CITY & COUNTY OF BROOMFIELD

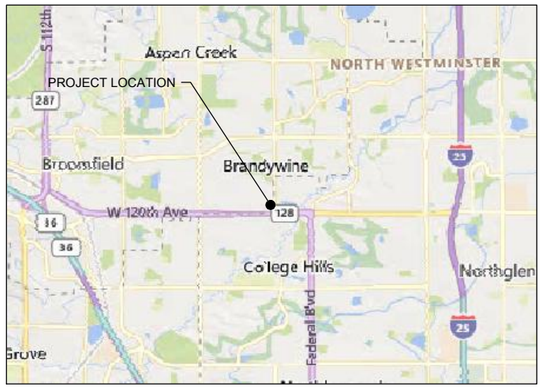
NISSEN RESERVOIR DRAINAGEWAY - PHASE 1

CONSTRUCTION PLANS

MAY 2024

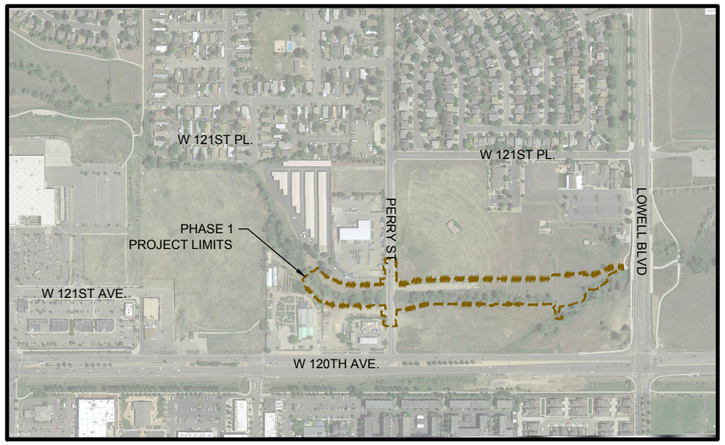
MILE HIGH FLOOD DISTRICT

ICON ENGINEERING



VICINITY MAP

1" = 1 MILE



LOCATION MAP

1" = 400'

INDEX OF SHEETS

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FOR AND ON BEHALF OF
ICON ENGINEERING, INC.

7000 S YOSEMITE ST, SUITE 120
CENTENNIAL, CO 80112
303-221-0802

MATT URSETTA, PE — PRINCIPAL & PROJECT MANAGER — 6/26/2024 Date

KYLE MOROSE, P.E., CFM — PROJECT ENGINEER — 6/26/2024 Date

MILE HIGH FLOOD DISTRICT APPROVALS

CHARLIE PAJARES, PE, CFM — PROJECT ENGINEER — Date

DAN HILL, PE, CFM — PROJECT MANAGER — Date

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARO

ACCEPTED BY: _____ 8/9/24

CITY ENGINEER (OR DESIGNEE) — DATE

UTILITY NOTICE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

811 Know what's below. Call before you dig.

ENGINEER OF RECORD

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF COLORADO. FOR AND ON BEHALF OF ICON ENGINEERING, INC.

MATT URSETTA
NAME

COLORADO LICENSED — MATTHEW J. URSETTA — 25513 — PROFESSIONAL ENGINEER — 05-28-2024

p:\P\17-029-md-352 - nissen reservoir\06_dwg final design\05_final_sheets\NRD - COVER SHEET.dwg, Opallares, Page Setup: ---- ICON HALF-SIZE.ctb, 6/27/2024 1:21 PM

GENERAL NOTES

1. ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION OF PUBLIC IMPROVEMENTS SHALL MEET OR EXCEED THE STANDARDS AND SPECIFICATIONS SE FORTH IN THE MILE HIGH FLOOD DISTRICT (MHFD) STANDARD SPECIFICATION AND IN THE CITY AND COUNTY OF BROOMFIELD (CCB) STANDARDS AND SPECIFICATIONS, AND APPLICABLE STATE AND FEDERAL REGULATIONS. WHERE THERE IS CONFLICT BETWEEN THESE PLANS AND THE SPECIFICATIONS, OR ANY APPLICABLE STANDARDS, THE HIGHER QUALITY STANDARD SHALL APPLY.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL DISTURBED SURFACES AND RELATED STRUCTURES, INCLUDING BUT NOT LIMITED TO, STAGING AREAS, DRIVEWAYS, CURBS, GUTTERS, WALKS, FENCES, DITCHES, CULVERTS, PAVEMENTS, AND SIGNS TO ORIGINAL CONDITIONS (OR BETTER). THE CONTRACTOR SHALL INCLUDE THIS WORK IN THE BID.

