDICATED, CHAMFER EDGES OF ALL PERMANENTLY EXPOSED CONCRETE SURFACES WITH A 45 DEGREE BEVEL, 3/4 INCH X 3/4 INCH. CHAMFER STRIP MAY NOT BE SHOWN ON THE DESIGN DRAWINGS.

16) JOINTS

ALL CONSTRUCTION JOINTS, CONTRACTION JOINTS AND EXPANSION JOINTS SHALL BE PROVIDED WHERE SHOWN ON THE APPROVED SHOP DRAWINGS. NO OTHER JOINTS SHALL BE INTRODUCED UNLESS APPROVED BY THE ENGINEER.

17) STRUCTURAL STEEL

17a) GENERAL

FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO CURRENT AISC MANUAL OF STEEL CONSTRUCTION.

17b) BOLTED CONNECTIONS

ANCHOR BOLTS, BOLTS AND NUTS SHALL BE ASTM A276 TYPE 316 STAINLESS STEEL. ALL STRUCTURAL BOLTED CONNECTIONS SHALL BE BEARING–TYPE CONNECTIONS.

17c) WELDING

CONFORM TO AWS D1.1. WELDING ELECTRODES FOR PLAIN STRUCTURAL STEEL SHALL BE AWS SERIES E–70. WELDING ELECTRODES FOR GALVANIZED STEEL SHALL BE AWS SERIES E6010 OR E6011.

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

STRUCTURAL NOTES

DWG. NO. A-04

SHEET NO. 4 of 77

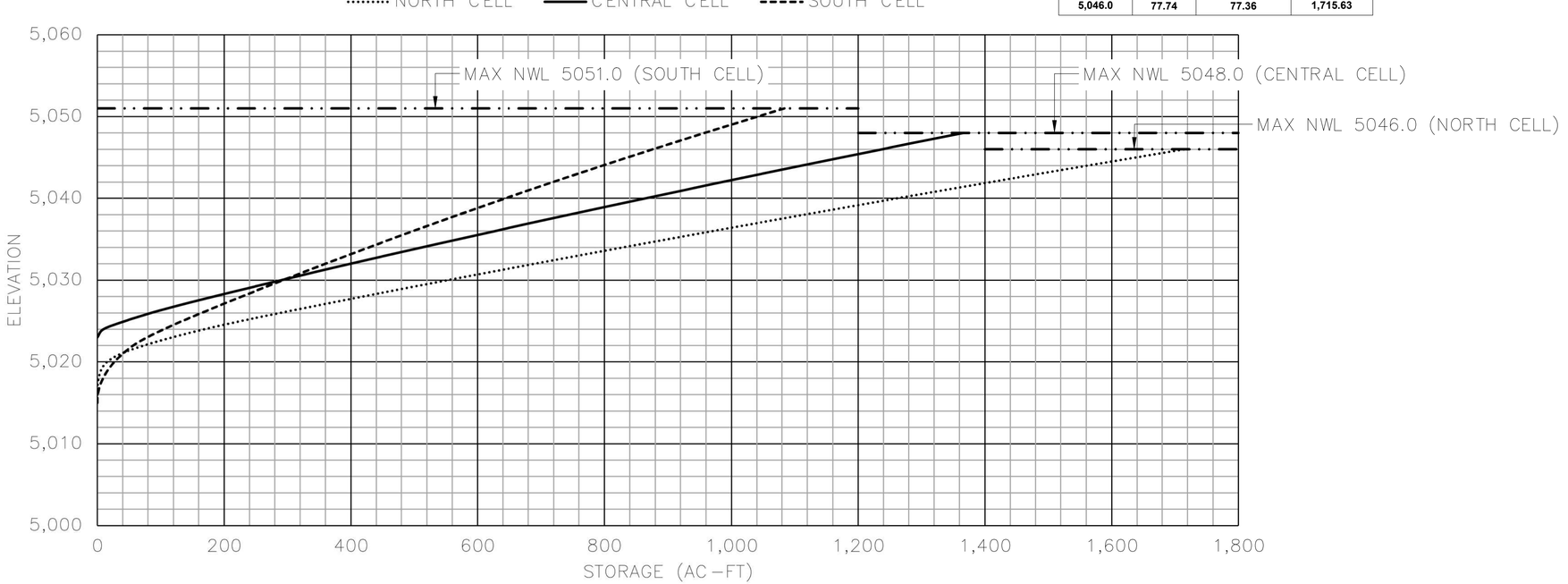
P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\STRUCTURAL NOTES.DWG 6/14/2021

NORTH CELL			
ELEVATION	AREA (AC)	INCR. VOLUME (AC-FT)	STORAGE (AC-FT)
5,016.0	0.01	0.01	0.01
5,017.0	0.72	0.37	0.38
5,018.0	2.53	1.62	2.00
5,019.0	5.07	3.80	5.80
5,020.0	13.54	9.31	15.11
5,021.0	30.44	21.99	37.10
5,022.0	41.93	36.18	73.28
5,023.0	47.65	44.79	118.07
5,024.0	53.70	50.68	168.75
5,025.0	61.49	57.59	226.34
5,026.0	63.83	62.66	289.00
5,027.0	65.08	64.46	353.46
5,028.0	66.07	65.57	419.03
5,029.0	66.93	66.50	485.53
5,030.0	67.66	67.29	552.82
5,031.0	68.36	68.02	620.84
5,032.0	69.03	68.69	689.53
5,033.0	69.66	69.34	758.87
5,034.0	70.26	69.96	828.83
5,035.0	70.86	70.57	899.40
5,036.0	71.46	71.16	970.56
5,037.0	72.06	71.75	1,042.31
5,038.0	72.66	72.36	1,114.67
5,039.0	73.26	72.96	1,187.63
5,040.0	73.88	73.57	1,261.20
5,041.0	74.49	74.18	1,335.38
5,042.0	75.10	74.80	1,410.18
5,043.0	75.72	75.41	1,485.59
5,044.0	76.34	76.03	1,561.62
5,045.0	76.97	76.65	1,638.27
5,046.0	77.74	77.36	1,715.63

CENTRAL CELL			
ELEVATION	AREA (AC)	INCR. VOLUME (AC-FT)	STORAGE (AC-FT)
5,023.0	0.00	0.00	0.00
5,024.0	28.61	9.54	9.54
5,025.0	39.44	33.88	43.42
5,026.0	45.52	42.45	85.86
5,027.0	49.26	47.38	133.24
5,028.0	52.17	50.71	183.94
5,029.0	53.11	52.64	236.58
5,030.0	54.00	53.56	290.14
5,031.0	54.67	54.34	344.48
5,032.0	55.44	55.06	399.53
5,033.0	56.28	55.86	455.39
5,034.0	56.98	56.63	512.02
5,035.0	57.57	57.28	569.29
5,036.0	58.15	57.86	627.15
5,037.0	58.72	58.43	685.58
5,038.0	59.28	59.00	744.58
5,039.0	59.85	59.57	804.15
5,040.0	60.42	60.13	864.29
5,041.0	61.00	60.71	924.99
5,042.0	61.58	61.29	986.28
5,043.0	62.17	61.88	1,048.16
5,044.0	62.77	62.47	1,110.63
5,045.0	63.38	63.07	1,173.70
5,046.0	64.00	63.69	1,237.39
5,047.0	64.65	64.32	1,301.71
5,048.0	65.30	64.97	1,366.69

SOUTH CELL			
ELEVATION	AREA (AC)	INCR. VOLUME (AC-FT)	STORAGE (AC-FT)
5,015.0	0.00	0.00	0.00
5,016.0	1.98	0.66	0.66
5,017.0	4.23	3.04	3.70
5,018.0	6.36	5.26	8.95
5,019.0	8.85	7.57	16.52
5,020.0	11.54	10.17	26.69
5,021.0	14.80	13.14	39.83
5,022.0	18.77	16.75	56.58
5,023.0	25.42	22.01	78.59
5,024.0	27.67	26.54	105.13
5,025.0	30.08	28.87	134.00
5,026.0	31.01	30.54	164.54
5,027.0	31.59	31.30	195.84
5,028.0	32.17	31.88	227.72
5,029.0	32.58	32.38	260.10
5,030.0	32.98	32.78	292.88
5,031.0	33.38	33.18	326.06
5,032.0	33.85	33.62	359.68
5,033.0	34.25	34.05	393.73
5,034.0	34.65	34.45	428.18
5,035.0	35.06	34.86	463.04
5,036.0	35.48	35.27	498.30
5,037.0	35.90	35.69	533.99
5,038.0	36.36	36.13	570.12
5,039.0	36.83	36.59	606.71
5,040.0	37.30	37.07	643.78
5,041.0	37.78	37.54	681.32
5,042.0	38.26	38.02	719.34
5,043.0	38.75	38.51	757.85
5,044.0	39.24	38.99	796.84
5,045.0	39.74	39.49	836.33
5,046.0	40.25	39.99	876.32
5,047.0	40.75	40.50	916.82
5,048.0	41.27	41.01	957.83
5,049.0	41.79	41.53	999.36
5,050.0	42.34	42.06	1,041.43
5,051.0	42.90	42.62	1,084.05

ELEVATION CAPACITY CURVE



NOTES:

1. ELEVATION CAPACITY FOR NORTH DAHLIA RESERVOIR IS NOT INCLUDED BECAUSE THE WORK DID NOT MODIFY THE INTERNAL SLOPES AND NO NEW TOPOGRAPHY WAS COLLECTED.
2. NORTH CELL ELEVATION CAPACITY DEVELOPED BY FANSWORTH GROUP BASED ON AERIAL SURVEY.

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COLORADO LICENSED ROBERT J. KUTZAK 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

ELEVATION CAPACITY CURVE

DWG. NO. A-05

SHEET NO. 5 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\GENERAL NOTES AND LEGEND.DWG 6/14/2021

SURVEY CONTROL POINTS (NOTE 6)

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
SCP-01	744503.71	166339.83	5056.10	NO. 5 REBAR WITH ALUM CAP
SCP-04	745618.34	165969.34	5054.82	NO. 5 REBAR WITH ALUM CAP
SCP-08	746722.07	167743.28	5051.21	NO. 5 REBAR WITH ALUM CAP
SCP-10	746577.18	164886.54	5057.96	NO. 5 REBAR WITH ALUM CAP
SCP-12	747245.02	164911.10	5060.38	NO. 5 REBAR WITH ALUM CAP

NW CORNER SEC 17 T25, R67W N: 748221.15 E: 162857.55

E 104TH AVE

1/4 CORNER SEC 17 T25, R67W N: 748228.14 E: 165496.40

851 LLC

WEST COOLEY NORTH CELL MAX NWL 5046.0

APPROX LIMITS OF 100-YEAR FLOODPLAIN (NOTE 1)

BORROW AREA 1 DWG A-07

SCP-12

DONALD R. DEWITT REVOCABLE TRUST

FORD SEEP FLUME

50' DRAINAGE EASEMENT

ADAMS COUNTY

CITY OF THORNTON

SPILLWAY

SLOPE PROTECTION

WEST COOLEY NORTH CELL TO CENTRAL CELL INTERCONNECT GATE VAULT

SITE 4 (DWG E-01)

STAFF GAUGE

ACCESS ROAD

PROPERTY BOUNDARY

OVERHEAD ELECTRICAL LINE

SCP-08

SCP-10

210' PUBLIC SERVICE OF COLORADO RIGHT-OF-WAY

WEST COOLEY CENTRAL CELL TO NORTH CELL INTERCONNECT GATE VAULT

ACCESS ROAD

BORROW AREA 2 DWG A-08

WEST COOLEY CENTRAL CELL MAX NWL 5048.0

SITE 3 (DWG D-01)

NOTE 2

APPROX LIMITS OF FLOODWAY (NOTE 1)

CONVEYOR

STABILIZED CONSTRUCTION ENTRANCE

PRIMARY SITE ENTRANCE

WETLAND MITIGATION AREA SEE SHEET H-01

SITE 2 (DWG C-01)

LCC DISCHARGE STRUCTURE

ACCESS ROAD

CITY OF THORNTON

E 100TH AVE

SCP-04

FULTON DITCH

FULTON DITCH DIVERSION STRUCTURE

McKAY ROAD PUMP STATION

WEST COOLEY SOUTH CELL TO CENTRAL CELL INTERCONNECT GATE VAULT

ACCESS ROAD IMPROVEMENTS DWG ####

McKAY RD

ACCESS ROAD

WEST COOLEY SOUTH CELL MAX NWL 5051.0

PROPERTY BOUNDARY

MULTI-USE TRAIL

ADAMS COUNTY 20' TRAIL EASEMENT

WEST COOLEY SOUTH CELL TO WEST SPRAT INTERCONNECT GATE VAULT

OVERHEAD ELECTRICAL LINE

SITE 1 (DWG B-01)

NOTE 2

ARVADA PUMP STATION

INLET STRUCTURE

STAFF GAUGE

CITY OF THORNTON

FULTON IRRIGATION DITCH COMPANY

FLOW

RIVER

WEST SPRAT PLATTE MAX NWL 5055.0

SCP-01

APPROX ALLUVIAL WELLS RAW WATER SYSTEM

PLATTE

SOUTH

SOUTH ADAMS COUNTY WATER AND SANITATION DISTRICT

ADAMS COUNTY TRAIL AND FULTON DITCH COMPANY ACCESS EASEMENT

N

0 150 300 600 900

SCALE IN FEET

NOTES:

1. APPROXIMATE LIMITS OF FLOODWAY AND 100-YEAR FLOODPLAIN FROM "FLOOD HAZARD AREA DELINEATION: SOUTH PLATTE RIVER, ADAMS COUNTY" (UDFCD, 2005).
2. PROTECT AND PRESERVE EXISTING ASPHALT PATCH AND REPLACE IF DAMAGED DURING CONSTRUCTION.
3. NOT USED.
4. BASIS OF BEARINGS IS THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 17 AS MONUMENTED WITH A 3.25" ALUMINUM CAP IN RANGE BOX PLS 23516 AT THE WEST END AND A 3.25" ALUMINUM CAP IN RANGE BOX PLS 23516 AT THE EAST END BEARING S89°50'54"W A DISTANCE OF 2638.89'.
5. VERTICAL AND HORIZONTAL DATUM:
   A. VERTICAL DATUM IS 1988 NAVD.
   B. HORIZONTAL DATUM IS BASED ON JOHN E. CHANCE (ADAMS COUNTY) SURVEY, 1996. THIS COORDINATE SYSTEM IS A MODIFIED PROJECT SYSTEM BASED ON COLORADO STATE PLANE CENTRAL ZONE (NAD83/92) MODIFIED TO GROUND BY A COMBINED FACTOR OF 1/0.99979199, AND NORTHING VALUES TRUNCATED BY 1,000,000 AND EASTING VALUES BY 3,000,000.
6. SURVEY CONTROL POINTS SET BY HCL ENGINEERING AND SURVEYING. ALUMINUM CAPS ARE 2-INCH DIAMETER AND ARE STAMPED, "CONTROL POINT CP" FOLLOWED BY THE CONTROL POINT NUMBER.

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

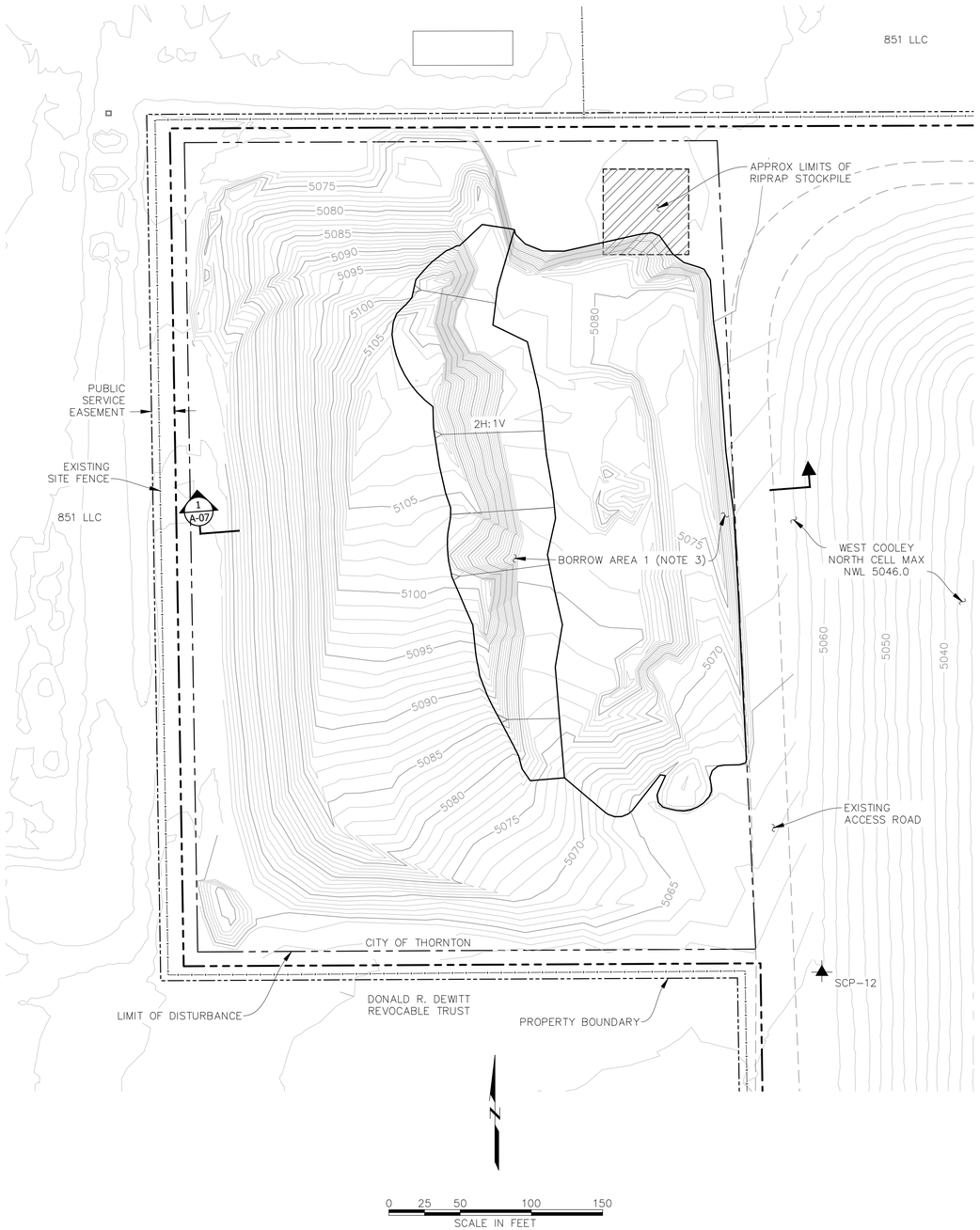
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

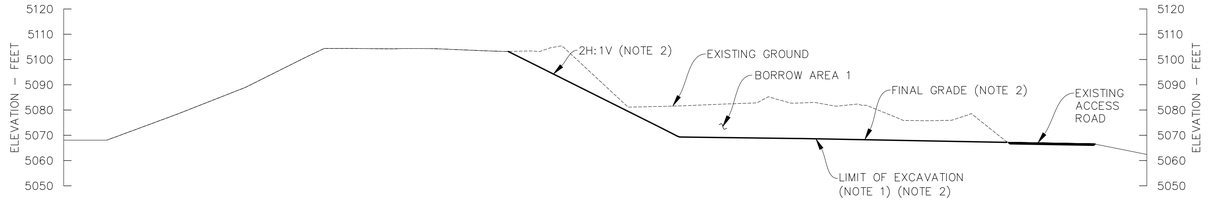
GENERAL PLAN OF EXISTING CONDITIONS AND SURVEY CONTROL

DWG. NO. A-06

SHEET NO. 6 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\GENERAL PLAN OF EXISTING CONDITIONS AND SURVEY CONTROL.DWG 6/14/2021





SECTION 1 / A-07

0 15 30 60 90
SCALE IN FEET

NOTES:

1. GRADE UNIFORMLY TO MATCH EXISTING GRADE AT TOE OF STOCKPILE.
2. LIMIT OF EXCAVATION SHOWN ILLUSTRATES INTENTION OF BORROW AREA FINAL GRADE AND IS EXPECTED TO PRODUCE MATERIAL IN EXCESS OF REQUIRED BORROW. WHERE POSSIBLE AND IN ACCORDANCE WITH SPECIFICATIONS, UTILIZE MATERIAL FROM REQUIRED EXCAVATIONS FOR FILL AND BACKFILL PRIOR TO USING MATERIAL FROM BORROW AREA.
3. MATERIAL FROM BORROW AREA 1 IS BEING ACQUIRED FOR USE ON OTHER THORNTON PROJECTS. CONFIRM TOPOGRAPHY DURING BIDDING AND AT START OF CONSTRUCTION.

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WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

BORROW AREA 1 - PLAN OF EXISTING CONDITIONS

DWG. NO. A-07

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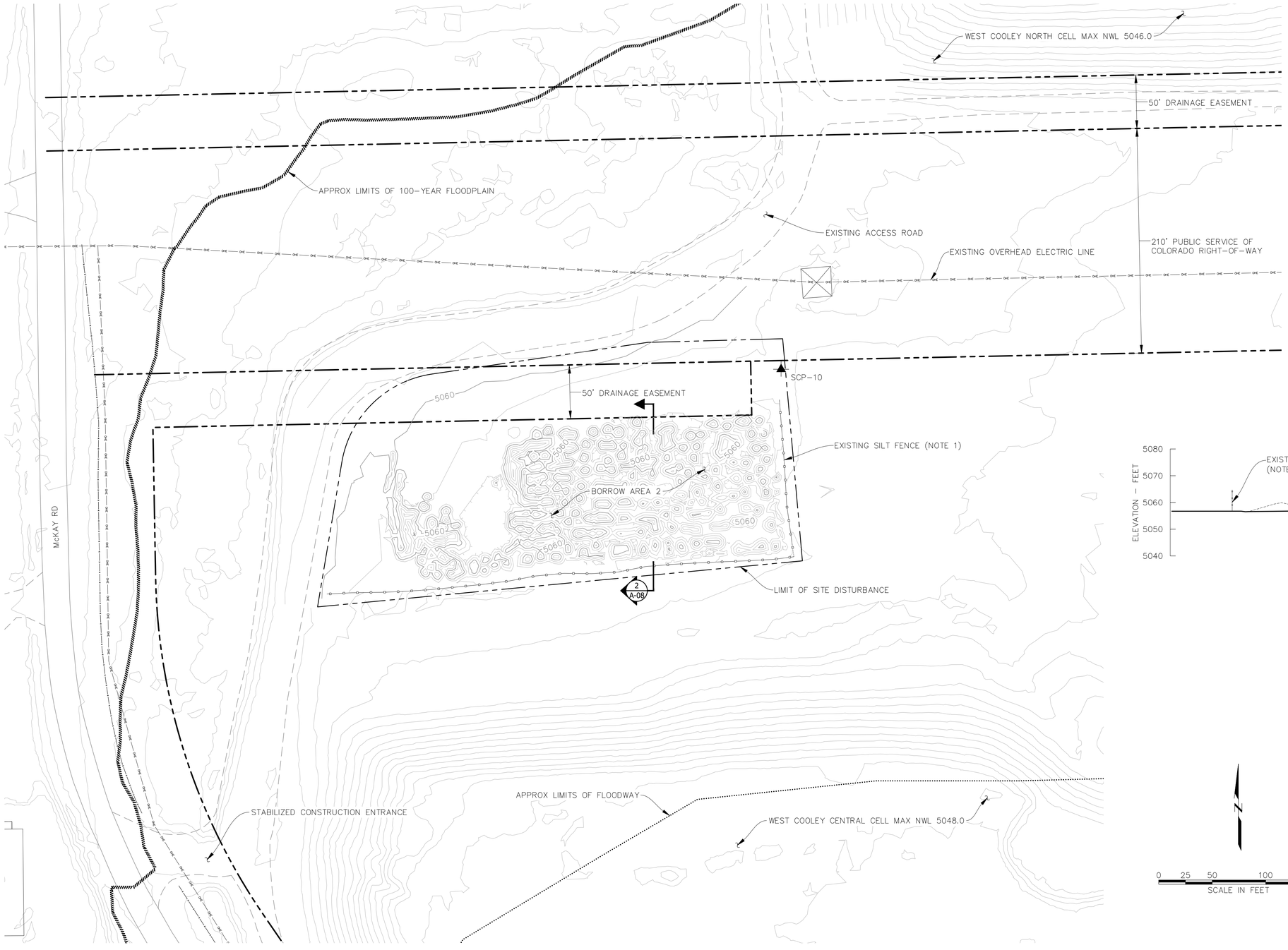
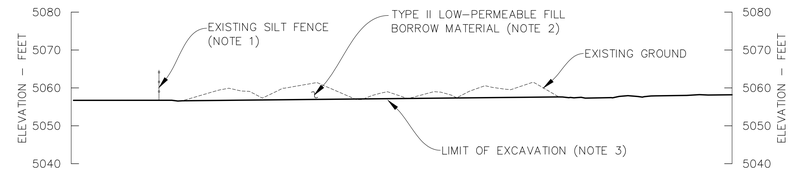
P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\BORROW AREAS.DWG 6/14/2021





SECTION 2 / A-08

0 10 20 40 60
SCALE IN FEET

NOTES:

1. REMOVE AT END OF CONSTRUCTION.
2. UTILIZE ALL MATERIAL MEETING SPECIFICATION REQUIREMENTS. DISPOSE OF REMAINING EARTHEN MATERIAL ONSITE AS DIRECTED BY THORNTON. DISPOSE OF DEBRIS OFFSITE.
3. GRADE UNIFORMLY TO MATCH EXISTING GRADE AT TOE OF STOCKPILE.

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RJH CONSULTANTS, INC.

City of Thornton

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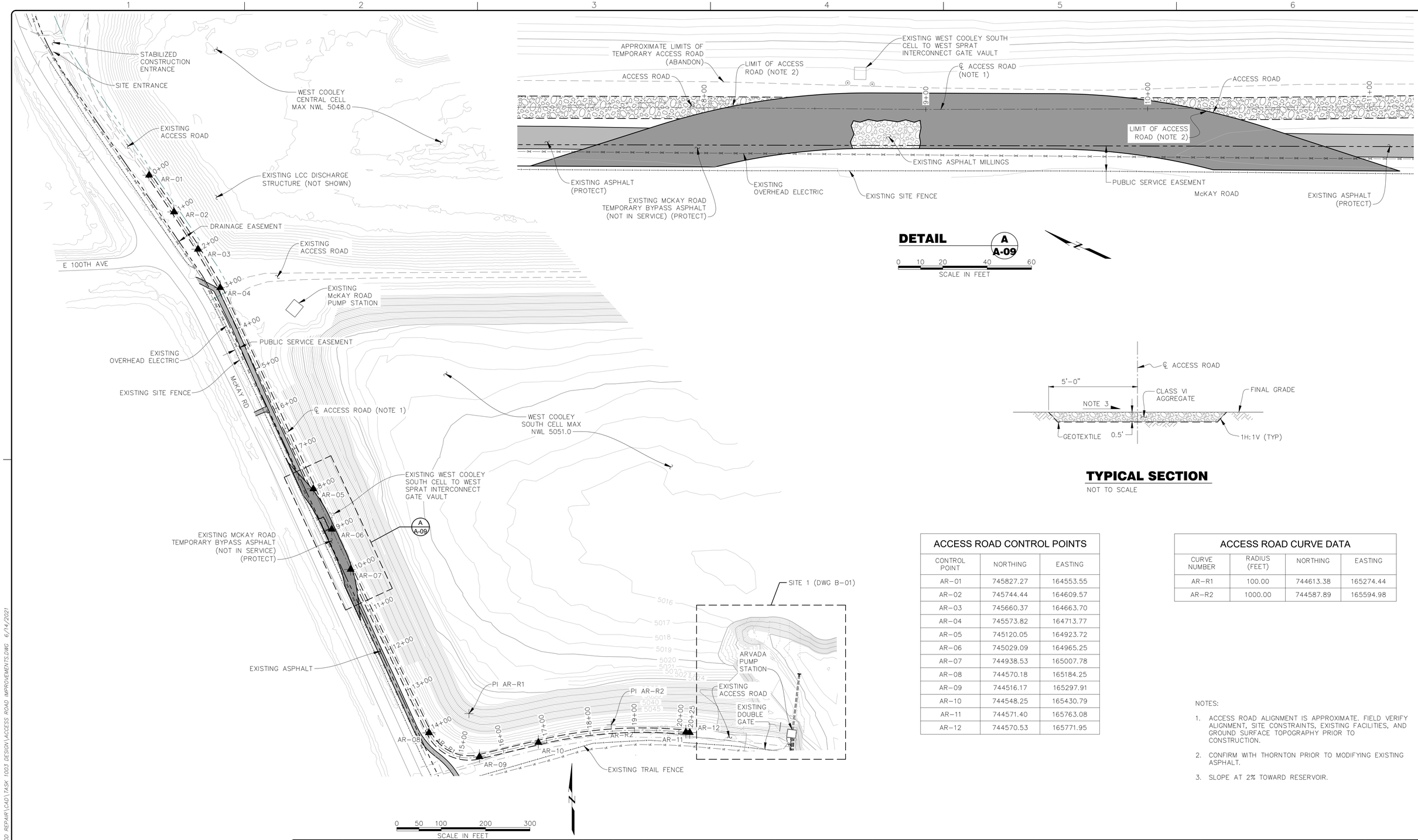
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

BORROW AREA 2 - PLAN OF MODIFICATIONS AND SECTION

DWG. NO. A-08

SHEET NO. 8 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\BORROW AREAS.DWG 6/14/2021



DETAIL A / A-09

0 10 20 40 60
SCALE IN FEET

TYPICAL SECTION

NOT TO SCALE

ACCESS ROAD CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
AR–01	745827.27	164553.55
AR–02	745744.44	164609.57
AR–03	745660.37	164663.70
AR–04	745573.82	164713.77
AR–05	745120.05	164923.72
AR–06	745029.09	164965.25
AR–07	744938.53	165007.78
AR–08	744570.18	165184.25
AR–09	744516.17	165297.91
AR–10	744548.25	165430.79
AR–11	744571.40	165763.08
AR–12	744570.53	165771.95

ACCESS ROAD CURVE DATA			
CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
AR–R1	100.00	744613.38	165274.44
AR–R2	1000.00	744587.89	165594.98

NOTES:

1. ACCESS ROAD ALIGNMENT IS APPROXIMATE. FIELD VERIFY ALIGNMENT, SITE CONSTRAINTS, EXISTING FACILITIES, AND GROUND SURFACE TOPOGRAPHY PRIOR TO CONSTRUCTION.
2. CONFIRM WITH THORNTON PRIOR TO MODIFYING EXISTING ASPHALT.
3. SLOPE AT 2% TOWARD RESERVOIR.

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COLORADO LICENSED ROBERT J. HUZJAK 25734 08/13/20 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

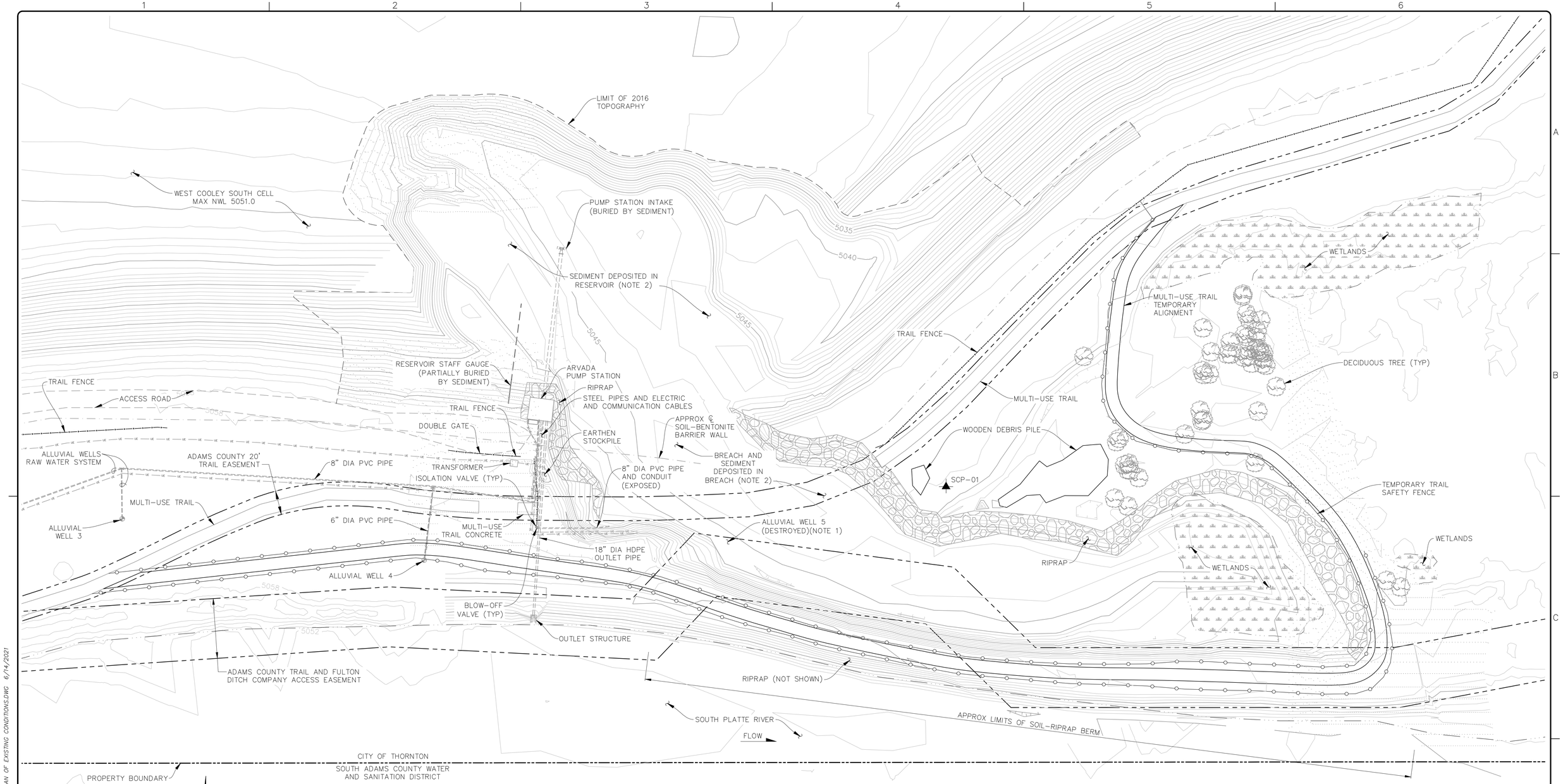
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

ACCESS ROAD IMPROVEMENTS

DWG. NO. A-09

SHEET NO. 9 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1003 DESIGN\ACCESS ROAD IMPROVEMENTS.DWG 6/14/2021



NOTE:

1. REMAINING COMPONENTS OF WELL BELOW EXISTING GROUND ARE NOT KNOWN.
2. REFER TO DWG B-09 FOR BOUNDARY BETWEEN THE SEDIMENT DELINEATIONS.

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RJH PROJECT 16116

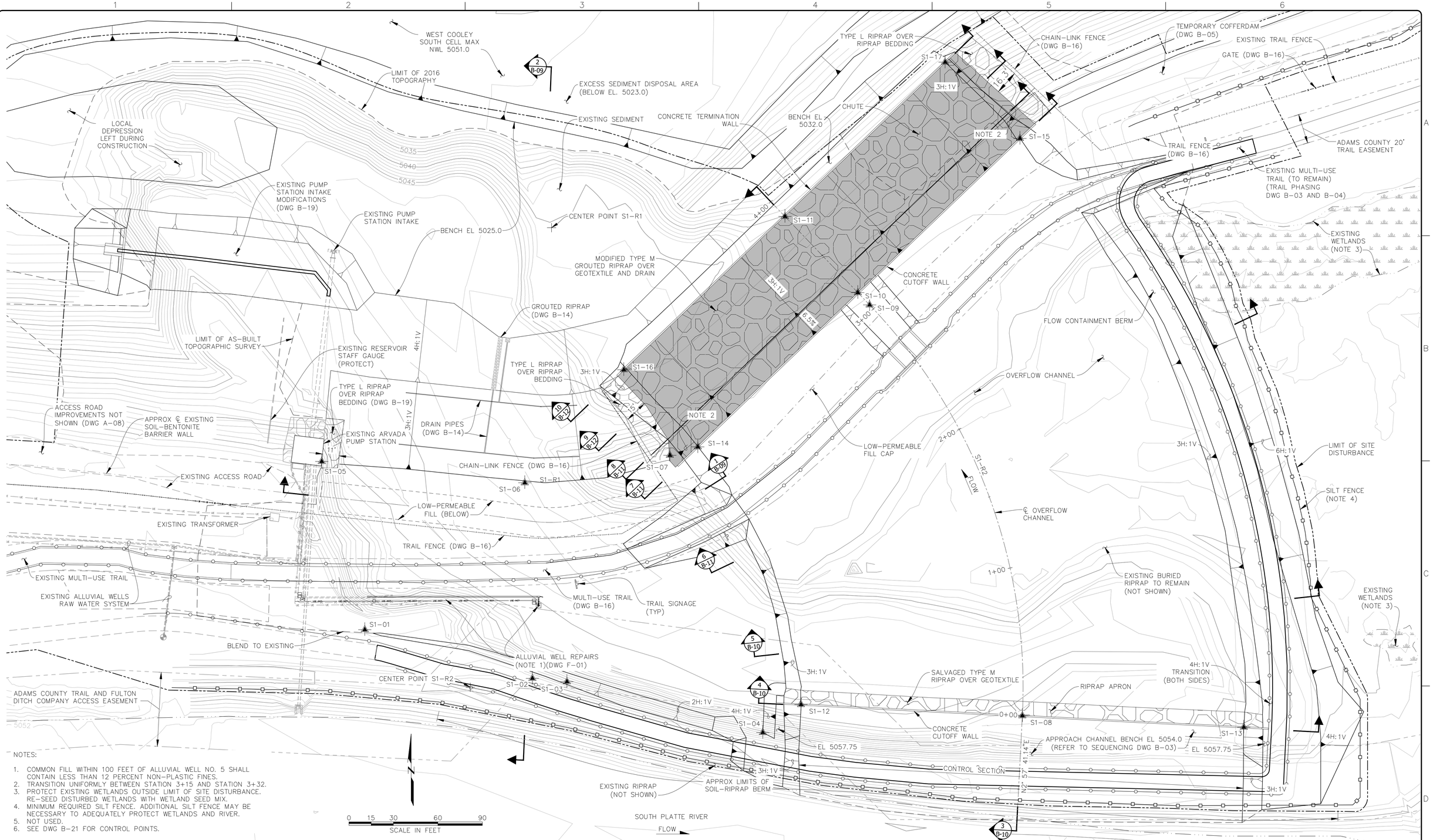
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PLAN OF EXISTING CONDITIONS

DWG. NO. B-01

SHEET NO. 10 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - PLAN OF EXISTING CONDITIONS.DWG 6/14/2021



NOTES:

1. COMMON FILL WITHIN 100 FEET OF ALLUVIAL WELL NO. 5 SHALL CONTAIN LESS THAN 12 PERCENT NON-PLASTIC FINES.
2. TRANSITION UNIFORMLY BETWEEN STATION 3+15 AND STATION 3+32.
3. PROTECT EXISTING WETLANDS OUTSIDE LIMIT OF SITE DISTURBANCE. RE-SEED DISTURBED WETLANDS WITH WETLAND SEED MIX.
4. MINIMUM REQUIRED SILT FENCE. ADDITIONAL SILT FENCE MAY BE NECESSARY TO ADEQUATELY PROTECT WETLANDS AND RIVER.
5. NOT USED.
6. SEE DWG B-21 FOR CONTROL POINTS.

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WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PLAN OF MODIFICATIONS

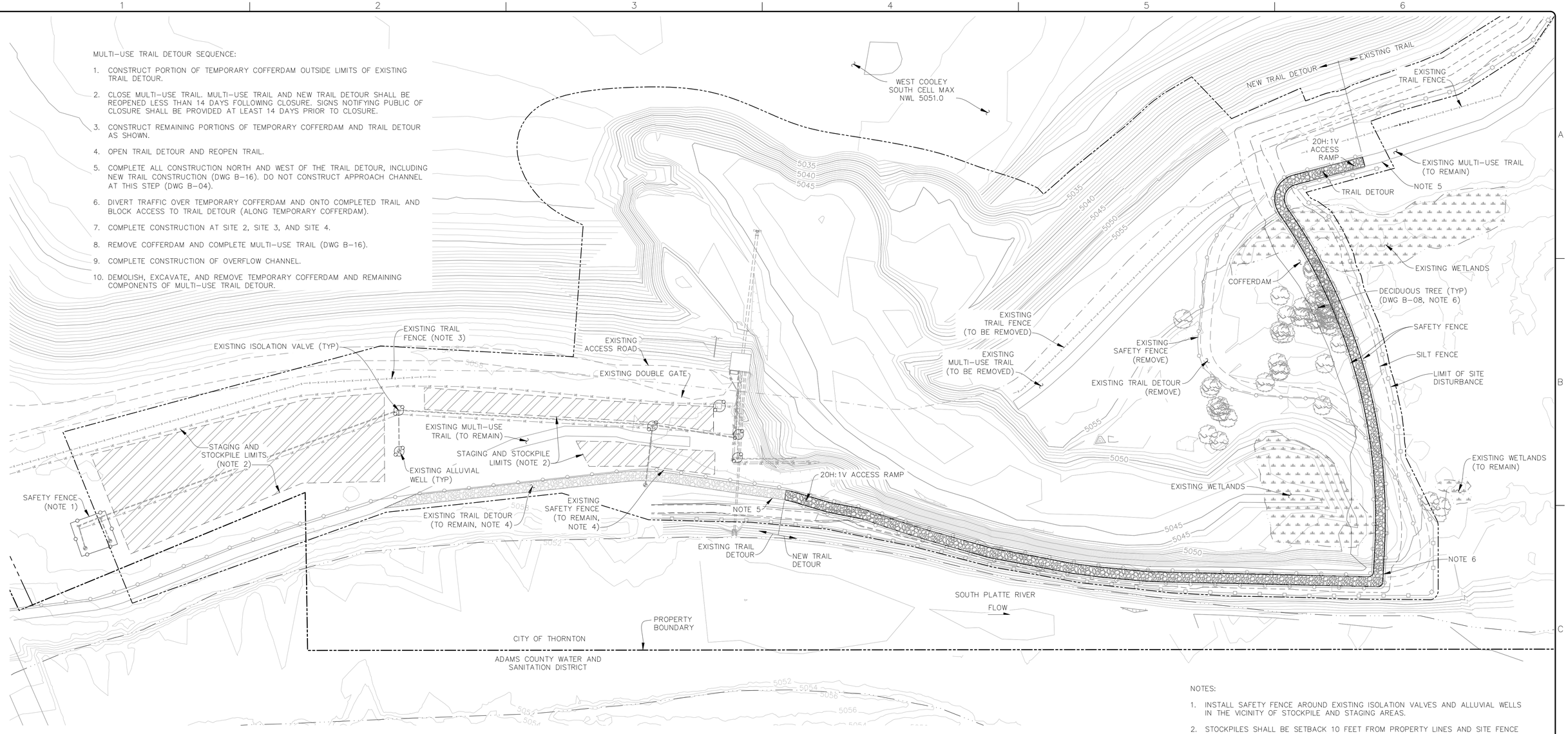
DWG. NO. B-02

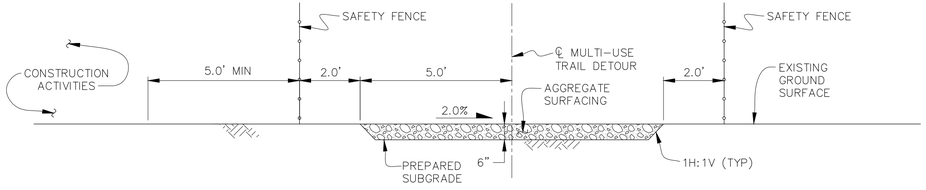
SHEET NO. 11 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - PLAN OF MODS.DWG 6/14/2021

MULTI–USE TRAIL DETOUR SEQUENCE:

1. CONSTRUCT PORTION OF TEMPORARY COFFERDAM OUTSIDE LIMITS OF EXISTING TRAIL DETOUR.
2. CLOSE MULTI–USE TRAIL. MULTI–USE TRAIL AND NEW TRAIL DETOUR SHALL BE REOPENED LESS THAN 14 DAYS FOLLOWING CLOSURE. SIGNS NOTIFYING PUBLIC OF CLOSURE SHALL BE PROVIDED AT LEAST 14 DAYS PRIOR TO CLOSURE.
3. CONSTRUCT REMAINING PORTIONS OF TEMPORARY COFFERDAM AND TRAIL DETOUR AS SHOWN.
4. OPEN TRAIL DETOUR AND REOPEN TRAIL.
5. COMPLETE ALL CONSTRUCTION NORTH AND WEST OF THE TRAIL DETOUR, INCLUDING NEW TRAIL CONSTRUCTION (DWG B–16). DO NOT CONSTRUCT APPROACH CHANNEL AT THIS STEP (DWG B–04).
6. DIVERT TRAFFIC OVER TEMPORARY COFFERDAM AND ONTO COMPLETED TRAIL AND BLOCK ACCESS TO TRAIL DETOUR (ALONG TEMPORARY COFFERDAM).
7. COMPLETE CONSTRUCTION AT SITE 2, SITE 3, AND SITE 4.
8. REMOVE COFFERDAM AND COMPLETE MULTI–USE TRAIL (DWG B–16).
9. COMPLETE CONSTRUCTION OF OVERFLOW CHANNEL.
10. DEMOLISH, EXCAVATE, AND REMOVE TEMPORARY COFFERDAM AND REMAINING COMPONENTS OF MULTI–USE TRAIL DETOUR.





TYPICAL SECTION
MULTI-USE TRAIL DETOUR
NOT TO SCALE

0 25 50 100 150
SCALE IN FEET

N

NOTES:

1. INSTALL SAFETY FENCE AROUND EXISTING ISOLATION VALVES AND ALLUVIAL WELLS IN THE VICINITY OF STOCKPILE AND STAGING AREAS.
2. STOCKPILES SHALL BE SETBACK 10 FEET FROM PROPERTY LINES AND SITE FENCE AND 15 FEET FROM EXISTING ISOLATION VALVES AND ALLUVIAL WELLS.
3. REMOVE EXISTING TRAIL FENCE ALONG NORTH EDGE OF STOCKPILE AREA TO ALLOW ACCESS DURING CONSTRUCTION. REPLACE IN–KIND AT THE END OF CONSTRUCTION.
4. MAINTAIN MULTI–USE TRAIL DETOUR AND SAFETY FENCE THROUGHOUT CONSTRUCTION UNTIL REMOVAL. SEE SEQUENCE THIS SHEET.
5. TRAFFIC CONTROL PLAN SHALL INCLUDE DISMOUNT ZONE SIGNS AT ACCESS RAMP TO COFFERDAM.
6. COORDINATE LOCATION OF COFFERDAM AND TRAIL TO PERMIT CONSTRUCTION OF OVERFLOW CHANNEL CONCRETE CUTOFF WALL (DWG B–10).

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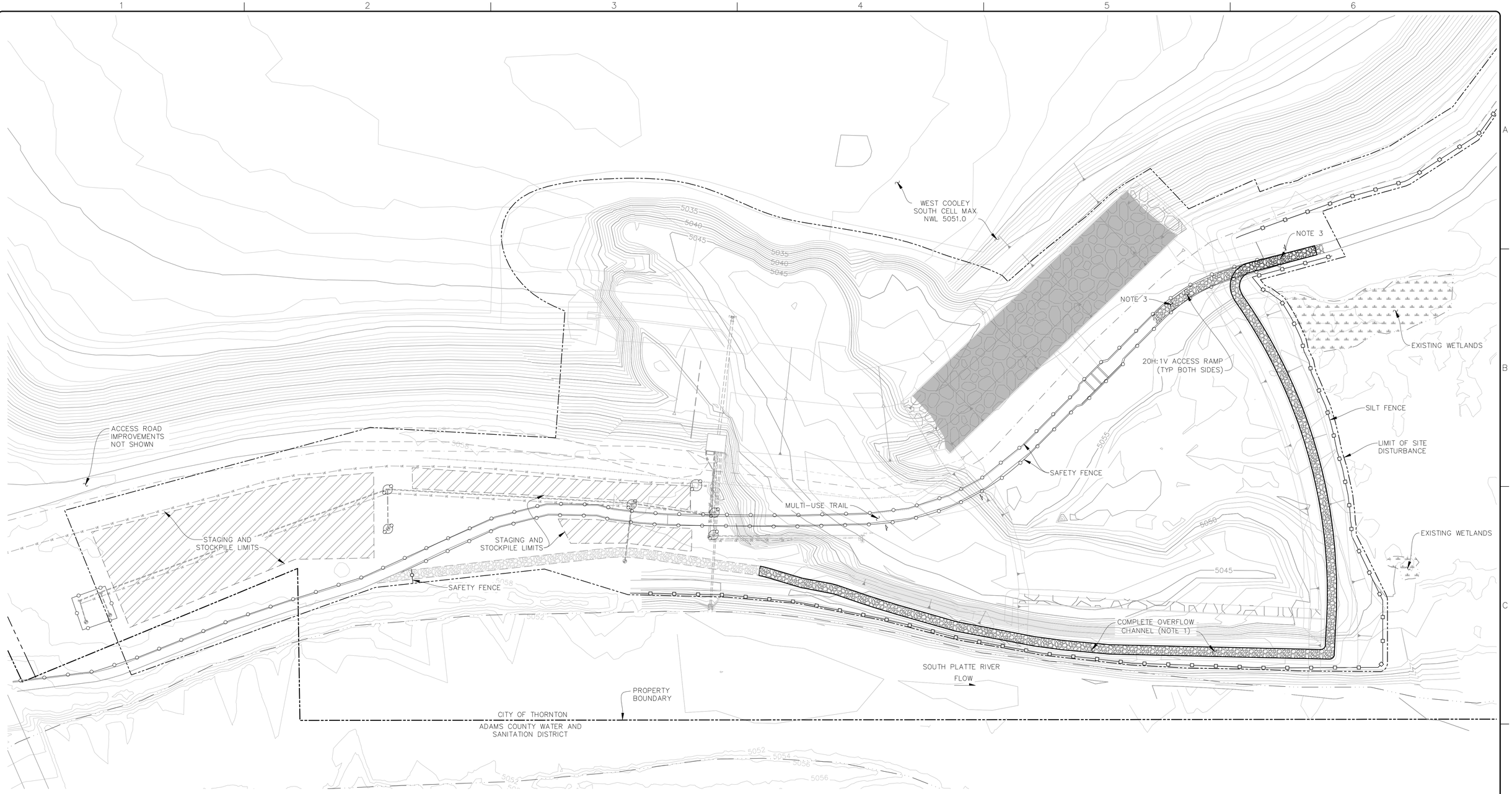
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PHASE I TRAIL DETOUR, STAGING AND STOCKPILING

DWG. NO. B-03

SHEET NO. 12 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – PHASING.DWG 6/14/2021



NOTES:

1. REFER TO CONSTRUCTION SEQUENCE ON B-03.
2. NOT USED.
3. TRAFFIC CONTROL PLAN SHALL INCLUDE SIGNS INDICATING A HILL AT BOTH SIDES OF THE COFFERDAM.