3. ANY QUANTITIES LISTED ARE APPROXIMATIONS AND ARE FOR GENERAL INFORMATION ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL QUANTITIES AND DIMENSIONS.

4. SOILS THAT CLASSIFY AS GP, GW, GM, GC, SP, SW, SM, OR SC IN ACCORDANCE WITH THE USCS CLASSIFICATION SYSTEM (GRANULAR MATERIALS) SHOULD BE COMPACTED TO 95 OR MORE PERCENT OF THE MAXIMUM MODIFIED PROCTOR DRY DENSITY AT MOISTURE CONTENTS WITHIN 2 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557. SOILS THAT CLASSIFY AS ML, MH, CL, OR CH SHOULD BE COMPACTED TO 95 PERCENT OF THE MAXIMUM STANDARD PROCTOR DENSITY AT MOISTURE CONTENTS FROM 1 PERCENT BELOW TO 3 PERCENT ABOVE THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698.

5. THE CONTRACTOR SHALL NOTIFY THE MHFD AND CCB A MINIMUM OF 72 HOURS PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY THE APPROPRIATE JURISDICTION PRIOR TO ANY REQUIRED INSPECTIONS. NOTIFICATIONS SHALL BE MADE AT LEAST 48 HOURS PRIOR TO REQUIRED INSPECTIONS.

6. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE MHFD, CCB, ICON ENGINEERING, AND IT'S SUBCONSULTANT ENGINEERS. MHFD, CCB, AND ICON ENGINEERING RESERVE THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS OR WORKMANSHIP THAT DOES NOT CONFORM TO THE STANDARDS AND SPECIFICATIONS.

7. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITIONS AT AND ADJACENT TO THE JOB SITE INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING THE PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.

8. THE CONTRACTOR SHALL PROTECT ALL EXISTING CURB, GUTTER, SIDEWALK AND ROADWAY PAVEMENT AT ACCESS POINTS FROM DAMAGE BY EQUIPMENT OR CONSTRUCTION. DAMAGE BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE OWNER.

9. THE CONTRACTOR SHALL BE RESPONSIBLE TO IMMEDIATELY CLEAN UP ANY TRASH OR MUD ON THE SITE OR ADJACENT STREETS AS A RESULT OF CONSTRUCTION.

10. STREET SWEEPING SHALL BE COMPLETED AT LEAST ONCE PER WEEK DURING PERIODS OF MATERIAL TRANSPORT.

11. THE CONTRACTOR SHALL BE RESPONSIBLE TO IMMEDIATELY CLEAN UP ANY TRASH OR MUD ON THE SITE OR ADJACENT STREETS AS A RESULT OF CONSTRUCTION.

12. CONSTRUCTION STAKING SHALL BE COMPLETED BY THE CONTRACTOR. ALL SURVEYING PROVIDED BY THE CONTRACTOR SHALL BE COMPLETED BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF COLORADO.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL FLOWS INCLUDING: STORMWATER FLOWS, IRRIGATION FLOWS, AND GROUNDWATER FLOWS ENTERING THE PROJECT SITE. ALL WORK SHALL BE COMPLETED IN DRY CONDITIONS.

14. PROJECT WORK WILL BE IN AN ACTIVE STREAM. CONTRACTOR SHALL BE RESPONSIBLE FOR WATER CONTROL AND DEWATERING AS NECESSARY TO COMPLETE WORK. CONTRACTOR WILL BE RESPONSIBLE FOR COLORADO STATE REQUIREMENTS ASSOCIATED WITH LOSS OF SURFACE WATER AND GROUNDWATER THROUGH EVAPORATION. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR OBTAINING A LICENSE FOR CONSTRUCTION DEWATERING WELLS IF ONE OR MORE WILL BE USED.