0 25 50 100 150
SCALE IN FEET

N

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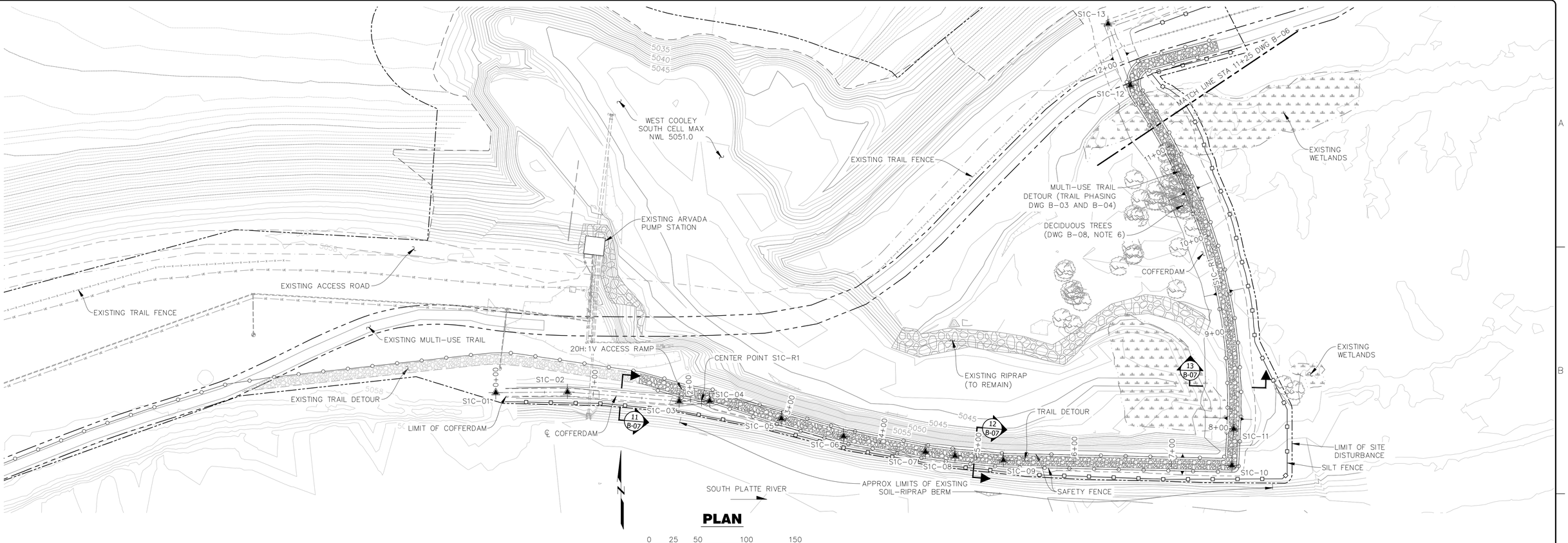
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - PHASE II TRAIL DETOUR, STAGING, AND STOCKPILING

DWG. NO. B-04

SHEET NO. 13 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – PHASING II.DWG 6/14/2021



NOTES:

1. TRANSITION CREST WIDTH AND SIDE SLOPES BETWEEN STATION 2+10 AND 2+20.
2. DO NOT DISTURB TREES OUTSIDE LIMIT OF COFFERDAM.
3. TEMPORARY COFFERDAM REMOVED AT PROJECT COMPLETION.

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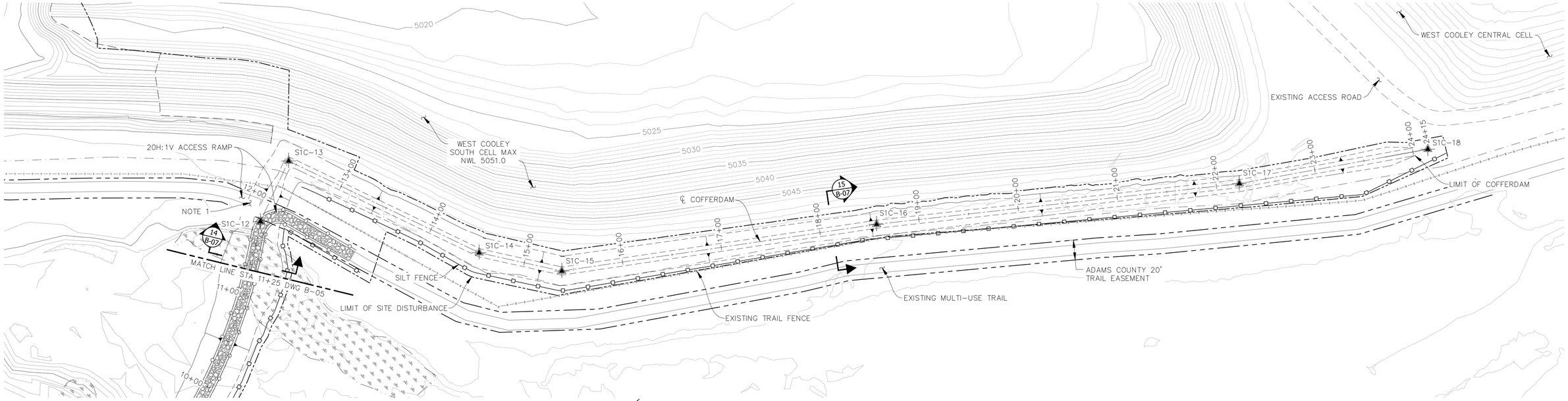
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - COFFERDAM PLAN AND PROFILE (1 OF 2)

DWG. NO. B-05

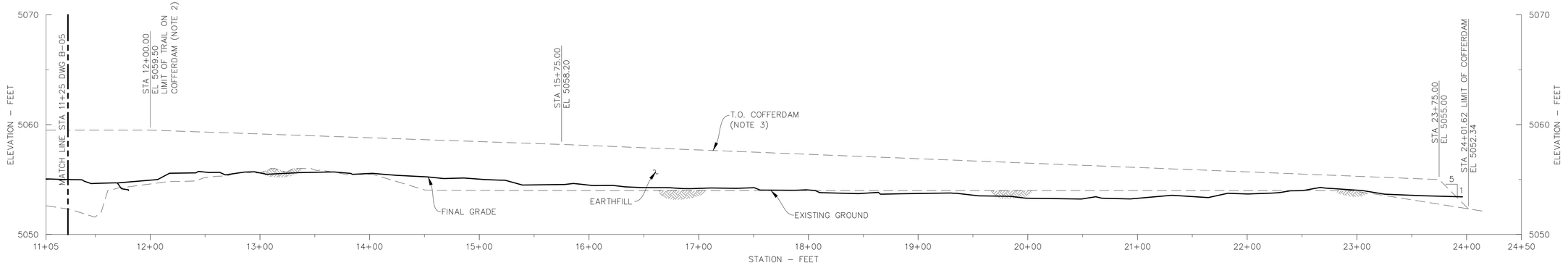
SHEET NO. 14 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – COFFERDAM PLAN AND PROFILE.DWG 6/14/2021



PLAN

0 25 50 100 150
SCALE IN FEET



PROFILE

0 25 50 100 150
SCALE IN FEET
(HORIZONTAL)

0 2.5 5 10 15
SCALE IN FEET
(VERTICAL)

NOTES:

1. SAWCUT, DEMOLISH, AND DISPOSE OF EXISTING MULTI-USE TRAIL AND FENCE BELOW COFFERDAM.
2. TRANSITION CREST WIDTH BETWEEN STATION 12+10 AND 12+20.
3. TEMPORARY COFFERDAM REMOVED AT PROJECT COMPLETION.

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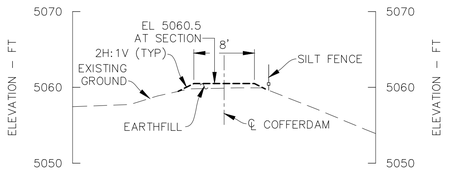
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - COFFERDAM PLAN AND PROFILE (2 OF 2)

DWG. NO. B-06

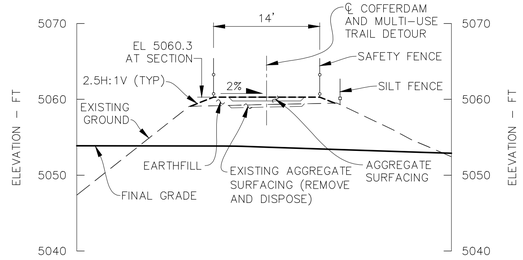
SHEET NO. 15 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - COFFERDAM PLAN AND PROFILE.DWG 6/14/2021



SECTION 11 B-05

0 5 10 20 30
SCALE IN FEET



SECTION 12 B-05

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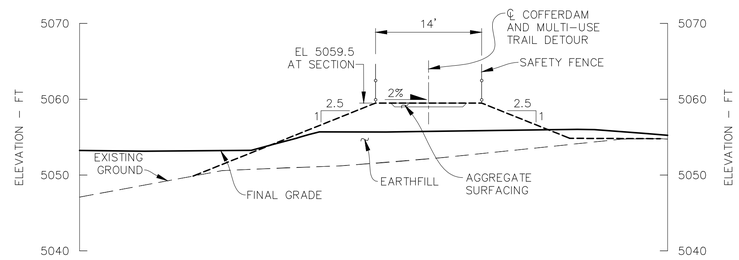
SCALE IN FEET



SECTION 13 B-05

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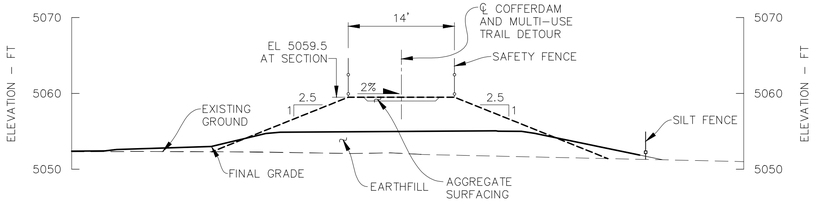
SCALE IN FEET



SECTION 14 B-06

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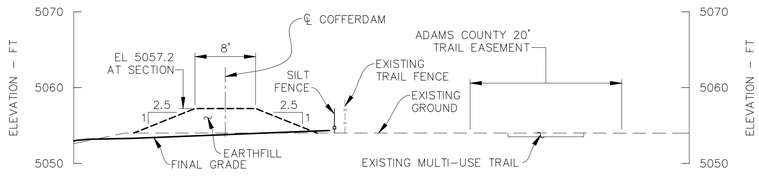
SCALE IN FEET



SECTION 15 B-06

0 5 10 20 30
SCALE IN FEET

NOTE:
1. TEMPORARY COFFERDAM REMOVED AT PROJECT COMPLETION.

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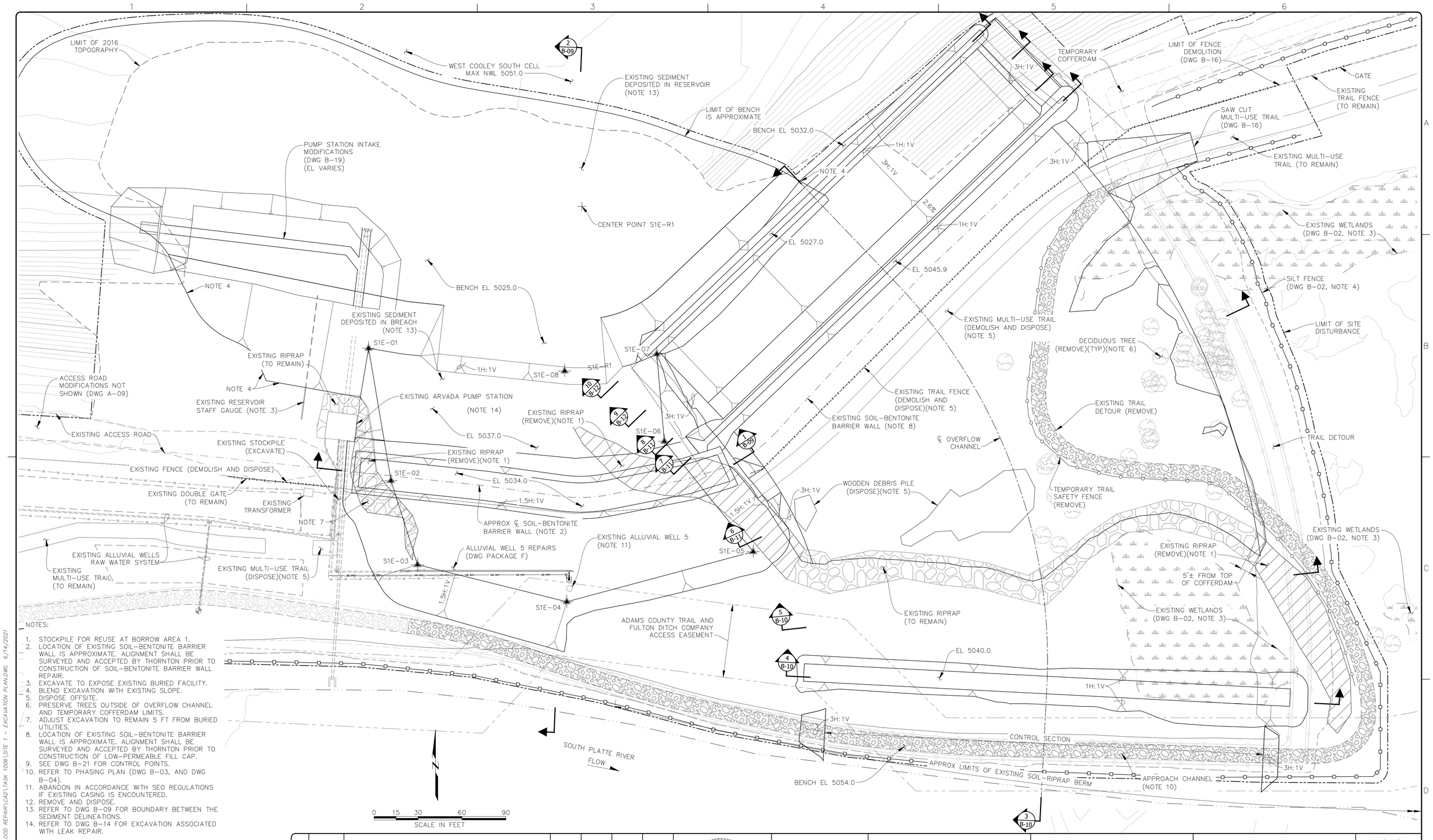
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - COFFERDAM SECTIONS

DWG. NO. B-07

SHEET NO. 16 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – COFFERDAM PLAN AND PROFILE.DWG 6/14/2021



NOTES:

1. STOCKPILE FOR REUSE AT BORROW AREA 1.
2. LOCATION OF EXISTING SOIL-BENTONITE BARRIER WALL IS APPROXIMATE. ALIGNMENT SHALL BE SURVEYED AND ACCEPTED BY THORNTON PRIOR TO CONSTRUCTION OF SOIL-BENTONITE BARRIER WALL REPAIR.
3. EXCAVATE TO EXPOSE EXISTING BURIED FACILITY.
4. BLEND EXCAVATION WITH EXISTING SLOPE.
5. DISPOSE OFFSITE.
6. PRESERVE TREES OUTSIDE OF OVERFLOW CHANNEL AND TEMPORARY COFFERDAM LIMITS.
7. ADJUST EXCAVATION TO REMAIN 5 FT FROM BURIED UTILITIES.
8. LOCATION OF EXISTING SOIL-BENTONITE BARRIER WALL IS APPROXIMATE. ALIGNMENT SHALL BE SURVEYED AND ACCEPTED BY THORNTON PRIOR TO CONSTRUCTION OF LOW-PERMEABLE FILL CAP.
9. SEE DWG B-21 FOR CONTROL POINTS.
10. REFER TO PHASING PLAN (DWG B-03, AND DWG B-04).
11. ABANDON IN ACCORDANCE WITH SEO REGULATIONS IF EXISTING CASING IS ENCOUNTERED.
12. REMOVE AND DISPOSE.
13. REFER TO DWG B-09 FOR BOUNDARY BETWEEN THE SEDIMENT DELINEATIONS.
14. REFER TO DWG B-14 FOR EXCAVATION ASSOCIATED WITH LEAK REPAIR.

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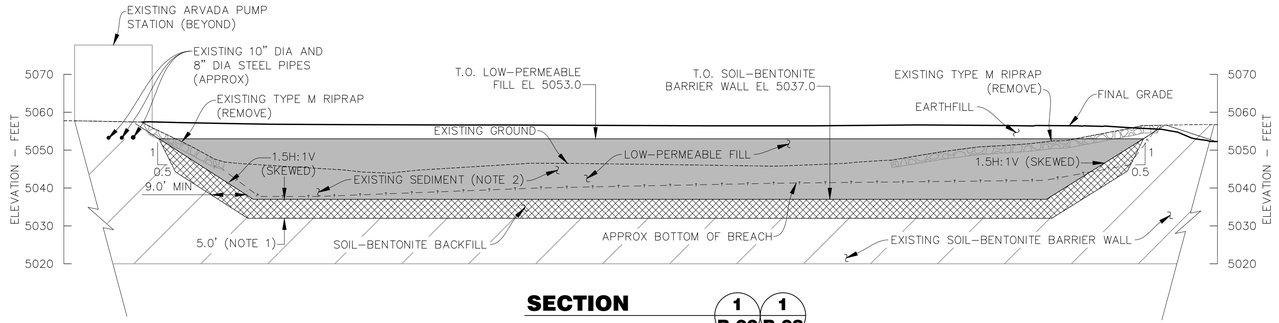
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - EXCAVATION PLAN

DWG. NO. B-08

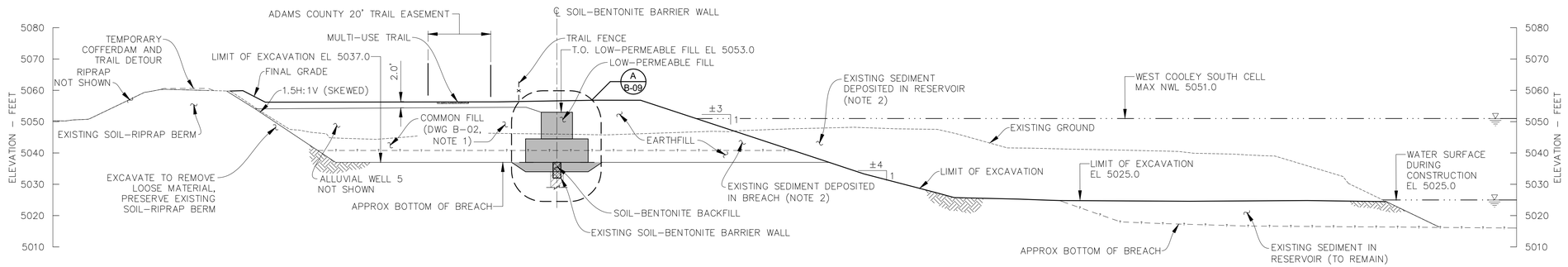
SHEET NO. 17 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - EXCAVATION PLAN.DWG 6/14/2021



SECTION 1 B-02 / 1 B-08

0 10 20 40 60
SCALE IN FEET



SECTION 2 B-02 / 2 B-08

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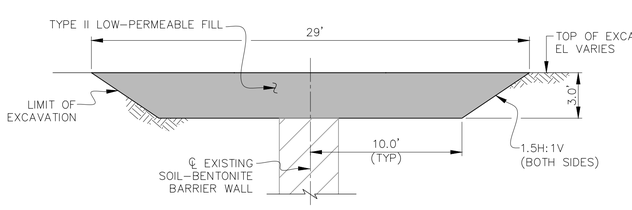

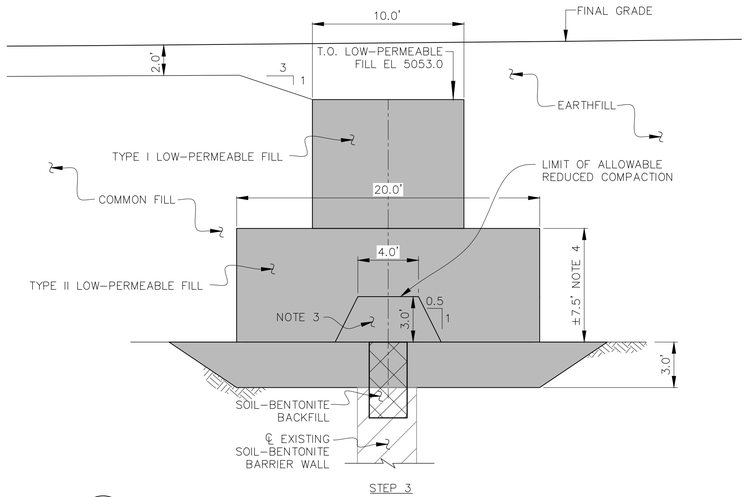

DETAIL A B-09

0 2.5 5 10 15
SCALE IN FEET

SOIL-BENTONITE BARRIER WALL REPAIR INSTALLATION SEQUENCE:

1. EXCAVATE SEDIMENT AS SHOWN ON THE SITE 1 EXCAVATION PLAN. PLACE LOW-PERMEABLE FILL AS SHOWN.
2. EXCAVATE THROUGH LOW-PERMEABLE FILL AND INTO EXISTING SOIL-BENTONITE BARRIER WALL. EXCAVATION MUST OVERLAP EXISTING BARRIER WALL BY MINIMUM OF 2 VERTICAL FEET. BACKFILL TRENCH WITH SOIL-BENTONITE BACKFILL.
3. PLACE LOW-PERMEABILITY FILL TO ELEVATION 5053.0.

NOTES:

1. EXCAVATE TOP 5.0 FEET OF EXISTING SOIL-BENTONITE BARRIER WALL.
2. SEDIMENT DEPOSITED DURING FLOOD EVENT. CONCRETE AND MISCELLANEOUS DEBRIS COULD BE LOCATED WITHIN SEDIMENT. EXCAVATE AND STOCKPILE SEDIMENT FOR USE AS COMMON FILL AND DISPOSE OF CONCRETE AND MISCELLANEOUS DEBRIS. LIMITS OF EXISTING SEDIMENT MAY VARY FROM THOSE SHOWN.
3. COMPACT LOW-PERMEABLE FILL DIRECTLY ABOVE AND ALONG SOIL-BENTONITE BARRIER WALL NOT LESS THAN 92-PERCENT RELATIVE COMPACTION.
4. UTILIZE ALL ACCEPTABLE TYPE II LOW-PERMEABLE FILL BEFORE PLACING TYPE I LOW-PERMEABLE FILL.

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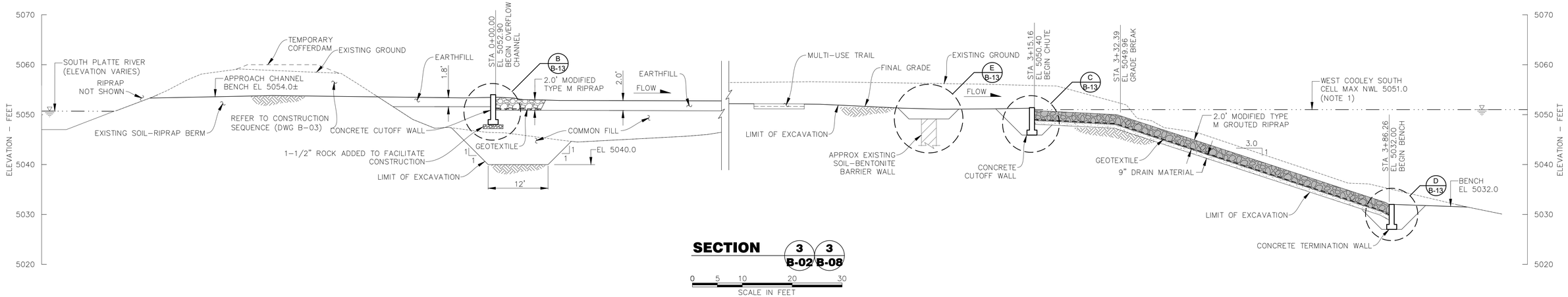
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - REPAIR SECTIONS AND DETAILS

DWG. NO. B-09

SHEET NO. 18 of 77

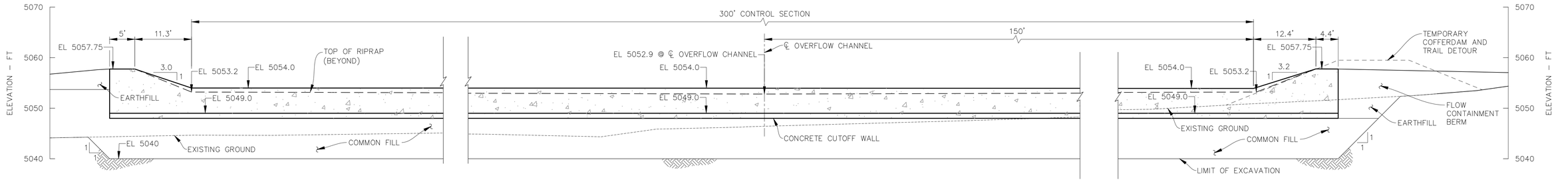
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - PLAN OF MODS.DWG 6/14/2021



SECTION 3 / B-02 — 3 / B-08

0 5 10 20 30

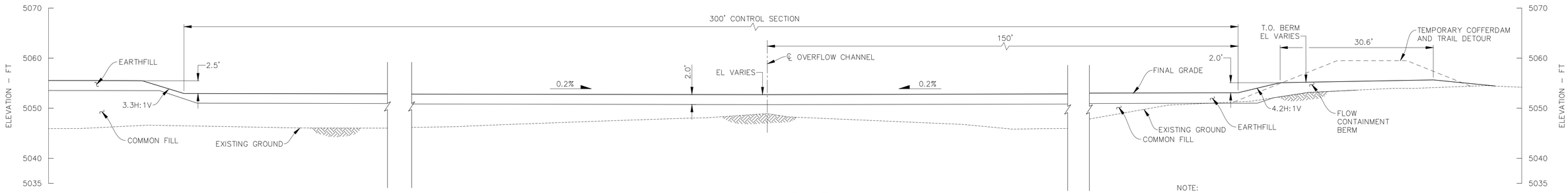
SCALE IN FEET



SECTION 4 / B-02 — 4 / B-08

0 5 10 20 30

SCALE IN FEET



SECTION 5 / B-02 — 5 / B-08

0 5 10 20 30

SCALE IN FEET

NOTE:

1. CONSTRUCTION WATER SURFACE ELEVATION IS 5025.0

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City of Thornton

RJH PROJECT 16116

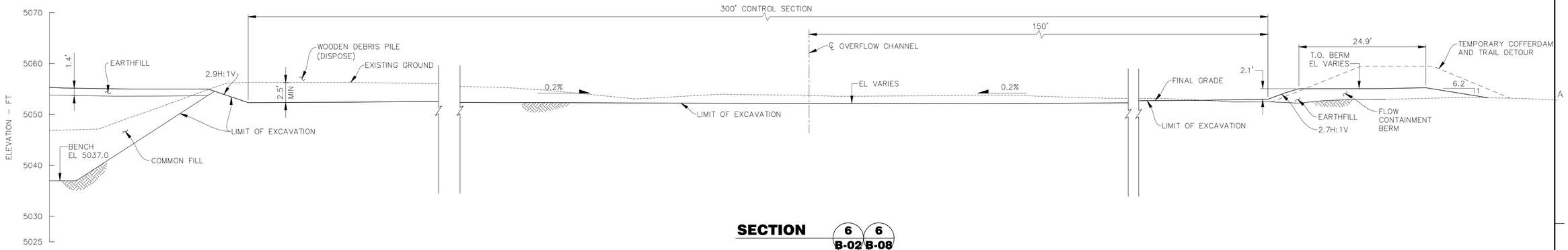
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - OVERFLOW CHANNEL SECTIONS (1 OF 3)

DWG. NO. B-10

SHEET NO. 19 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – PLAN OF MODS.DWG 6/14/2021



SECTION 6 (B-02) 6 (B-08)

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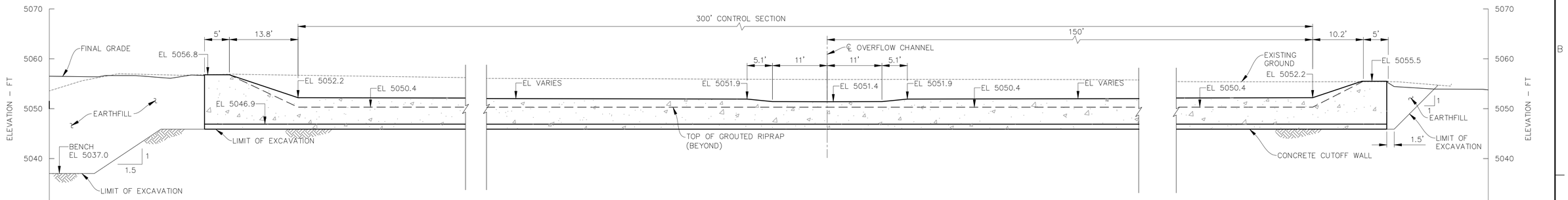

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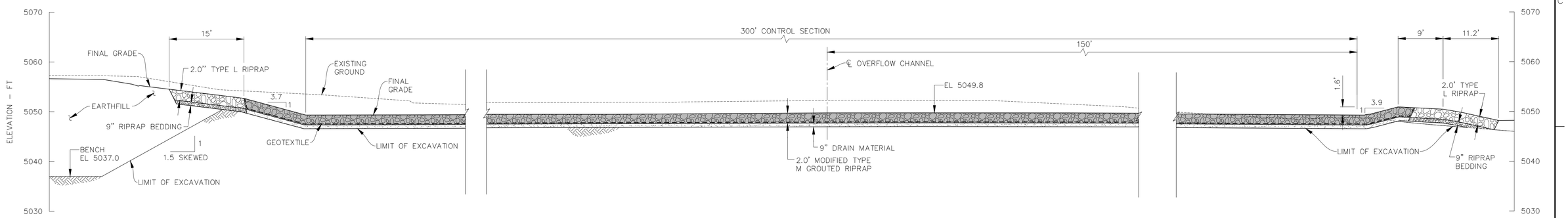

SECTION 8 (B-02) 8 (B-08)

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SCALE IN FEET

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COLORADO LICENSED PROFESSIONAL ENGINEER ROBERT J. HUSSAR 25734 06/15/21

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

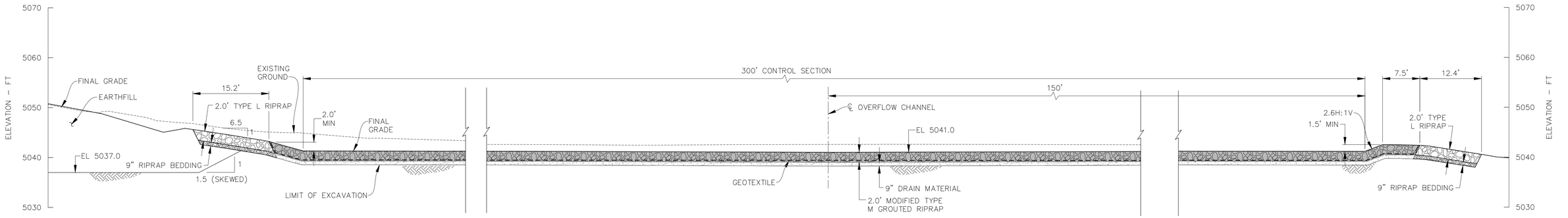
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - OVERFLOW CHANNEL SECTIONS (2 OF 3)

DWG. NO. B-11

SHEET NO. 20 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – PLAN OF MODS.DWG 6/14/2021



SECTION 9 / B-02 B-08

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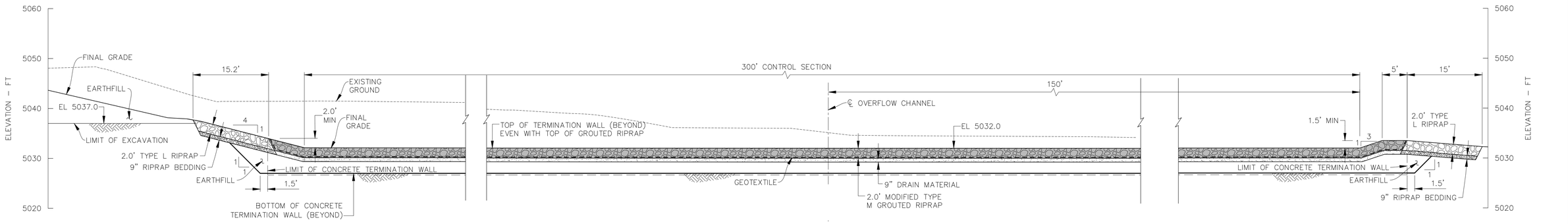

SECTION 10 / B-02 B-08

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SCALE IN FEET

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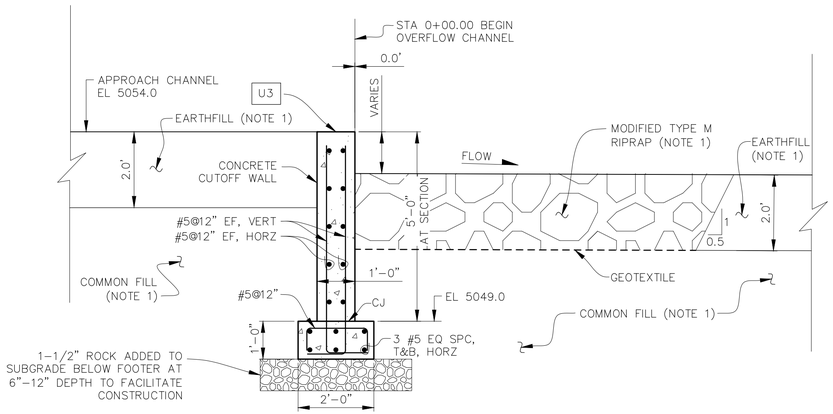
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - OVERFLOW CHANNEL SECTIONS (3 OF 3)

DWG. NO. B-12

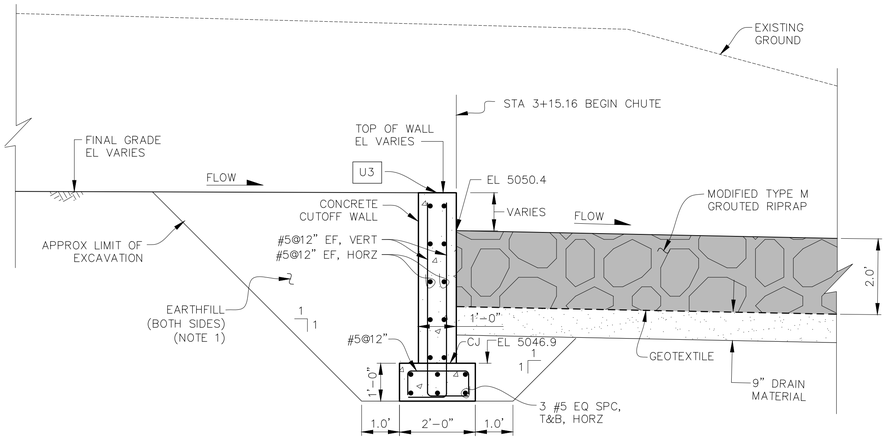
SHEET NO. 21 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 – PLAN OF MODS.DWG 6/14/2021



DETAIL B B-10

SCALE IN FEET



DETAIL C B-10

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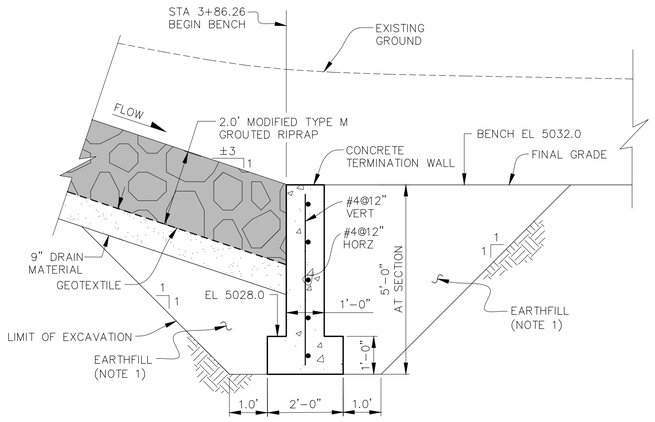
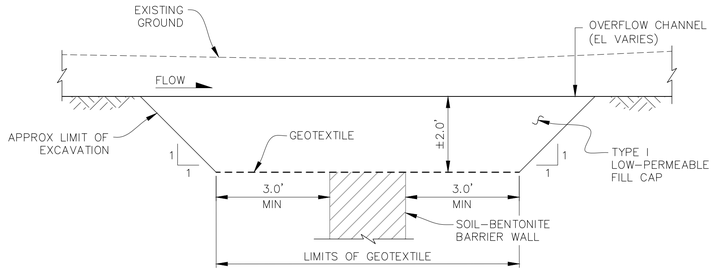


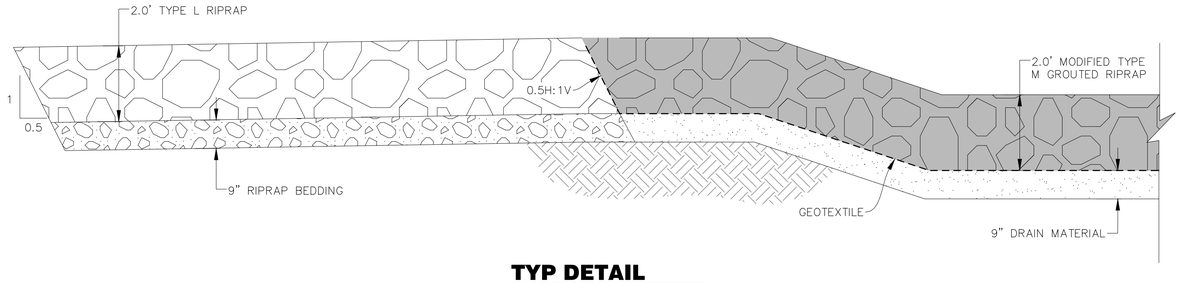
DETAIL D B-10

SCALE IN FEET



DETAIL E B-10

SCALE IN FEET



TYP DETAIL

NOT TO SCALE

NOTE:

1. MAINTAIN FILL LEVEL WITHIN 2 FT ON ALL SIDES OF STRUCTURE.

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ROBERT J. HUSSEY
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PROFESSIONAL ENGINEER
06/13/21

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

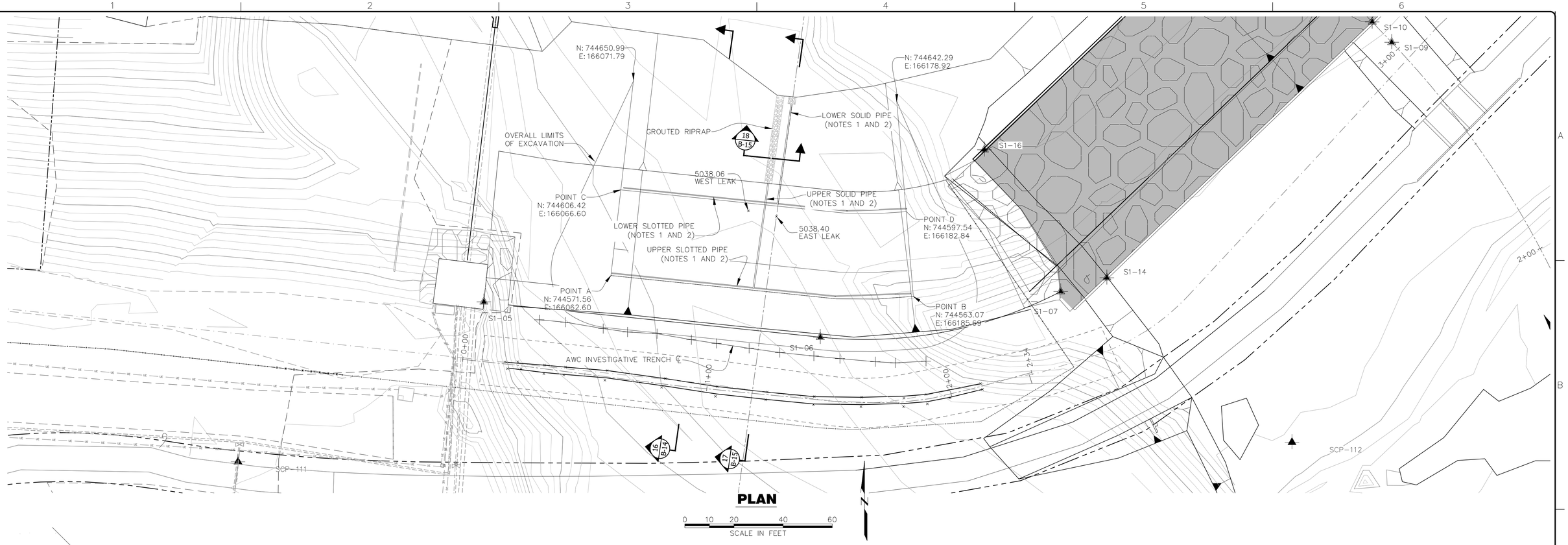
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - OVERFLOW CHANNEL DETAILS

DWG. NO. B-13

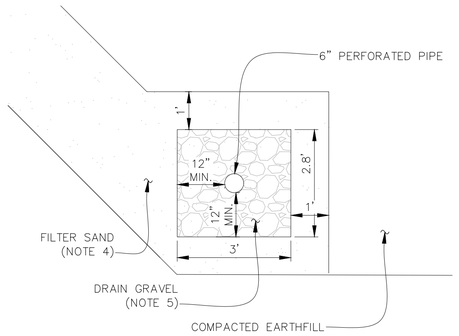
SHEET NO. 22 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - PLAN OF MODS.DWG 6/14/2021



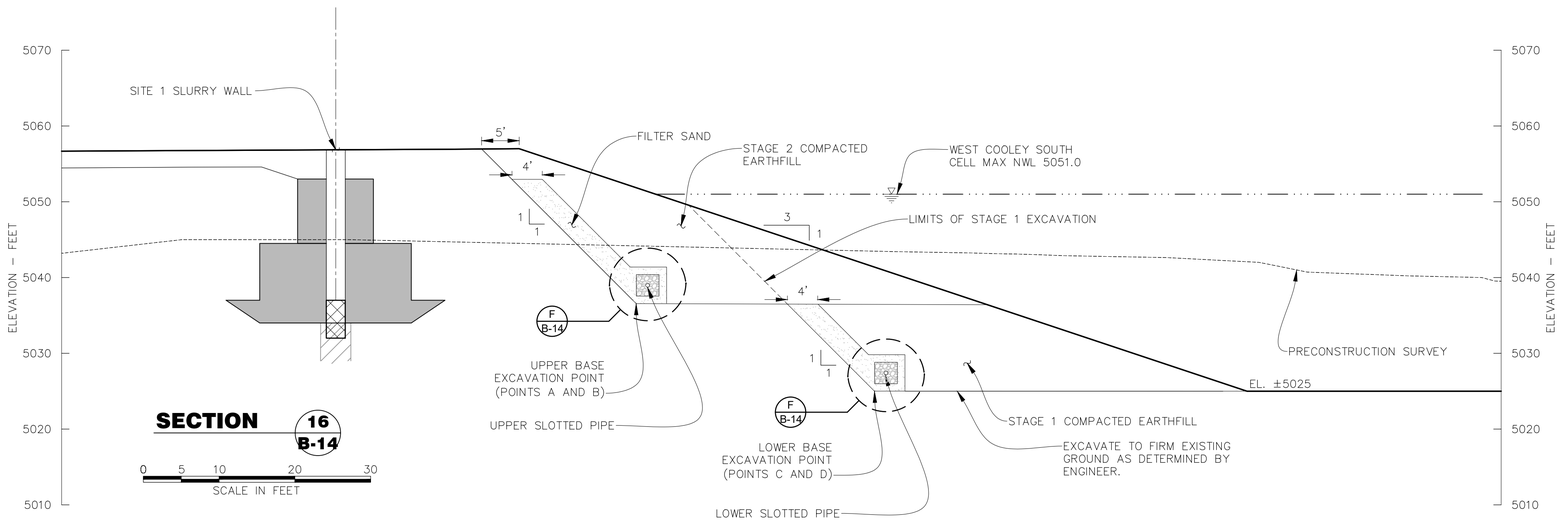
PLAN

0 10 20 40 60
SCALE IN FEET



DETAIL F B-14

0 1 2 4 6
SCALE IN FEET



SECTION 16 B-14

0 5 10 20 30
SCALE IN FEET

NOTES:

1. FILTER SAND AND DRAIN GRAVEL NOT SHOWN IN PLAN FOR CLARITY.
2. SLOTTED PIPE AND SOLID PIPE SHALL BE 6" ADS N-12 DUAL WALL HDPE PIPE. SLOTTED PIPE SHALL HAVE 0.125" SLOT WIDTH AND 1 SQ. IN OPEN AREA PER FOOT OF PIPE.
3. FILL OVER 6" PIPE SHALL NOT EXCEED 20 FEET ABOVE THE TOP OF PIPE.
4. FILTER SAND SHALL BE ON SITE ALLUVIUM GRANULAR SEDIMENT MEETING THE GRADATION SHOWN IN TABLE 1 ON SHEET 2.
5. DRAIN GRAVEL SHALL BE CDOT AGGREGATE NO. 57 OR NO. 6.