15. CONSTRUCTION EROSION AND SEDIMENT CONTROL BMPs SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PROJECT GRADING, EROSION, AND SEDIMENT CONTROL PLANS, AND CITY AND COUNTY OF BROOMFIELD STANDARDS.

UTILITY NOTES

1. A SUBSURFACE UTILITY ENGINEERING NOTIFICATION WAS SUBMITTED ON JANUARY 6TH, 2020 (TICKET NO. A000601785-00A) TO THE COLORADO UTILITY NOTIFICATION ASSOCIATION. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS, DISCUSSIONS WITH THE UTILITY OWNERS AND OPERATORS, AND TESTHOLES. INFORMATION FROM TEST HOLES IS PRESENTED ON THE UTILITY DRAWINGS.

2. THE CONTRACTOR SHALL NOTIFY THE NOTIFICATION ASSOCIATION PRIOR TO EXCAVATION WORK AND ABIDE BY ALL APPLICABLE STATUTES TO PROTECT UTILITIES. THE CONTRACTOR, UNLESS OTHERWISE NOTED ON THESE PLANS, SHALL PROTECT THE UTILITIES SHOWN AND ANY OTHER UTILITY LINES OR STRUCTURES NOT SHOWN ON THESE PLANS. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR DAMAGES TO THE UTILITIES.

3. THE LOCATIONS OF ALL UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES BEFORE COMMENCING CONSTRUCTION AND TO COORDINATE THE CONSTRUCTION SCHEDULE WITH UTILITY OWNERS. NO ADDITIONAL PAYMENT WILL BE MADE FOR UTILITY COORDINATION AND THE MINOR ADJUSTMENT OF STRUCTURES TO CLEAR A CONFLICTING UTILITY.

4. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) FOR UTILITY LOCATES AT 811 FOR UTILITY LOCATIONS AT LEAST THREE WORKING DAYS PRIOR TO ANY EXCAVATION OR GRADING.

5. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES AND COORDINATE WITH UTILITY OWNERS PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES DURING CONSTRUCTION AND SHALL HOLD THE OWNERS AND THE ENGINEER HARMLESS FOR THE DAMAGE ARISING FROM FAILURE TO ADEQUATELY PROTECTING UTILITIES. THE MHFD, CCB, AND ICON ENGINEERING WILL NOT BE RESPONSIBLE FOR DAMAGES TO UTILITIES AND OR/ANY OTHER DELAYS OR COSTS ASSOCIATED WITH DAMAGES TO UTILITIES.

6. THE CONTRACTOR SHALL RECONSTRUCT ANY WATER AND SEWER UTILITIES OR SERVICES DAMAGED BY EXECUTION OF THE WORK AT THE CONTRACTOR'S EXPENSE.

7. IF DURING CONSTRUCTION, CONDITIONS ARE ENCOUNTERED WHICH COULD INDICATE A SITUATION THAT IS NOT IDENTIFIED IN THE PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.

SITE RESTORATION NOTES

1. SEED MIX AND PLANTINGS SHALL BE COORDINATED WITH DHM DESIGN PRIOR TO CONSTRUCTION. SEED MIX AND PLANT LISTS ARE INCLUDED ON THE LANDSCAPING PLAN.

2. LOCATIONS AND SPECIES FOR TREES, SHRUBS AND HERBACEOUS PLUG PLANTINGS SHALL BE COORDINATED WITH THE OWNERS AND DHM DESIGN.