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COLORADO LICENSED ROBERT J. HULSEY 25734 06/18/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

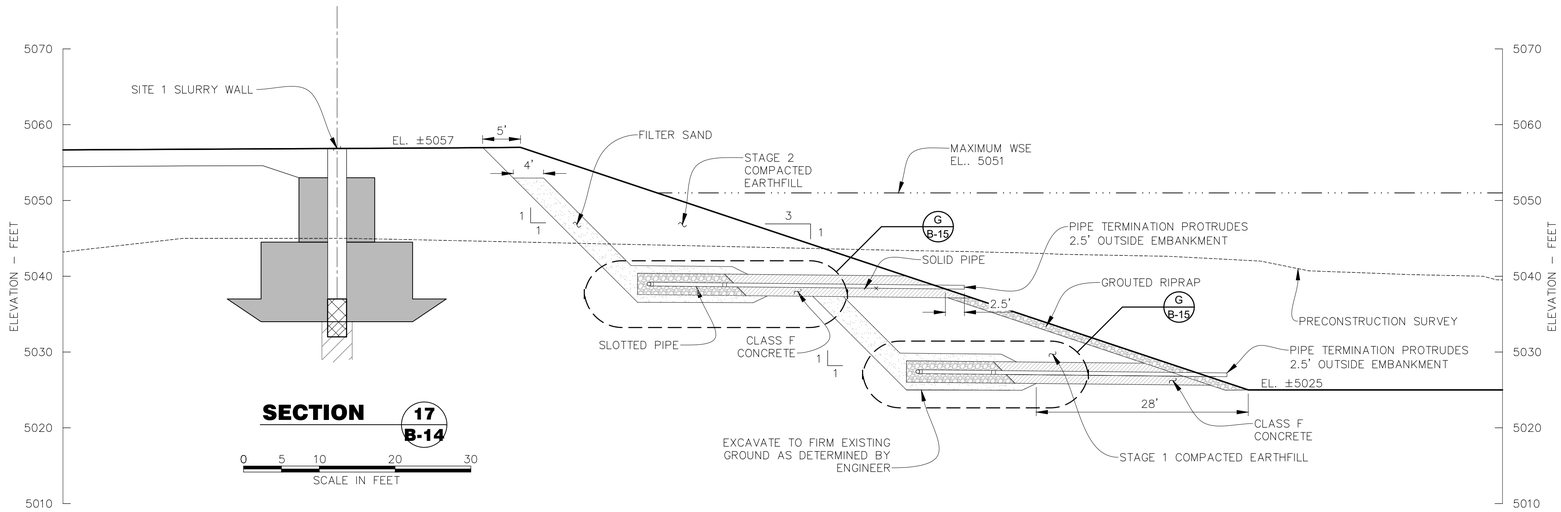
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

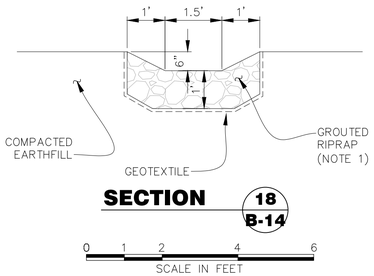
SITE 1 - LEAK REPAIR PLAN AND SECTION

DWG. NO. B-14

SHEET NO. 23 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\16116 - SUBSURFACE_SITE 1 - LEAK-REPAIRS.DWG 6/14/2021





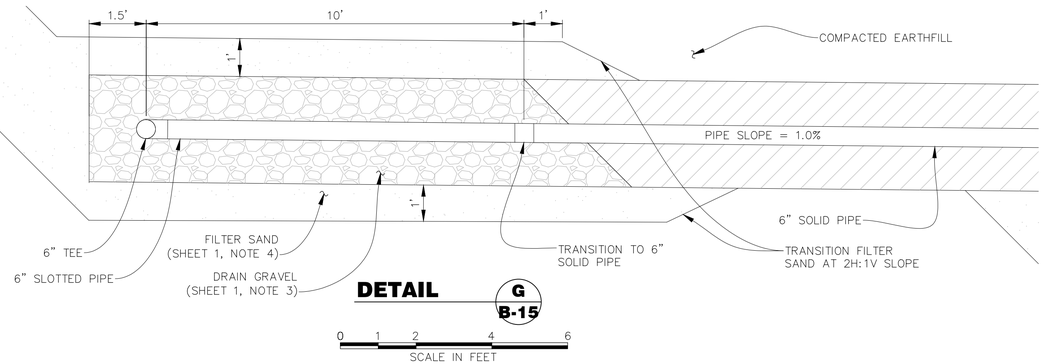


TABLE 1 – FILTER SAND GRADATION

SIEVE NAME	PERCENT PASSING
2"	95–100
3/4"	80–100
3/8"	70–90
No. 4	60–80
No. 16	35–60
No. 40	0–25
No. 200	0–5

NOTES:

1. RIPRAP SHALL MEET THE FOLLOWING CRITERIA:
   D_{50} = 4 IN
   MAXIMUM ROCK SIZE = 9 IN
   MINIMUM ROCK SIZE = 2 IN

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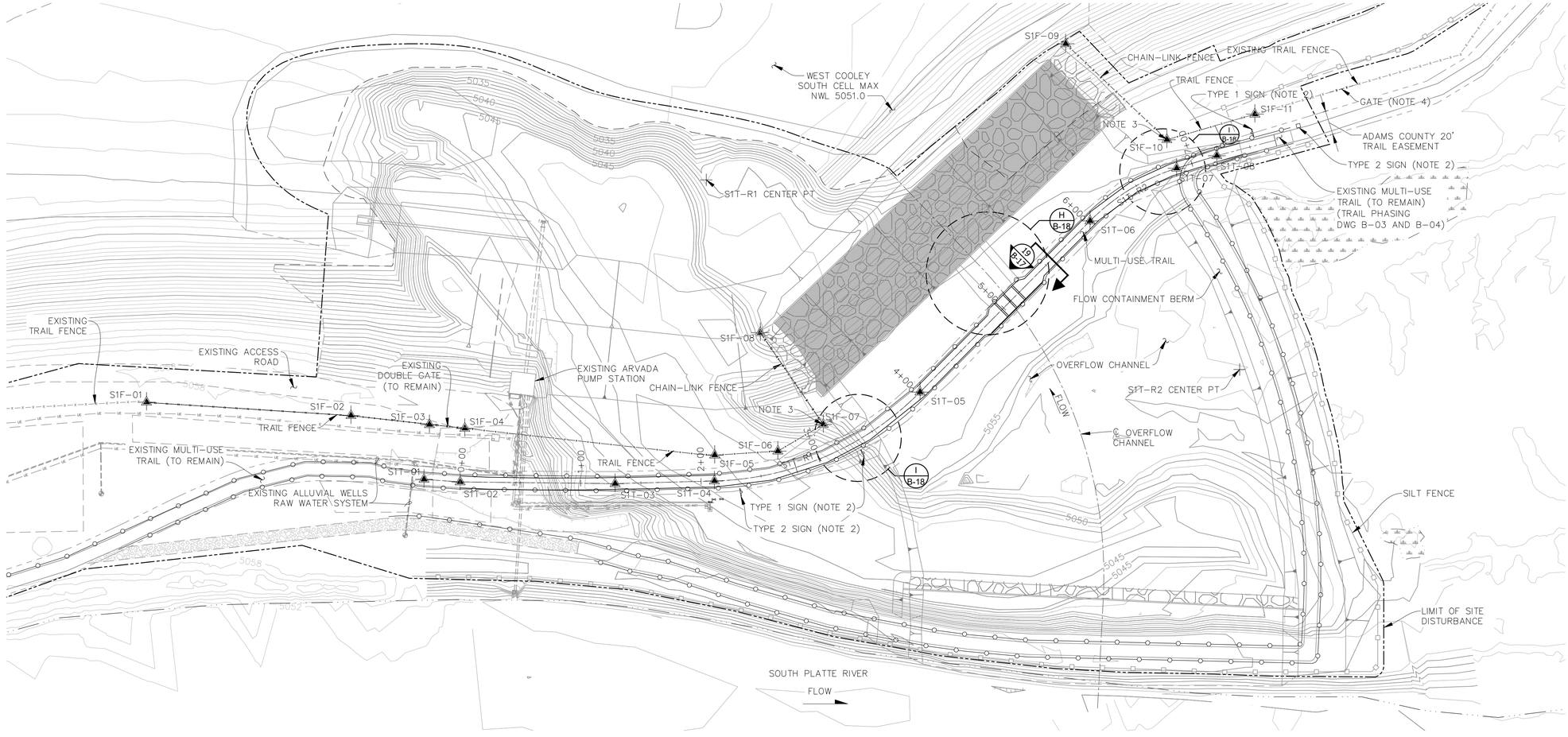
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - LEAK REPAIR SECTIONS AND DETAILS

DWG. NO. B-15

SHEET NO. 24 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\16116 – SUBSURFACE_SITE 1 – LEAK-REPAIRS.DWG 6/14/2021



NOTES:

1. SEE DWG B-21 FOR CONTROL POINTS.
2. LOCATE SIGNS ON RIGHT SIDE OF TRAIL AT EACH SIDE APPROACHING THE OVERFLOW CHANNEL AT 10 FT AND 100 FT FROM THE TOP OF THE OVERFLOW CHANNEL SLOPE. TOTAL OF 4 SIGNS.
3. TRANSITION TRAIL FENCE TO CHAIN-LINK FENCE.
4. PROVIDE 20 FOOT DOUBLE SWING GATE. COORDINATE LOCATION WITH THORNTON PRIOR TO INSTALLATION.

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City of Thornton

RJH PROJECT 16116

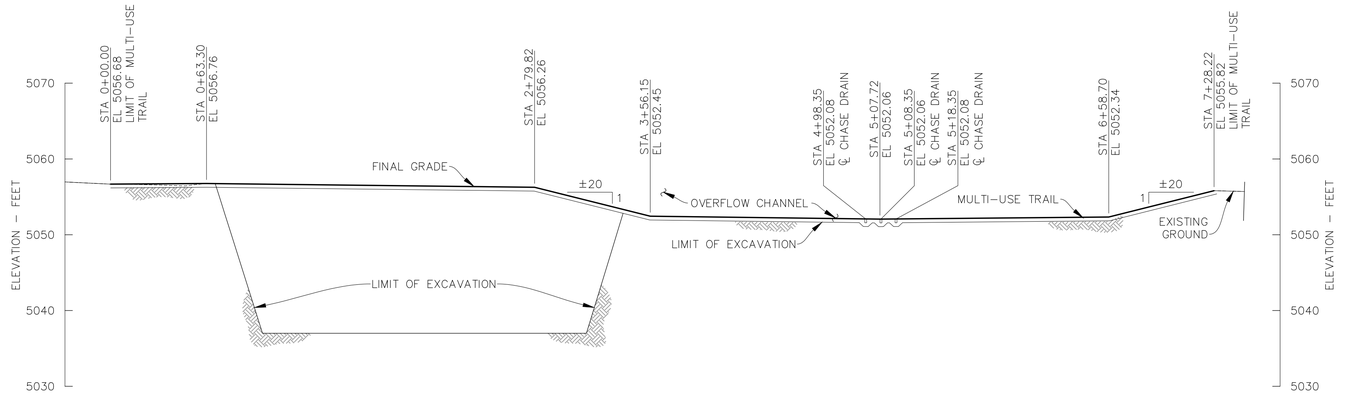
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PLAN OF MULTI-USE TRAIL AND FENCES

DWG. NO. B-16

SHEET NO. 25 of 77

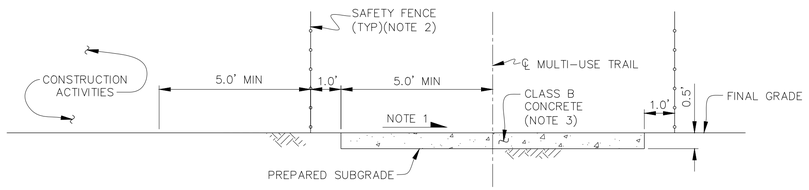
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - TRAIL AND FENCE.DWG 6/14/2021



PROFILE
MULTI-USE TRAIL

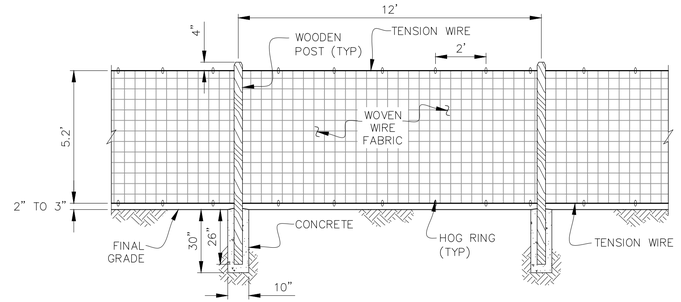
0 25 50 100 150
HORIZONTAL SCALE IN FEET

0 5 10 20 30
VERTICAL SCALE IN FEET

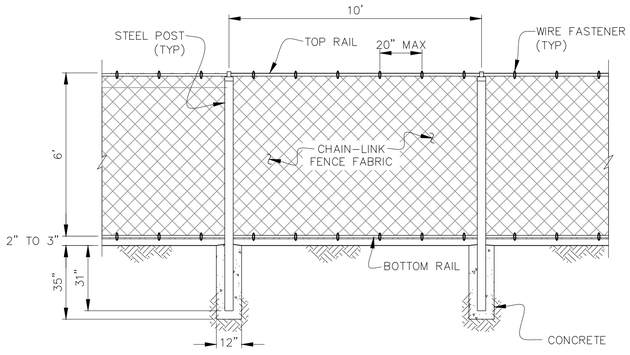


SECTION
MULTI-USE TRAIL
NOT TO SCALE

19
B-16



TYPICAL DETAIL
TRAIL FENCE
NOT TO SCALE



TYPICAL DETAIL
CHAIN-LINK FENCE
NOT TO SCALE

NOTES:

1. SLOPE AT GRADE OF OVERFLOW CHANNEL WITHIN OVERFLOW CHANNEL AND 2 PERCENT OUTSIDE OVERFLOW CHANNEL IN DIRECTION OF PREVAILING SLOPE.
2. REMOVE FOLLOWING CONSTRUCTION.
3. EXCAVATE AND PREPARE SUBGRADE FOR MULTI-USE TRAIL. CLASS B CONCRETE TO BE CONSTRUCTED BY OTHERS.

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RJH PROJECT 16116

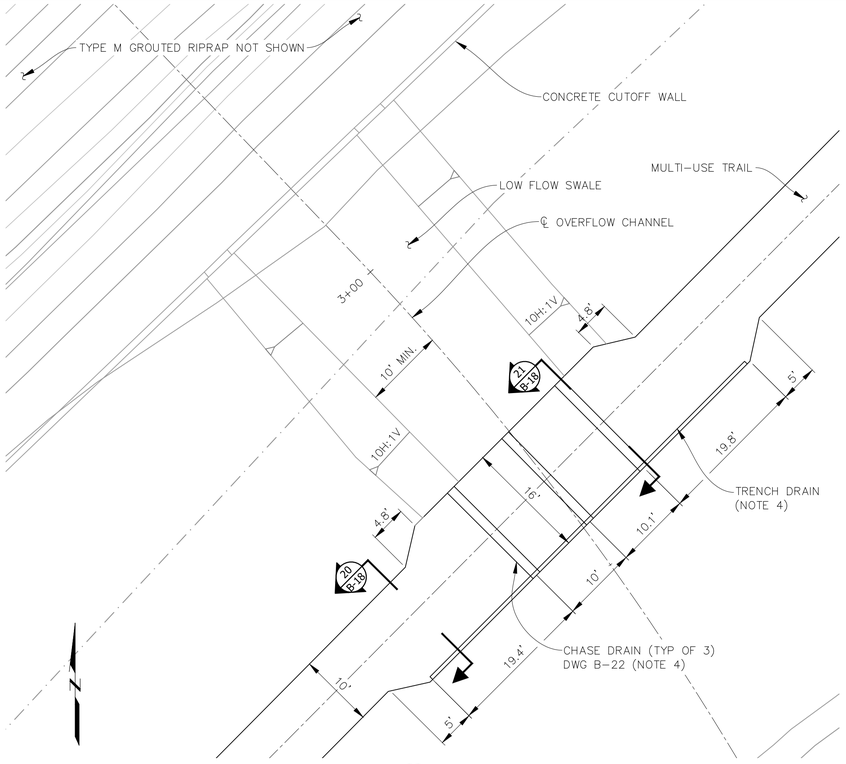
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - MULTI-USE TRAIL PROFILE, SECTION AND DETAILS

DWG. NO. B-17

SHEET NO. 26 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - TRAIL AND FENCE.DWG 6/14/2021



DETAIL H B-16

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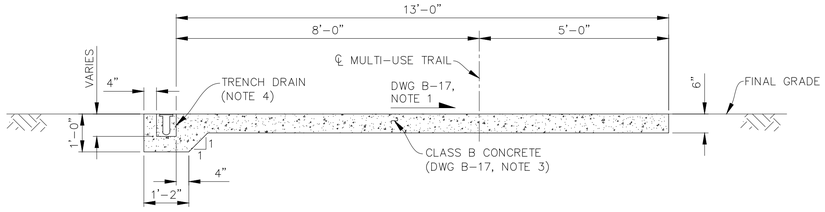
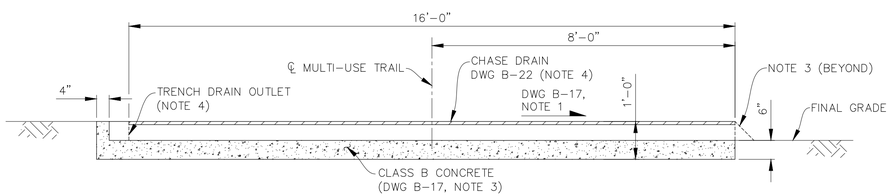
SCALE IN FEET



SECTION 20 B-18

0 1 2 4 6
SCALE IN FEET



SECTION 21 B-18

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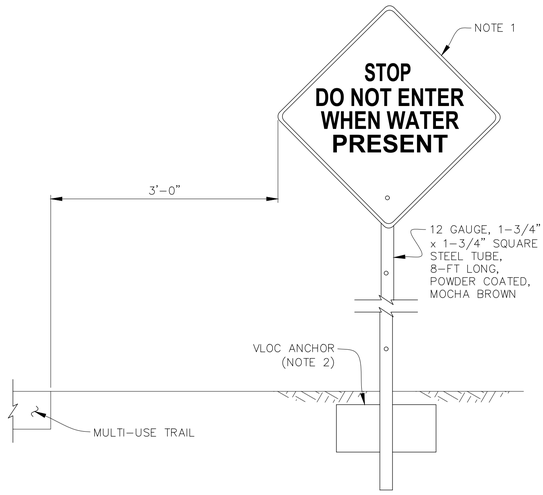
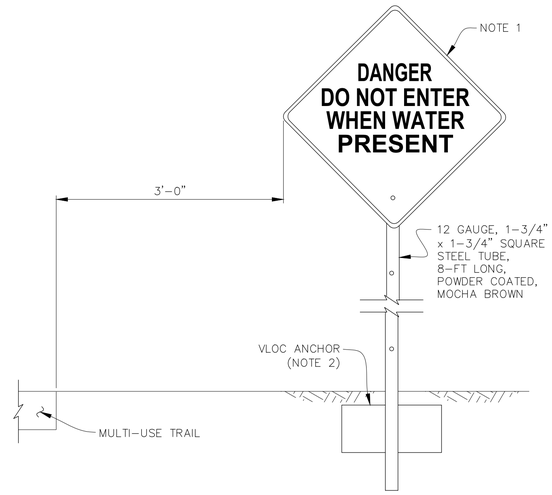
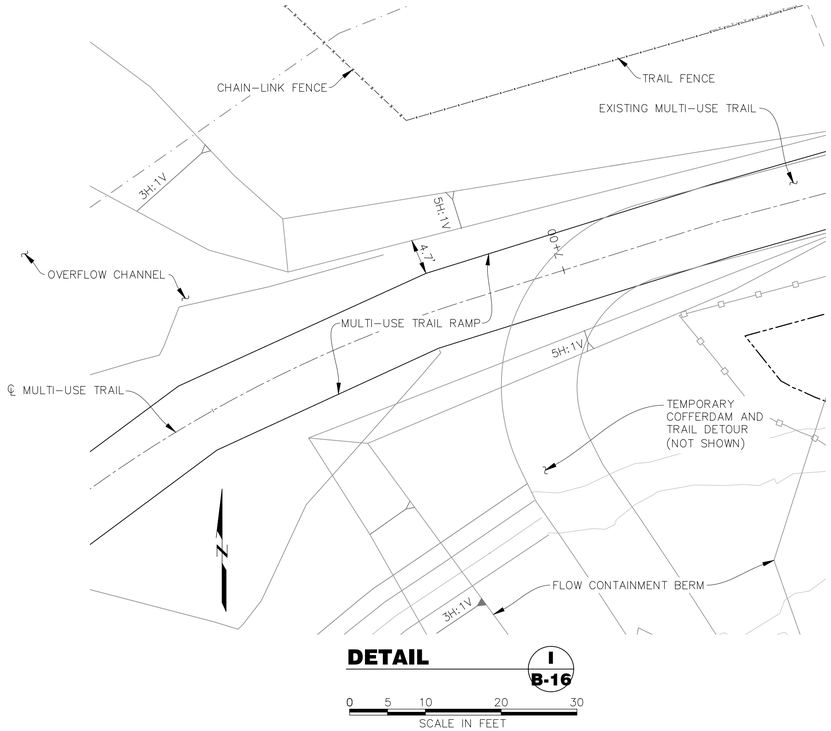


TYPICAL DETAIL
TYPE 1 SIGN
N.T.S.



TYPICAL DETAIL
TYPE 2 SIGN
N.T.S.



DETAIL I B-16

0 5 10 20 30
SCALE IN FEET

TRENCH DRAIN DETAIL

NOTE:

1. SIGNS SHALL BE IN ACCORDANCE WITH MUTCD, TYPE W4, AND SHALL BE YELLOW BACKGROUND WITH BLACK LETTERS.
2. VLOC SIGN POST ANCHOR DETAIL IN ACCORDANCE WITH CITY OF THORNTON STANDARDS AND SPECIFICATIONS, DRAWING NO. 700-11.
3. SLOPE CONCRETE TO LOW FLOW SWALE AT 1H:1V.
4. TRENCH DRAIN – PER 6 IN ENVIROFLOW II – MANUFACTURED BY JAY R. SMITH MFG. CO. 800.46764.84 WWW.JRSMITH.COM

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

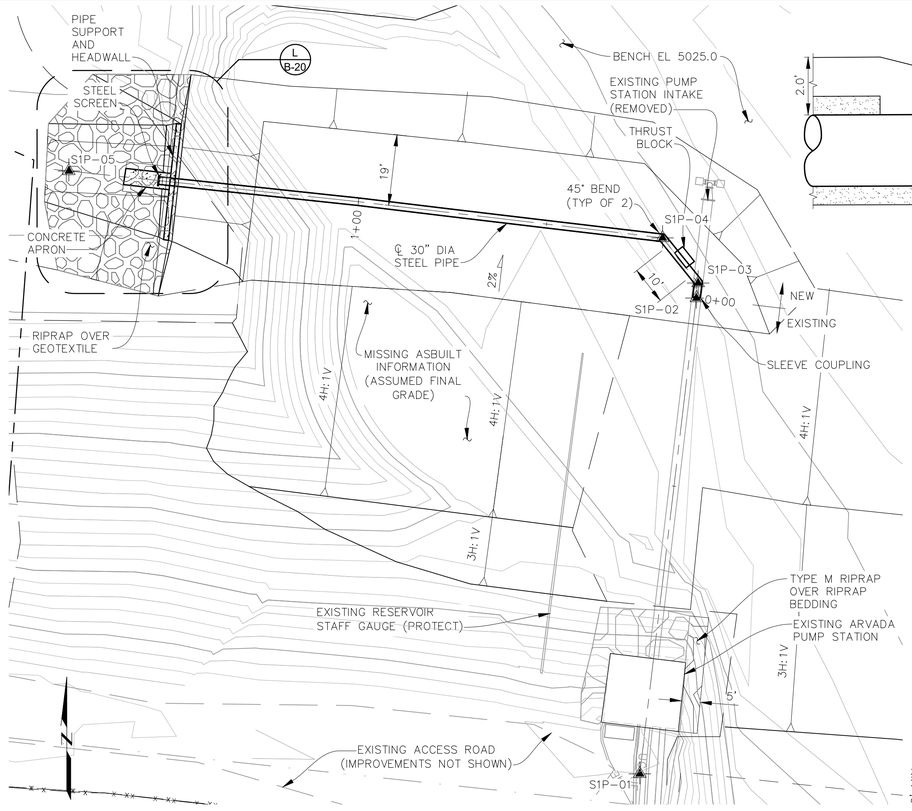
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - MULTI-USE TRAIL DETAILS

DWG. NO. B-18

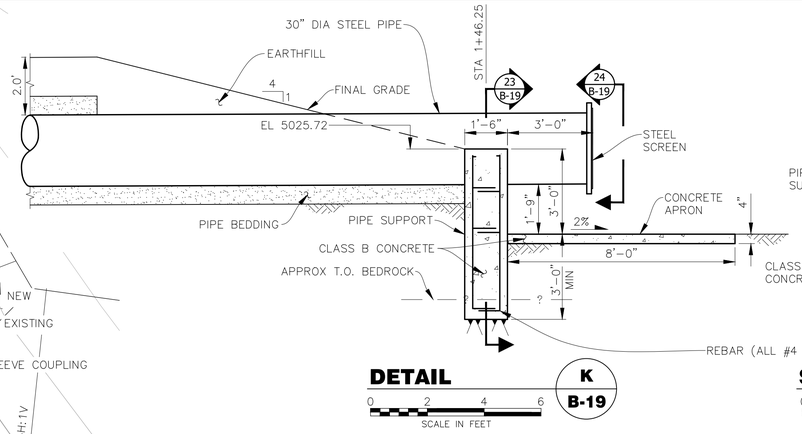
SHEET NO. 27 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 1 - TRAIL AND FENCE.DWG 6/14/2021



PLAN

0 10 20 40 60
SCALE IN FEET



DETAIL K B-19

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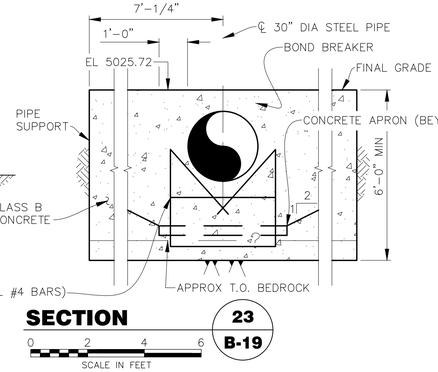
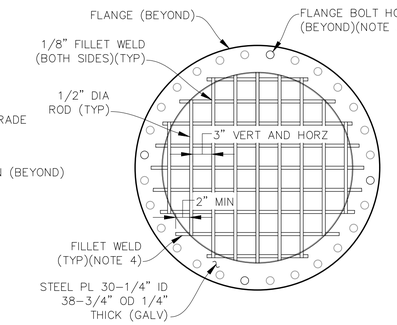


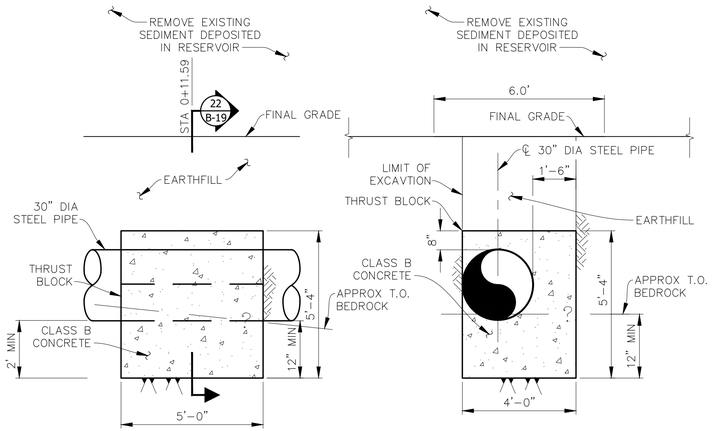
SECTION 23 B-19

0 2 4 6
SCALE IN FEET



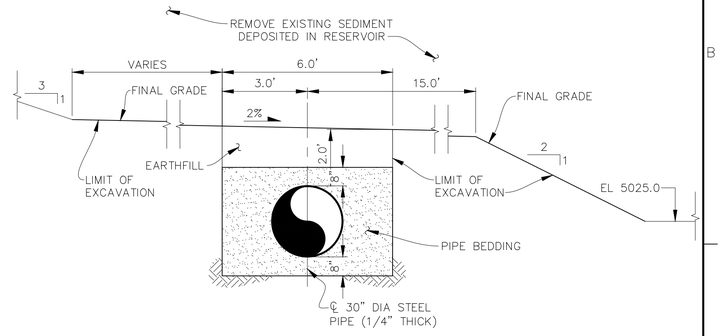
SECTION 24 B-19

NOT TO SCALE



DETAIL J B-19

0 2 4 6
SCALE IN FEET

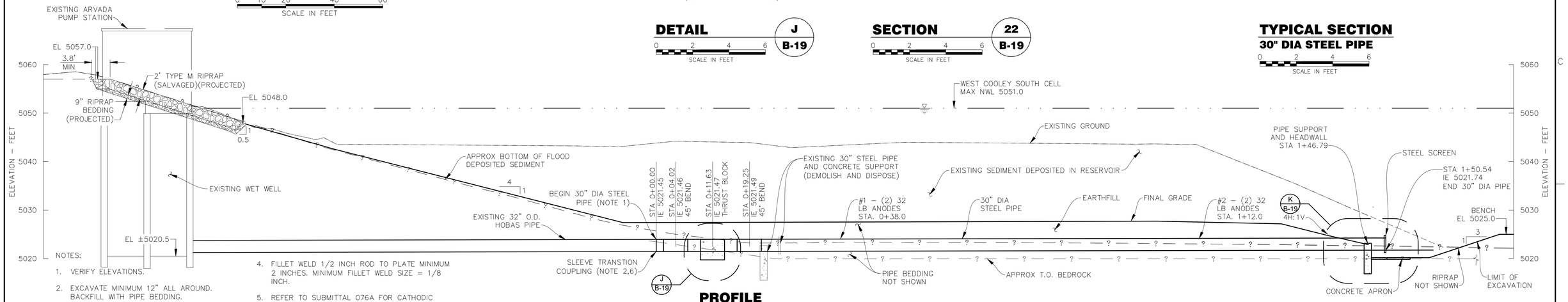


SECTION 22 B-19

0 2 4 6
SCALE IN FEET

TYPICAL SECTION
30" DIA STEEL PIPE

0 2 4 6
SCALE IN FEET



PROFILE

0 5 10 20 30
SCALE IN FEET

NOTES:

1. VERIFY ELEVATIONS.
2. EXCAVATE MINIMUM 12" ALL AROUND. BACKFILL WITH PIPE BEDDING.
3. PROVIDE 4 BOLTS HOLES IN STEEL PLATE. MATCH BOLT HOLES TO FLANGE. SEPARATE HOLES BY 7 HOLES AS SHOWN.
4. FILLET WELD 1/2 INCH ROD TO PLATE MINIMUM 2 INCHES. MINIMUM FILLET WELD SIZE = 1/8 INCH.
5. REFER TO SUBMITTAL 076A FOR CATHODIC PROTECTION DETAILS.
6. 413 STEEL TRANSITION COUPLING 32.00" O.D. X 30.50" O.D PIPE. MEETS AWWA C219 STANDARDS. REFER TO CHANGE ORDER 003 FOR CONNECTION DETAILS.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2020	RECORD DRAWINGS	MSS	KMA	RJH	RJH

COLORADO LICENSED ROBERT J. HULLAN 25734 05/15/20 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PUMP STATION RESERVOIR INTAKE (1 OF 2)

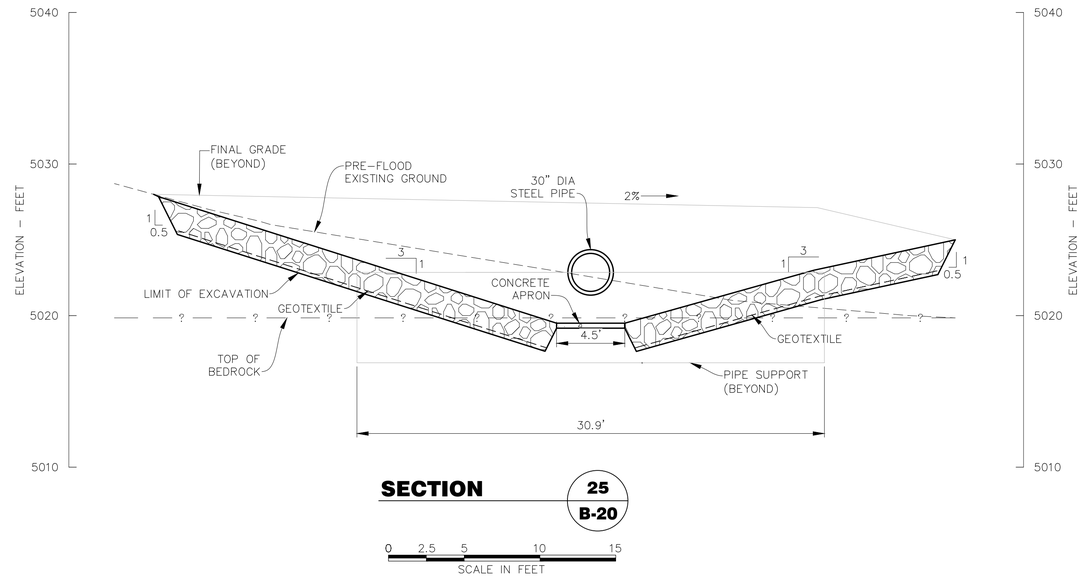
DWG. NO. B-19

SHEET NO. 28 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\2020-11-23_RF1025_SITE 1 - RESERVOIR INTAKE.DWG 6/14/2021

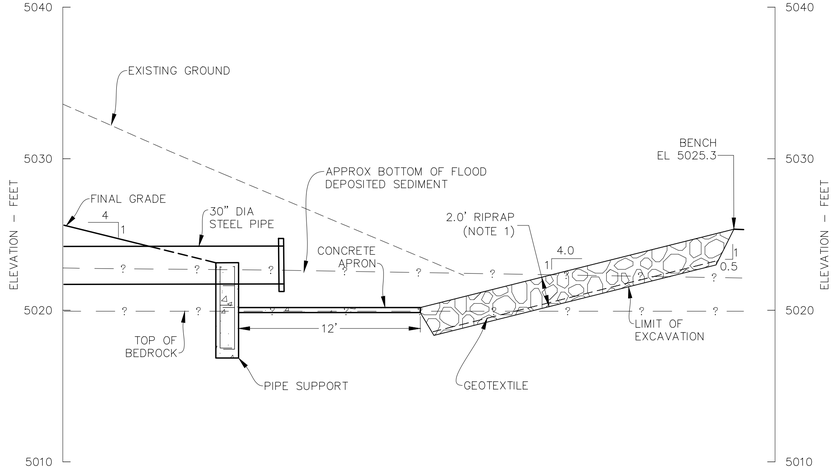
DETAIL L / B-19

0 2.5 5 10 15
SCALE IN FEET



SECTION 25 / B-20

0 2.5 5 10 15
SCALE IN FEET



SECTION 26 / B-20

0 2.5 5 10 15
SCALE IN FEET

NOTES:
1. USE EXISTING ON SITE SALVAGED RIP–RAP.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HILLS 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - PUMP STATION RESERVOIR INTAKE (2 OF 2)

DWG. NO. B-20

SHEET NO. 29 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\2020-11-23_RF1025_SITE 1 – RESERVOIR INTAKE.DWG 6/14/2021

DWG B-02 CONSTRUCTION CONTROL POINTS				
DESCRIPTION	CONTROL POINT	NORTHING	EASTING	ELEVATION
EARTHFILL	S1–01	744447.38	166039.92	5056.90
EARTHFILL	S1–02	744414.53	166152.98	5056.00
EARTHFILL	S1–03	744412.30	166176.27	5056.00
EARTHFILL	S1–04	744378.02	166308.38	5055.70
EARTHFILL	S1–05	744560.86	166010.87	5057.00
EARTHFILL	S1–06	744546.48	166147.82	5057.00
EARTHFILL	S1–07	744565.04	166245.70	5057.00
℄ OVERFLOW CHANNEL	S1–08	744389.32	166483.45	NOTE 2
℄ OVERFLOW CHANNEL	S1–09	744666.43	166380.42	NOTE 2
℄ OVERFLOW CHANNEL	S1–10	744674.73	166372.48	NOTE 2
℄ OVERFLOW CHANNEL	S1–11	744726.09	166323.31	NOTE 2
CUTOFF WALL	S1–12	744396.91	166334.14	NOTE 2
CUTOFF WALL	S1–13	744381.60	166632.80	NOTE 2
CUTOFF WALL	S1–14	744570.71	166264.55	NOTE 2
CUTOFF WALL	S1–15	744778.72	166481.83	NOTE 2
TERMINATION WALL	S1–16	744622.72	166214.61	NOTE 2
TERMINATION WALL	S1–17	744830.18	166431.32	NOTE 2

DWG B-08 EXCAVATION CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S1E–01	744621.66	166020.17
S1E–02	744531.28	166035.51
S1E–03	744473.88	166053.62
S1E–04	744448.57	166155.58
S1E–05	744482.76	166282.92
S1E–06	744558.13	166222.19
S1E–07	744617.78	166217.04
S1E–08	744606.15	166154.09

DWG B-05 AND B-06 COFFERDAM CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
SC1–01	744417.61	165900.23
SC1–02	744418.23	165973.62
SC1–03	744408.81	166088.15
SC1–04	744409.10	166119.51
SC1–05	744391.05	166192.87
SC1–06	744372.91	166256.57
SC1–07	744356.95	166340.46
SC1–08	744352.89	166370.79
SC1–09	744348.36	166420.45
SC1–10	744343.05	166654.57
SC1–11	744380.36	166656.50
SC1–12	744732.92	166550.49
SC1–13	744795.84	166527.62
SC1–14	744865.85	166727.60
SC1–15	744911.41	166799.22
SC1–16	745167.66	166989.12
SC1–17	745453.48	167217.38
SC1–18	745611.44	167326.54

DWG B-16 MULTI-USE TRAIL CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S1T–01	744488.70	165919.69
S1T–02	744486.59	165949.71
S1T–03	744485.18	166078.32
S1T–04	744487.39	166160.72
S1T–05	744561.14	166331.40
S1T–06	744703.21	166472.49
S1T–07	744746.90	166544.35
S1T–08	744757.34	166577.70

DWG B-16 FENCE CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S1F–01	744552.79	165689.39
S1F–02	744541.65	165859.06
S1F–03	744534.13	165924.20
S1F–04	744531.04	165953.58
S1F–05	744508.83	166160.94
S1F–06	744512.17	166213.37
S1F–07	744534.30	166251.10
S1F–08	744610.50	166198.83
S1F–09	744850.25	166452.25
S1F–10	744770.62	166536.25
S1F–11	744791.81	166609.29

DWG B-16 FENCE CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S1F–01	744552.79	165689.39
S1F–02	744541.65	165859.06
S1F–03	744534.13	165924.20
S1F–04	744531.04	165953.58
S1F–05	744508.83	166160.94
S1F–06	744512.17	166213.37
S1F–07	744534.30	166251.10
S1F–08	744610.50	166198.83
S1F–09	744850.25	166452.25
S1F–10	744770.62	166536.25
S1F–11	744791.81	166609.29

DWG B-19 INTAKE MODIFICATION CONSTRUCTION CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S1P–01	744546.67	166000.40
S1P–02	744672.23	166015.31
S1P–03	744676.20	166015.78
S1P–04	744688.12	166006.39
S1P–05	744705.77	165849.68

DWG B-02 CURVE DATA			
CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S1–R1	173.00	744718.53	166165.88
S1–R2	372.88	744408.58	166111.06

DWG B-08 CURVE DATA			
CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S1E–R1	113.00	744718.53	166165.88

DWG B-16 MULTI-USE TRAIL CURVE DATA			
CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S1T–R1	250.00	744737.30	166154.01
S1T–R2	175.00	744579.90	166596.66

NOTES:

1. CONTROL POINTS FOR CONCRETE TERMINATION WALL AND CONCRETE CUTOFF WALL CORRESPOND TO THE CENTER OF THE PLAN WALL THICKNESS.
2. ELEVATIONS PROVIDED ON CROSS SECTIONS.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. KUZJAK 25734 06/14/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

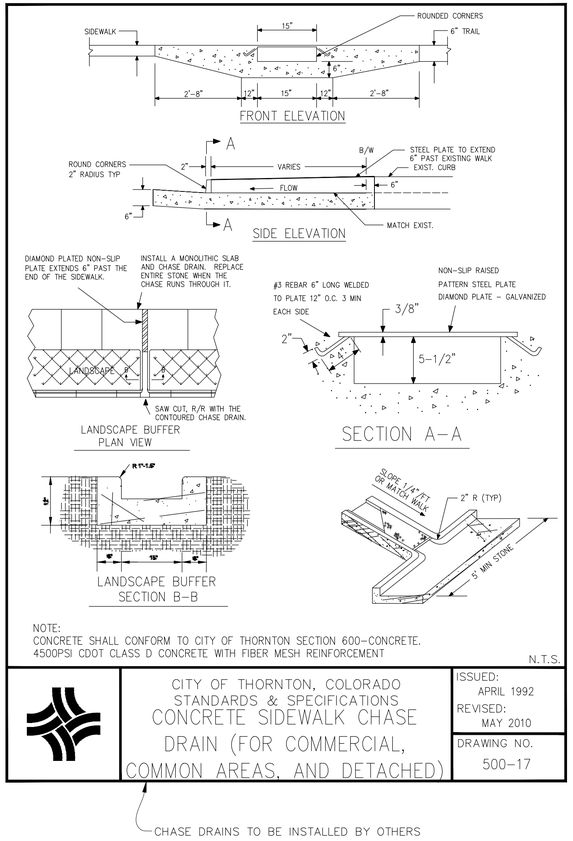
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - CONTROL POINTS

DWG. NO. B-21

SHEET NO. 30 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CONTROL POINTS.DWG 6/14/2021

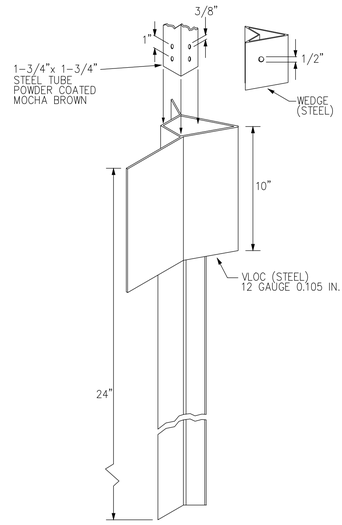


NOTE:
CONCRETE SHALL CONFORM TO CITY OF THORNTON SECTION 600-CONCRETE.
4500PSI CDOT CLASS D CONCRETE WITH FIBER MESH REINFORCEMENT

N.T.S.

	CITY OF THORNTON, COLORADO STANDARDS & SPECIFICATIONS CONCRETE SIDEWALK CHASE DRAIN (FOR COMMERCIAL, COMMON AREAS, AND DETACHED)	ISSUED: APRIL 1992 REVISED: MAY 2010 DRAWING NO. 500-17

CHASE DRAINS TO BE INSTALLED BY OTHERS



NOTE: ALL TUBINGS ARE #12 U.S. STD. GAUGE WALL THICKNESS.
SIGN POST INSTALLATION SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND THESE SPECIFICATIONS:
1. THE SIGN POST ANCHOR SHALL BE DRIVEN INTO THE GROUND TO 1" ABOVE THE GROUND. SIDEWALK SHALL BE POURED AROUND SIGN POST ANCHOR OR EXISTING SIDEWALK SHALL BE CORE DRILLED AND SEALED AROUND THE POST ANCHOR.
2. INSERT SIGN POST INTO ANCHOR ASSEMBLY 6 INCHES AND INSTALL WEDGE.
3. INSTALLED SIGN AND POST SHALL BE PLUMB AND FREE OF VERTICAL AND LATERAL MOVEMENT.

N.T.S.

	CITY OF THORNTON, COLORADO STANDARDS & SPECIFICATIONS SIGN POST ANCHOR DETAIL	ISSUED: FEBRUARY 2003 REVISED: APRIL 2010 DRAWING NO. 700-11

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED
ROBERT J. HUDIAK
25734
PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

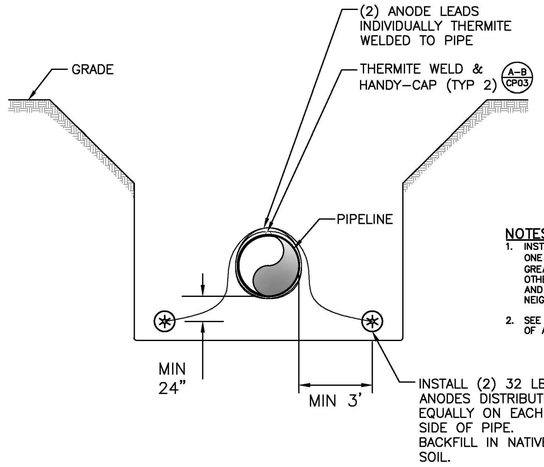
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - THORNTON STANDARD DETAILS

DWG. NO. B-22

SHEET NO. 31 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\DETAILS B.DWG 6/14/2021



NOTES:
1. INSTALL ANODES A MINIMUM OF 3 FEET OR ONE (1) PIPE DIAMETER (WHICHEVER IS GREATER) FROM THE PIPELINE AND ANY OTHER UNDERGROUND METALLIC STRUCTURES AND A MINIMUM OF 10 FEET FROM NEIGHBORING ANODES.
2. SEE NOTES 3-5 FOR INSTALLATION DETAILS OF ANODES.

(A) DIRECT BONDED ANODE GROUNDBED
SCALE: NTS

NOTE:
1. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE PLANS FOR THIS PROJECT AND ACTUAL FIELD CONDITIONS WHICH MAY INTERFERE WITH THIS PROJECT.
2. NO BELOW GRADE SPLICING OF WIRES IS ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. CONTRACTOR SHALL ENSURE ALL WIRES ARE OF SUFFICIENT LENGTH FOR EACH INTENDED APPLICATION.
3. REMOVE ANODES FROM PLASTIC OR OTHER SHIPPING BAG AND POSITION ACCORDING TO DETAIL DRAWINGS. DO NOT REMOVE CLOTH SACK.
4. INSTALL ANODES A MINIMUM OF 3 FEET FROM EDGE OF PIPE OR ANY OTHER METALLIC OBJECT AND PLACE BELOW THE INVERT OF THE PIPE.
5. BACKFILL WITH NATIVE SOIL A MINIMUM OF 12 INCHES AROUND ANY REFERENCE ELECTRODES, COUPONS, OR ANODES THEN FLOOD EACH WITH A MINIMUM OF 5 GALLONS OF FRESH WATER. AFTER WATER ABSORPTION, CONTINUE BACKFILLING AS PER SPECIFICATIONS.
6. ROUTE ALL TEST LEADS AND ANODE WIRES IN APPROPRIATELY SIZED CONDUIT BETWEEN THE PIPE AND THE TEST STATION BASE WHERE APPLICABLE. THE CONDUIT WILL ALSO AID THE INSTALLER AS THE PIPELINE IS PADDED AND BACKFILLED BY PROVIDING MEANS TO LEAN THE TEST STATION AGAINST THE TRENCH WALL.
7. IF POSSIBLE, INSTALL TEST STATIONS OVER CENTERLINE OF PIPE. PLACE TEST STATIONS IN PROTECTED LOCATIONS (NEXT TO FENCES, APPURTENANCES, OUT OF ROADWAYS, ETC.) OR OTHER EASILY ACCESSIBLE AREAS.
8. PIPELINE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ELECTRICAL ISOLATION OF THE NEW PIPELINE FROM EXISTING PIPELINES, CONCRETE REBAR, ELECTRICAL GROUNDING, CASINGS, PIPE SUPPORTS, OR OTHER METALLIC STRUCTURES.
9. DURING BACKFILL, INSTALL CATHODIC PROTECTION WARNING TAPE 12-18 INCHES ABOVE ANY CATHODIC PROTECTION WIRES OR DEVICES.
10. TYPICAL WIRE INSULATION COLORS:
    BLUE = PROTECTED PROJECT STRUCTURE
    WHITE = INSULATED/BONDED STRUCTURE
    BLACK = CONTINUITY BOND OR ANODE
11. SEE PROJECT SPECIFICATIONS FOR FURTHER INFORMATION.

WEST COOLEY 2015 FLOOD REPAIRS PROJECT - SITE 1 ANODE SCHEDULE

STATION	TEST STATION NO.	DETAIL DRAWING	DESCRIPTION	NOTES
0+38	1	A / CP01	DIRECT BOND (2) ANODES	
1+12	2	A / CP01	DIRECT BOND (2) ANODES	
BACKFILL ANODES IN NATIVE SOIL. DO NOT INSTALL IN PEAGRAVEL OR SIMILAR PIPE BEDDING MATERIAL.				

NOTES:
1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	12/05/19	ISSUED FOR REVIEW
2	01/14/20	ISSUED FOR 95% REVIEW

City of Thornton

TITLE / LOCATION: CATHODIC PROTECTION
TEST STATION DETAILS
WEST COOLEY 2015 FLOOD REPAIRS
SITE #1

SUBMITTED BY: QUALCORR ENGINEERING
PROJECT NO.: 19-???
DESIGNED BY: MMV
DRAWN BY: CAS
CHECKED BY: VWJ
DATE: 12/02/19

SHEET: CP01

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–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUZJAK 25734 01/13/20 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

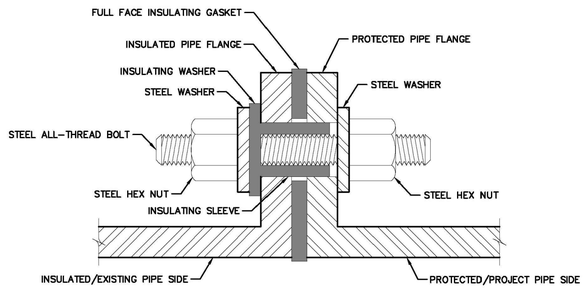
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - CATHODIC DETAILS (1 OF 3)

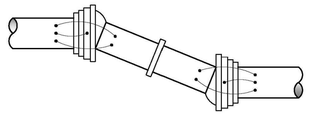
DWG. NO. B-23

SHEET NO. 32 of 77

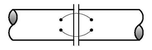
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021



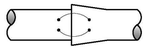
A FLANGE ISOLATION KIT DETAIL
(SINGLE WASHER SET FOR BURIED APPLICATIONS)
SCALE: NTS



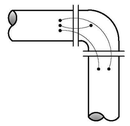
FLEXIBLE JOINT



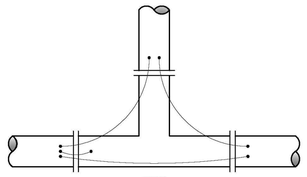
FLANGE TO FLANGE



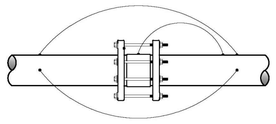
BELL AND SPIGOT



BEND

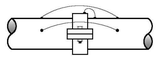


TEE



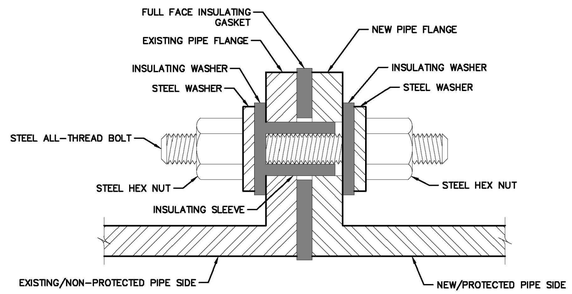
NON-INSULATING COUPLING

NOTE:
DO NOT INSTALL CONTINUITY BONDS OVER INSULATING COUPLINGS, ISOLATING FLANGES, NON-METALLIC PIPING, AND ISOLATING FITTINGS



VICTAULIC COUPLING

VALVE



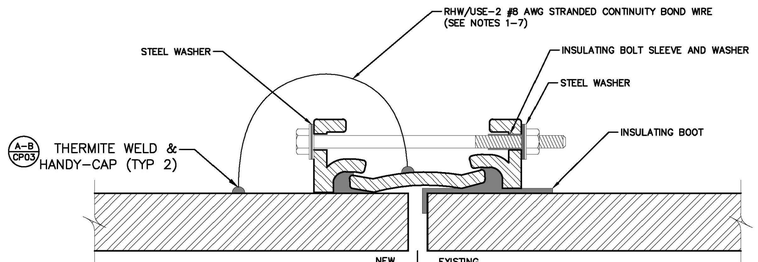
B FLANGE ISOLATION KIT DETAIL
(DOUBLE WASHER SET FOR ABOVE GRADE OR VAULTED APPLICATIONS)
SCALE: NTS

CONTINUITY BONDING NOTES:

1. TYPICAL FOR NON-WELDED PIPING OR WELDED PIPING WITH MECHANICAL COUPLINGS.
2. RHW/USE-2 BLACK INSULATED STRANDED COPPER BOND WIRES SHALL BE SIZED ACCORDING TO THE FOLLOWING TABLE UNLESS OTHERWISE NOTED.
3. CLEAN PIPE PRIOR TO THERMITE WELDING.
4. UTILIZE COPPER SLEEVES FOR THERMITE WELDING OF #8 AWG OR SMALLER WIRES.
5. ENSURE ALL BLOW-OFF AND HYDRANT PIPING ARE BONDED AND ELECTRICALLY CONTINUOUS WITH ADJACENT WATER MAIN (IF METALLIC).
6. ALL FOLLOWER BONDS TO METALLIC FITTINGS SHALL HAVE A SINGLE #8 AWG JOINT BOND WIRE ATTACHED.
7. DO NOT BOND ACROSS ANY INSULATING FLANGE, COUPLING, UNION, OR NON-METALLIC PIECE OF PIPE.

NOMINAL PIPE ø	WIRE SIZE	# OF WIRES
12" OR LESS	#8	2
13"-36"	#4	2
>36"	#2	3

C FITTING CONTINUITY BONDING DETAILS
SCALE: NTS



NOTE:
IF COUPLING WILL BE RESTRAINED, INSULATING BOLT SLEEVES AND WASHERS MUST BE INSTALLED ON EACH RESTRAINING BOLT ON THE EXISTING PIPE SIDE OF THE CONNECTION.

NOTE:
CONSULT ENGINEER IF WAX-TAPE IS TO BE APPLIED TO COUPLING HARDWARE

D INSULATED COUPLING BONDING
SCALE: NTS

NOTES:

1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	12/06/19	ISSUED FOR REVIEW
2	01/14/20	ISSUED FOR 95% REVIEW

City of Thornton

TITLE / LOCATION:
CATHODIC PROTECTION
CONTINUITY BOND AND FIK DETAILS
WEST COOLEY 2015 FLOOD REPAIRS

SUBMITTED BY:	qualCORR engineering
PROJECT NO.:	19-222
DESIGNED BY:	MAV
DRAWN BY:	CAS
CHECKED BY:	VNJ
DATE:	12/02/19

SHEET CP02

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COLORADO LICENSED ROBERT J. HILLYARD 25734 01/13/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

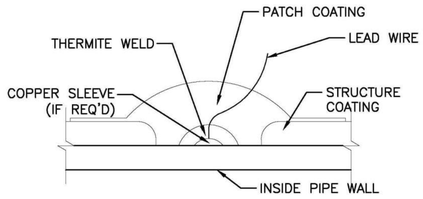
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 1 - CATHODIC DETAILS (2 OF 3)

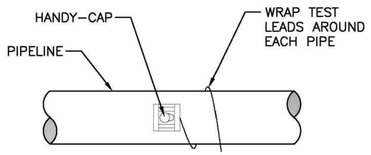
DWG. NO. B-24

SHEET NO. 33 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021

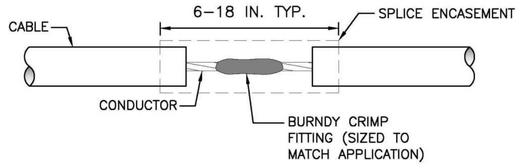


A THERMITE WELD DETAIL
SCALE: NTS



B HANDY–CAP APPLICATION
SCALE: NTS

NOTE:
ALL SPLICES MUST BE APPROVED BY COMPANY REPRESENTATIVE PRIOR TO USE. PROVIDE WIRING OF SUFFICIENT LENGTH SO THAT ADDITIONAL SPLICES ARE NOT REQUIRED.



C WIRE SPLICING PROCEDURE
SCALE: NTS

THERMITE WELDING INSTRUCTIONS:

1. REMOVE APPROXIMATELY 4" DIAMETER CIRCLE OF PIPELINE COATING AT STRUCTURE CONNECTION LOCATION.
2. CLEAN AREA APPROXIMATELY 2" DIAMETER TO BRIGHT METAL.
3. REMOVE 2" OF INSULATION FROM END OF WIRE.
4. WELD CONDUCTOR TO PIPE. USE APPROPRIATE GRAPHITE MOLD AND CARTRIDGE CHARGE SIZE. COPPER SLEEVES ARE REQUIRED FOR #8 AWG OR SMALLER WIRES.
5. TEST THE THERMITE WELD CONNECTION BY STRIKING THE COMMON SEVERAL BLOWS ON THE SIDE USING A ONE POUND HAMMER. TOP OF WELD MAY BE HAMMERED FLAT IF REQUIRED.
6. APPLY HANDY–CAP. SEE DETAIL B.

HANDY–CAP APPLICATION PROCEDURES:

1. CLEAN ALL MUD, DIRT, GREASE, OIL, AND OTHER CONTAINMENTS FROM THE METAL SURFACE AND ANY PART OF THE MILL APPLIED COATING WHICH IS TO BE COVERED.
2. APPLY A COAT OF ROYSTON 747 PRIMER (if required) AND ALLOW TO DRY TO A NON–GLOSSY APPEARANCE, WHICH WILL TAKE APPROXIMATELY 5 MINUTES DEPENDING ON HUMIDITY AND TEMPERATURE.
3. REMOVE THE RELEASE PAPER FROM THE BOTTOM OF THE ROYSTON HANDY CAP. BEND THE PLASTIC SHEET INWARD AT THE SERRATIONS WHEN APPLYING TO A SMALL DIAMETER PIPE. POSITION AND PLACE THE HANDY CAP ON THE WELDED AREA WITH THE TUNNEL OVER THE LEAD WIRE.
4. PUSH THE DOME OF THE CAP FIRMLY IN THE WELD AREA. NOW LIFT THE WIRE AWAY FROM THE PIPE AND SQUEEZE THE BLACK RUBBER COMPOUND COMPLETELY AROUND AND UNDERNEATH THE WIRE. THEN PUSH THE LEAD WIRE BACK DOWN ON THE PIPE AND PRESS THE ELASSTOMERIC COMPOUND INTO FIRM CONTACT WITH THE PIPE OVER THE ENTIRE AREA.

NO FURTHER PROTECTION IS NECESSARY IF THE ROYSTON HANDY CAP COVERS THE ENTIRE EXPOSED METAL AREA. UNCOVERED AREAS SHOULD BE PROTECTED BY APPLYING TAPE OR MASTIC SUCH AS TRENTON PIPELINE TAPE CP OR ROYSTON ROSKOTE MASTIC.

WHEN COATING OR WRAPPING THE ROYSTON HANDY CAP, REMOVE THE NARROW STRIPS OF PLASTIC RELEASE FILM ON THE TOP OF THE CAP. THIS WILL ASSURE MAXIMUM PROTECTION BY EFFECTING A POSITIVE WATERPROOF SEAL.

TYPICAL PROCEDURE TO SPLICE ANODE OR CABLE:

1. CUT BACK INSULATION FROM END OF ANODES OR CABLES APPROX. 1 INCH. BE SURE ALL CABLE ENDS AND CONNECTIONS ARE CLEAN OF DIRT AND FOREIGN MATTER AND THAT ALL CONNECTIONS ARE BARE METAL.
2. PUT CABLES IN APPROPRIATE SIZED CRIMP FITTING AND CRIMP.
3. APPLY ELECTRICAL PUTTY TO FILL IN ANY VOIDS AND IRREGULAR SHAPES.
4. APPLY ELECTRICAL RUBBER TAPE AROUND THE PUTTY AND CABLE WHERE INSULATION WAS REMOVED.
5. APPLY ELECTRICAL TAPE ALONG THE ENTIRE SPLICE AND A MINIMUM OF 2 INCHES ON EACH ANODE OR CABLE END.
6. APPLY ELECTRICAL COATING ALONG THE ENTIRE SPLICE.
7. EPOXY SPLICE KIT MAY BE USED IN LIEU OF RUBBER AND PLASTIC TAPE.

NOTES:

1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	12/06/19	ISSUED FOR REVIEW
2	01/14/20	ISSUED FOR 95% REVIEW

City of Thornton

TITLE / LOCATION:
CATHODIC PROTECTION
STANDARD DETAILS
WEST COOLEY 2015 FLOOD REPAIRS

SUBMITTED BY: qualCORR ENGINEERING
PROJECT NO.: 19–???
DESIGNED BY: MMV
DRAWN BY: CAS
CHECKED BY: VWJ
DATE: 12/02/19

SHEET CP03

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City of Thornton

RJH PROJECT 16116

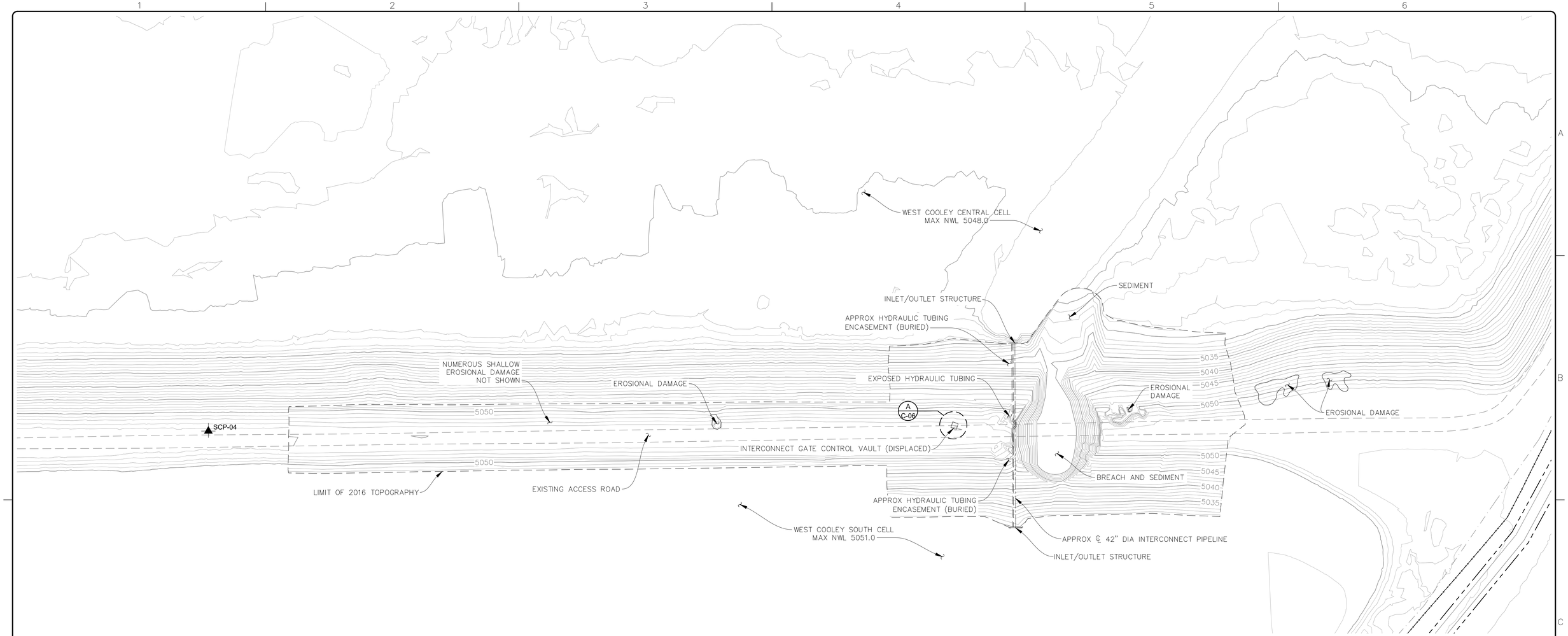
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 1 - CATHODIC DETAILS (3 OF 3)

DWG. NO. B-25

SHEET NO. 34 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021



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PROFESSIONAL ENGINEER

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City of Thornton

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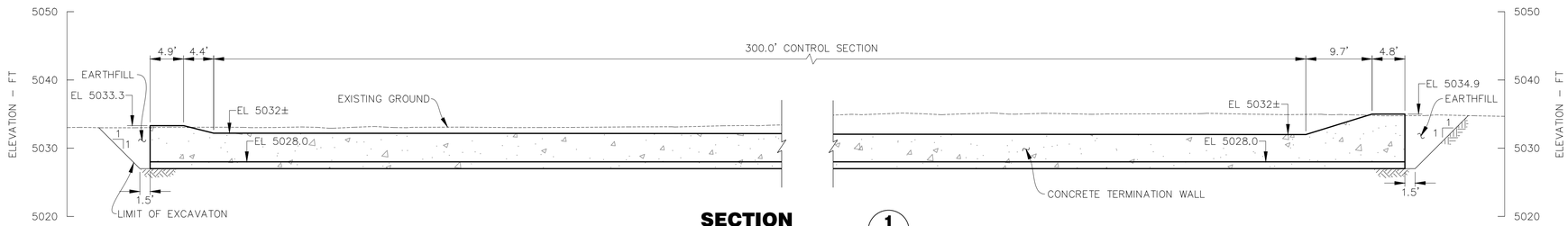
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 2 - PLAN OF EXISTING CONDITIONS

DWG. NO. C-01

SHEET NO. 35 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 - PLAN OF EXISTING CONDITIONS.DWG 6/14/2021



SECTION 1 / C-02

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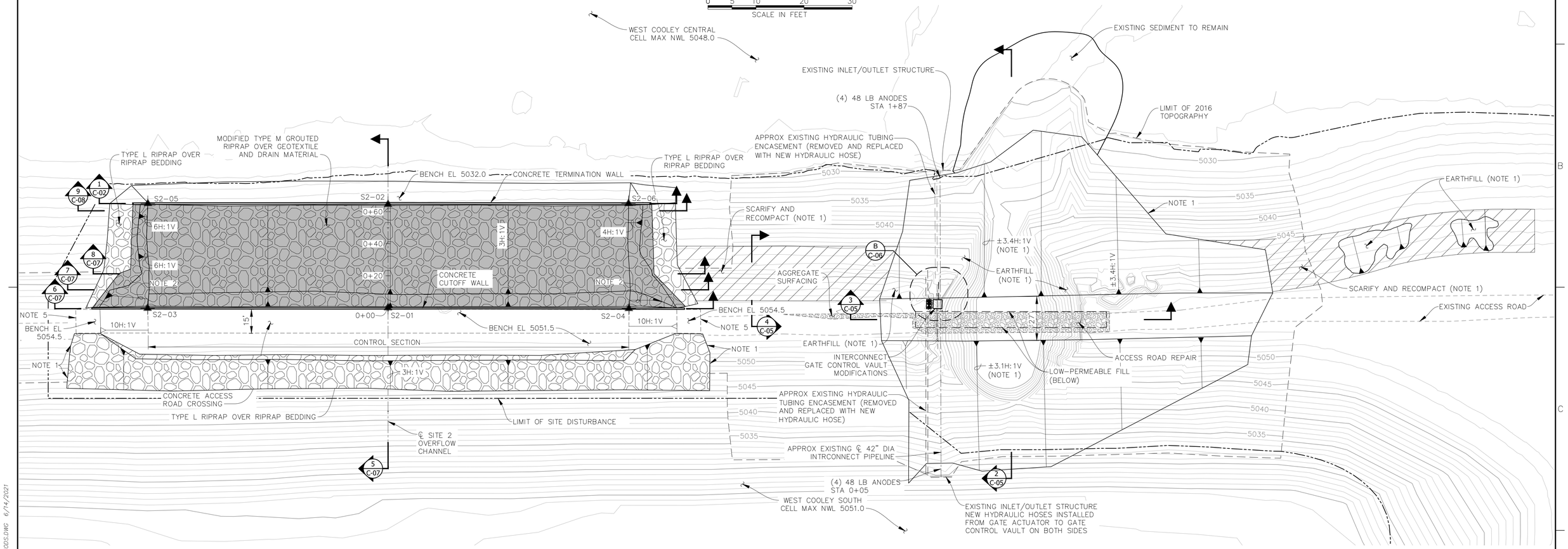

N

0 15 30 60 90
SCALE IN FEET

SITE 2 CONSTRUCTION CONTROL POINTS

CONTROL POINT	DESCRIPTION	NORTHING	EASTING
S2-01	℄ OVERFLOW CHANNEL	745623.74	166461.20
S2-02	℄ OVERFLOW CHANNEL	745688.36	166461.20
S2-03	CONCRETE CUTOFF WALL	745623.44	166311.13
S2-04	CONCRETE CUTOFF WALL	745623.29	166611.52
S2-05	CONCRETE TERMINATION WALL	745688.85	166311.25
S2-06	CONCRETE TERMINATION WALL	745688.86	166611.32

NOTES:

1. MATCH ADJACENT SLOPE.
2. TRANSITION SIDE SLOPES UNIFORMLY BETWEEN STA 0+11.3 AND 0+21.3
3. CONTROL POINTS FOR CONCRETE TERMINATION WALL AND CONCRETE CUTOFF WALL CORRESPOND TO CENTER OF PLAN WALL THICKNESS.
4. CONTROL POINTS FOR REPAIR EXCAVATION PROVIDED ON DWG C-03.
5. LIMIT OF CONCRETE ACCESS ROAD. PLACE AGGREGATE SURFACING TO TRANSITION TO EXISTING ACCESS ROAD.

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City of Thornton

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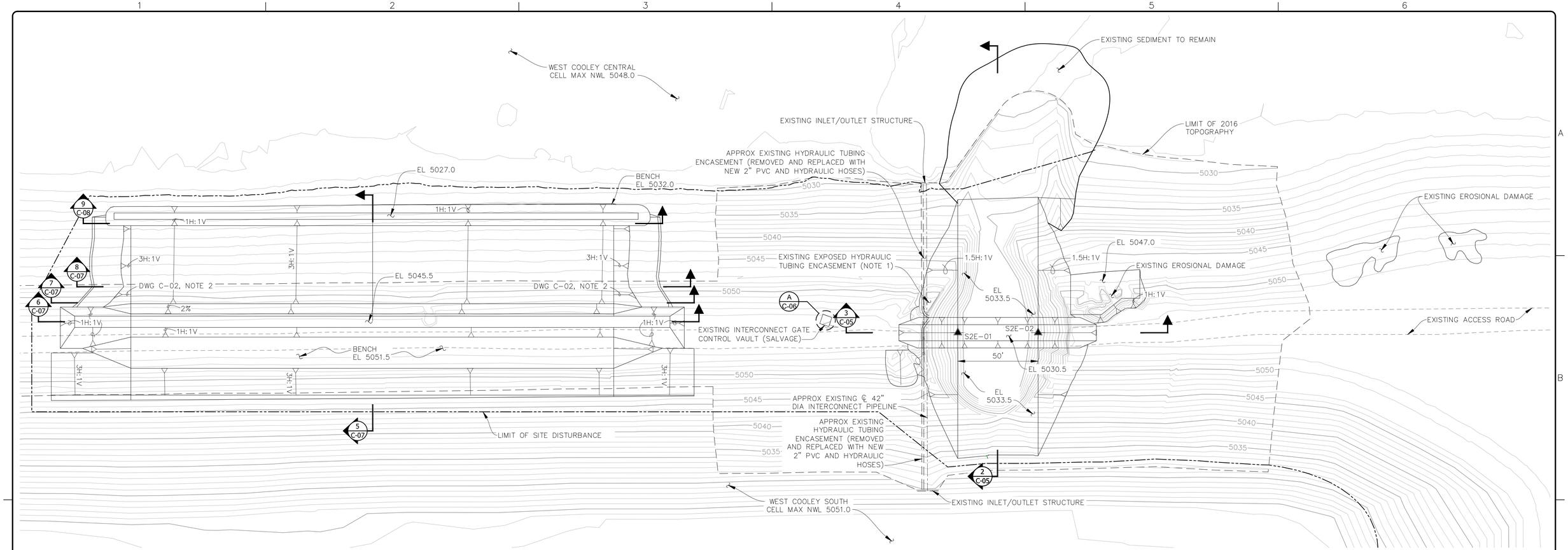
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 2 - GENERAL PLAN OF MODIFICATIONS

DWG. NO. C-02

SHEET NO. 36 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 – PLAN OF MODS.DWG 6/14/2021



SITE 2 EXCAVATION CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
S2E-01	745616.40	166825.32
S2E-02	745616.40	166875.24

N

0 15 30 60 90
SCALE IN FEET

NOTE:

1. EXCAVATE TO EXPOSE UNDAMAGED HYDRAULIC TUBING ENCASEMENT.

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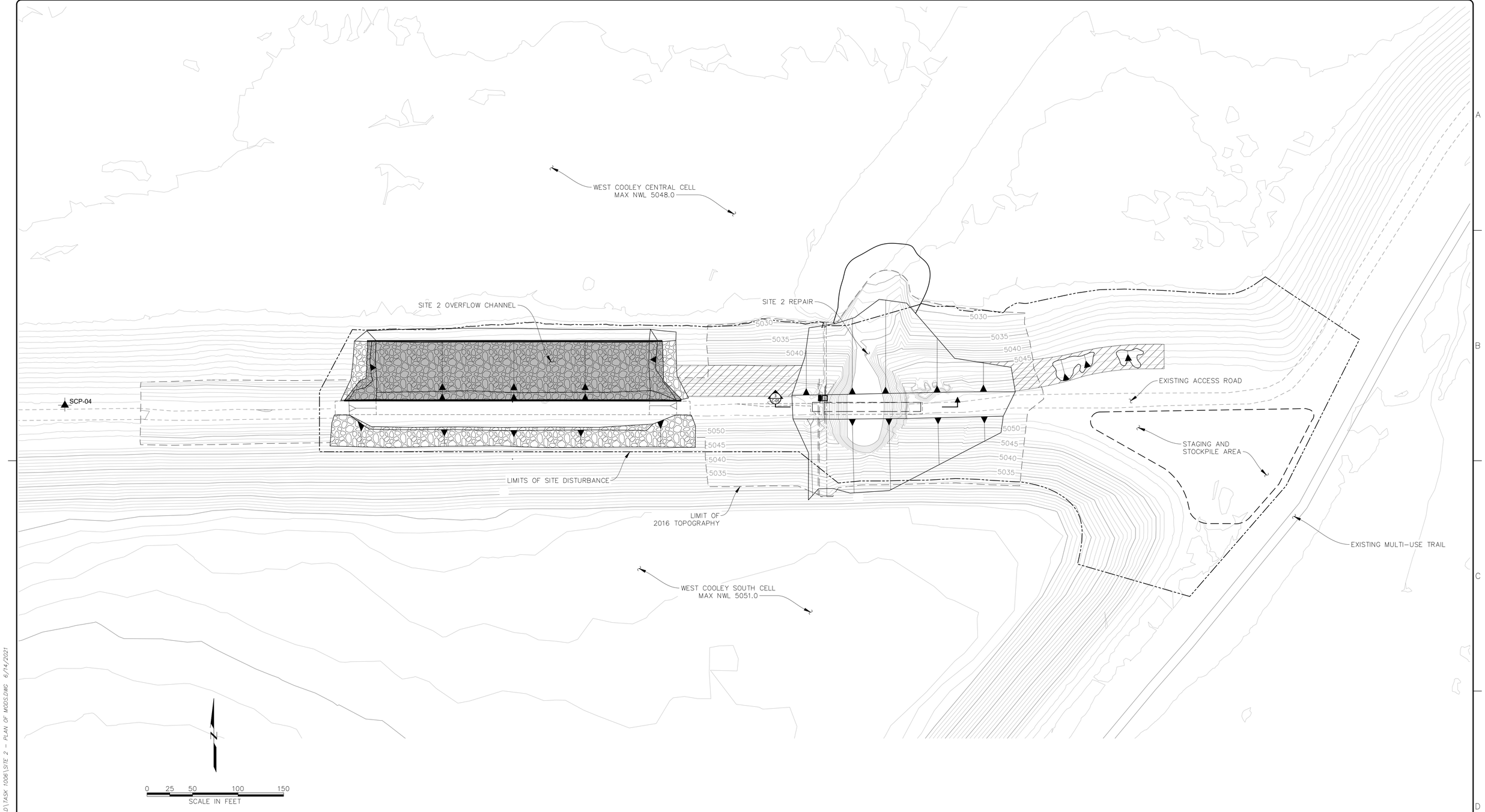
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 2 - EXCAVATION PLAN

DWG. NO. C-03

SHEET NO. 37 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 – EXCAVATION PLAN.DWG 6/14/2021



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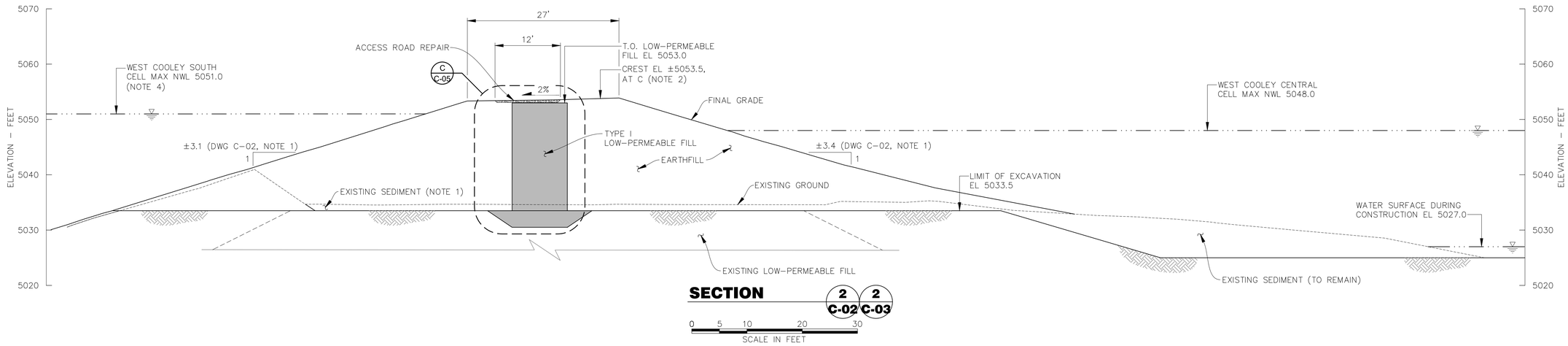
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 2 - STAGING, STOCKPILING, AND LIMIT OF SITE DISTURBANCE

DWG. NO. C-04

SHEET NO. 38 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 - PLAN OF MODS.DWG 6/14/2021



SECTION 2 C-02 / 2 C-03

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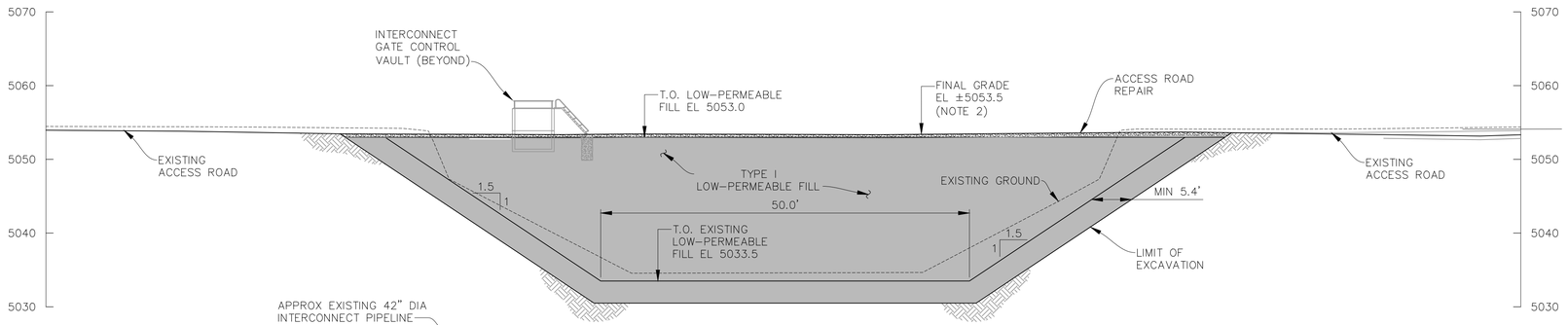

SECTION 3 C-02 / 3 C-03

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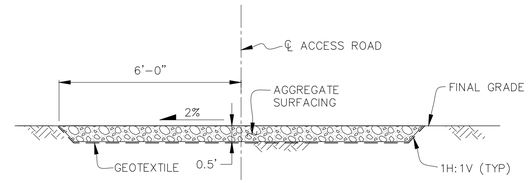
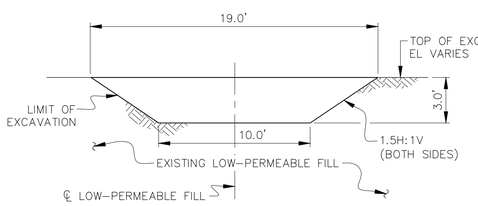


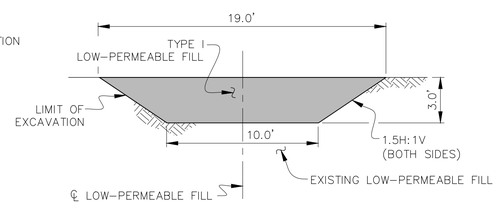
TYP DETAIL
ACCESS ROAD
NOT TO SCALE

LOW-PERMEABLE FILL INSTALLATION SEQUENCE:

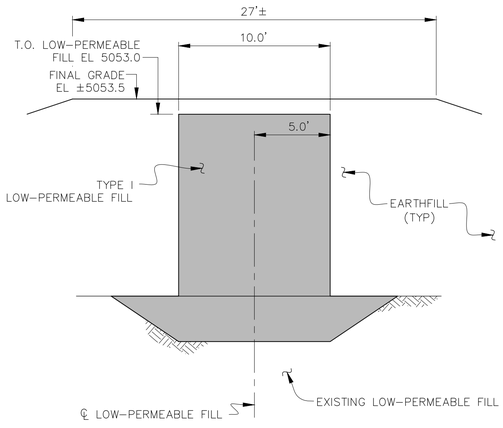
1. EXCAVATE AS SHOWN ON DRAWINGS. EXCAVATE ADDITIONAL 3 FEET DEEP TO THE DIMENSIONS PROVIDED.
2. PLACE TYPE I LOW-PERMEABILITY FILL AS SHOWN IN STEP 2.
3. PLACE TYPE I LOW-PERMEABILITY FILL TO ELEVATION 5053.0 AND ADJACENT EARTHFILL AS SHOWN IN STEP 3.



STEP 1



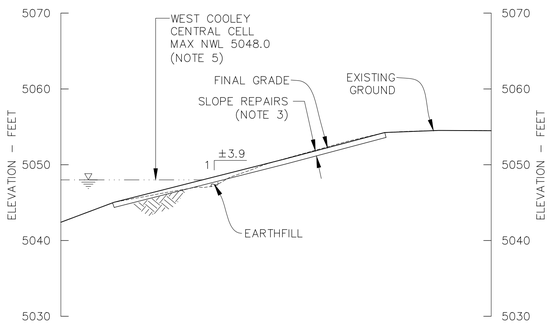
STEP 2



STEP 3

DETAIL C C-05

0 2.5 5 10 15
SCALE IN FEET



SECTION 4 C-02

0 5 10 20 30
SCALE IN FEET

NOTES:

1. LIMITS OF SEDIMENT MAY VARY FROM THOSE SHOWN.
2. MATCH ADJACENT SLOPE AT BOTH ENDS OF EXCAVATION.
3. REMOVE EXISTING VEGETATION AND DEBRIS. SCARIFY, GRADE, AND RE-COMPACT TOP 8 INCHES.
4. CONSTRUCTION WATER LEVEL IS EL. 5025.0.
5. CONSTRUCTION WATER LEVEL IS EL 5027.0.

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COLORADO LICENSED ROBERT J. HUTZAK 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

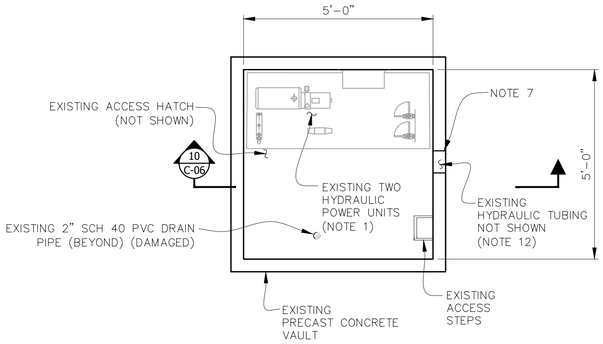
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 2 - REPAIR SECTIONS

DWG. NO. C-05

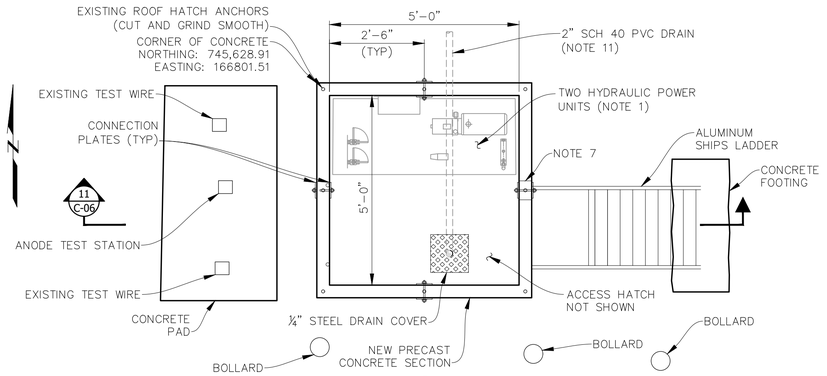
SHEET NO. 39 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 - PLAN OF MODS.DWG 6/14/2021



DETAIL A C-01 / A C-03
EXISTING VAULT

0 1 2 4
SCALE IN FEET



DETAIL B C-02
MODIFIED VAULT

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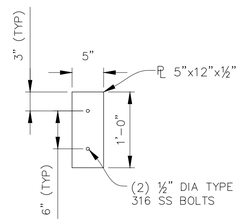
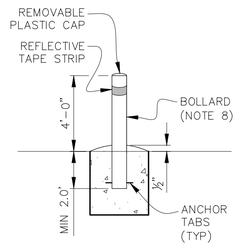
SCALE IN FEET

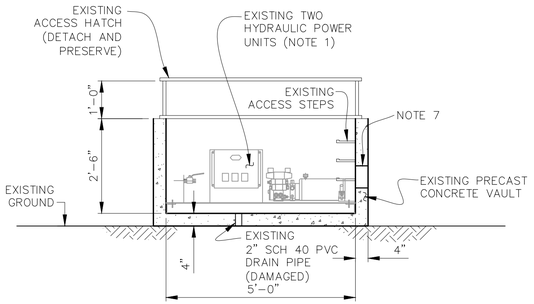


TYP DETAIL
CONNECTION PLATE

0 1 2
SCALE IN FEET

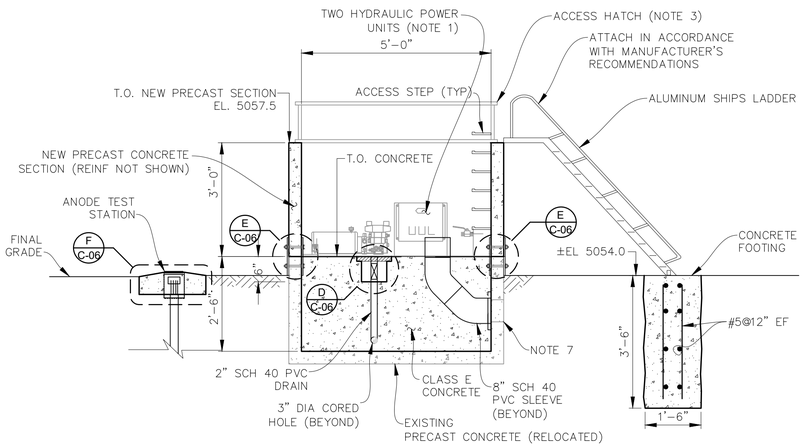


TYP DETAIL
BOLLARD
NOT TO SCALE



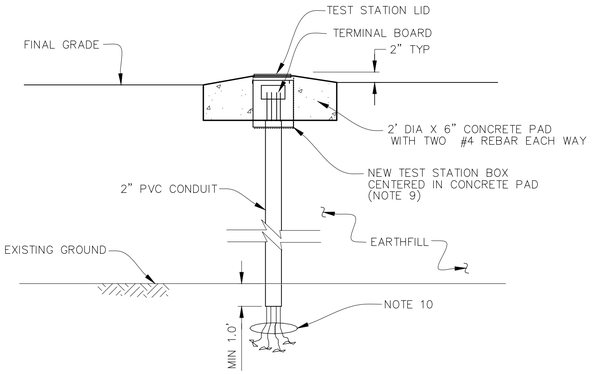
SECTION 10 C-06
EXISTING VAULT

0 1 2 4
SCALE IN FEET

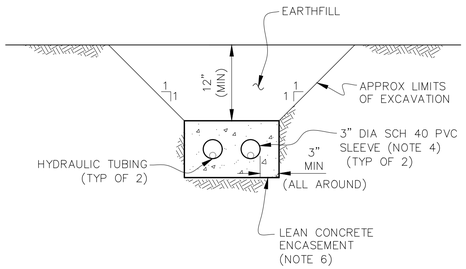


SECTION 11 C-06
MODIFIED VAULT

0 1 2 4
SCALE IN FEET

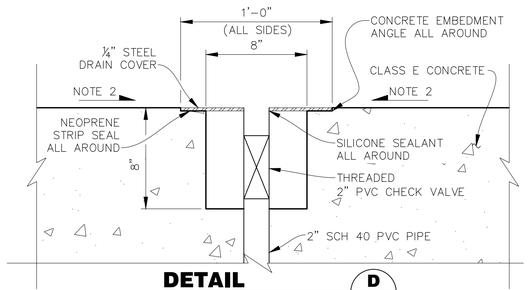


DETAIL F C-06
ANODE TEST STATION
NOT TO SCALE



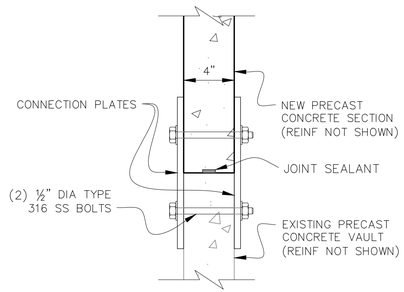
TYPICAL SECTION
HYDRAULIC TUBING ENCASEMENT

0 .5 1 2 3
SCALE IN FEET



DETAIL D C-06

0 1/2 1
SCALE IN FEET



DETAIL E C-06

0 1/2 1
SCALE IN FEET

NOTES:

1. PRESERVE AND REINSTALL EXISTING HYDRAULIC POWER UNITS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. SLOPE BACKFILL CONCRETE AT 1–PERCENT SLOPE TOWARDS DRAIN PIPE.
3. REINSTALL EXISTING ACCESS HATCH.
4. INSTALL PVC PIPE AROUND EXISTING HYDRAULIC TUBING. DO NOT DETACH HYDRAULIC TUBING. CUT PVC PIPE LONGITUDINALLY TO ACCOMMODATE ENCASEMENT OF HYDRAULIC TUBING. INSTALL AND TIGHTEN STAINLESS STEEL BANDS AROUND PVC CONDUITS PRIOR TO ENCASEMENT AT MINIMUM 10 FOOT SPACING.
5. NOT USED.
6. EXTEND CONCRETE ENCASEMENT TO EXISTING GATE CONTROL VAULT.
7. EXISTING 6 INCH TO 7 INCH DIA BLOCKOUT FOR HYDRAULIC TUBING. ANNULAR SPACE FILLED WITH GROUT.
8. 5½ INCH DIAMETER CONCRETE FILLED BEACON TRAFFIC BOLLARD, TYPE BBOLPP–48–5.5. SET BOLLARD IN CONCRETE PER MANUFACTURERS SPECIFICATIONS. MINIMUM DEPTH 3.0 FEET. POWDER COATED SAFETY YELLOW FINISH.
9. A MINIMUM OF 2 FEET OF SLACKWIRE SHALL BE PROVIDED FOR ALL WIRES INSIDE THE TEST STATION BOX. THE 2" PVC CONDUIT SHALL EXTEND APPROXIMATELY 3 INCHES INTO THE BOTTOM OF THE TEST STATION BOX.
10. LOCATE EXISTING WIRES. CUT WIRES BACK TO REMOVE FRAYED ENDS. SPLICE NEW WIRES ON TO EXISTING WIRES WITH WATERPROOF SPLICE. LOCATE THE SPLICES WITHIN THE PVC CONDUIT.
11. SLOPE AT 2–PERCENT TO DAYLIGHT IN RESERVOIR WITH 2" STAINLESS STEEL FLAPGATE
12. FIELD VERIFY LOCATION OF EXISTING HYDRAULIC TUBING.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUZIAK 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

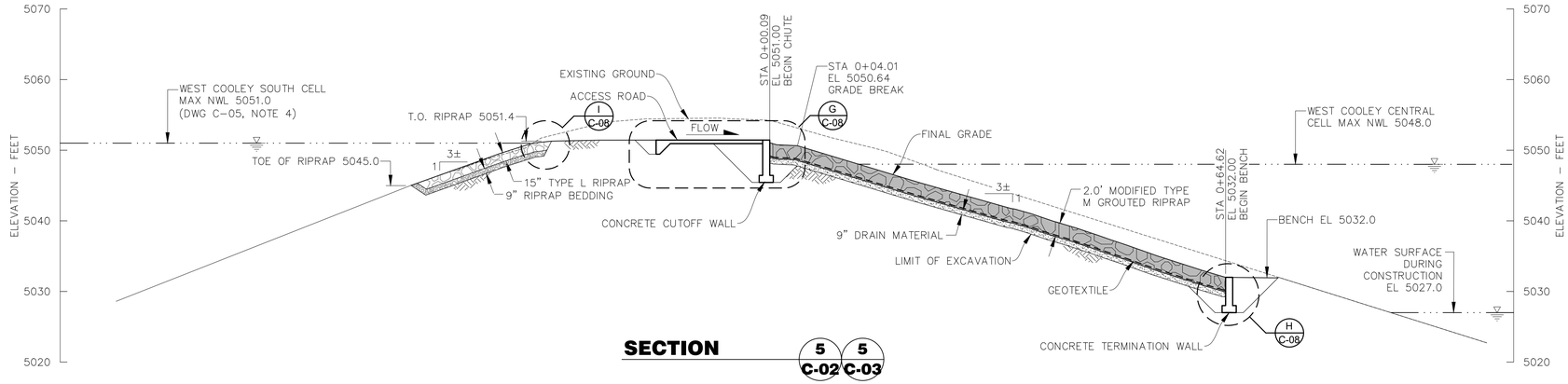
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 2 - INTERCONNECT GATE CONTROL VAULT MODIFICATIONS

DWG. NO. C-06

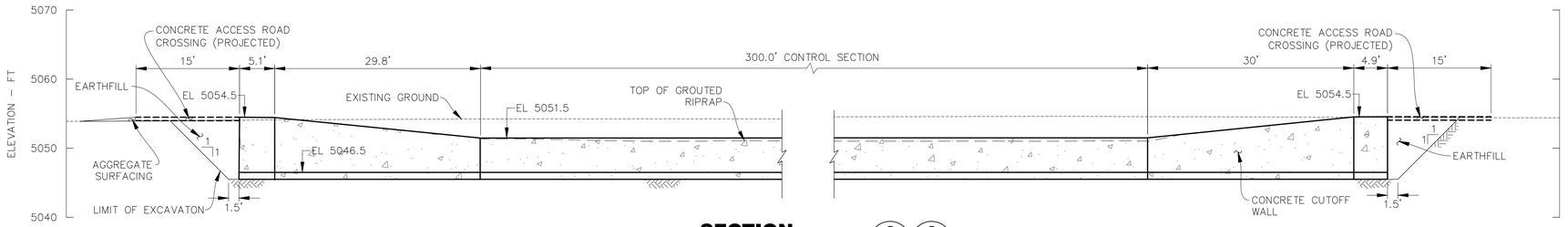
SHEET NO. 40 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 – PLAN OF MODS.DWG 6/14/2021



SECTION 5 C-02 / 5 C-03

0 5 10 20 30
SCALE IN FEET



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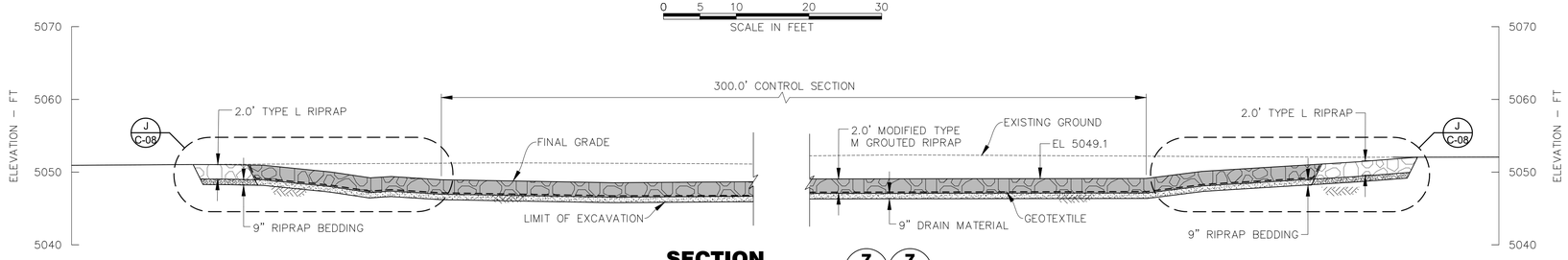

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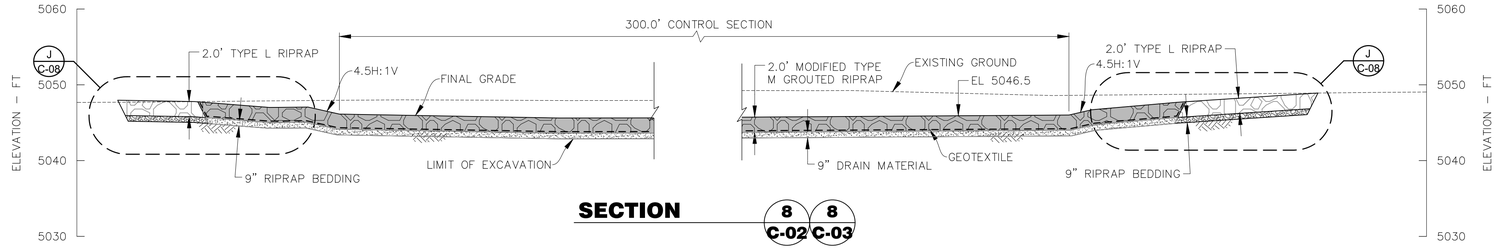

SECTION 8 C-02 / 8 C-03

0 5 10 20 30
SCALE IN FEET

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PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

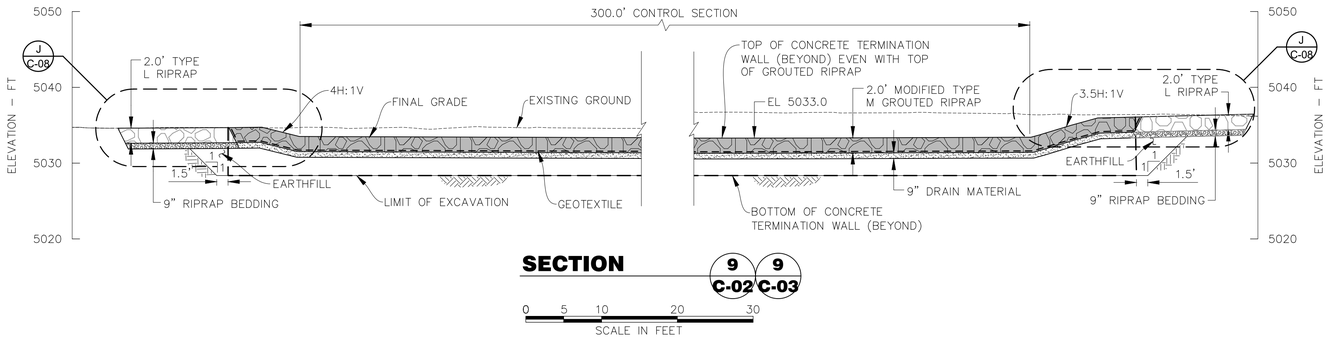
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 2 - OVERFLOW CHANNEL SECTIONS (1 OF 2)