3. ESTABLISHMENT PROCEDURES AND WATERING SHALL BE IN ACCORDANCE WITH LANDSCAPING PLANS AND SPECIFICATIONS.

ABBREVIATIONS

APPROX – APPROXIMATELY
ALG – ALIGNMENT
CI – CAST IRON
CL – CENTER LINE
CCB – CITY AND COUNTY OF BROOMFIELD
CFS – CUBIC FEET PER SECOND
C & G – CURB AND GUTTER
C G & SW – CURB, GUTTER, & SIDEWALK
CONN – CONNECT, CONNECTION
CPM. – CAPITAL PROJECTS MANAGEMENT
DIP – DUCTILE IRON PIPE (WATER)
DT – DECIDUOUS TREE
DWD – DENVER WATER DEPARTMENT
E – EAST
E.G.L. – ENERGY GRADE LINE
EOA – EDGE OF ASPHALT
EX, EXIST – EXISTING
FG – FINAL GRADE
FL – FLOW LINE
FO – FIBER OPTIC LINE
FS – FINISHED SURFACE
G – GAS
GB – GRADE BREAK
GV – GATE VALVE
HCL – HORIZONTAL CONTROL LINE
H.G.L. – HYDRAULIC GRADE LINE
HORIZ – HORIZONTAL
INV. – INVERT
KB – KICK BLOCK
LF – LINEAR FEET
ME – MATCH EXISTING
MH – MANHOLE
N – NORTH
NJH – NATIONAL JEWISH HEALTH HOSPITAL
NTS – NOT TO SCALE
OHE – OVERHEAD ELECTRIC LINE
PC – POINT OF CURVATURE
PI – POINT OF INTERSECTION
PL – PROPERTY LINE
POB – POINT OF BEGINNING
POE – POINT OF ENDING
PT – POINT OF TANGENCY
PVC – POLY VINYL CHLORIDE, POINT OF VERTICAL CURVATURE
PVI – POINT OF VERTICAL INTERSECTION
PVRC – POINT OF VERTICAL REVERSE CURVATURE
PVT – POINT OF VERTICAL TANGENCY
q – DESIGN FLOW
Qfull – FULL FLOW CAPACITY
RCBC – REINFORCED CONCRETE BOX CULVERT
RCP – REINFORCED CONCRETE PIPE
RPMP – REINFORCED POLYMER MORTAR PIPE
ROW – RIGHT OF WAY
S – SOUTH
SLV – SLEEVE
STRM – STORM WATER
SS / SSWR – SANITARY SEWER
SW – SIDEWALK
TELE – TELEPHONE LINE
TCE – TEMPORARY CONSTRUCTION EASEMENT
TOC – TOP OF CURB
T.O.P. – TOP OF PIPE
T.O.W. – TOP OF WALL
TYP. – TYPICAL
UNK – UNKNOWN
VERT – VERTICAL
VCP – VITRIFIED CLAY PIPE
W – WEST
W/ – WITH
WAT / WTR – WATER

MASTER LEGEND

- EL (B) — EXISTING ELECTRIC UTILITY (QUALITY LEVEL B)
- EL (D) — EXISTING ELECTRIC UTILITY (QUALITY LEVEL D)
- UG (B) — EXISTING GAS UTILITY (QUALITY LEVEL B)
- UG (D) — EXISTING GAS UTILITY (QUALITY LEVEL D)
- SS (B) — EXISTING SANITARY SEWER (QUALITY LEVEL B)
- ST (B) — EXISTING STORM SEWER (QUALITY LEVEL B)
- ST (D) — EXISTING STORM SEWER (QUALITY LEVEL D)
- FO (B) — EXISTING COMMUNICATION UTILITY (QUALITY LEVEL B)
- FO (D) — EXISTING COMMUNICATION UTILITY (QUALITY LEVEL D)
- W (B) — EXISTING REUSE WATERLINE (QUALITY LEVEL B)
- W (B) — EXISTING POTABLE WATERLINE (QUALITY LEVEL B)
- W (C) — EXISTING POTABLE WATERLINE (QUALITY LEVEL C)
- W (D) — EXISTING POTABLE WATERLINE (QUALITY LEVEL D)
- EXISTING SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING LOT LINE
- EXISTING EASEMENT LINE
- ICB — EXISTING IRRIGATION CONTROL BOX
- EXISTING LIGHT POLE
- SS W — EXISTING UTILITY MANHOLE
- EXISTING STORM FLARED END SECTION