DWG. NO. C-07

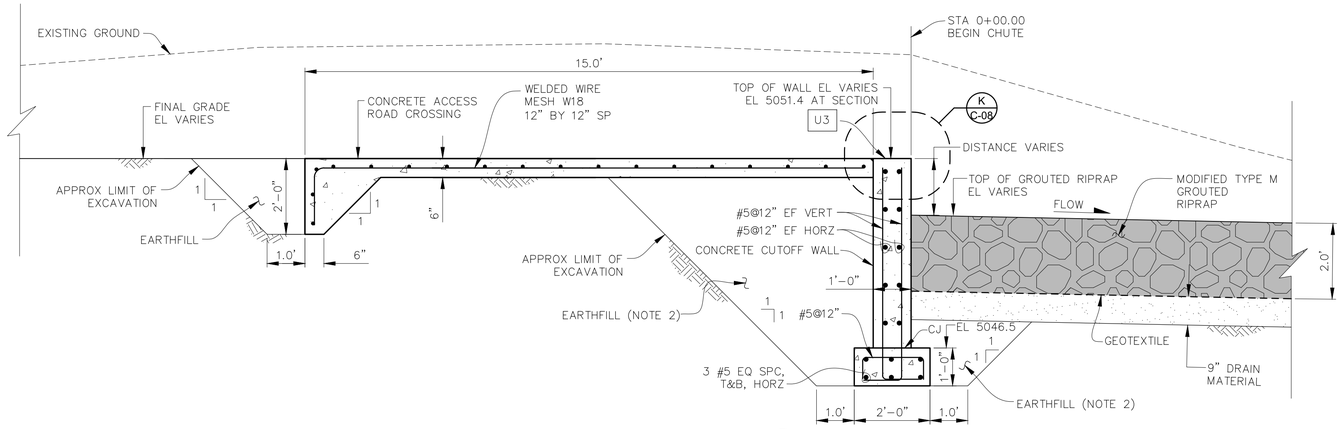
SHEET NO. 41 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 – PLAN OF MODS.DWG 6/14/2021



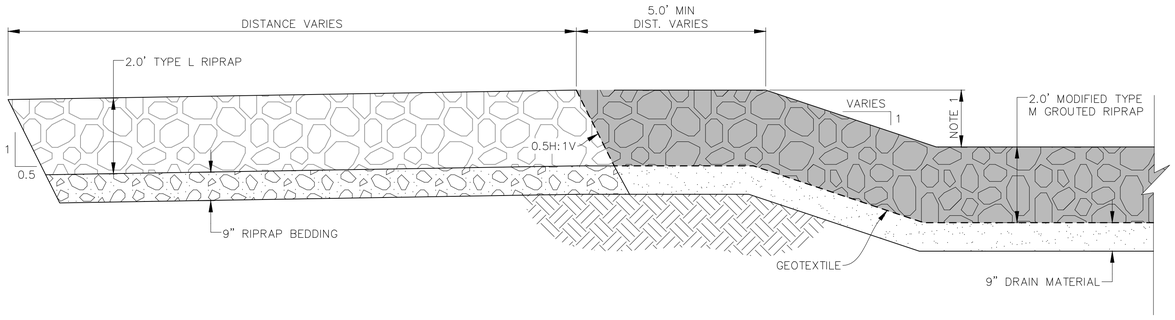
SECTION 9 C-02 / 9 C-03

0 5 10 20 30
SCALE IN FEET



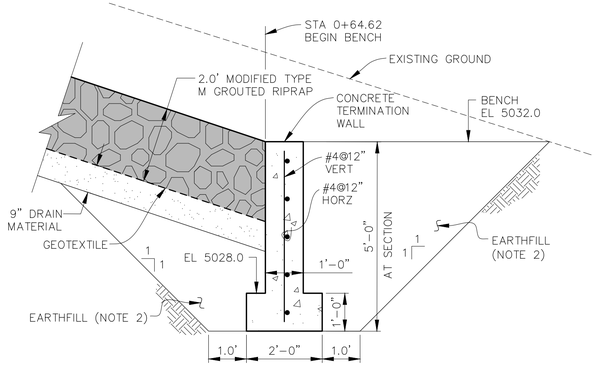
DETAIL G C-07

0 1 2 4 6
SCALE IN FEET



DETAIL J C-07 / J C-08

0 1 2 4 6
SCALE IN FEET



DETAIL H C-07

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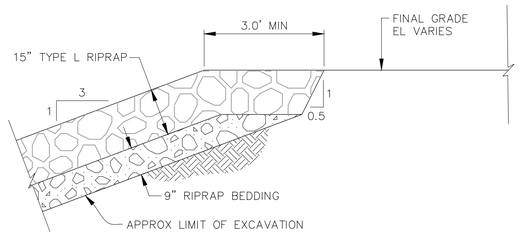

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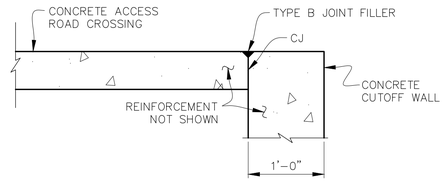

DETAIL K C-08

0 0.5 1 2 3
SCALE IN FEET

NOTES:

1. PROVIDE 2–FOOT MINIMUM BETWEEN STA 0+00 AND 0+11.3 AND 1.5–FOOT MINIMUM BETWEEN STA 0+11.3 AND 0+64.6.
2. MAINTAIN FILL LEVEL WITHIN 2 FT ON ALL SIDES OF STRUCTURE.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
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COLORADO LICENSED PROFESSIONAL ENGINEER ROBERT J. HILLMAN 25734 06/13/21

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

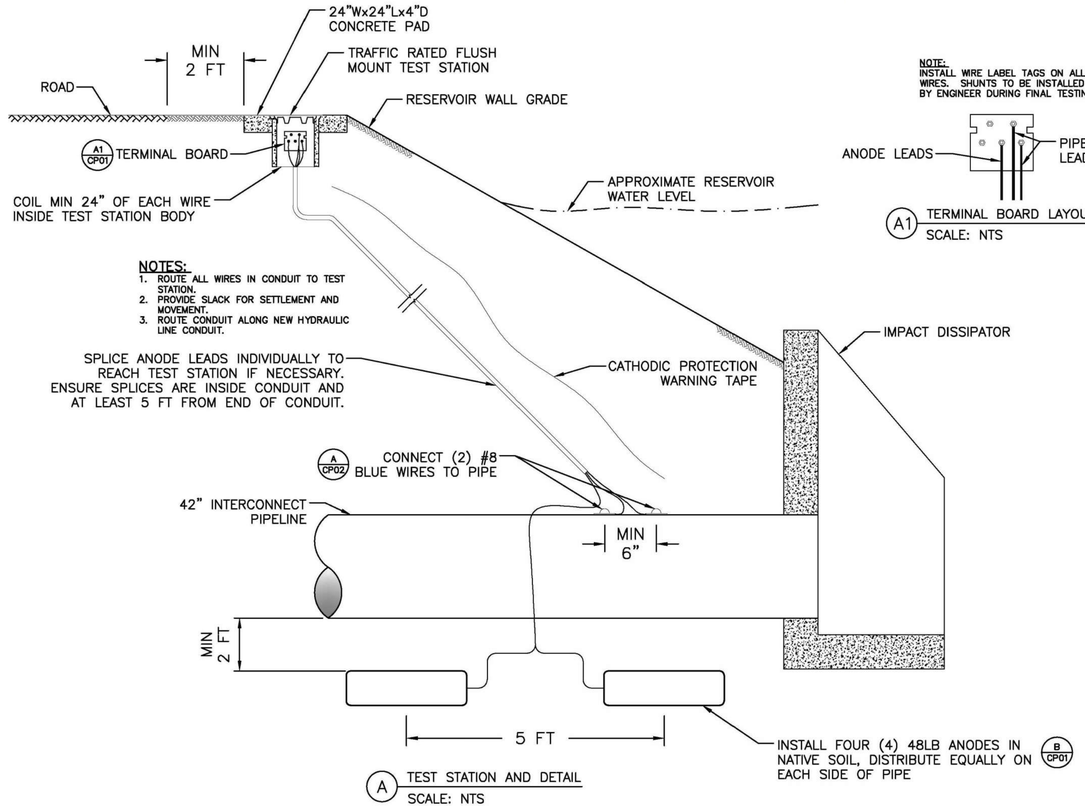
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 2 - OVERFLOW CHANNEL SECTIONS (2 OF 2)

DWG. NO. C-08

SHEET NO. 42 of 77

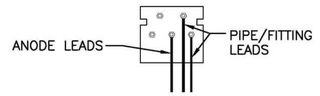
P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 2 – PLAN OF MODS.DWG 6/14/2021



NOTES:
1. ROUTE ALL WIRES IN CONDUIT TO TEST STATION.
2. PROVIDE SLACK FOR SETTLEMENT AND MOVEMENT.
3. ROUTE CONDUIT ALONG NEW HYDRAULIC LINE CONDUIT.

(A) TEST STATION AND DETAIL
SCALE: NTS

NOTE:
INSTALL WIRE LABEL TAGS ON ALL WIRES. SHUNTS TO BE INSTALLED BY ENGINEER DURING FINAL TESTING



(A1) TERMINAL BOARD LAYOUT
SCALE: NTS

NOTES:
1. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE PLANS FOR THIS PROJECT AND ACTUAL FIELD CONDITIONS WHICH MAY INTERFERE WITH THIS PROJECT.
2. NO BELOW GRADE SPLICING OF WIRES IS ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. CONTRACTOR SHALL ENSURE ALL WIRES ARE OF SUFFICIENT LENGTH FOR EACH INTENDED APPLICATION. ANODE WIRE SPLICES SHOWN ON DRAWINGS MUST BE LOCATED INSIDE CONDUIT AT LEAST 5 FEET FROM END OF CONDUIT.
3. REMOVE ANODES FROM PLASTIC OR OTHER SHIPPING BAG AND POSITION ACCORDING TO DETAIL DRAWINGS. DO NOT REMOVE CLOTH SACK.
4. INSTALL ANODES A MINIMUM OF 3 FEET FROM EDGE OF PIPE OR ANY OTHER METALLIC OBJECT AND PLACE BELOW THE INVERT OF THE PIPE.
5. BACKFILL WITH NATIVE SOIL A MINIMUM OF 12 INCHES AROUND ANY ANODES THEN FLOOD EACH WITH A MINIMUM OF 5 GALLONS OF FRESH WATER. AFTER WATER ABSORPTION, CONTINUE BACKFILLING AS PER SPECIFICATIONS.
6. ROUTE ALL TEST LEADS AND ANODE WIRES IN APPROPRIATELY SIZED CONDUIT BETWEEN THE PIPE AND THE TEST STATION BASE WHERE APPLICABLE.
7. IF POSSIBLE, INSTALL TEST STATIONS OVER CENTERLINE OF PIPE. PLACE TEST STATIONS IN PROTECTED LOCATIONS (NEXT TO FENCES, APPURTENANCES, OUT OF ROADWAYS, ETC.) OR OTHER EASILY ACCESSIBLE AREAS.
8. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ELECTRICAL ISOLATION OF PIPELINE FROM OTHER PIPELINES, CONCRETE REBAR, ELECTRICAL GROUNDING, CASINGS, PIPE SUPPORTS, OR OTHER METALLIC STRUCTURES.
9. DURING BACKFILL, INSTALL DETECTABLE CATHODIC PROTECTION WARNING TAPE 12–18 INCHES ABOVE ANY CATHODIC PROTECTION WIRES OR DEVICES.
10. TYPICAL WIRE INSULATION COLORS:
    BLUE = PROTECTED PROJECT STRUCTURE BLACK = ANODE
11. SEE PROJECT SPECIFICATIONS FOR FURTHER INFORMATION.

WEST COOLEY 2015 FLOOD REPAIRS PROJECT - SITE 2 TEST STATION SCHEDULE				
STATION	TEST STATION NO.	DETAIL DRAWING	DESCRIPTION	NOTES
0+05	S2-1	A / CP01	DIRECT BOND (4) ANODES	PLACE TEST STATION ON SOUTH SIDE OF GRAVEL ROAD
1+87	S2-2	A / CP01	DIRECT BOND (4) ANODES	PLACE TEST STATION ON NORTH SIDE OF GRAVEL ROAD
BACKFILL ANODES IN NATIVE SOIL. DO NOT INSTALL IN PEAGRAVEL OR SIMILAR PIPE BEDDING MATERIAL.				

NOTES:
1. FLOWABLE FILL SURROUNDING PIPE MUST BE REMOVED TO INSTALL THERMITE WELDS.
2. SEE NOTES 3–6 FOR INSTALLATION DETAILS OF ANODES

(B) ANODE PLACEMENT DETAIL
SCALE: NTS

NOTES:
1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	1/10/20	ISSUED FOR 60% REVIEW

City of Thornton

TITLE / LOCATION: CATHODIC PROTECTION
TEST STATION DETAILS
WEST COOLEY 2015 FLOOD REPAIRS
INTERCONNECT PIPING SITE 2

SUBMITTED BY: QUALCORR Engineering
PROJECT NO.: 19-???
DESIGNED BY: MAV
DRAWN BY: CAS
CHECKED BY: VHJ
DATE: 12/02/19

SHEET CP01

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City of Thornton

RJH PROJECT 16116

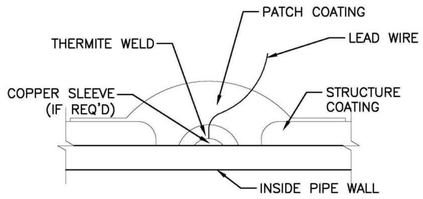
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 2 - CATHODIC DETAILS (1 OF 2)

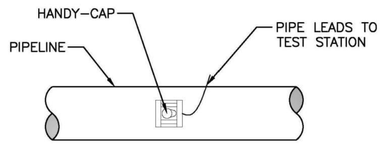
DWG. NO. C-09

SHEET NO. 43 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021

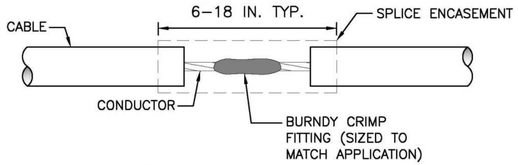


A THERMITE WELD DETAIL
SCALE: NTS



B HANDY–CAP APPLICATION
SCALE: NTS

NOTE:
ALL SPLICES MUST BE APPROVED BY ENGINEER PRIOR TO USE. PROVIDE WIRING OF SUFFICIENT LENGTH SO THAT ADDITIONAL SPLICES ARE NOT REQUIRED.



C WIRE SPLICING PROCEDURE
SCALE: NTS

THERMITE WELDING INSTRUCTIONS:

1. REMOVE APPROXIMATELY 4" DIAMETER CIRCLE OF PIPELINE COATING AT STRUCTURE CONNECTION LOCATION.
2. CLEAN AREA APPROXIMATELY 2" DIAMETER TO BRIGHT METAL.
3. REMOVE 2" OF INSULATION FROM END OF WIRE.
4. WELD CONDUCTOR TO PIPE. USE APPROPRIATE GRAPHITE MOLD AND CARTRIDGE CHARGE SIZE. COPPER SLEEVES ARE REQUIRED FOR #8 AWG OR SMALLER WIRES.
5. TEST THE THERMITE WELD CONNECTION BY STRIKING THE COMMON SEVERAL BLOWS ON THE SIDE USING A ONE POUND HAMMER. TOP OF WELD MAY BE HAMMERED FLAT IF REQUIRED.
6. APPLY HANDY–CAP. SEE DETAIL B.

HANDY–CAP APPLICATION PROCEDURES:

1. CLEAN ALL MUD, DIRT, GREASE, OIL, AND OTHER CONTAINMENTS FROM THE METAL SURFACE AND ANY PART OF THE MILL APPLIED COATING WHICH IS TO BE COVERED.
2. APPLY A COAT OF ROYSTON 747 PRIMER (If required) AND ALLOW TO DRY TO A NON–GLOSSY APPEARANCE, WHICH WILL TAKE APPROXIMATELY 5 MINUTES DEPENDING ON HUMIDITY AND TEMPERATURE.
3. REMOVE THE RELEASE PAPER FROM THE BOTTOM OF THE ROYSTON HANDY CAP. BEND THE PLASTIC SHEET INWARD AT THE SERRATIONS WHEN APPLYING TO A SMALL DIAMETER PIPE. POSITION AND PLACE THE HANDY CAP ON THE WELDED AREA WITH THE TUNNEL OVER THE LEAD WIRE.
4. PUSH THE DOME OF THE CAP FIRMLY IN THE WELD AREA. NOW LIFT THE WIRE AWAY FROM THE PIPE AND SQUEEZE THE BLACK RUBBER COMPOUND COMPLETELY AROUND AND UNDERNEATH THE WIRE. THEN PUSH THE LEAD WIRE BACK DOWN ON THE PIPE AND PRESS THE ELASSTOMERIC COMPOUND INTO FIRM CONTACT WITH THE PIPE OVER THE ENTIRE AREA.

NO FURTHER PROTECTION IS NECESSARY IF THE ROYSTON HANDY CAP COVERS THE ENTIRE EXPOSED METAL AREA. UNCOVERED AREAS SHOULD BE PROTECTED BY APPLYING TAPE OR MASTIC SUCH AS TRENTON PIPELINE TAPE CP OR ROYSTON ROSKOTE MASTIC.

WHEN COATING OR WRAPPING THE ROYSTON HANDY CAP, REMOVE THE NARROW STRIPS OF PLASTIC RELEASE FILM ON THE TOP OF THE CAP. THIS WILL ASSURE MAXIMUM PROTECTION BY EFFECTING A POSITIVE WATERPROOF SEAL.

TYPICAL PROCEDURE TO SPLICE ANODE OR CABLE:

1. CUT BACK INSULATION FROM END OF ANODES OR CABLES APPROX. 1 INCH. BE SURE ALL CABLE ENDS AND CONNECTIONS ARE CLEAN OF DIRT AND FOREIGN MATTER AND THAT ALL CONNECTIONS ARE BARE METAL.
2. PUT CABLES IN APPROPRIATE SIZED CRIMP FITTING AND CRIMP.
3. APPLY ELECTRICAL PUTTY TO FILL IN ANY VOIDS AND IRREGULAR SHAPES.
4. APPLY ELECTRICAL RUBBER TAPE AROUND THE PUTTY AND CABLE WHERE INSULATION WAS REMOVED.
5. APPLY ELECTRICAL TAPE ALONG THE ENTIRE SPLICE AND A MINIMUM OF 2 INCHES ON EACH ANODE OR CABLE END.
6. APPLY ELECTRICAL COATING ALONG THE ENTIRE SPLICE.
7. EPOXY SPLICE KIT MAY BE USED IN LIEU OF RUBBER AND PLASTIC TAPE.

NOTES:

1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	1/10/20	ISSUED FOR 60% REVIEW

City of Thornton

TITLE / LOCATION:
CATHODIC PROTECTION
STANDARD DETAILS
WEST COOLEY 2015 FLOOD REPAIRS

SUBMITTED BY:	qualcorr engineering
PROJECT NO.:	19–???
DESIGNED BY:	MMV
DRAWN BY:	CAS
CHECKED BY:	VWJ
DATE:	12/02/19

SHEET CP02

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COLORADO LICENSED
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on 12/3/19
PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

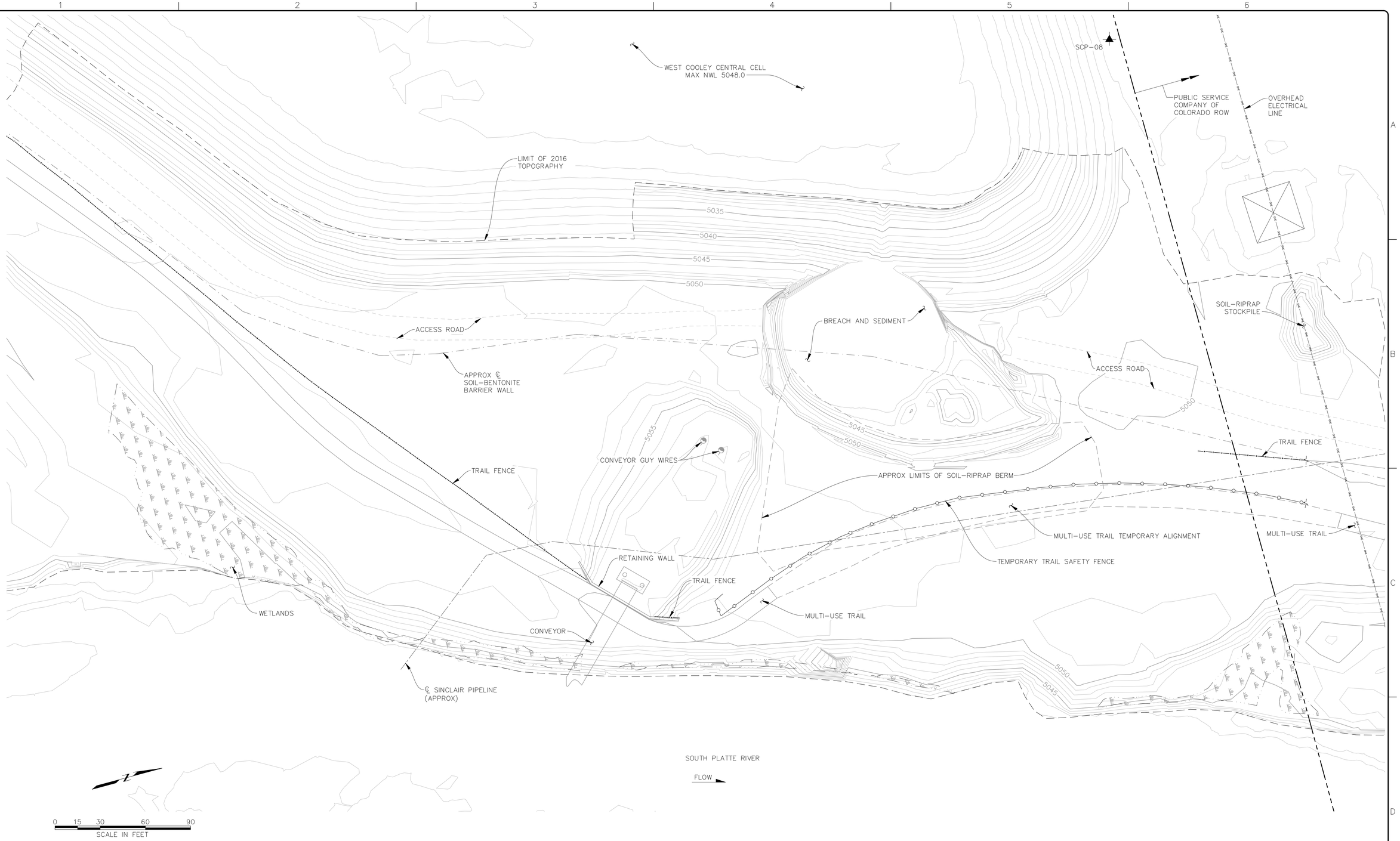
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 2 - CATHODIC DETAILS (2 OF 2)

DWG. NO. C-10

SHEET NO. 44 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021



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ROBERT J. HUDSPEAK
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06/13/21
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City of Thornton

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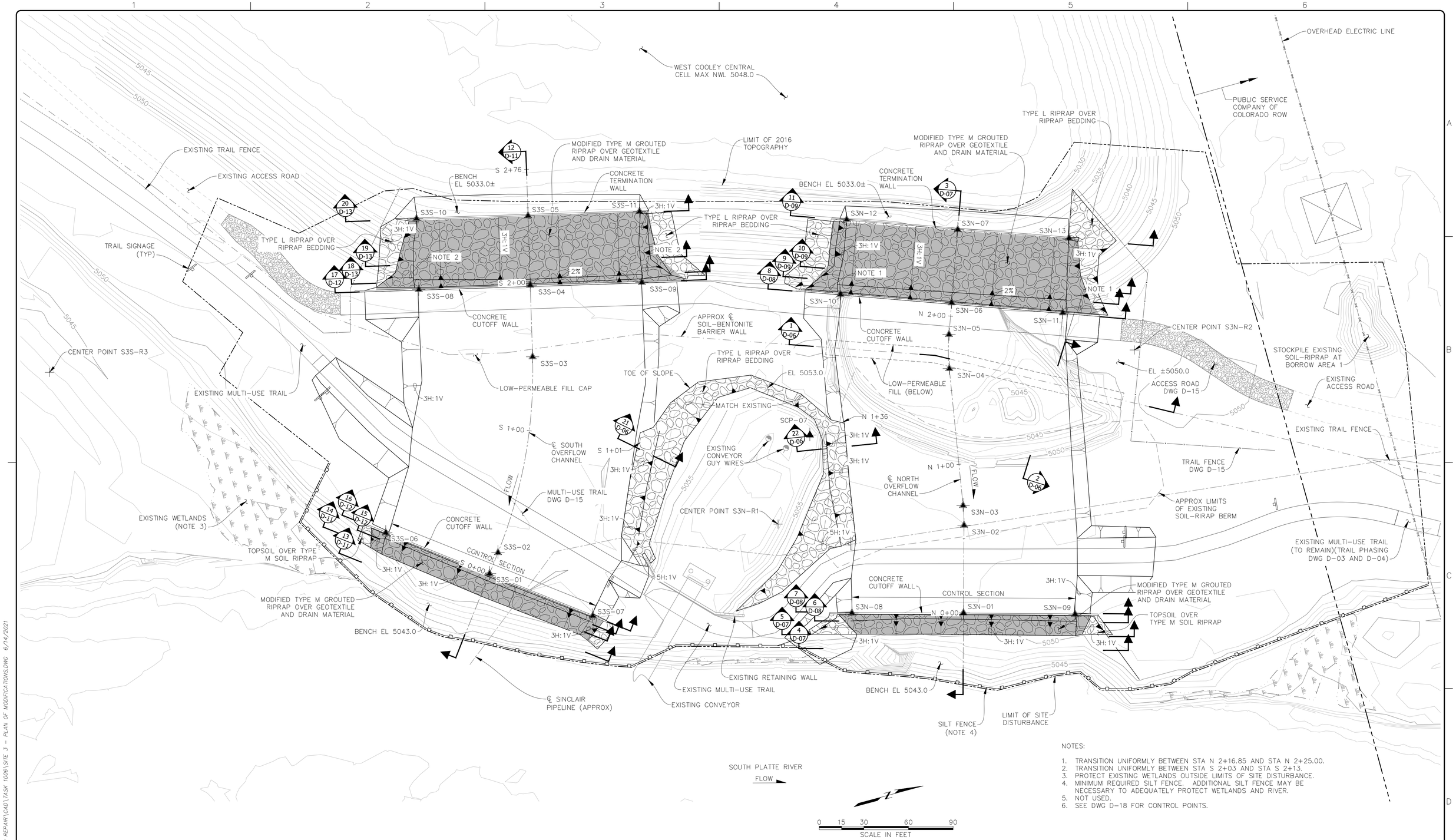
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 3 - PLAN OF EXISTING CONDITIONS

DWG. NO. D-01

SHEET NO. 45 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF EXISTING CONDITIONS.DWG 6/14/2021



NOTES:

1. TRANSITION UNIFORMLY BETWEEN STA N 2+16.85 AND STA N 2+25.00.
2. TRANSITION UNIFORMLY BETWEEN STA S 2+03 AND STA S 2+13.
3. PROTECT EXISTING WETLANDS OUTSIDE LIMITS OF SITE DISTURBANCE.
4. MINIMUM REQUIRED SILT FENCE. ADDITIONAL SILT FENCE MAY BE NECESSARY TO ADEQUATELY PROTECT WETLANDS AND RIVER.
5. NOT USED.
6. SEE DWG D-18 FOR CONTROL POINTS.

0 15 30 60 90
SCALE IN FEET

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City of Thornton

RJH PROJECT 16116

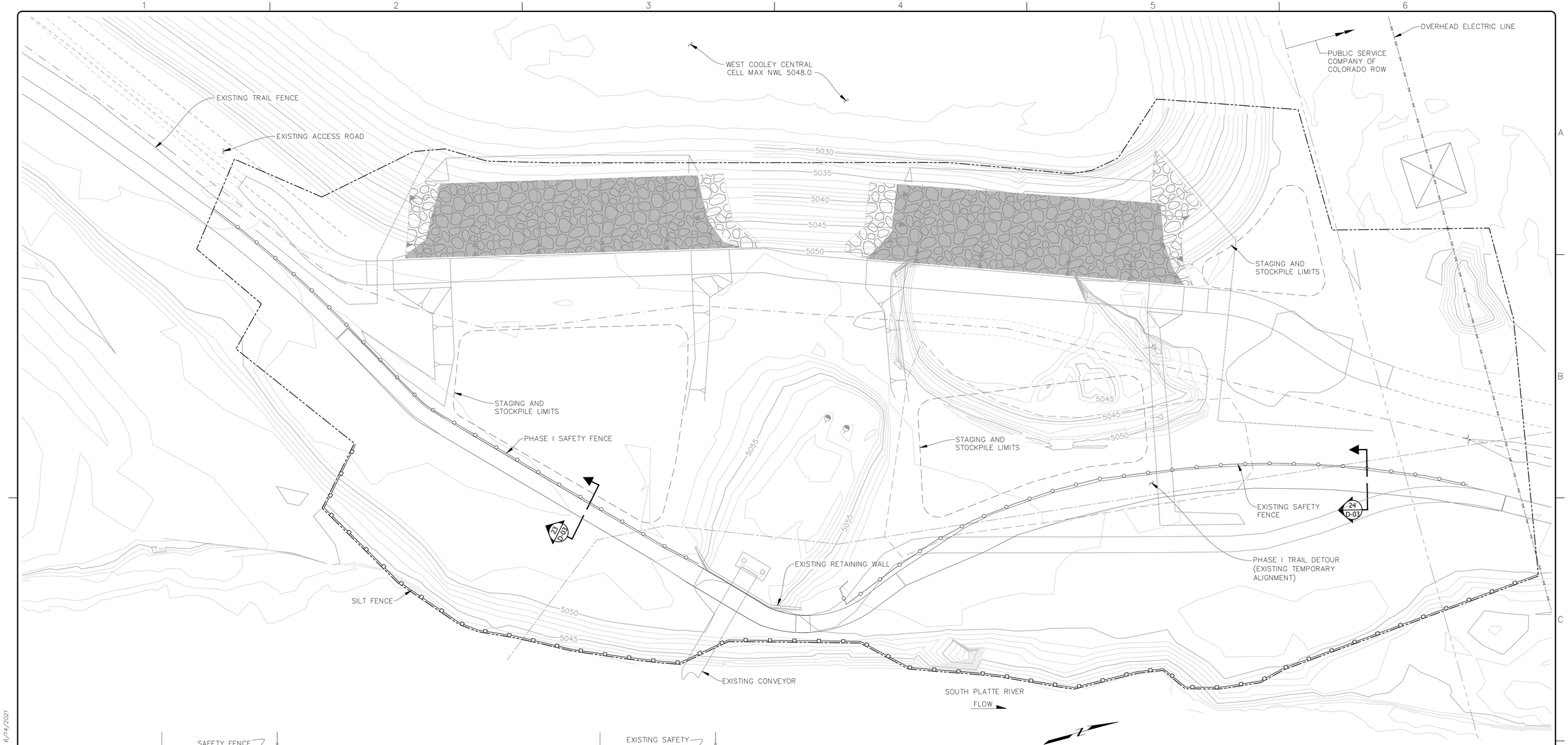
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

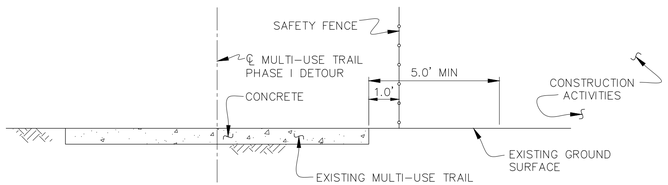
SITE 3 - PLAN OF MODIFICATIONS

DWG. NO. D-02

SHEET NO. 46 of 77

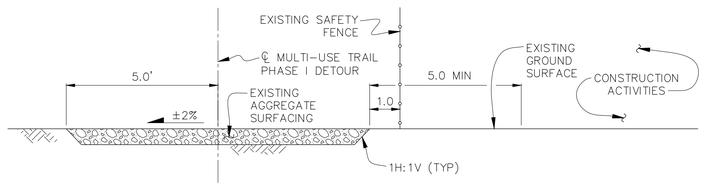
P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – PLAN OF MODIFICATIONS.DWG 6/14/2021





SECTION 23 D-03

NOT TO SCALE



SECTION 24 D-03

NOT TO SCALE

NOTE:

1. MAINTAIN MULTI-USE TRAIL DETOUR THROUGHOUT CONSTRUCTION UNTIL REMOVAL. SEE SEQUENCE THIS SHEET.

MULTI-USE TRAIL DETOUR SEQUENCE:

1. COMPLETE ALL WORK WEST OF THE PHASE I TRAIL DETOUR, INCLUDING NEW ACCESS ROAD THROUGH OVERFLOW CHANNEL.
2. DIVERT TRAFFIC TO COMPLETED ACCESS ROAD (PHASE II DETOUR)(DWG D-04).
3. COMPLETE CONSTRUCTION, INCLUDING NEW MULTI-USE TRAIL (DWG D-15).
4. DIVERT TRAFFIC TO COMPLETED MULTI-USE TRAIL.

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City of Thornton

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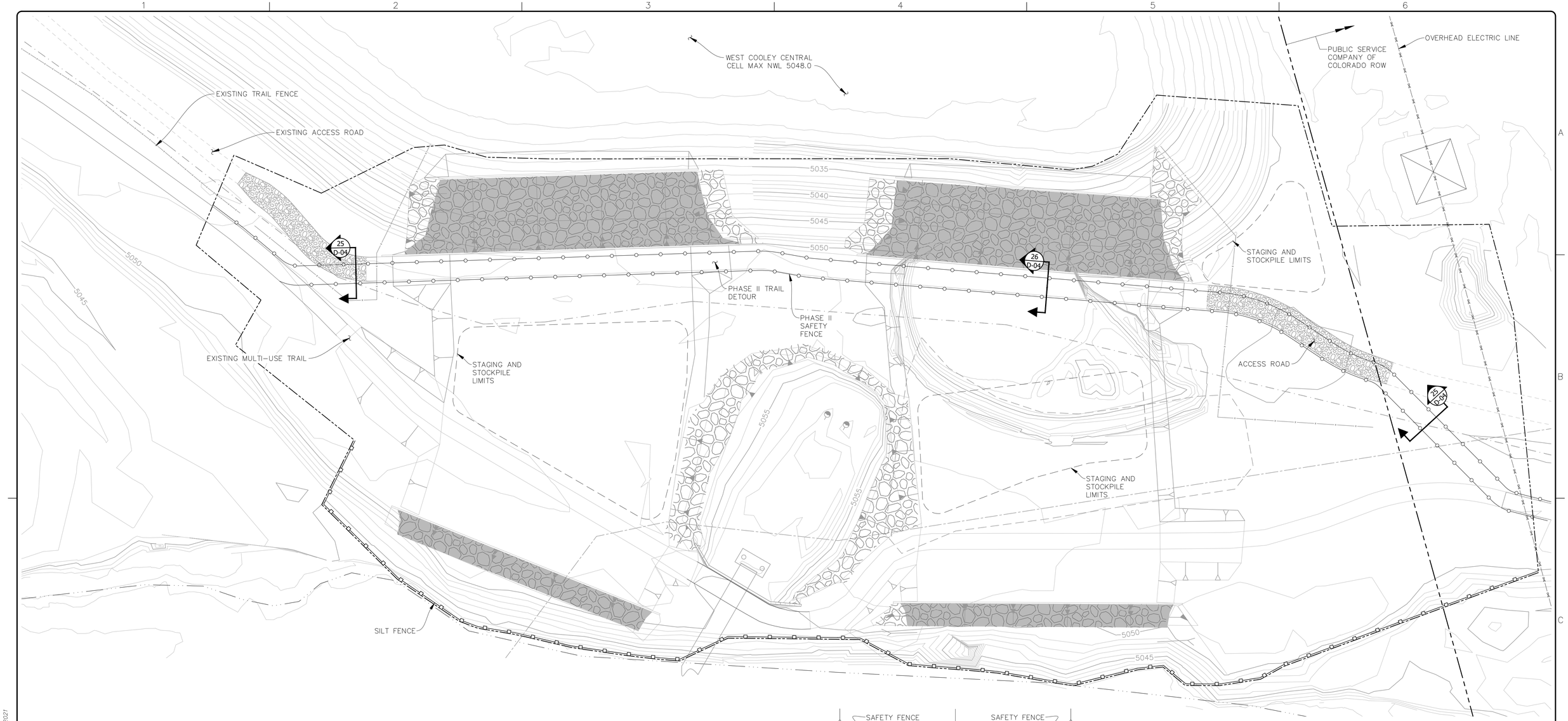
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

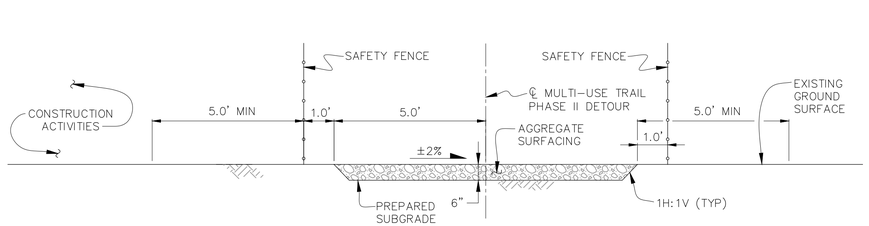
SITE 3 - PHASE I CONSTRUCTION

DWG. NO. D-03

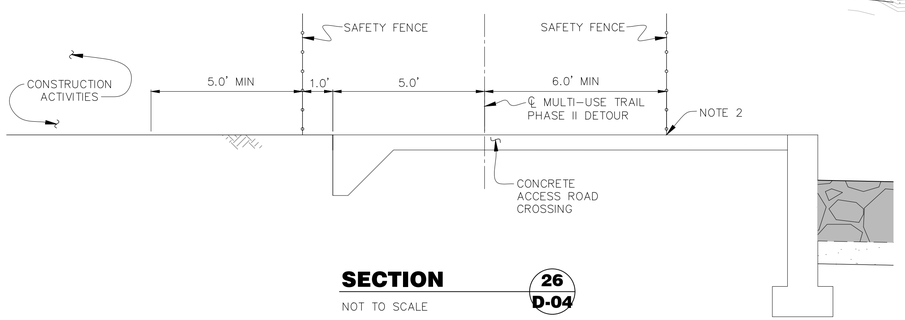
SHEET NO. 47 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PHASING.DWG 6/14/2021





SECTION 25 D-04
NOT TO SCALE



SECTION 26 D-04
NOT TO SCALE

NOTES:

1. SEE CONSTRUCTION SEQUENCE DWG D-03.
2. PROTECT CONCRETE ACCESS ROAD FROM DAMAGE DUE TO SAFETY FENCE.

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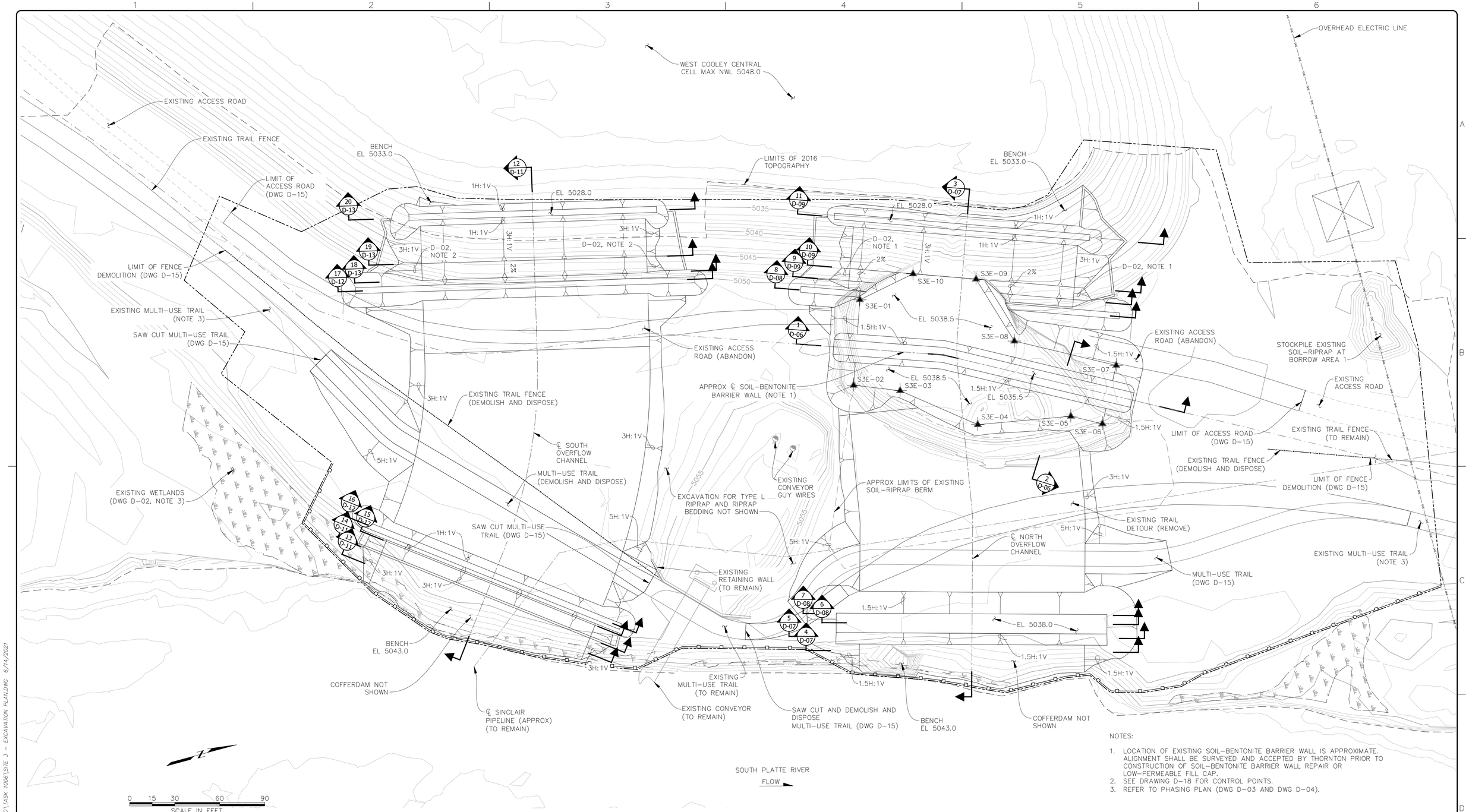
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - PHASE II CONSTRUCTION

DWG. NO. D-04

SHEET NO. 48 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – PHASING II.DWG 6/14/2021



NOTES:

1. LOCATION OF EXISTING SOIL–BENTONITE BARRIER WALL IS APPROXIMATE. ALIGNMENT SHALL BE SURVEYED AND ACCEPTED BY THORNTON PRIOR TO CONSTRUCTION OF SOIL–BENTONITE BARRIER WALL REPAIR OR LOW–PERMEABLE FILL CAP.
2. SEE DRAWING D–18 FOR CONTROL POINTS.
3. REFER TO PHASING PLAN (DWG D–03 AND DWG D–04).

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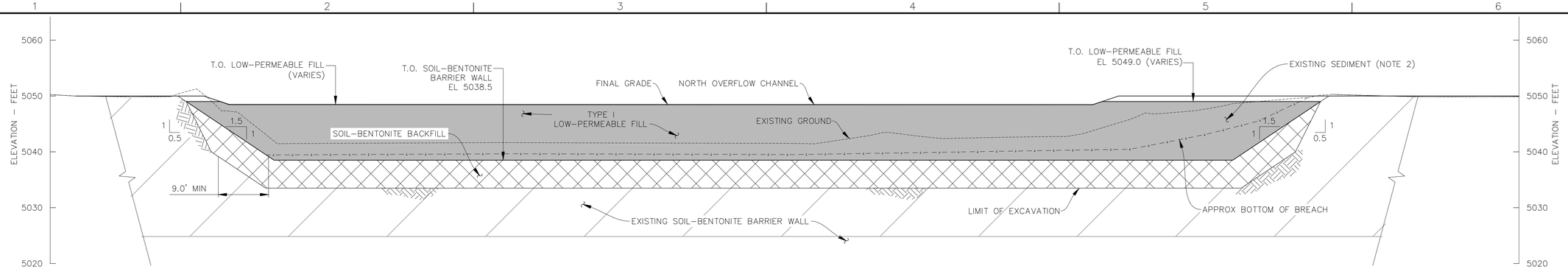
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - PLAN OF EXCAVATION

DWG. NO. D-05

SHEET NO. 49 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – EXCAVATION PLAN.DWG 6/14/2021



SECTION 1 D-02 / 1 D-05

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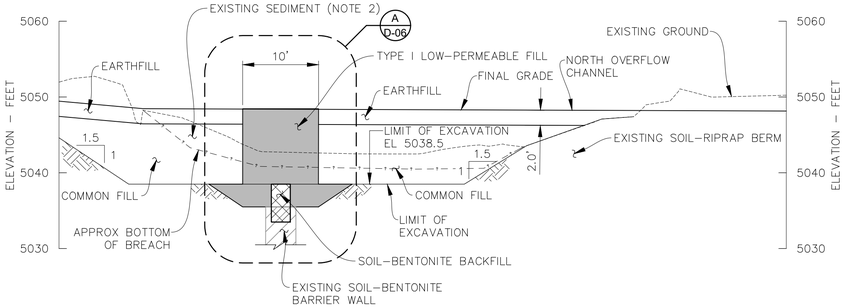
SCALE IN FEET



SECTION 2 D-02 / 2 D-05

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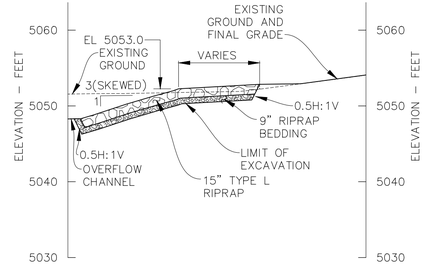

SECTION 21 D-02

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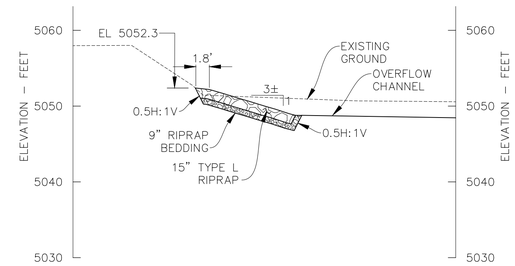
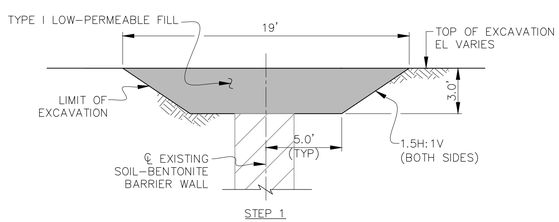
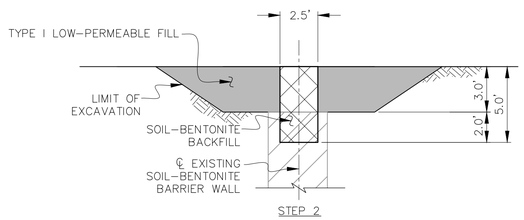


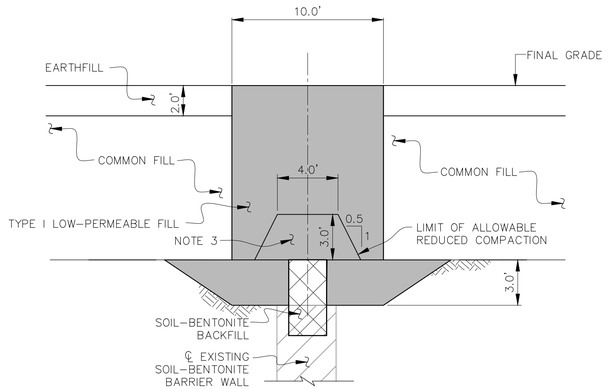
SECTION 22 D-02

0 5 10 20 30

SCALE IN FEET







DETAIL A D-06 / A D-07

0 2.5 5 10 15

SCALE IN FEET

SOIL-BENTONITE BARRIER WALL REPAIR INSTALLATION SEQUENCE:

1. EXCAVATE SEDIMENT AS SHOWN ON THE SITE 3 EXCAVATION PLAN. PLACE TYPE I LOW-PERMEABLE FILL AS SHOWN.
2. EXCAVATE THROUGH TYPE I LOW-PERMEABLE FILL AND INTO EXISTING SOIL-BENTONITE BARRIER WALL. EXCAVATION MUST OVERLAP EXISTING BARRIER WALL BY MINIMUM OF 2 FEET. BACKFILL TRENCH WITH SOIL-BENTONITE BACKFILL.
3. PLACE TYPE I LOW-PERMEABILITY FILL TO ELEVATIONS SHOWN.

NOTES:

1. NOT USED.
2. SEDIMENT DEPOSITED DURING FLOOD EVENT. CONCRETE AND MISCELLANEOUS DEBRIS COULD BE LOCATED WITHIN SEDIMENT. EXCAVATE AND STOCKPILE SEDIMENT FOR USE AS COMMON FILL AND DISPOSE OF CONCRETE AND MISCELLANEOUS DEBRIS. LIMITS OF EXISTING SEDIMENT MAY VARY FROM THOSE SHOWN.
3. COMPACT TYPE I LOW-PERMEABLE FILL DIRECTLY ABOVE AND ALONG SOIL-BENTONITE BARRIER WALL NOT LESS THAN 92-PERCENT RELATIVE COMPACTION.

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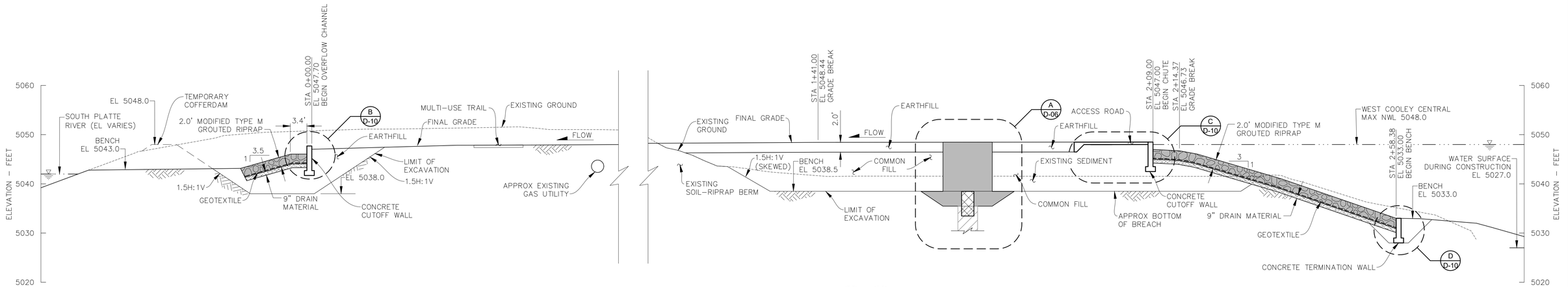
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - REPAIR SECTIONS

DWG. NO. D-06

SHEET NO. 50 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 3 D-02 / 3 D-05

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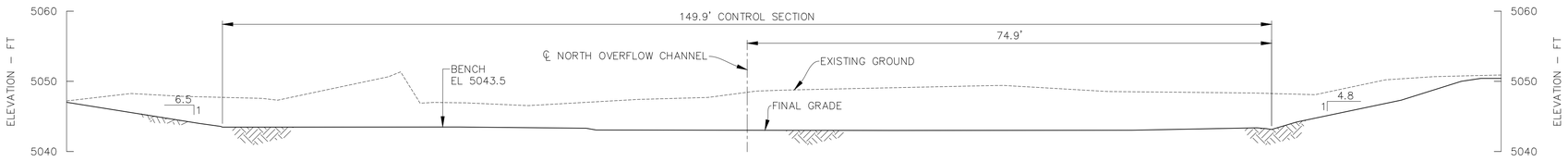

SECTION 4 D-02 / 4 D-05

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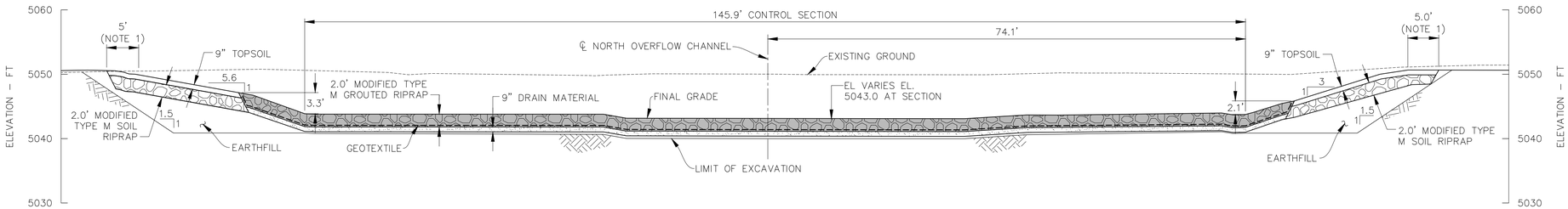

SECTION 5 D-02 / 5 D-05

0 5 10 20 30
SCALE IN FEET

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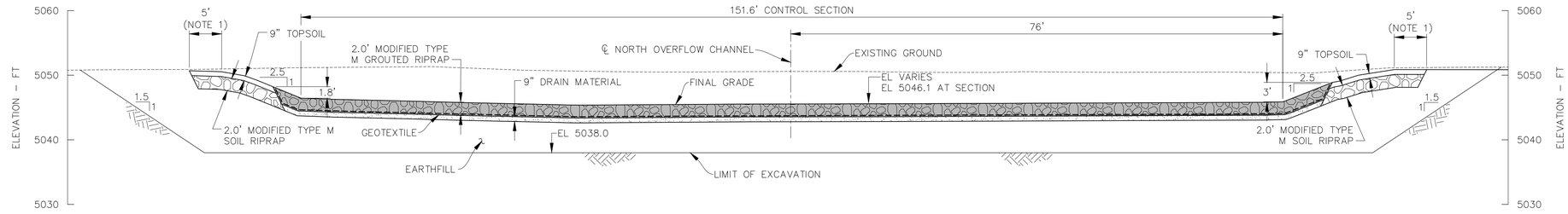
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - NORTH OVERFLOW CHANNEL SECTIONS (1 OF 3)

DWG. NO. D-07

SHEET NO. 51 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 6 D-02 / 6 D-05

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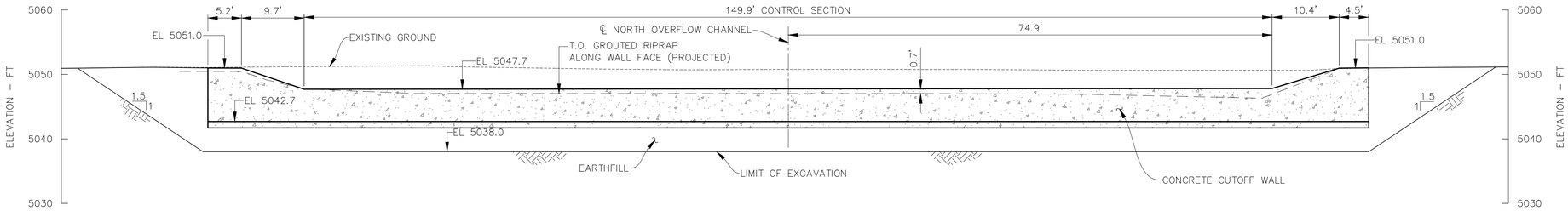
SCALE IN FEET



SECTION 7 D-02 / 7 D-05

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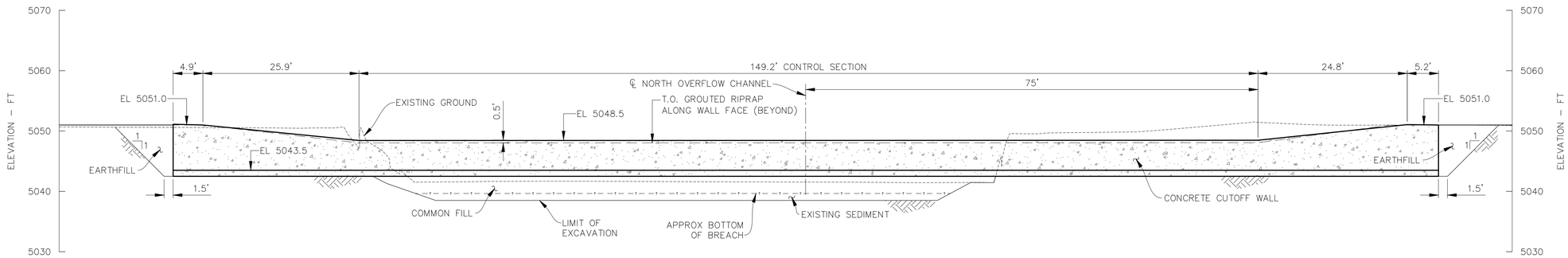

SECTION 8 D-02 / 8 D-05

0 5 10 20 30
SCALE IN FEET

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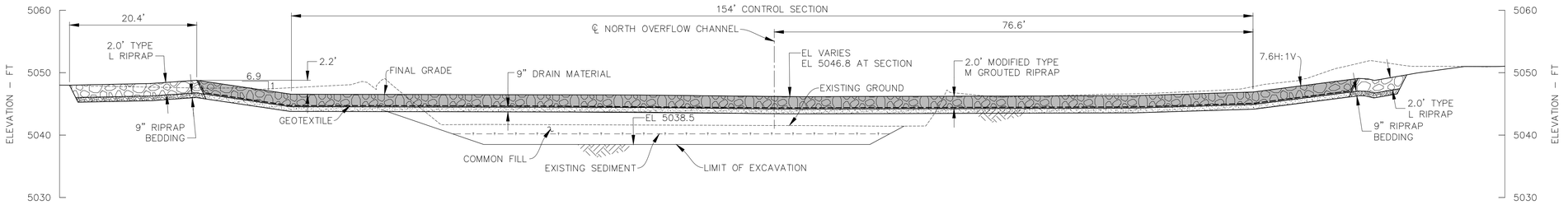
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - NORTH OVERFLOW CHANNEL SECTIONS (2 OF 3)

DWG. NO. D-08

SHEET NO. 52 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 100E\SITE 3 – PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 9 D-02 / 9 D-05

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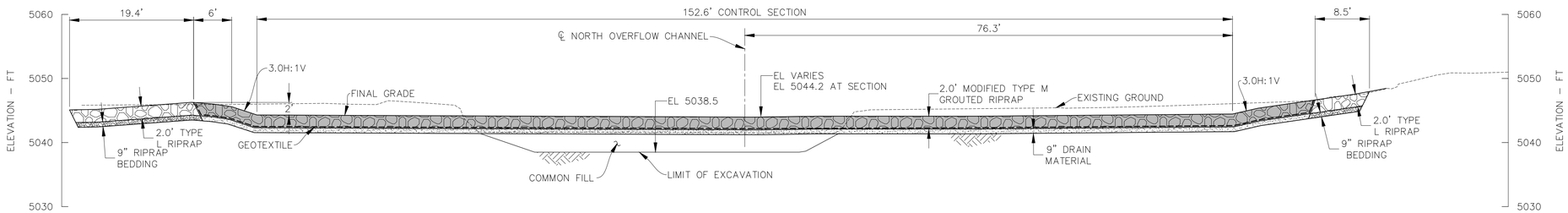

SECTION 10 D-02 / 10 D-05

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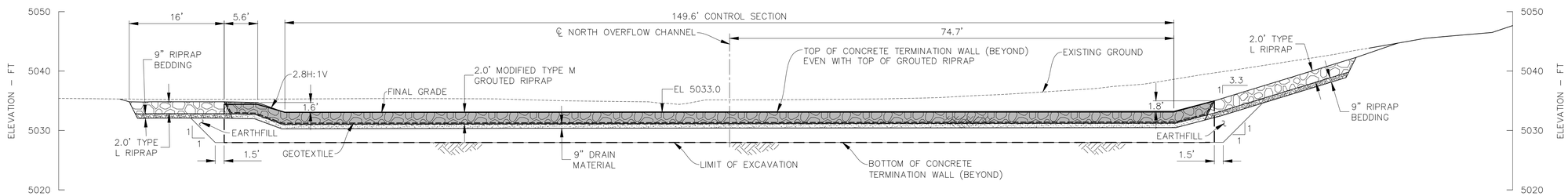

SECTION 11 D-02 / 11 D-05

0 5 10 20 30
SCALE IN FEET

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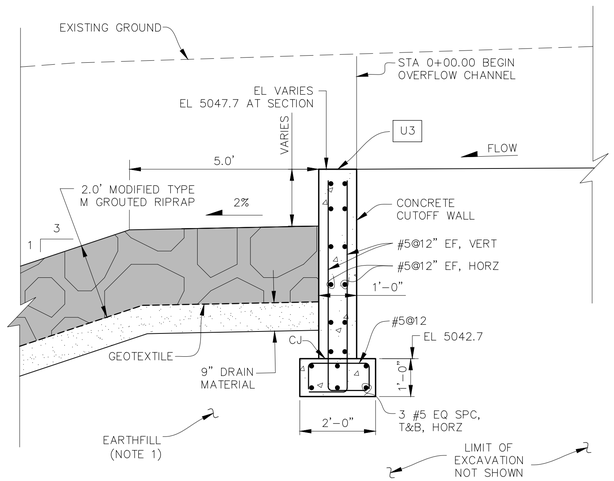
SITE 3 - NORTH OVERFLOW CHANNEL SECTIONS (3 OF 3)

DWG. NO. D-09

SHEET NO. 53 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – PLAN OF MODIFICATIONS.DWG 6/14/2021



DETAIL B **D-07**

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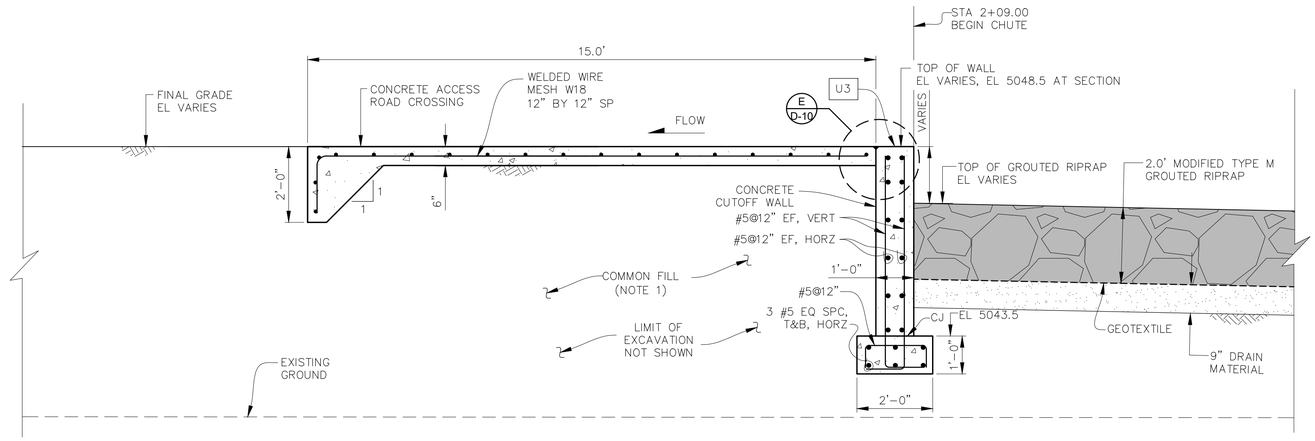
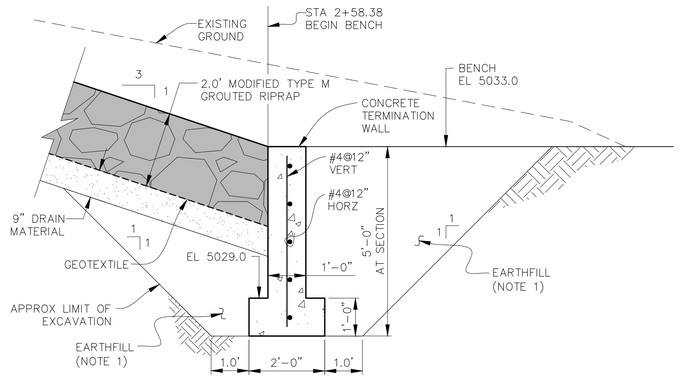
SCALE IN FEET



DETAIL C **D-07**

0 1 2 4
SCALE IN FEET



DETAIL D **D-07**

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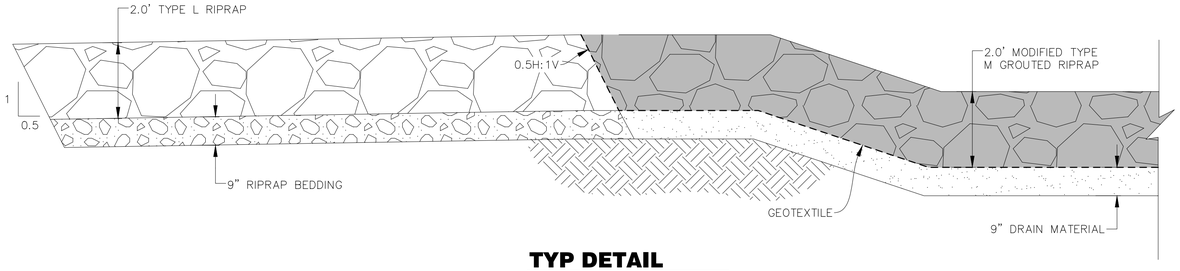
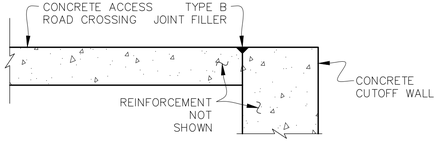


TYP DETAIL

NOT TO SCALE



DETAIL E **D-10**

NOT TO SCALE

NOTES:

1. MAINTAIN FILL LEVEL WITHIN 2 FT ON ALL SIDES OF STRUCTURE.

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City of Thornton

RJH PROJECT 16116

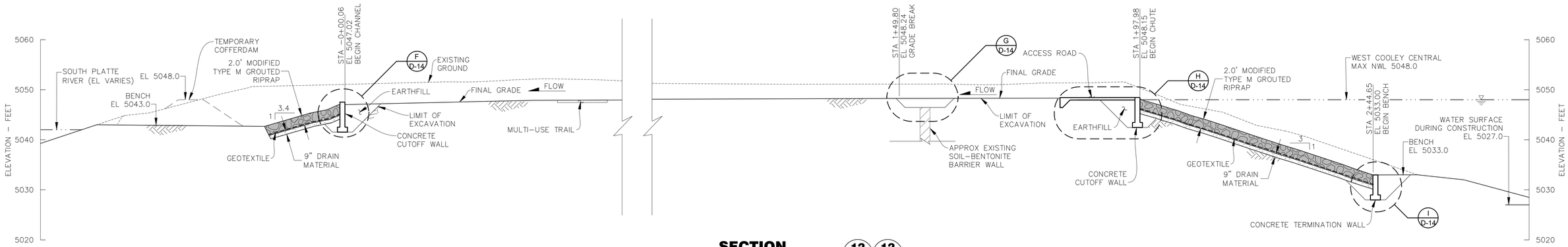
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - NORTH OVERFLOW CHANNEL DETAILS

DWG. NO. D-10

SHEET NO. 54 of 77

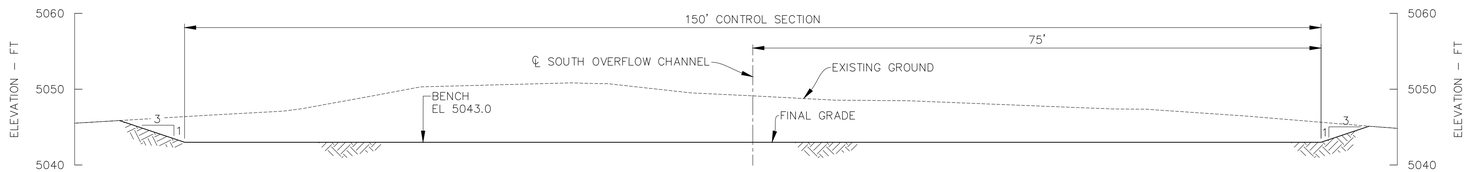
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 12 D-02 / 12 D-05

0 5 10 20 30

SCALE IN FEET



SECTION 13 D-02 / 13 D-05

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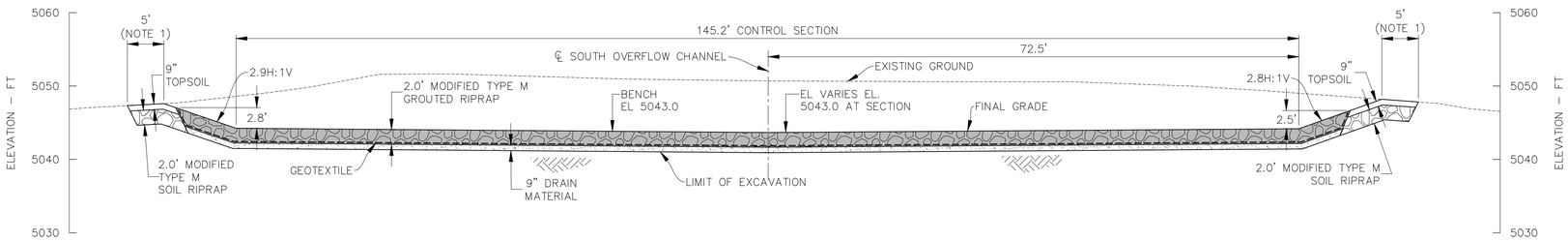

SECTION 14 D-02 / 14 D-05

0 5 10 20 30

SCALE IN FEET

NOTES:

1. AS-BUILT SURVEY DID NOT INCLUDED TOPSOIL COVERED TYPE M SOIL RIPRAP AREAS. EXTENTS SHOWN ARE DESIGN DIMENSIONS.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUTZAK 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

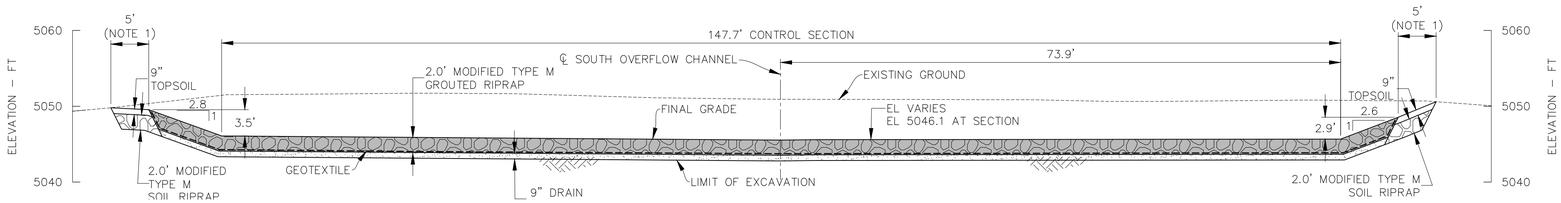
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - SOUTH OVERFLOW CHANNEL SECTIONS (1 OF 3)

DWG. NO. D-11

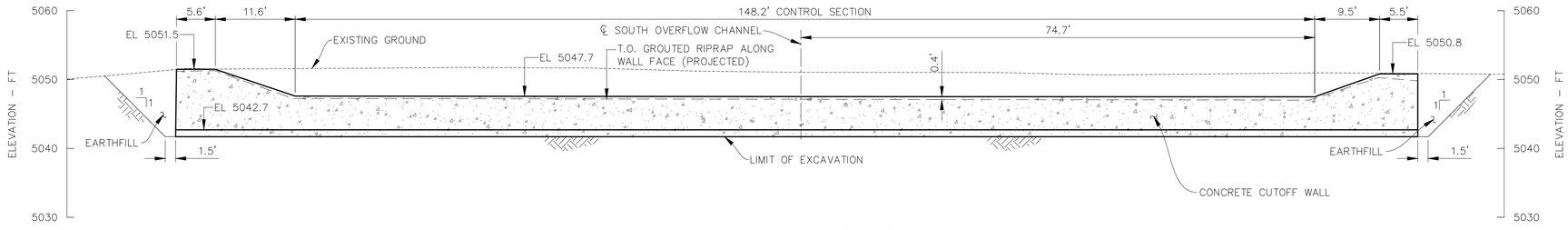
SHEET NO. 55 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 15 D-02 / 15 D-05

0 5 10 20 30
SCALE IN FEET



SECTION 16 D-02 / 16 D-05

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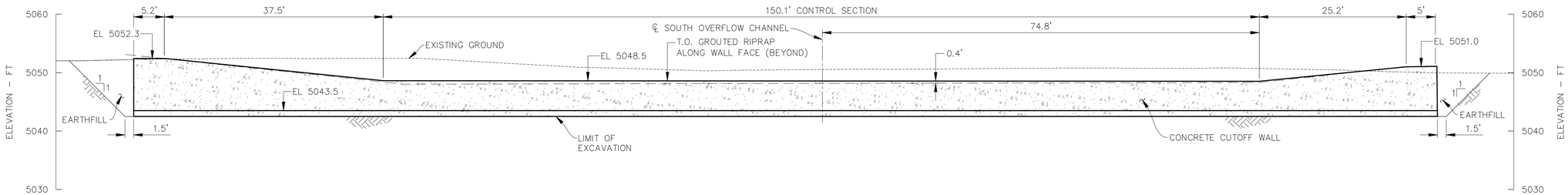

SECTION 17 D-02 / 17 D-05

0 5 10 20 30
SCALE IN FEET

NOTES:

1. AS–BUILT SURVEY DID NOT INCLUDED TOPSOIL COVERED TYPE M SOIL RIPRAP AREAS. EXTENTS SHOWN ARE DESIGN DIMENSIONS.

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

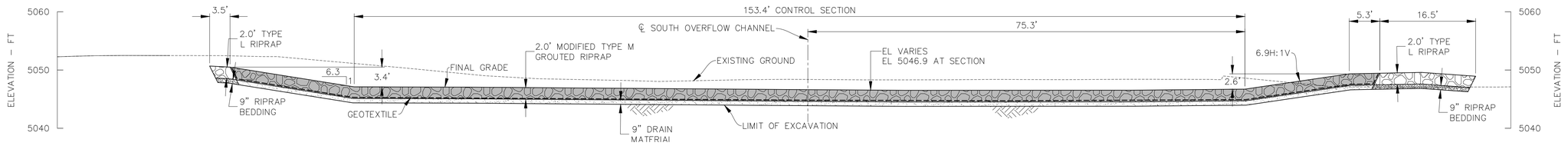
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - SOUTH OVERFLOW CHANNEL SECTIONS (2 OF 3)

DWG. NO. D-12

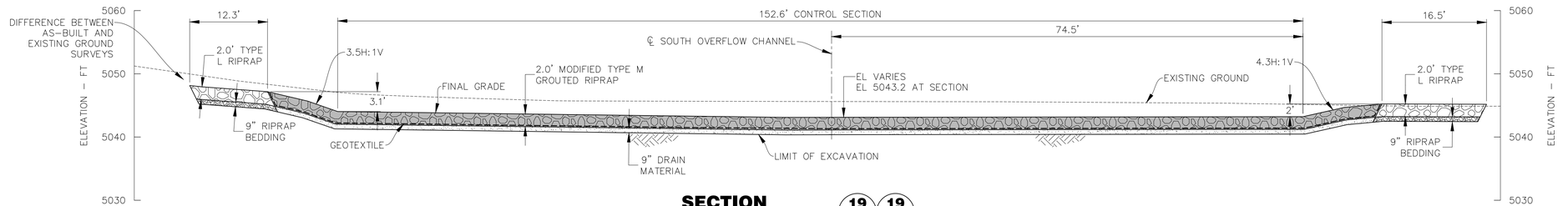
SHEET NO. 56 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – PLAN OF MODIFICATIONS.DWG 6/14/2021



SECTION 18 D-02 / 18 D-05

0 5 10 20 30
SCALE IN FEET



SECTION 19 D-02 / 19 D-05

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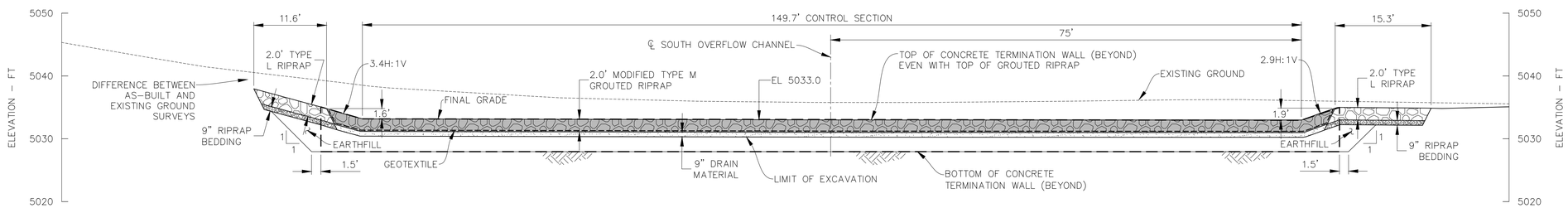
SCALE IN FEET



SECTION 20 D-02 / 20 D-05

0 5 10 20 30
SCALE IN FEET

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

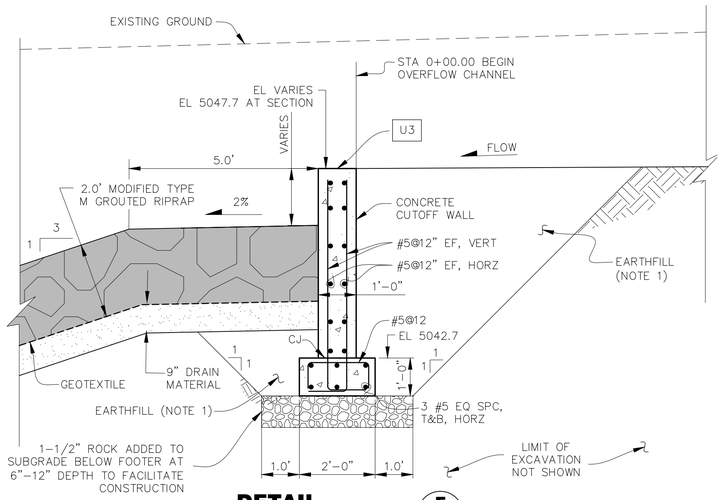
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - SOUTH OVERFLOW CHANNEL SECTIONS (3 OF 3)

DWG. NO. D-13

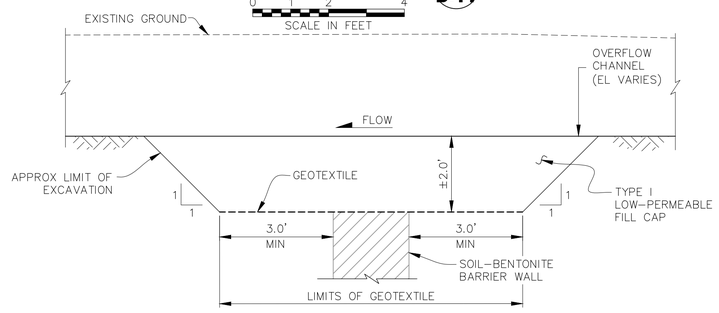
SHEET NO. 57 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – PLAN OF MODIFICATIONS.DWG 6/14/2021



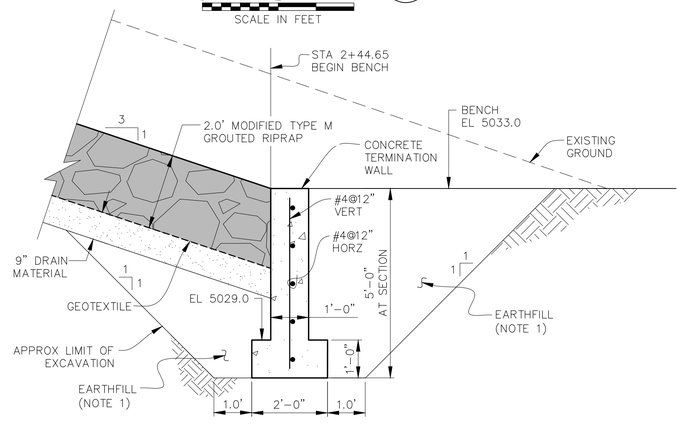
DETAIL F D-11

SCALE IN FEET



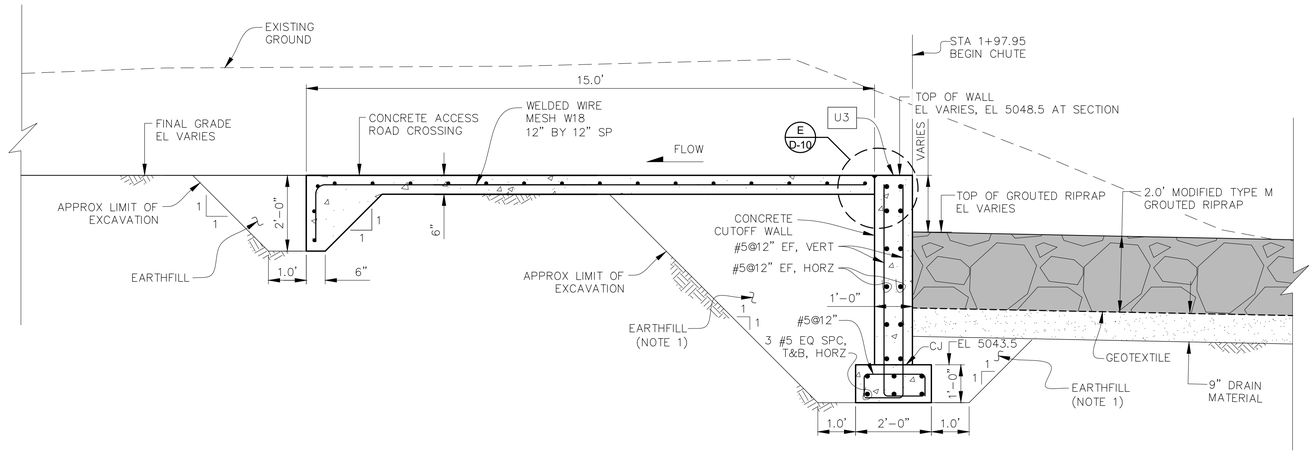
DETAIL G D-11

SCALE IN FEET



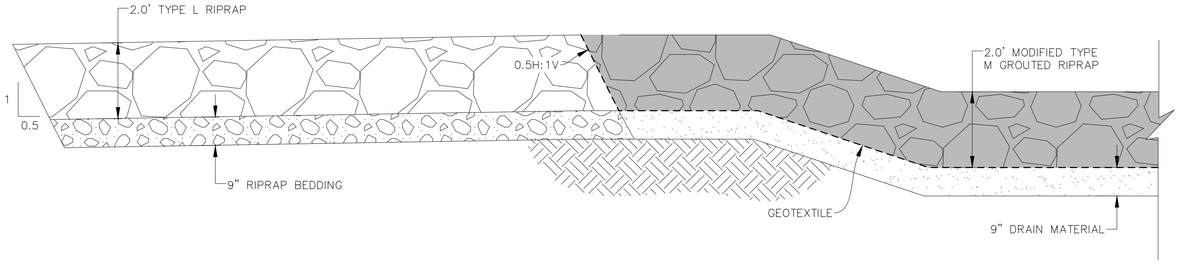
DETAIL I D-11

SCALE IN FEET



DETAIL H D-11

SCALE IN FEET



TYP DETAIL

NOT TO SCALE

NOTE:

1. MAINTAIN FILL LEVEL WITHIN 2 FT OF ON SIDES OF STRUCTURE.

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

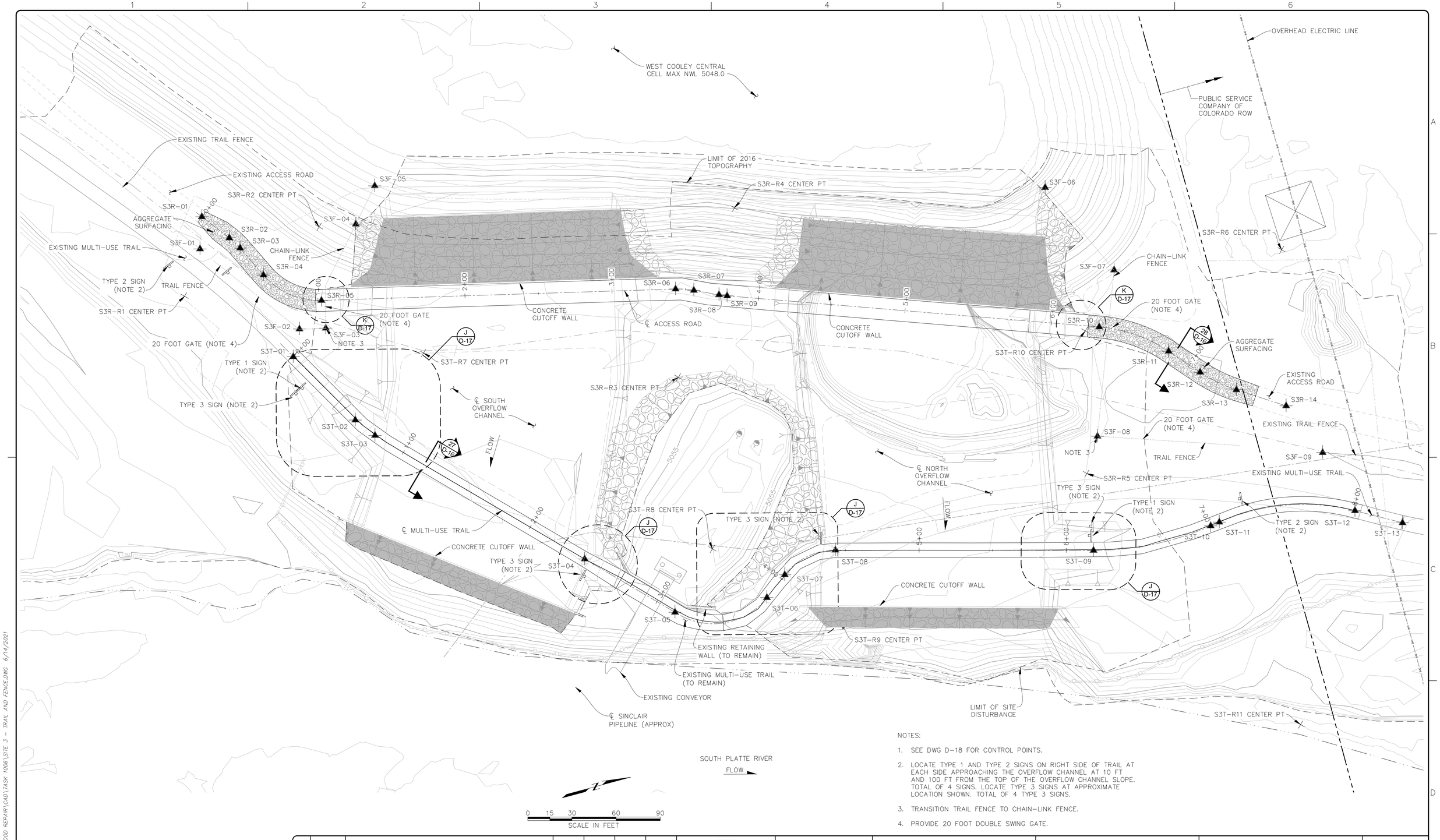
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - SOUTH OVERFLOW CHANNEL DETAILS

DWG. NO. D-14

SHEET NO. 58 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - PLAN OF MODIFICATIONS.DWG 6/14/2021



NOTES:

1. SEE DWG D-18 FOR CONTROL POINTS.
2. LOCATE TYPE 1 AND TYPE 2 SIGNS ON RIGHT SIDE OF TRAIL AT EACH SIDE APPROACHING THE OVERFLOW CHANNEL AT 10 FT AND 100 FT FROM THE TOP OF THE OVERFLOW CHANNEL SLOPE. TOTAL OF 4 SIGNS. LOCATE TYPE 3 SIGNS AT APPROXIMATE LOCATION SHOWN. TOTAL OF 4 TYPE 3 SIGNS.
3. TRANSITION TRAIL FENCE TO CHAIN-LINK FENCE.
4. PROVIDE 20 FOOT DOUBLE SWING GATE.

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COLORADO LICENSED ROBERT J. HILLMAN 25734 on 6/14/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

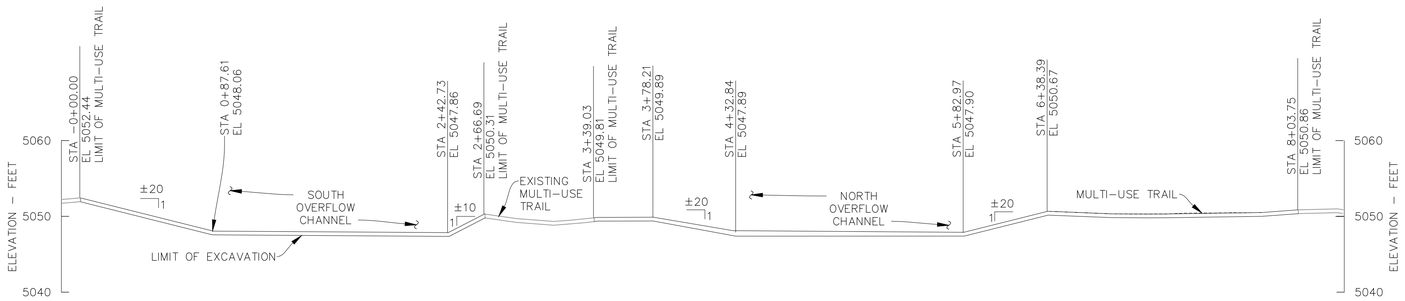
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - PLAN OF MULTI-USE TRAIL, ACCESS ROAD, AND FENCES

DWG. NO. D-15

SHEET NO. 59 of 77

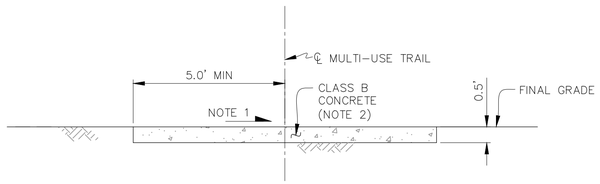
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - TRAIL AND FENCE.DWG 6/14/2021



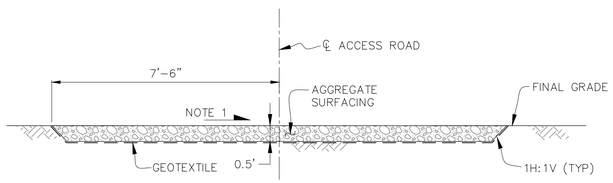
PROFILE
MULTI-USE TRAIL

0 25 50 100 150
HORIZONTAL SCALE IN FEET

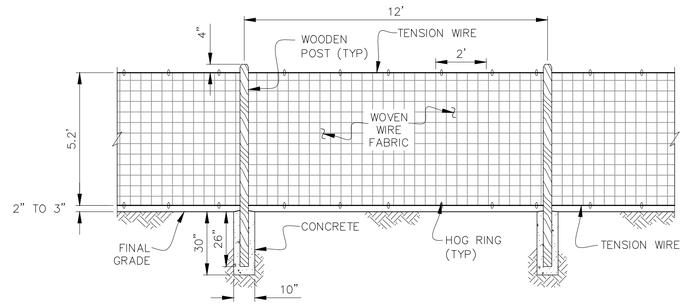
0 5 10 20 30
VERTICAL SCALE IN FEET



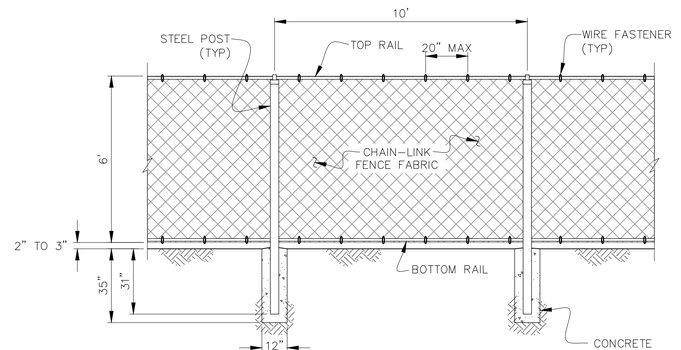
SECTION 27
NOT TO SCALE
D-15



SECTION 28
NOT TO SCALE
D-15



TYPICAL DETAIL
TRAIL FENCE
NOT TO SCALE



TYPICAL DETAIL
CHAIN-LINK FENCE
NOT TO SCALE

NOTES:

1. SLOPE AT GRADE OF OVERFLOW CHANNEL WITHIN OVERFLOW CHANNEL AND 2 PERCENT IN THE DIRECTION OF PREVAILING SLOPE AT LOCATIONS OUTSIDE OF OVERFLOW CHANNEL.
2. EXCAVATE AND PREPARE SUBGRADE FOR MULTI-USE TRAIL. CLASS B CONCRETE TO BE CONSTRUCTED BY OTHERS.

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–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUMM 25734 6/14/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - MULTI-USE TRAIL PROFILE, SECTION, AND DETAILS

DWG. NO. D-16

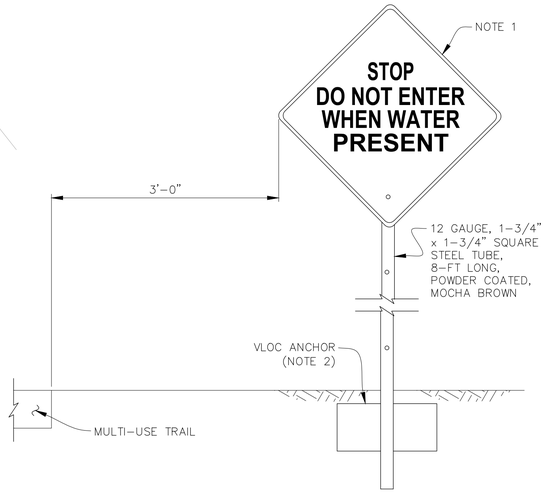
SHEET NO. 60 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - TRAIL AND FENCE.DWG 6/14/2021

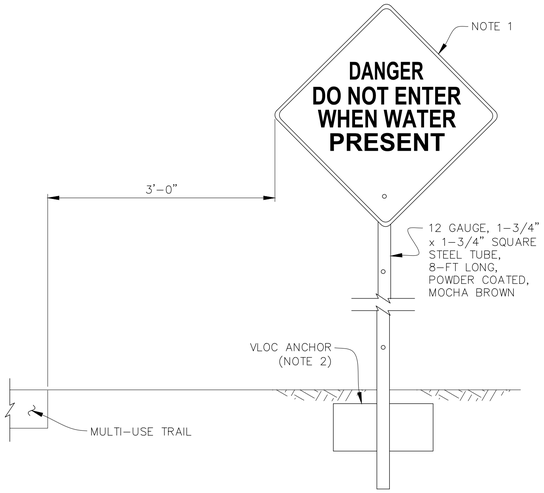
DETAIL J D-15

0 2.5 5 10 15

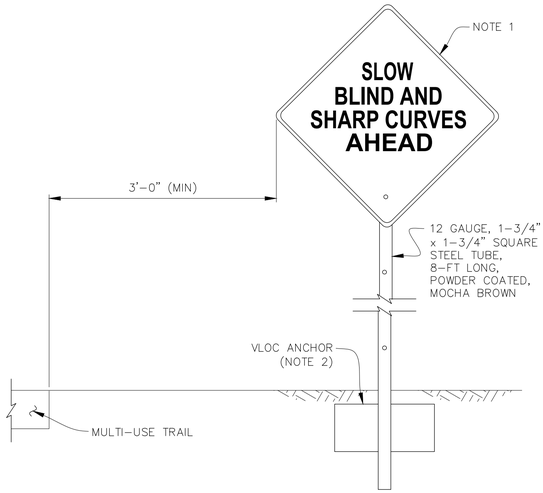
SCALE IN FEET



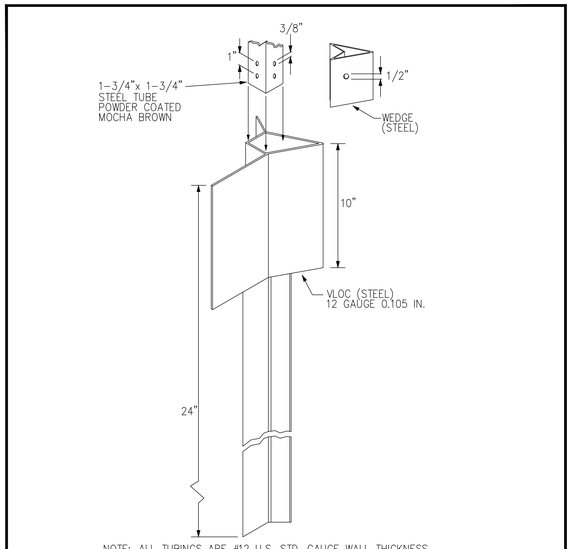
TYPICAL DETAIL
TYPE 1 SIGN
N.T.S.



TYPICAL DETAIL
TYPE 2 SIGN
N.T.S.



TYPICAL DETAIL
TYPE 3 SIGN
N.T.S.



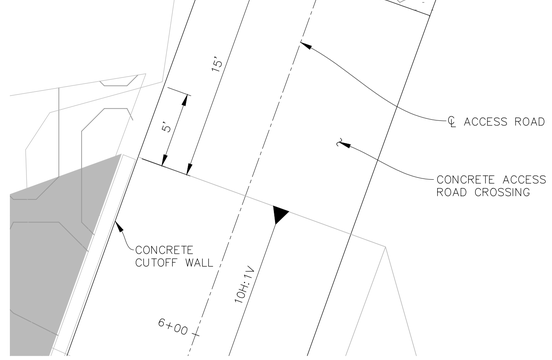
NOTE: ALL TUBINGS ARE #12 U.S. STD. GAUGE WALL THICKNESS.
SIGN POST INSTALLATION SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS AND THESE SPECIFICATIONS:
1. THE SIGN POST ANCHOR SHALL BE DRIVEN INTO THE GROUND TO 1" ABOVE THE GROUND. SIDEWALK SHALL BE POURED AROUND SIGN POST ANCHOR OR EXISTING SIDEWALK SHALL BE CORE DRILLED AND SEALED AROUND THE POST ANCHOR.
2. INSERT SIGN POST INTO ANCHOR ASSEMBLY 6 INCHES AND INSTALL WEDGE.
3. INSTALLED SIGN AND POST SHALL BE PLUMB AND FREE OF VERTICAL AND LATERAL MOVEMENT.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

SIGN POST ANCHOR DETAIL

ISSUED: FEBRUARY 2003
REVISED: APRIL 2010
DRAWING NO. 700-11



DETAIL K D-15

0 2.5 5 10 15

SCALE IN FEET

NOTE:

1. SIGNS SHALL BE IN ACCORDANCE WITH MUTCD, TYPE W4, AND SHALL BE YELLOW BACKGROUND WITH BLACK LETTERS.
2. VLOC SIGN POST ANCHOR DETAIL IN ACCORDANCE WITH CITY OF THORNTON STANDARDS AND SPECIFICATIONS, DRAWING NO. 700-11.

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COLORADO LICENSED ROBERT J. HILLMAN 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 3 - MULTI-USE TRAIL DETAILS

DWG. NO. D-17

SHEET NO. 61 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 - TRAIL AND FENCE.DWG 6/14/2021

DWG D-02 CONSTRUCTION CONTROL POINTS

CONTROL POINT	DESCRIPTION	NORTHING	EASTING
S3N–01	℄ OVERFLOW CHANNEL	746489.26	168077.85
S3N–02	℄ OVERFLOW CHANNEL	746504.84	168021.06
S3N–03	℄ OVERFLOW CHANNEL	746507.67	168008.06
S3N–04	℄ OVERFLOW CHANNEL	746522.53	167916.80
S3N–05	℄ OVERFLOW CHANNEL	746528.28	167894.59
S3N–06	℄ OVERFLOW CHANNEL	746535.51	167874.48
S3N–07	℄ OVERFLOW CHANNEL	746552.21	167828.01
S3N–08	CONCRETE CUTOFF WALL	746416.78	168058.54
S3N–09	CONCRETE CUTOFF WALL	746561.47	168098.12
S3N–10	CONCRETE CUTOFF WALL	746464.76	167849.57
S3N–11	CONCRETE CUTOFF WALL	746605.91	167900.32
S3N–12	CONCRETE TERMINATION WALL	746481.80	167802.17
S3N–13	CONCRETE TERMINATION WALL	746622.96	167852.92
S3S–01	℄ OVERFLOW CHANNEL	746188.34	167969.88
S3S–02	℄ OVERFLOW CHANNEL	746197.47	167957.71
S3S–03	℄ OVERFLOW CHANNEL	746253.99	167836.62
S3S–04	℄ OVERFLOW CHANNEL	746264.94	167789.74
S3S–05	℄ OVERFLOW CHANNEL	746275.56	167744.26
S3S–06	CONCRETE CUTOFF WALL	746128.05	167925.26
S3S–07	CONCRETE CUTOFF WALL	746248.03	168015.29
S3S–08	CONCRETE CUTOFF WALL	746191.80	167773.15
S3S–09	CONCRETE CUTOFF WALL	746337.86	167807.29
S3S–10	CONCRETE TERMINATION WALL	746202.65	167726.71
S3S–11	CONCRETE TERMINATION WALL	746348.72	167760.84

DWG D-05 EXCAVATION CONTROL POINTS

CONTROL POINT	NORTHING	EASTING
S3E–01	746471.30	167855.84
S3E–02	746452.55	167909.75
S3E–03	746481.52	167921.28
S3E–04	746525.64	167956.54
S3E–05	746586.99	167967.19
S3E–06	746606.03	167977.51
S3E–07	746625.00	167942.29
S3E–08	746563.61	167909.04
S3E–09	746549.65	167862.55
S3E–10	746510.00	167848.31

DWG D-02 SPILLWAYS CURVE DATA

CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S3N–R1	125.00	746384.30	167987.98
S3N–R2	125.00	746645.90	167936.88
S3S–R3	325.00	745937.51	167762.65

DWG D-15 ACCESS ROAD CONTROL POINTS

CONTROL POINT	NORTHING	EASTING
S3R–01	746078.30	167693.79
S3R–02	746092.64	167712.50
S3R–03	746097.94	167721.09
S3R–04	746108.52	167742.90
S3R–05	746142.13	167769.76
S3R–06	746376.64	167824.57
S3R–07	746388.41	167828.65
S3R–08	746404.14	167836.01
S3R–09	746409.26	167838.12
S3R–10	746648.09	167923.99
S3R–11	746689.40	167952.12
S3R–12	746706.36	167971.44
S3R–13	746727.11	167989.37
S3R–14	746756.94	168008.71

DWG D-15 ACCESS ROAD CURVE DATA

CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S3R–R1	50.00	746052.96	167742.92
S3R–R2	50.00	746153.51	167721.07
S3R–R3	60.00	746362.98	167882.99
S3R–R4	60.00	746429.56	167781.66
S3R–R5	100.00	746614.26	168018.09
S3R–R6	100.00	746781.51	167905.46

DWG D-15 MULTI-USE TRAIL CONTROL POINTS

CONTROL POINT	NORTHING	EASTING
S3T–01	746113.70	167801.77
S3T–02	746143.30	167854.23
S3T–03	746153.54	167867.83
S3T–04	746269.45	167985.83
S3T–05	746319.41	168036.68
S3T–06	746382.31	168043.23
S3T–07	746398.04	168031.38
S3T–08	746435.61	168024.11
S3T–09	746605.06	168069.72
S3T–10	746686.33	168074.24
S3T–11	746692.62	168073.28
S3T–12	746783.72	168089.62
S3T–13	746812.80	168105.92

DWG D-15 MULTI-USE TRAIL CURVE DATA

CURVE NUMBER	RADIUS (FEET)	NORTHING	EASTING
S3T–R7	65.00	746199.91	167822.28
S3T–R8	49.27	746355.08	168001.64
S3T–R9	50.00	746425.65	168072.74
S3T–R10	150.00	746638.31	167924.19
S3T–R11	150.00	746710.40	168220.48

DWG D-15 FENCE CONTROL POINT

CONTROL POINT	NORTHING	EASTING
S3F–01	746071.45	167714.58
S3F–02	746122.67	167784.65
S3F–03	746140.08	167788.72
S3F–04	746178.14	167725.69
S3F–05	746197.26	167703.92
S3F–06	746637.13	167822.96
S3F–07	746667.90	167889.26
S3F–08	746627.77	167995.43
S3F–09	746772.71	168045.78

NOTES:

1. CONTROL POINTS FOR CONCRETE TERMINATION WALL AND CONCRETE CUTOFF WALL CORRESPOND TO THE CENTER OF THE PLAN WALL THICKNESS.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED — ROBERT J. HIJAR — 25734 — 05/13/21 — PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

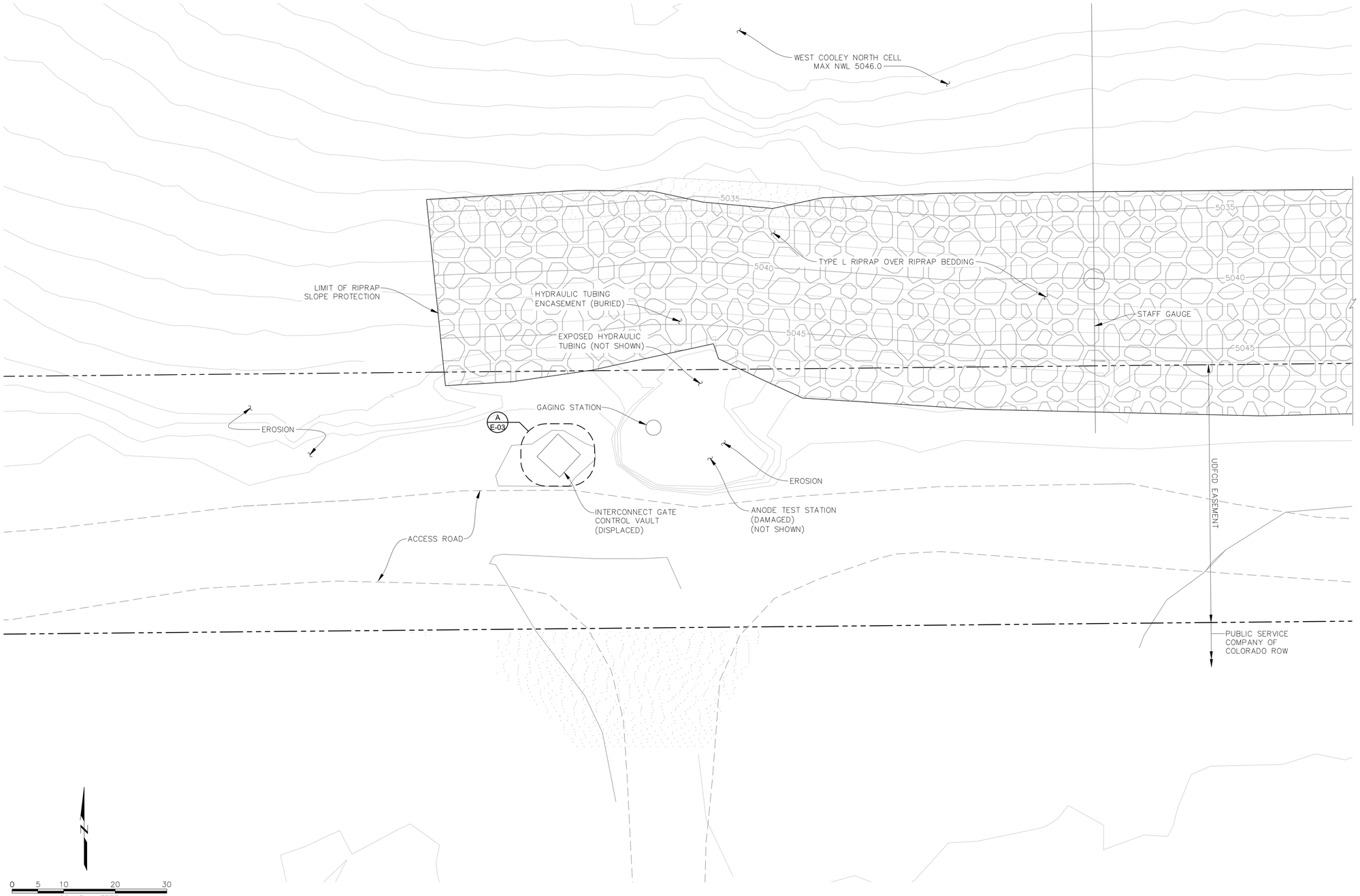
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 3 - CONTROL POINTS

DWG. NO. D-18

SHEET NO. 62 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 3 – TRAIL AND FENCE.DWG 6/14/2021



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COLORADO LICENSED
ROBERT J. HUDSPETH
25734
6/14/21
PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

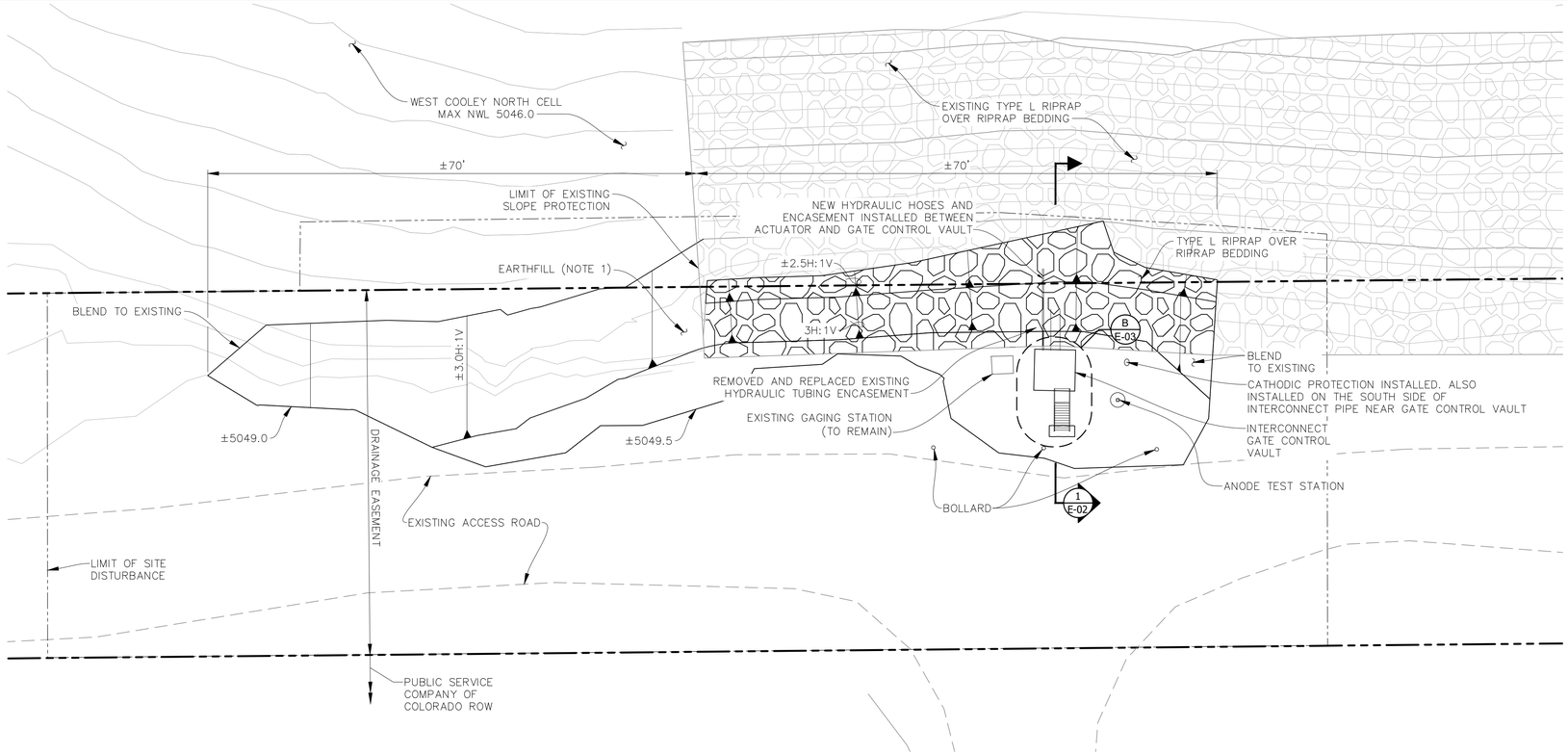
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 4 - PLAN OF EXISTING CONDITIONS

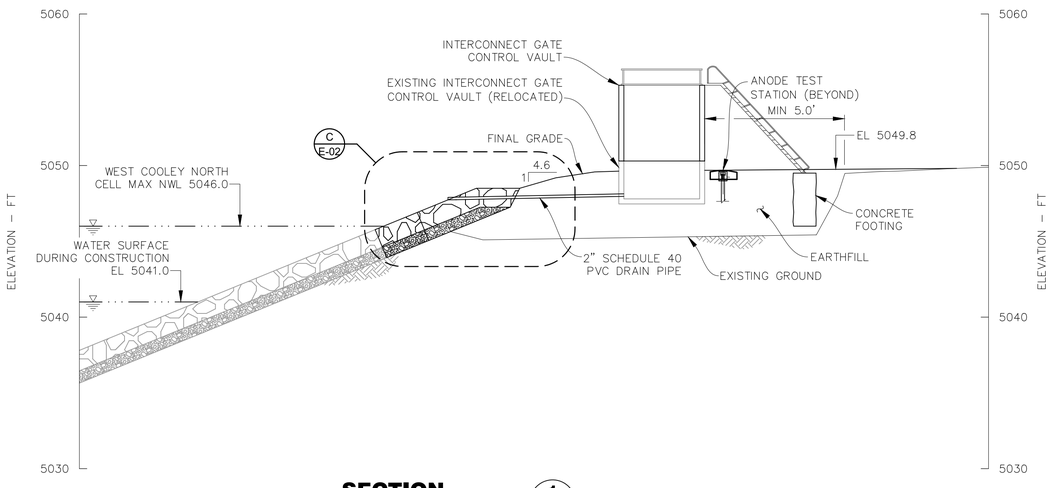
DWG. NO. E-01

SHEET NO. 63 of 77

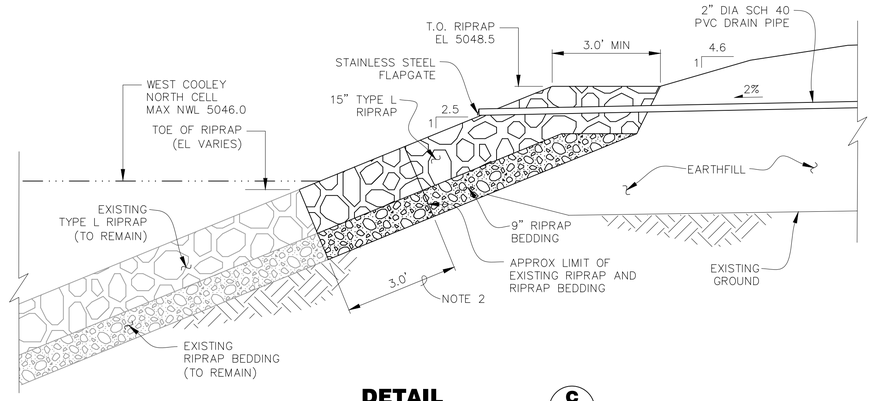
P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 4 - PLAN OF EXISTING CONDITIONS.DWG 6/14/2021



PLAN 0 5 10 20 30 SCALE IN FEET



SECTION 1 E-02 0 2.5 5 10 15 SCALE IN FEET



DETAIL C E-02 0 1 2 4 6 SCALE IN FEET

NOTES:

1. PLACE EARTHFILL TO MATCH ADJACENT SLOPE.
2. REMOVE TOP 3 FEET OF EXISTING RIPRAP AND RIPRAP BEDDING.

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RJH CONSULTANTS, INC.

City of Thornton

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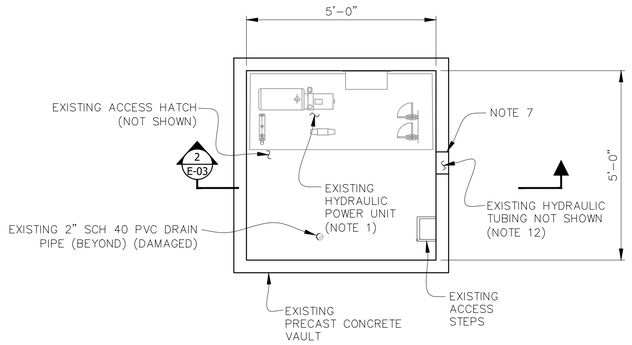
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 4 - MODIFICATIONS PLAN AND SECTIONS

DWG. NO. E-02

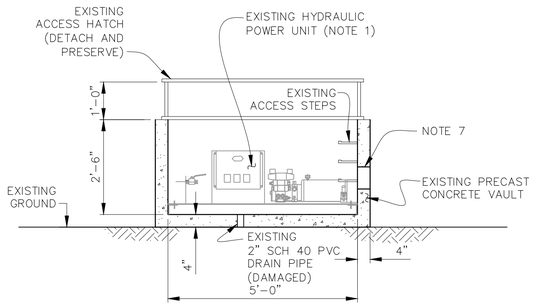
SHEET NO. 64 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 4 – PLAN OF MODIFICATIONS.DWG 6/14/2021



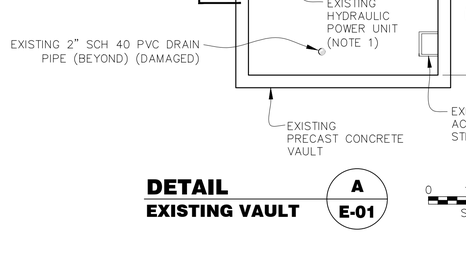
DETAIL A
EXISTING VAULT E-01

0 1 2 4
SCALE IN FEET



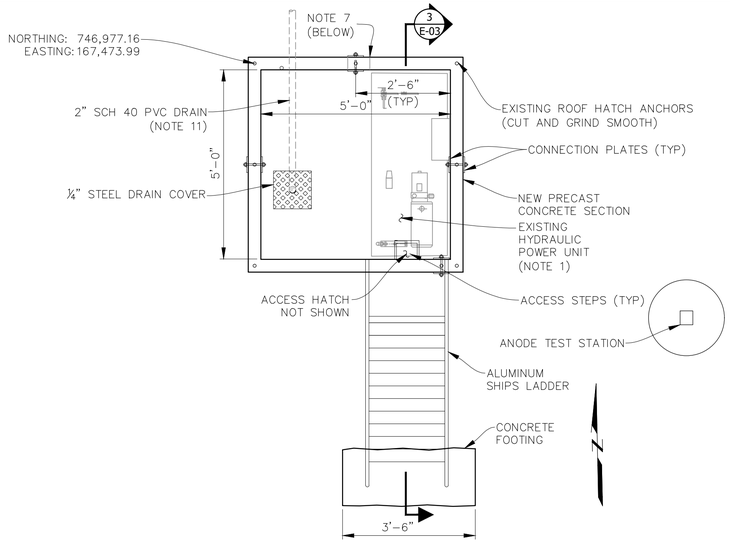
SECTION 2
EXISTING VAULT E-03

0 1 2 4
SCALE IN FEET



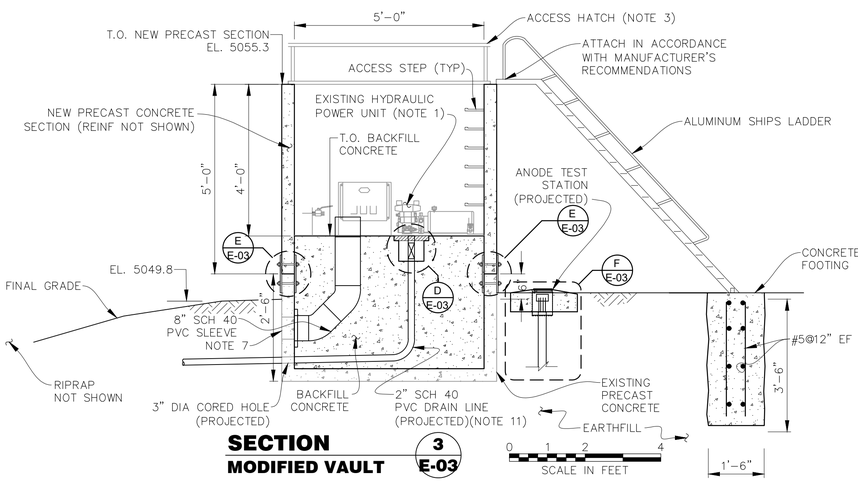
TYPICAL SECTION

0 .5 1 2 3
SCALE IN FEET



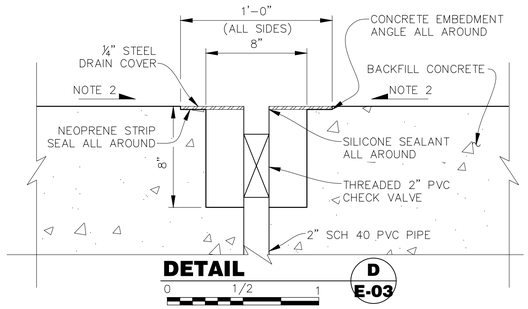
DETAIL B
MODIFIED VAULT E-02

0 1 2 4
SCALE IN FEET



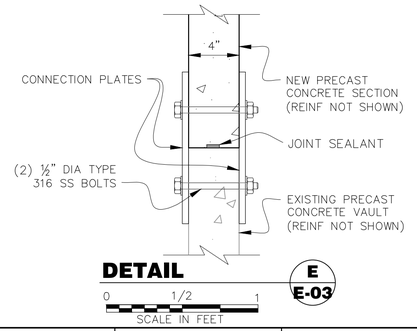
SECTION 3
MODIFIED VAULT E-03

0 1 2 4
SCALE IN FEET



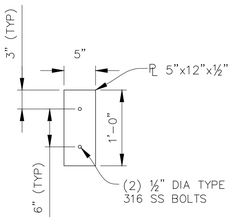
DETAIL D
E-03

0 1/2 1
SCALE IN FEET



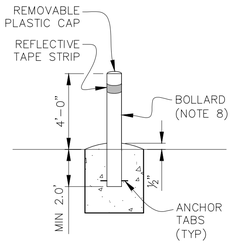
DETAIL E
E-03

0 1/2 1
SCALE IN FEET

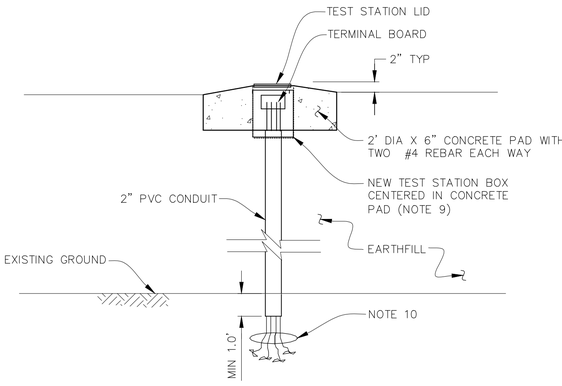


TYP DETAIL
CONNECTION PLATE

0 1 2
SCALE IN FEET



TYP DETAIL
BOLLARD
NOT TO SCALE



DETAIL F
ANODE TEST STATION E-03
NOT TO SCALE

NOTES:

1. PRESERVE AND REINSTALL EXISTING HYDRAULIC POWER UNIT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. SLOPE BACKFILL CONCRETE AT 1–PERCENT SLOPE TOWARDS DRAIN PIPE.
3. REINSTALL EXISTING ACCESS HATCH.
4. INSTALL PVC PIPE AROUND EXISTING HYDRAULIC TUBING. DO NOT DETACH HYDRAULIC TUBING. CUT PVC PIPE LONGITUDINALLY TO ACCOMMODATE ENCASEMENT OF HYDRAULIC TUBING. INSTALL AND TIGHTEN STAINLESS STEEL BAND CLAMPS AROUND PVC CONDUITS PRIOR TO ENCASEMENT AT MINIMUM 10 FOOT SPACING.
5. NOT USED.
6. EXTEND CONCRETE ENCASEMENT TO EXISTING GATE CONTROL VAULT.
7. EXISTING 6 INCH TO 7 INCH DIA BLOCKOUT FOR HYDRAULIC LINES. ANNULAR SPACE FILLED WITH GROUT.
8. 5½ INCH DIAMETER CONCRETE FILLED BEACON TRAFFIC BOLLARD, TYPE BBOLPP–48–5.5. SET BOLLARD IN CONCRETE PER MANUFACTURERS SPECIFICATIONS. MINIMUM DEPTH 3.0 FEET. POWDER COATED SAFETY YELLOW FINISH.
9. A MINIMUM OF 2 FEET OF SLACKWIRE SHALL BE PROVIDED FOR ALL WIRES INSIDE THE TEST STATION BOX. THE 2" PVC CONDUIT SHALL EXTEND APPROXIMATELY 3 INCHES INTO THE BOTTOM OF THE TEST STATION BOX.
10. LOCATE EXISTING WIRES. CUT WIRES BACK TO REMOVE FRAYED ENDS. SPLICE NEW WIRES ON TO EXISTING WIRES WITH WATERPROOF SPLICE. LOCATE THE SPLICES WITHIN THE PVC CONDUIT.
11. SLOPE AT 2 PERCENT TO DAYLIGHT IN RESERVOIR WITH 2 INCH STAINLESS STEEL FLAP GATE.
12. FIELD VERIFY LOCATION OF EXISTING HYDRAULIC TUBING.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUTAR 25734 PROFESSIONAL ENGINEER 06/13/21

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

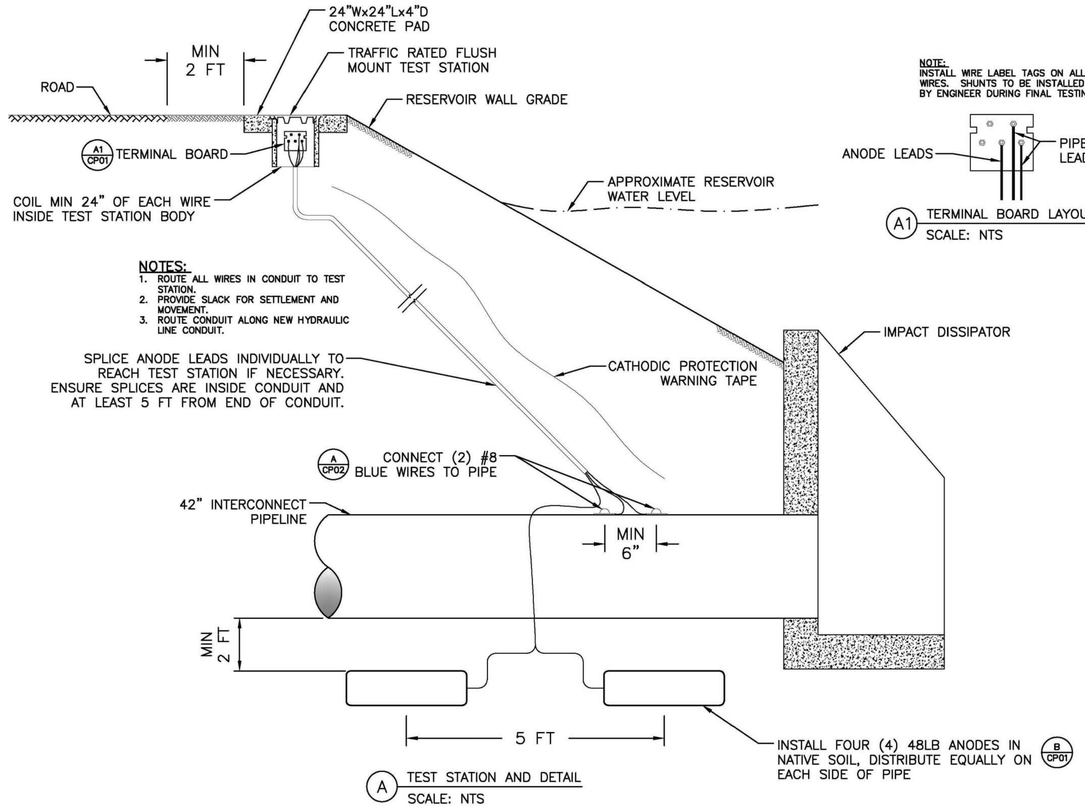
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 4 - INTERCONNECT GATE CONTROL VAULT MODIFICATIONS

DWG. NO. E-03

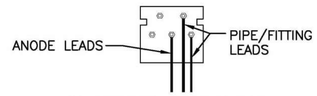
SHEET NO. 65 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE 4 – PLAN OF INTERCONNECT MODS.DWG 6/14/2021



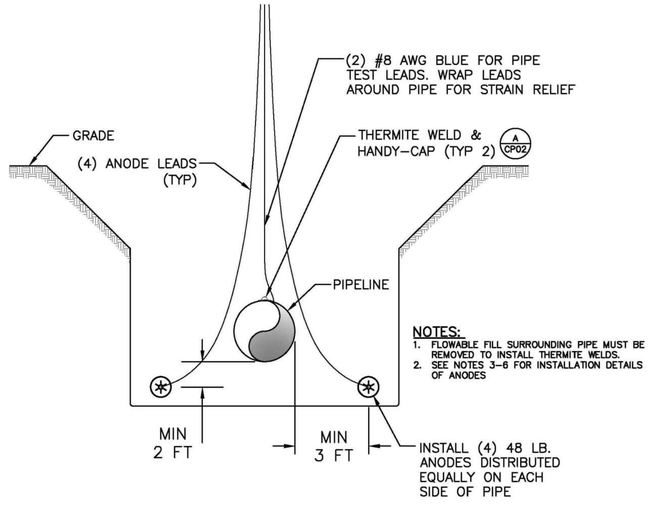
A TEST STATION AND DETAIL
SCALE: NTS

NOTE:
INSTALL WIRE LABEL TAGS ON ALL WIRES. SHUNTS TO BE INSTALLED BY ENGINEER DURING FINAL TESTING



A1 TERMINAL BOARD LAYOUT
SCALE: NTS

NOTES:
1. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE PLANS FOR THIS PROJECT AND ACTUAL FIELD CONDITIONS WHICH MAY INTERFERE WITH THIS PROJECT.
2. NO BELOW GRADE SPLICING OF WIRES IS ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. CONTRACTOR SHALL ENSURE ALL WIRES ARE OF SUFFICIENT LENGTH FOR EACH INTENDED APPLICATION. ANODE WIRE SPLICES SHOWN ON DRAWINGS MUST BE LOCATED INSIDE CONDUIT AT LEAST 5 FEET FROM END OF CONDUIT.
3. REMOVE ANODES FROM PLASTIC OR OTHER SHIPPING BAG AND POSITION ACCORDING TO DETAIL DRAWINGS. DO NOT REMOVE CLOTH SACK.
4. INSTALL ANODES A MINIMUM OF 3 FEET FROM EDGE OF PIPE OR ANY OTHER METALLIC OBJECT AND PLACE BELOW THE INVERT OF THE PIPE.
5. BACKFILL WITH NATIVE SOIL A MINIMUM OF 12 INCHES AROUND ANY ANODES THEN FLOOD EACH WITH A MINIMUM OF 5 GALLONS OF FRESH WATER. AFTER WATER ABSORPTION, CONTINUE BACKFILLING AS PER SPECIFICATIONS.
6. ROUTE ALL TEST LEADS AND ANODE WIRES IN APPROPRIATELY SIZED CONDUIT BETWEEN THE PIPE AND THE TEST STATION BASE WHERE APPLICABLE.
7. IF POSSIBLE, INSTALL TEST STATIONS OVER CENTERLINE OF PIPE. PLACE TEST STATIONS IN PROTECTED LOCATIONS (NEXT TO FENCES, APPURTENANCES, OUT OF ROADWAYS, ETC.) OR OTHER EASILY ACCESSIBLE AREAS.
8. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ELECTRICAL ISOLATION OF PIPELINE FROM OTHER PIPELINES, CONCRETE REBAR, ELECTRICAL GROUNDING, CASINGS, PIPE SUPPORTS, OR OTHER METALLIC STRUCTURES.
9. DURING BACKFILL, INSTALL DETECTABLE CATHODIC PROTECTION WARNING TAPE 12–18 INCHES ABOVE ANY CATHODIC PROTECTION WIRES OR DEVICES.
10. TYPICAL WIRE INSULATION COLORS:
    BLUE = PROTECTED PROJECT STRUCTURE BLACK = ANODE
11. SEE PROJECT SPECIFICATIONS FOR FURTHER INFORMATION.



B ANODE PLACEMENT DETAIL
SCALE: NTS

WEST COOLEY 2015 FLOOD REPAIRS PROJECT - SITE 4 TEST STATION SCHEDULE

STATION	TEST STATION NO.	DETAIL DRAWING	DESCRIPTION	NOTES
0+05	S4-1	A / CP01	DIRECT BOND (4) ANODES	PLACE TEST STATION NEAR EXISTING/OLD TEST STATION
3+89	S4-2	A / CP01	DIRECT BOND (4) ANODES	PLACE TEST STATION NEAR EXISTING/OLD TEST STATION
BACKFILL ANODES IN NATIVE SOIL. DO NOT INSTALL IN PEAGRAVEL OR SIMILAR PIPE BEDDING MATERIAL.				

NOTES:
1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	1/10/20	ISSUED FOR 60% REVIEW

City of Thornton

CATHODIC PROTECTION
TEST STATION DETAILS
WEST COOLEY 2015 FLOOD REPAIRS
INTERCONNECT PIPING SITE 4

TITLE / LOCATION

SUBMITTED BY: QUALCORR Engineering
PROJECT NO.: 19-???
DESIGNED BY: MMV
DRAWN BY: CAS
CHECKED BY: WHJ
DATE: 12/02/19

SHEET CP01

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COLORADO LICENSED ROBERT J. HUDZIAK 25734 6/14/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

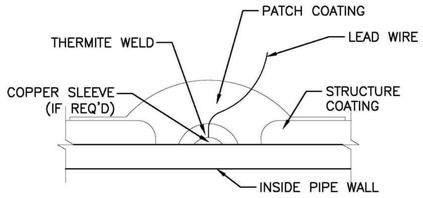
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

SITE 4 - CATHODIC DETAILS (1 OF 2)

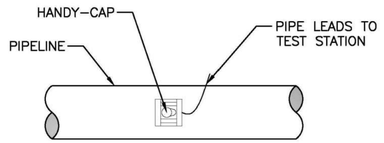
DWG. NO. E-04

SHEET NO. 66 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021

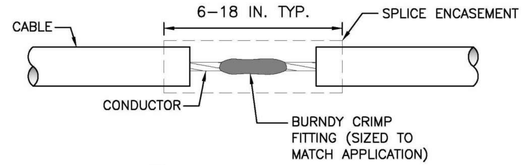


A THERMITE WELD DETAIL
SCALE: NTS



B HANDY–CAP APPLICATION
SCALE: NTS

NOTE:
ALL SPLICES MUST BE APPROVED BY ENGINEER PRIOR TO USE. PROVIDE WIRING OF SUFFICIENT LENGTH SO THAT ADDITIONAL SPLICES ARE NOT REQUIRED.



C WIRE SPLICING PROCEDURE
SCALE: NTS

THERMITE WELDING INSTRUCTIONS:

1. REMOVE APPROXIMATELY 4" DIAMETER CIRCLE OF PIPELINE COATING AT STRUCTURE CONNECTION LOCATION.
2. CLEAN AREA APPROXIMATELY 2" DIAMETER TO BRIGHT METAL.
3. REMOVE 2" OF INSULATION FROM END OF WIRE.
4. WELD CONDUCTOR TO PIPE. USE APPROPRIATE GRAPHITE MOLD AND CARTRIDGE CHARGE SIZE. COPPER SLEEVES ARE REQUIRED FOR #8 AWG OR SMALLER WIRES.
5. TEST THE THERMITE WELD CONNECTION BY STRIKING THE COMMON SEVERAL BLOWS ON THE SIDE USING A ONE POUND HAMMER. TOP OF WELD MAY BE HAMMERED FLAT IF REQUIRED.
6. APPLY HANDY–CAP. SEE DETAIL B.

HANDY–CAP APPLICATION PROCEDURES:

1. CLEAN ALL MUD, DIRT, GREASE, OIL, AND OTHER CONTAINMENTS FROM THE METAL SURFACE AND ANY PART OF THE MILL APPLIED COATING WHICH IS TO BE COVERED.

2. APPLY A COAT OF ROYSTON 747 PRIMER (if required) AND ALLOW TO DRY TO A NON–GLOSSY APPEARANCE, WHICH WILL TAKE APPROXIMATELY 5 MINUTES DEPENDING ON HUMIDITY AND TEMPERATURE.

3. REMOVE THE RELEASE PAPER FROM THE BOTTOM OF THE ROYSTON HANDY CAP. BEND THE PLASTIC SHEET INWARD AT THE SERRATIONS WHEN APPLYING TO A SMALL DIAMETER PIPE. POSITION AND PLACE THE HANDY CAP ON THE WELDED AREA WITH THE TUNNEL OVER THE LEAD WIRE.

4. PUSH THE DOME OF THE CAP FIRMLY IN THE WELD AREA. NOW LIFT THE WIRE AWAY FROM THE PIPE AND SQUEEZE THE BLACK RUBBER COMPOUND COMPLETELY AROUND AND UNDERNEATH THE WIRE. THEN PUSH THE LEAD WIRE BACK DOWN ON THE PIPE AND PRESS THE ELASSTOMERIC COMPOUND INTO FIRM CONTACT WITH THE PIPE OVER THE ENTIRE AREA.

NO FURTHER PROTECTION IS NECESSARY IF THE ROYSTON HANDY CAP COVERS THE ENTIRE EXPOSED METAL AREA. UNCOVERED AREAS SHOULD BE PROTECTED BY APPLYING TAPE OR MASTIC SUCH AS TRENTON PIPELINE TAPE CP OR ROYSTON ROSKOTE MASTIC.

WHEN COATING OR WRAPPING THE ROYSTON HANDY CAP, REMOVE THE NARROW STRIPS OF PLASTIC RELEASE FILM ON THE TOP OF THE CAP. THIS WILL ASSURE MAXIMUM PROTECTION BY EFFECTING A POSITIVE WATERPROOF SEAL.

TYPICAL PROCEDURE TO SPLICE ANODE OR CABLE:

1. CUT BACK INSULATION FROM END OF ANODES OR CABLES APPROX. 1 INCH. BE SURE ALL CABLE ENDS AND CONNECTIONS ARE CLEAN OF DIRT AND FOREIGN MATTER AND THAT ALL CONNECTIONS ARE BARE METAL.
2. PUT CABLES IN APPROPRIATE SIZED CRIMP FITTING AND CRIMP.
3. APPLY ELECTRICAL PUTTY TO FILL IN ANY VOIDS AND IRREGULAR SHAPES.
4. APPLY ELECTRICAL RUBBER TAPE AROUND THE PUTTY AND CABLE WHERE INSULATION WAS REMOVED.
5. APPLY ELECTRICAL TAPE ALONG THE ENTIRE SPLICE AND A MINIMUM OF 2 INCHES ON EACH ANODE OR CABLE END.
6. APPLY ELECTRICAL COATING ALONG THE ENTIRE SPLICE.
7. EPOXY SPLICE KIT MAY BE USED IN LIEU OF RUBBER AND PLASTIC TAPE.

NOTES:

1. INFORMATION FROM SUBMITTAL.

NO.	DATE	REVISION DESCRIPTION
1	1/10/20	ISSUED FOR 60% REVIEW

City of Thornton

TITLE / LOCATION:
CATHODIC PROTECTION
STANDARD DETAILS
WEST COOLEY 2015 FLOOD REPAIRS

SUBMITTED BY:	qualCORR ENGINEERING
PROJECT NO.:	19–???
DESIGNED BY:	MAV
DRAWN BY:	CAS
CHECKED BY:	VMJ
DATE:	12/02/19

SHEET CP02

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUMMEL 25734 PROFESSIONAL ENGINEER 04/13/21

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

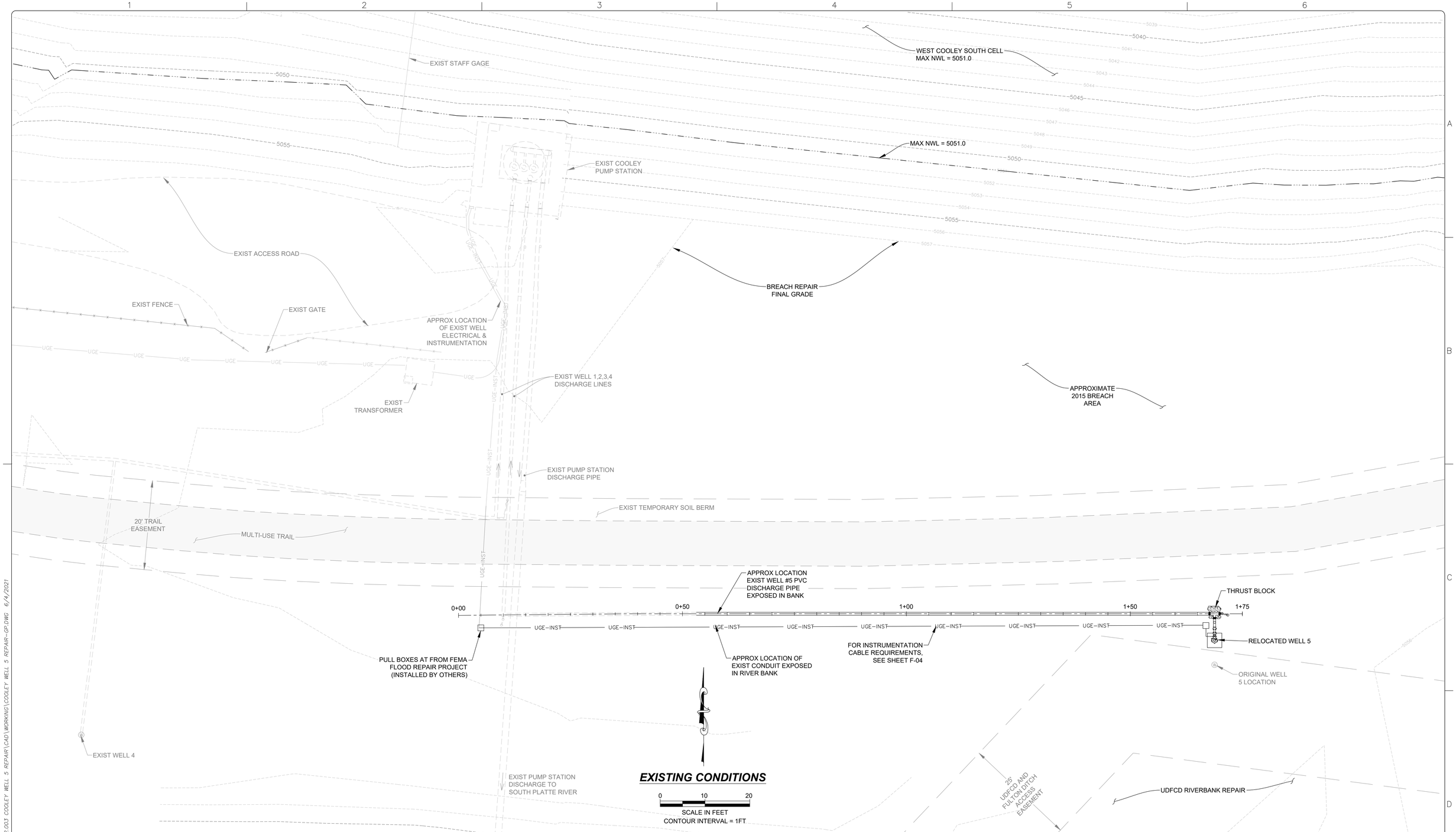
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

SITE 4 - CATHODIC DETAILS (2 OF 2)

DWG. NO. E-05

SHEET NO. 67 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\CATHODIC DETAILS.DWG 6/14/2021



EXISTING CONDITIONS

0 10 20

SCALE IN FEET
CONTOUR INTERVAL = 1FT

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
1	5/2021	RECORD DRAWINGS	VDW	BC/ITR	GGC	VDW

COLORADO LICENSED
IVOR G. DENCKER
45331
PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.
DEERE & AULT CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

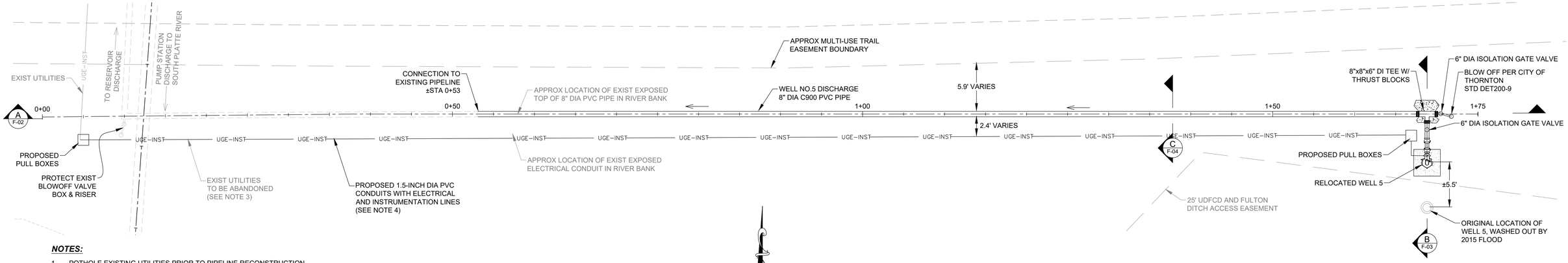
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

COOLEY WELL 5 REPLACEMENT SITE PLAN

DWG. NO. F-01

SHEET NO. 68 of 77

G:\362 RJH CONSULTANTS\362.003 COOLEY WELL 5 REPAIR\CAD\WORKING\COOLEY WELL 5 REPAIR-GP.DWG 6/4/2021

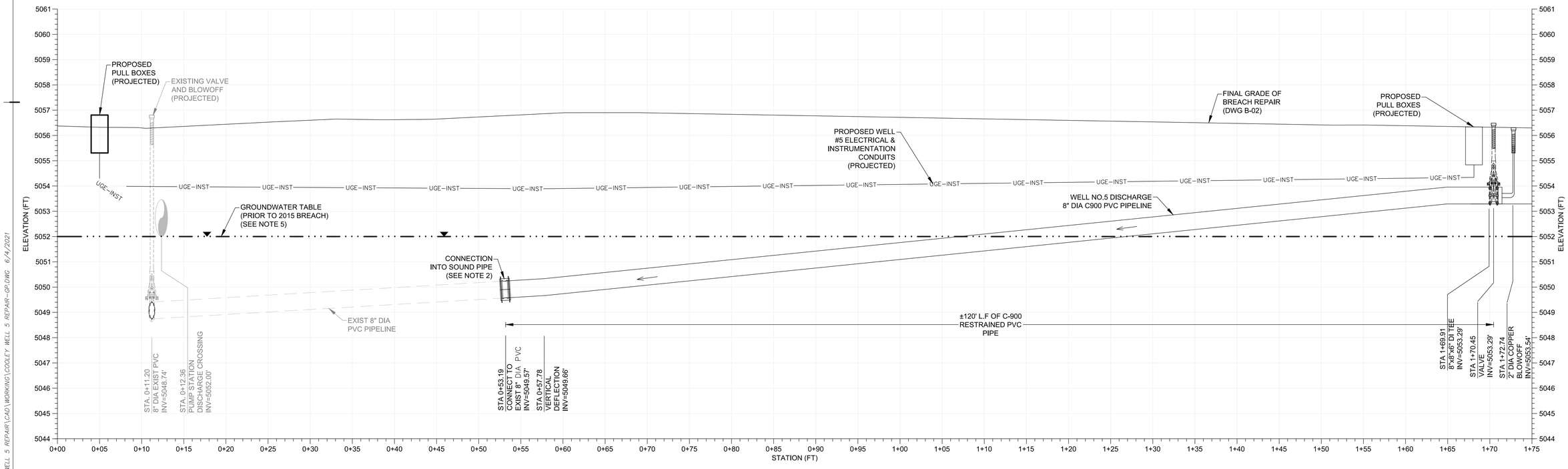


NOTES:

1. POTHOLE EXISTING UTILITIES PRIOR TO PIPELINE RECONSTRUCTION.
2. EXPOSE AND INSPECT CONDITION OF EXISTING PVC PIPELINE, REMOVE ALL SEDIMENT AND/OR DEBRIS FROM PIPE. ENSURE PIPELINE IS OPEN TO PUMP STATION, TEST BY FLUSHING CLEAN WATER FROM PUMP STATION OUT INTO BREACH PRIOR TO CONSTRUCTING BREACH REPAIR. CAP AND MARK END OF SOUND PIPE FOR SUBSEQUENT CONNECTION FOLLOWING BREACH REPAIR. ESTABLISH CONNECTION BY STABBING EXISTING PIPE INTO NEW PIPE AND USING SPECIFIED RESTRAINT.
3. EXPOSE AND INSPECT EXISTING ELECTRIC AND INSTRUMENTATION LINES AND CONDUIT. DISPOSE OF OFFSITE, OR AS DIRECTED BY THE CITY OF THORNTON.
4. INSTALL 315 FEET OF NEW ELECTRIC CABLE AND 4-20MA INSTRUMENTATION CABLE BETWEEN WELL AND WESTERN PULL BOXES. COIL EXTRA CABLE INSIDE PULL BOXES.
5. DEWATER AS NEEDED TO INSTALL NEW PIPE AND TO CONNECT TO EXISTING PIPELINE. DISCHARGE WATER INTO WEST COOLEY LAKE.

PIPELINE RECONSTRUCTION PLAN

0 6 12
SCALE IN FEET
CONTOUR INTERVAL = 1FT



PIPELINE RECONSTRUCTION PROFILE A F-02

Vertical Scale (FT) 0 2' 4'
Horizontal Scale (FT) 0 6' 12'

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COLORADO LICENSED VICTOR G. DEHOYOS 45331 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.
DEERE & AULT CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

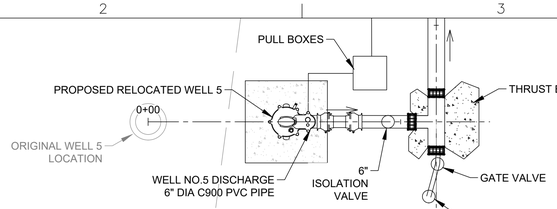
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

COOLEY WELL 5 DISCHARGE PIPELINE CONSTRUCTION PLAN AND PROFILE A

DWG. NO. F-02

SHEET NO. 69 of 77

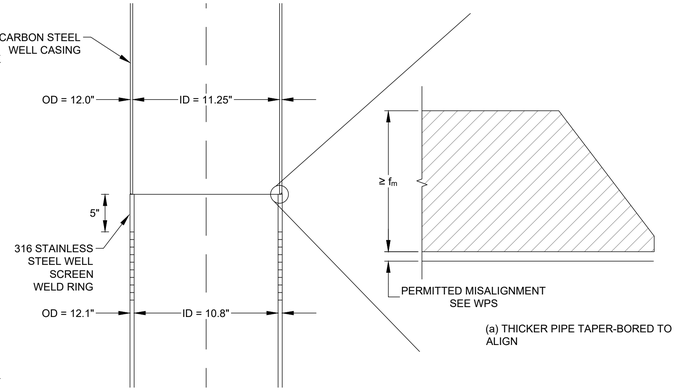
G:\0362 RJH CONSULTANTS\0362.003 COOLEY WELL 5 REPAIR\CAD\WORKING\COOLEY WELL 5 REPAIR-GP.DWG 6/4/2021



COOLEY WELL 5 REPLACEMENT PLAN VIEW

0 3 6

SCALE IN FEET
CONTOUR INTERVAL = 1FT

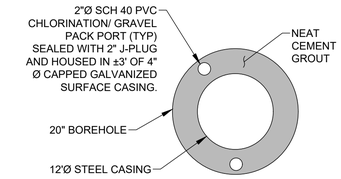


WELL CASING AND WELL SCREEN CONNECTION DETAIL

NTS

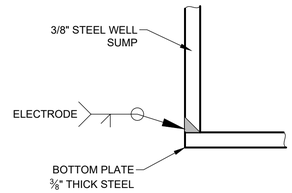
NOTES:

1. PROVIDE WELDER CERTIFICATIONS AND SUBMIT TO THE CITY OF THORNTON FOR REVIEW BY INTERMOUNTAIN TESTING COMPANY.



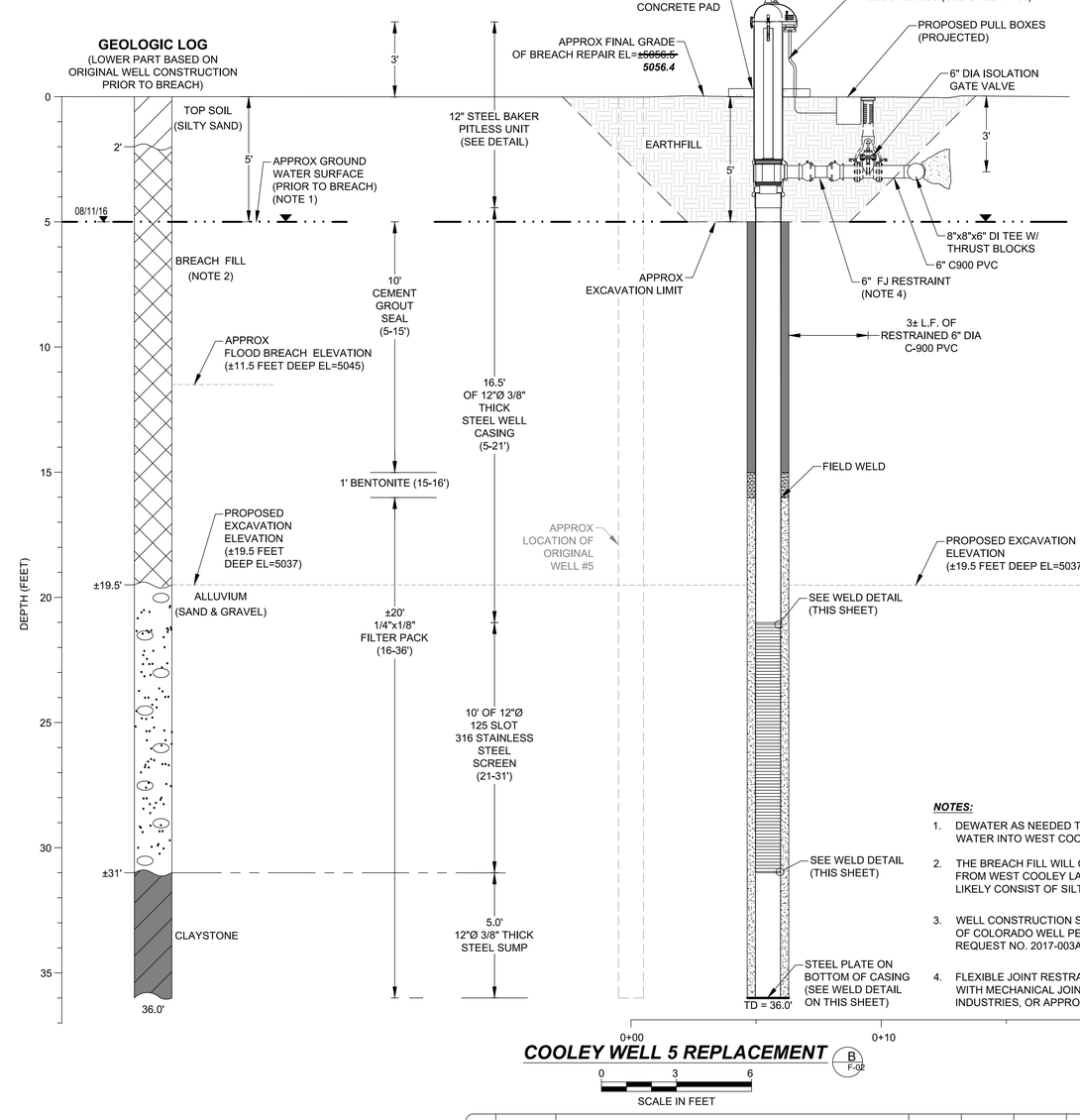
GRAVEL PORT DETAIL

NTS



BOTTOM PLATE WELDING DETAIL

NTS



COOLEY WELL 5 REPLACEMENT

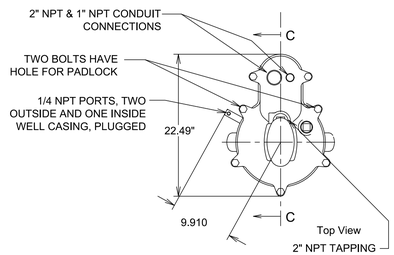
B F-02

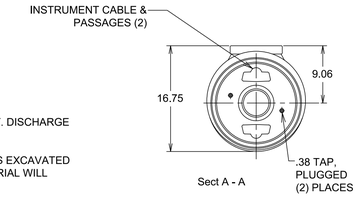
0 3 6

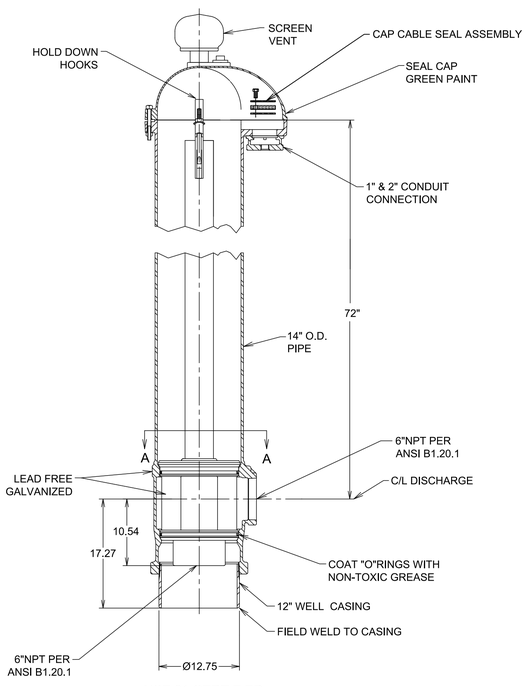
SCALE IN FEET

NOTES:

1. DEWATER AS NEEDED TO EXCAVATE AND INSTALL PITLESS UNIT. DISCHARGE WATER INTO WEST COOLEY LAKE.
2. THE BREACH FILL WILL CONSIST OF FLOOD SEDIMENT DEPOSITS EXCAVATED FROM WEST COOLEY LAKE DURING BREACH REPAIR. THE MATERIAL WILL LIKELY CONSIST OF SILTY SAND WITH GRAVEL.
3. WELL CONSTRUCTION SHALL MEET ALL CONDITIONS SET FORTH ON STATE OF COLORADO WELL PERMIT NO. 78778-FR AND IN CONSTRUCTION VARIANCE REQUEST NO. 2017-003A IN THE APPENDIX OF THE SPECIFICATIONS.
4. FLEXIBLE JOINT RESTRAINT SHALL BE A 6" NOMINAL, DOUBLE BALL FITTING WITH MECHANICAL JOINTS ON BOTH ENDS. MANUFACTURED BY ROMAC INDUSTRIES, OR APPROVED EQUAL.







NSF 61 CERTIFIED

Sect C - C

12" STEEL BAKER PITLESS UNIT DETAIL

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COLORADO LICENSED VICTOR G. DENOLFO 45331 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC. DEERE & AULT CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

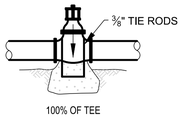
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

COOLEY WELL 5 REPLACEMENT PLAN, PROFILE B AND DETAILS

DWG. NO. F-03

SHEET NO. 70 of 77

G:\362 RJH CONSULTANTS\362.003 COOLEY WELL 5 REPAIR\CAD WORKING\COOLEY WELL 5 REPAIR-GP.DWG 6/4/2021



HORIZONTAL THRUST BLOCK DETAIL FOR OUTLET PIPING

N.T.S

CONCRETE THRUST BLOCK
MINIMUM BEARING SURFACE AREA
(IN SQUARE FEET)

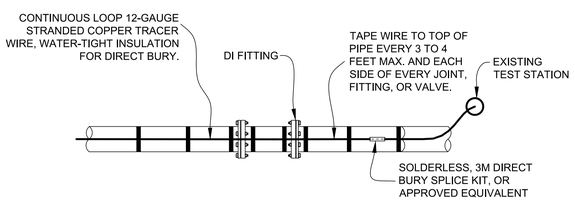
SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4"	1	1	2	4	3
6"	1	2	4	8	6
8"	2	4	7	14	10
10"	3	6	11	21	15
12"	4	8	16	29	21
16"	7	14	27	50	36

CONCRETE THRUST BLOCK VOLUME

SIZE OF PIPE	11 1/4°	22 1/2°	45°
	VOL (CF)	VOL (CF)	VOL (CF)
4"	4	8	15
6"	9	18	33
8"	16	31	58
10"	25	49	90
12"	36	70	129

NOTES:

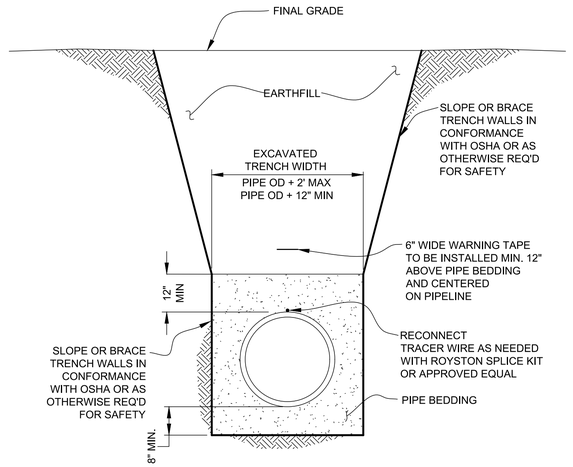
1) ALL CONCRETE TO BE 3,000 P.S.I. MIN.
2) DESIGN BASED ON A TEST PRESSURE OF 150 P.S.I. AND SAFETY FACTOR OF 1.5
3) BLOCKS TO BE CENTERED HORIZONTALLY ON THE BEND.
4) ASSUMED BEARING CAPACITY IS 1500 LB/SQ. FT.
5) INSTALL POLY BOND BREAKERS BETWEEN PIPE AND CONCRETE WITH NO CONCRETE COVERING BOLTS OR GLANDS.
6) MEGALUGS (OR OTHER APPROVED MECHANICAL JOINT RESTRAINT DEVICES) SHALL BE INSTALLED ON ALL FITTINGS.



TRACER WIRE DETAIL

0 3' 6'

SCALE: 1" = 3'



TYPICAL PIPE TRENCH DETAIL

C F-02

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COLORADO LICENSED VICTOR G. DEWOLFE 45331 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC. DEERE & AULT CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

COOLEY WELL 5
PIPELINE RECONSTRUCTION DETAILS

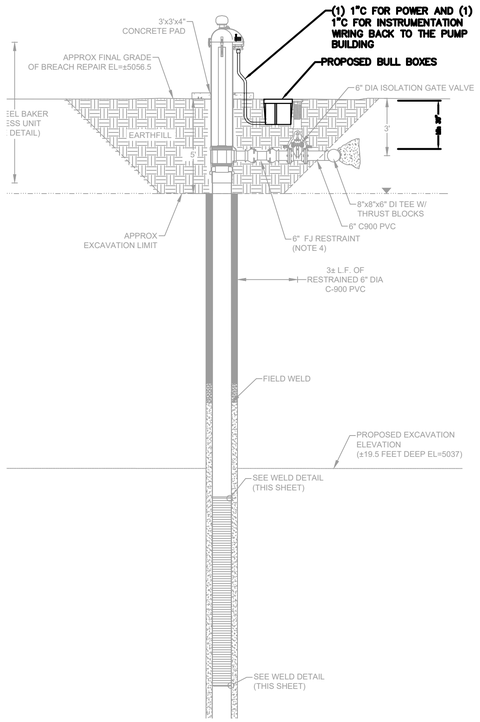
DWG. NO. F-04

SHEET NO. 71 of 77

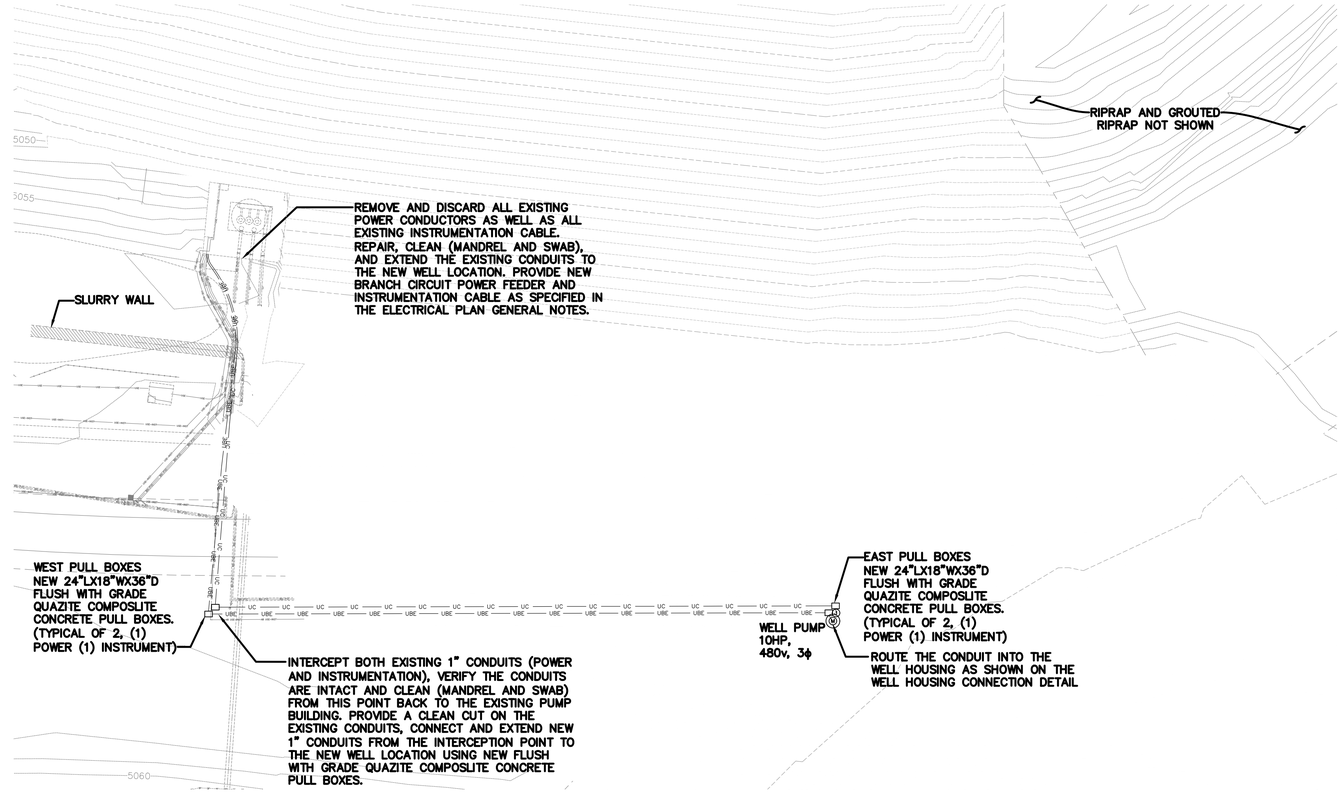
G:\0362 RJH CONSULTANTS\0362.003 COOLEY WELL 5 REPAIR\CAD\WORKING\COOLEY WELL 5 REPAIR-GP.DWG 6/4/2021

LEGEND

- FLAG NOTE
- J–BOX
- MOTOR
- CEILING RECEPTACLE
- FLOOR RECEPTACLE
- DUPLEX RECEPTACLE
- FOUR–PLEX RECEPTACLE
- SPECIAL NEMA RECEPTACLE
- HEAVY DUTY DISCONNECT SWITCH
- MOTOR STARTER
- HEAVY DUTY STARTER–DISCONNECT
- Sto THERMAL OVERLOAD SW
- BRANCH CIRCUIT PANEL
- BOLD LINEWEIGHT AND/OR "N" INDICATES NEW DEVICE OR EQUIPMENT
- BOLD LINEWEIGHT AND/OR "R" INDICATES DEVICE OR EQUIPMENT TO BE REPLACED
- LIGHT LINEWEIGHT AND/OR "E" INDICATES EXISTING DEVICE TO REMAIN
- DASHED LINETYPE AND/OR "D" INDICATES DEVICE TO BE REMOVED / DEMOLISHED
- OPE — OVERHEAD PRIMARY ELECTRIC
- OSE — OVERHEAD SECONDARY ELECTRIC
- UPE — UNDERGROUND PRIMARY ELECTRIC
- USE — UNDERGROUND SECONDARY ELECTRIC
- UBE — UNDERGROUND BRANCH ELECTRIC
- UC — UNDERGROUND COMMUNICATION

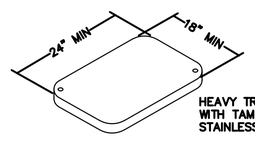


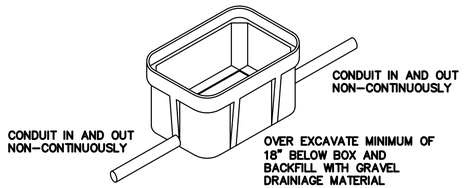
Pump Housing Connection Detail



Site Electrical Plan

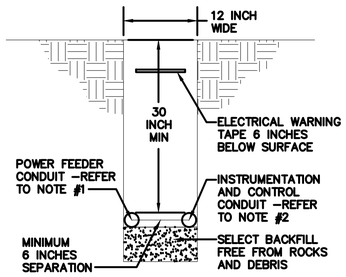
0 10 20 40 60
SCALE IN FEET





FLUSH WITH GRADE ENCLOSURES AND PULL BOXES SHALL BE QUAZITE® AS MANUFACTURED BY STRONGWELL OR APPROVED EQUAL. THE PULL/SPLICE BOX SHALL BE CONSTRUCTED OF POLYMER CONCRETE CONSISTING OF SAND AND AGGREGATE BOUND TOGETHER WITH A POLYMER RESIN. INTERNAL REINFORCEMENT MAY BE PROVIDED BY MEANS OF STEEL, FIBERGLASS, OR A COMBINATION OF THE TWO. BOXES AND COVERS SHALL BE CONCRETE GRAY, AND SUSTAIN A MINIMUM VERTICAL TEST LOAD OF 22,500LBS. OVER A 10" SQUARE. BOXES SHALL BE STACKABLE TO MEET REQUIRED DEPTH.

In–Grade Pull Box Detail



Electrical Trench Detail

ELECTRICAL PLAN GENERAL NOTES

NOTE #1: Provide (3#10+1#10G) in the 1-inch Power Feeder Conduit. The conductors shall be rated and listed for wet location, manufactured by Southwire or equivalent. The conductors shall be new and continuous from the Pump Station Motor Control Center to the to the East Pull Box (shown at Station 1+74 on the F-01 Pipeline Drawing) with a minimum of 50-feet of conductors coiled up in the Pull Box for extension to the Well #5 location when the Well and Pump are constructed.

NOTE #2: One (1) new Instrumentation Cable shall be furnished and installed in the 1-inch Instrumentation Conduit. The Cable shall be a #16AWG twisted-shielded pair cable rated and listed for wet location, manufactured by Belden or equivalent. The cable shall be new and continuous from the Pump Station PLC Panel to the to the East Pull Box (shown at Station 1+74 on the F-01 Pipeline Drawing) with a minimum of 50-feet of cable coiled up in the Pull Box for extension to the Well #5 location when the Well and Pump are constructed.

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
1	5/2021	RECORD DRAWINGS	AEI	AEI	DJA	DJA

COLORADO REGISTERED PROFESSIONAL ENGINEER 38398 06/11/2021

RJH CONSULTANTS, INC. DEERE & AULT CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

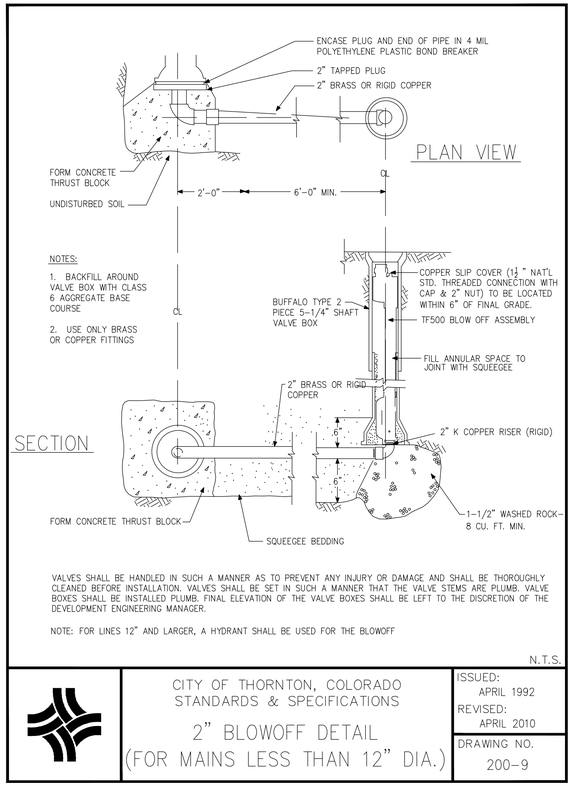
COOLEY WELL 5 REPLACEMENT
SITE ELECTRICAL PLAN

DWG. NO. F-05

SHEET NO. 72 of 77

Packerman Engineering, inc

Q:\0362 RJH CONSULTANTS\0362.003 COOLEY WELL 5 REPAIR\CAD\IMPORT\TCSC WELL 5 ELECTRICAL - STANDARD\TCSC WELL 5 ELECTRICAL.DWG 6/4/2021



VALVES SHALL BE HANDLED IN SUCH A MANNER AS TO PREVENT ANY INJURY OR DAMAGE AND SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. VALVES SHALL BE SET IN SUCH A MANNER THAT THE VALVE STEMS ARE PLUMB. VALVE BOXES SHALL BE INSTALLED PLUMB. FINAL ELEVATION OF THE VALVE BOXES SHALL BE LEFT TO THE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER.

NOTE: FOR LINES 12" AND LARGER, A HYDRANT SHALL BE USED FOR THE BLOWOFF

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

2" BLOWOFF DETAIL (FOR MAINS LESS THAN 12" DIA.)

ISSUED: APRIL 1992
REVISED: APRIL 2010

DRAWING NO. 200-9

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–	05/2021	RECORD DRAWINGS	–	KLH	AJY	RJH

COLORADO LICENSED ROBERT J. HUZAR 25734 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT
THORNTON, COLORADO

THORNTON STANDARD DETAIL

DWG. NO. F-06

SHEET NO. 73 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\DETAILS F.DWG 6/14/2021

NORTH DAHLIA SURVEY CONTROL POINTS				
CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
SCP-105	740653.07	162378.83	5072.47	BRASS CAP
SCP-106	740588.13	163806.48	5073.61	BRASS CAP
SCP-107	738344.73	163049.53	5072.30	ALUM CAP
SCP-108	738222.53	161812.21	5075.84	ALUM CAP
SCP-109	739227.82	161544.13	5071.60	ALUM CAP
SCP-110	737636.80	160245.85	5078.60	ALUM CAP

OUTLET WORKS DISCHARGE CHANNEL
SCP-105
EAST SPRAT PLATTE MAX NWL 5055.0
SCP-106
EMERGENCY SPILLWAY
NORTH DAHLIA TO EAST SPRAT PLATTE INTERCONNECT GATE CONTROL VAULTS
RIPRAP SLOPE PROTECTION
APPROX ALLUVIAL WELLS RAW WATERLINE
EMERGENCY SPILLWAY
765'
1
G-03
RIPRAP SLOPE PROTECTION TO BE GROUTED
TIGERS AKA NORTH DAHLIA DAM AND RESERVOIR MAX NWL 5069.0
SCP-109
℄ SOIL-BENTONITE BARRIER WALL (APPROX)
APPROX LIMITS OF 100-YEAR FLOODPLAIN (NOTE 1)
APPROX LIMITS OF FLOODWAY (NOTE 1)
MONITORING WELL OR PIEZOMETER (TYP)
RIPRAP SLOPE PROTECTION
NORTH DAHLIA TO SOUTH DAHLIA INTERCONNECT GATE CONTROL VAULT
RIPRAP SLOPE PROTECTION
GAGING STATION
GRAVEL ACCESS ROAD
PROPERTY BOUNDARY (NOTE 3)
STAFF GAUGE
SCP-107
SOUTH PLATTE RIVER
SCP-108
SITE ENTRANCE AND STABILIZED CONSTRUCTION ENTRANCE
PROPERTY BOUNDARY (NOTE 3)
E 88TH AVE
E 89TH AVE
APPROX LIMITS OF FLOODWAY (NOTE 1)
APPROX LIMITS OF 100-YEAR FLOODPLAIN (NOTE 1)
SCP-110
EAST 88TH AVENUE
SOUTH DAHLIA RESERVOIR MAX NWL 5071.4

N

0 100 200 400 600
SCALE IN FEET

NOTES:

1. APPROXIMATE LIMITS OF FLOODWAY AND 100-YEAR FLOODPLAIN FROM "FLOOD HAZARD AREA DELINEATION: SOUTH PLATTE RIVER, ADAMS COUNTY" (UDFCD, 2005).
2. TOPOGRAPHIC SURVEY WITHIN THE REPAIR AREA FROM TOPOGRAPHIC SURVEY BY HARRIS KOCHER SMITH (HKS) (SEPTEMBER 2014). BEARINGS ARE GRID BEARINGS OF THE COLORADO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE. SURVEY BASED ON THE LINE BETWEEN ADAMS COUNTY STATION 0205, AS MONUMENTED BY A USGS 3-3/4" BRASS CAP STAMPED "ELEVATION ABOVE SEA 5090 FEET DATUM DENVER" (NGS BENCHMARK "5090", PID KK0395), AND ADAMS COUNTY STATION 0193, AS MONUMENTED BY A 3-1/4" ALUMINUM CAP.
3. PROPERTY BOUNDARIES FROM HARRIS KOCHER SMITH (SEPTEMBER 2014).

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NO.	DATE	ISSUE/REVISION	DES	DRN	CHK	APP
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COLORADO LICENSED ROBERT J. HILLMAN 25734 06/13/21 PROFESSIONAL ENGINEER

RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

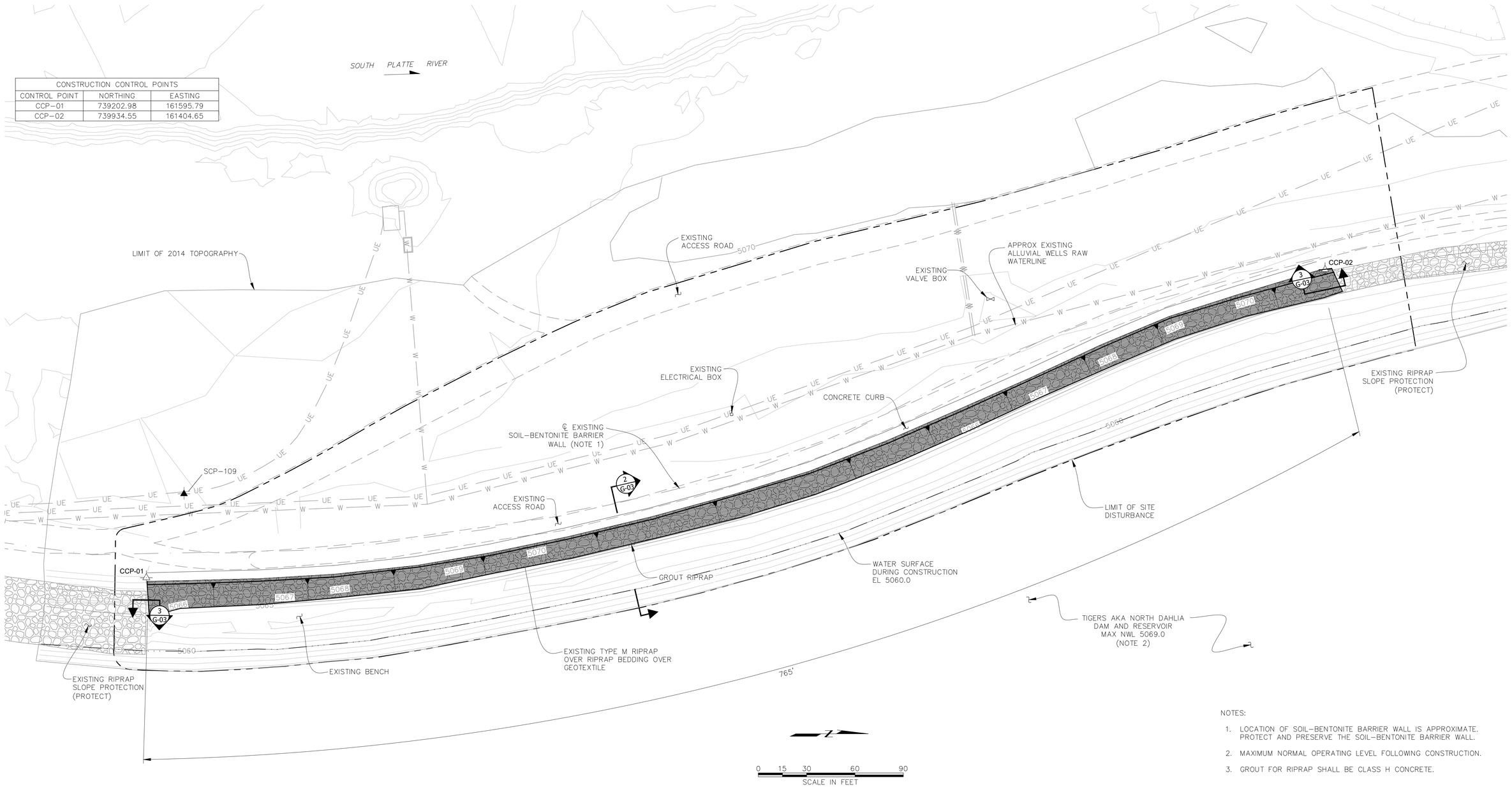
NORTH DAHLIA EXISTING SITE PLAN AND SURVEY CONTROL

DWG. NO. G-01

SHEET NO. 74 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1006\SITE PLAN AND SURVEY CONTROL.DWG 6/14/2021

CONSTRUCTION CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
CCP-01	739202.98	161595.79
CCP-02	739934.55	161404.65



NOTES:

1. LOCATION OF SOIL-BENTONITE BARRIER WALL IS APPROXIMATE. PROTECT AND PRESERVE THE SOIL-BENTONITE BARRIER WALL.
2. MAXIMUM NORMAL OPERATING LEVEL FOLLOWING CONSTRUCTION.
3. GROUT FOR RIPRAP SHALL BE CLASS H CONCRETE.

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City of Thornton

RJH PROJECT 16116

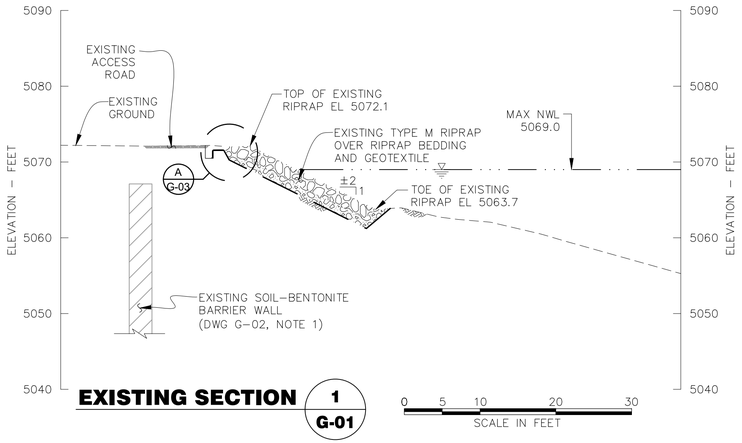
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

NORTH DAHLIA GENERAL PLAN OF MODIFICATIONS

DWG. NO. G-02

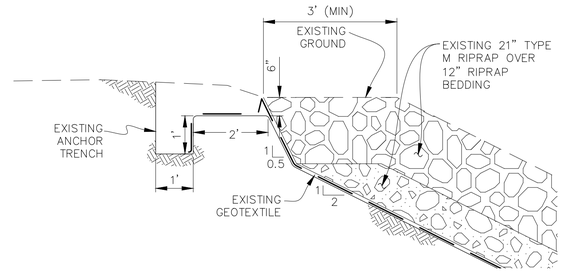
SHEET NO. 75 of 77

P:\16116 - W COOLEY FLOOD REPAIR\CAD\TASK 1026\PLAN OF MODS SECTIONS AND DETAILS.DWG 6/14/2021



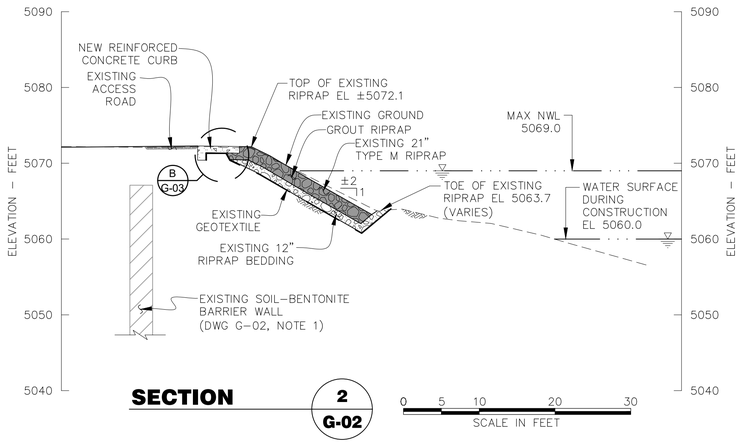
EXISTING SECTION 1 / G-01

0 5 10 20 30
SCALE IN FEET



DETAIL
EXISTING ANCHOR TRENCH A / G-03

0 1 2 4
SCALE IN FEET



SECTION 2 / G-02

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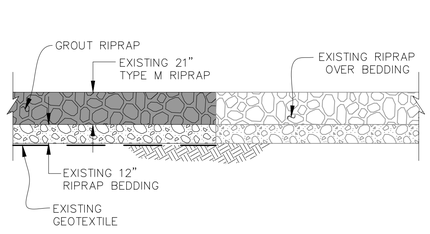
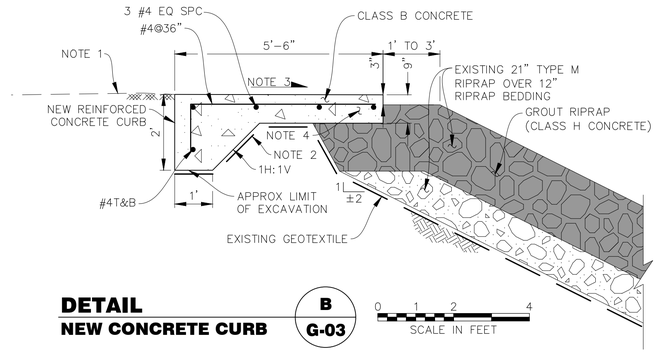
SCALE IN FEET



SECTION 3 / G-02

0 2 4 8 12
SCALE IN FEET



DETAIL
NEW CONCRETE CURB B / G-03

0 1 2 4
SCALE IN FEET

NOTES:

1. PLACE TOPSOIL AND SEED DISTURBED AREAS.
2. PLACE EXISTING GEOTEXTILE ALONG BASE OF CURB.
3. SLOPE TO DRAIN, MAX SLOPE SHALL BE 2 PERCENT.
4. REMOVE AND REPLACE EXISTING RIPRAP AS NEEDED TO INSTALL CONCRETE CURB.

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City of Thornton

RJH PROJECT 16116

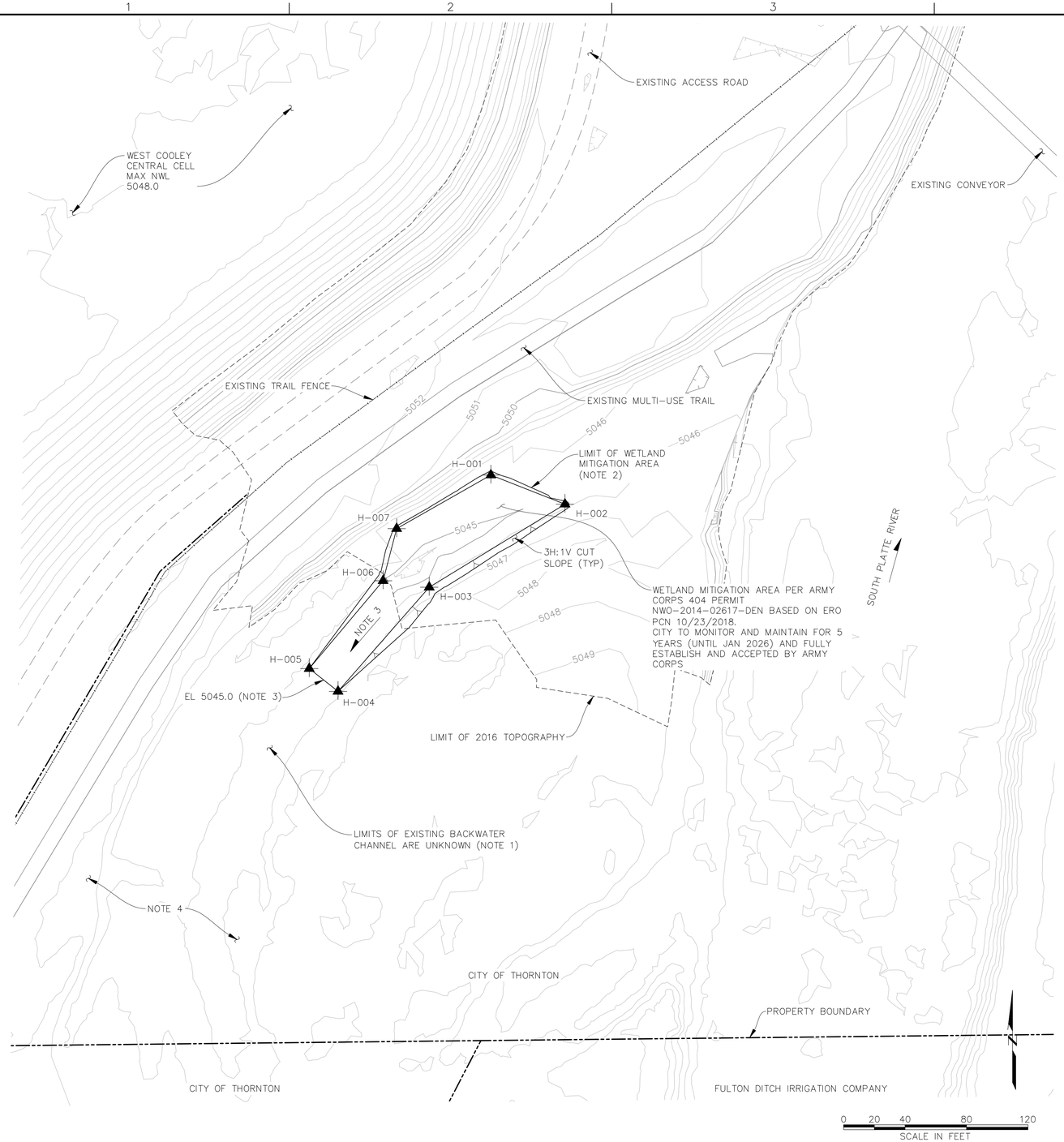
WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

NORTH DAHLIA EXISTING AND PROPOSED SECTIONS AND DETAILS

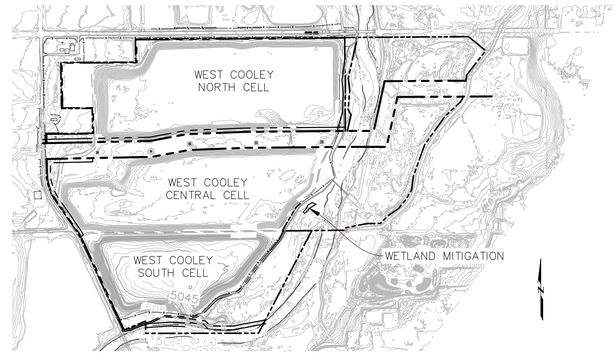
DWG. NO. G-03

SHEET NO. 76 of 77

P:\16116 – W COOLEY FLOOD REPAIR\CAD\TASK 1006\PLAN OF MOS SECTIONS AND DETAILS.DWG 6/14/2021



WETLAND MITIGATION CONTROL POINTS		
CONTROL POINT	NORTHING	EASTING
H-001	745996.41	167756.17
H-002	745977.41	167804.38
H-003	745923.39	167716.03
H-004	745855.60	167656.65
H-005	745870.43	167637.92
H-006	745927.62	167685.99
H-007	745961.52	167694.82



VICINITY MAP

SCALE: 1"=1000'

Table 1. Wetland seed mix - loamy to sandy loam soils.

Common Name	Scientific Name	Growth Season	Growth Form	Wetland Indicator[1]	Lb/ac (PLS)[2]
Grasses and Herbaceous Species					
American sloughgrass	*Beckmannia syzigachne*	Cool	Sod	OBL	**0.84**
Baltic rush	*Luncus balticus*	Cool	Sod	OBL	0.10
Creeping spikerush	*Eleocharis palustris*			OBL	1.00
Fowl mannagrass	*Glyceria striata*	Cool	Sod	OBL	3.33
Fowl bluegrass	*Poa palustris*			FACW	0.15
Prairie cordgrass	*Spartina pectinata*	Warm	Sod	FACW	2.00
Switchgrass	*Panicum virgatum*	Warm	Sod/Bunch	FAC	1.20
Western wheatgrass	*Pascopyrum smithii*	Cool	Sod	FACJ	2.00
Wildflowers					
Blue vervain	*Verbena hastata*			FACW	0.10
Nuttall's sunflower	*Helianthus nuttallii*			FAC	0.10
TOTAL PLS POUNDS/ACRE					**12.47**

[1]Wetland Indicator OBL = Obligate, FACW = Facultative Wetland, FAC = Facultative, FACU = Facultative Upland.

2Drill seed; double rate if broadcast; PLS = pure live seed: LB/ac = pounds per acre.

Table 2. Planting schedule

Common Name	Scientific Name	Quantity	Size
Sandbar willow (harvested on-site)	*Salix exigua*	1000	Stakes
Total willow stakes		**500**	

Table 3. Upland area mix

Common Name	Scientific Name	Growth Season	Growth Form	Lb/ac (PLS)[1]
Grasses				
Blue grama	*Bouteloua gracillis*	Warm	Sod	0.60
Green needlegrass	*stipa viridula*	Cool	Bunch	2.00
Indian ricegrass	*Acantherum hymenoides*	Cool	Bunch	3.00
Junegrass	*Koeleria macranthera*	Cool	Bunch	0.20
Little bluestem	*Schizachyrium scoparium*	Warm	Bunch	2.30
Prairie sandreed	*Calamovilfa longifolia*	Warm	Sod	1.00
Sand dropseed	*Sporobolus cryptandrus*	Warm	Bunch	0.10
Sideoats grama	*Bouteloua curtipedula*	Warm	Sod	3.00
Thickspike wheatgrass	*Elymus lanceolatus*	Cool	Sod	2.00
Western wheatgrass	*Pascopyrum Smithii*	Cool	Sod	4.00
				18.20
Herbaceous/Wildflowers				
Blanket flower	*Gaillardia aristata*			0.80
Fringed sagebrush	*Artemisia frigida*			0.08
Tansy aster	*Machaeranthera tanacetifolia*			1.00
TOTAL PLS POUNDS/ACRE				21.18

[1]Drill seed, if broadcast seeding, doubling the rate; LB/ac = pounds per acre. PLS = pure live seed.

NOTES:

1. ELEVATION OF BACKWATER CHANNEL ASSUMED TO BE AT ELEVATION 5044 FOR DESIGN. FIELD VERIFY AND PROVIDE TO THORNTON.
2. VERIFY PROPOSED GRADING WITH THORNTON PRIOR TO CONSTRUCTING WETLAND MITIGATION AREA. CONSTRUCTION OF WETLAND MITIGATION AREA TO BE FIELD FIT UNDER THE DIRECTION OF THORNTON.
3. SLOPE WETLAND MITIGATION AREA TOWARD EXISTING BACKWATER CHANNEL AT 0.5%. MINIMUM ELEVATION SHALL BE EL 5045.0. WETLAND MITIGATION AREA SHALL BE AT LEAST 6230 SQUARE FEET.
4. 2 FOOT TOPOGRAPHY PROVIDED BY CITY OF THORNTON (2008).

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RJH CONSULTANTS, INC.

City of Thornton

RJH PROJECT 16116

WEST COOLEY RESERVOIR - 2015 FLOOD REPAIRS PROJECT THORNTON, COLORADO

WETLAND MITIGATION

DWG. NO. H-01

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