PROJECT CONTACT LIST

ORGANIZATION	TITLE	NAME	PHONE NUMBER
MILE HIGH FLOOD DISTRICT	PROJECT MANAGER	DAN HILL, PE, CFM	303-749-5422
CITY AND COUNTY OF BROOMFIELD	PROJECT MANAGER	REBECCA BAKER, PE, CFM	303-438-6259
CITY AND COUNTY OF BROOMFIELD	UTILITIES SUPERVISOR	JEFF RUGER	303-464-5116
ICON ENGINEERING	CIVIL ENGINEER	MATT URSETTA, PE	303-221-0802
SAN ENGINEERING	STRUCTURAL ENGINEER	JOHN MIGLIACCIO, PE	303-953-9014
GROUND ENGINEERING	GEOTECHNICAL ENGINEER	AMY CRANDALL, PE	303-289-1989
DHM DESIGN	LANDSCAPE DESIGN	MARK WILCOX	720-763-3966
DALEY LAND SURVEYING	SURVEYOR	ROB DALEY, PLS	303-953-9841

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED MATTHEW J. URSETTA 25513 05-28-2024 PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
GENERAL NOTES
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 2 OF 90

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CITY ENGINEER (OR DESIGNEE) DATE

CONTROL POINTS POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
5	1212295.58	3128641.51	5267.36	CP – NGS A 413
6	1217499.37	3128295.45	5310.01	CP – GPS NO. 6
12	1212894.45	3128726.88	5271.83	CP – 1.5IN ALUM CAP
13	1213298.55	3128666.37	5271.71	CP – 1.5IN A/C
14	1213215.42	3129485.84	5261.64	CP – 1.5IN A/C
15	1212667.63	3130251.58	5252.51	CP – 1.5IN A/C
16	1212687.27	3130844.38	5246.42	CP – 1.5IN A/C
2171	1213290.67	3128826.39	5268.24	CP – SPIKE

CONTROL POINTS POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
4003	1212754.92	3129767.89	5255.45	CP – SPIKE
4004	1212868.82	3129667.24	5258.19	CP – SPIKE
4005	1212689.27	3131281.14	5237.43	CP – SPIKE
4006	1212728.66	3131381.56	5237.17	CP – CHISEL X
11307	1213550.24	3128597.99	5273.39	CP – SPIKE
11308	1213585.25	3128520.48	5270.82	CP – SPIKE
11309	1213692.34	3128557.92	5271.84	CP – SPIKE
11548	1213640.88	3128425.78	5271.68	CP – SPIKE

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- △39 SURVEY CONTROL POINT AND POINT NUMBER

N

0 100' 200'

NOTES:

1. SEE SHEETS 4 THRU 6 FOR EASEMENT INFORMATION AND PROPOSED GEOMETRY.
2. SURVEY NOTES:
   - SURVEY AND MAPPING COMPLETED BY DALEY LAND SURVEYING ON 9/28/18.
   - UPDATED SURVEY COMPLETED BY DALEY ON SEPTEMBER 2023
   - GROUND SCALE FACTOR: 1.0002737813.
   - VERTICAL DATUM: NAVD 88
   - VERTICAL BENCHMARK: NGS A 413 (POINT NO. 5)
   - HORIZONTAL DATUM: MODIFIED STATE PLANE COLORADO NORTH ZONE.
   - PROJECT NORTHING = SPC*SCALE FACTOR–331.829
   - PROJECT EASTING = SPC*SCALE FACTOR–857.111
3. PRIMARY SURVEY POINTS ARE POINT NUMBERS 5 AND 6

COLORADO LICENSED
TREVOR J. DALEY
25513
05-23-2024
PROFESSIONAL ENGINEER

COUNTRY VISTA FILING NO. 2
RECEPTION NO. C0044303
OWNER: CITY AND COUNTY OF BROOMFIELD

△11309 △11548 △11308 △11307

TO POINT #6: S 07°12'24" E, 4242.06'

TENNYSON WAY

TRACT C
A AND B SUBDIVISION REPLAT B
RECEPTION NO. 2008001889
OWNER: CITY AND COUNTY OF BROOMFIELD

CONTINENTAL ESTATES
FILE 13 MAP NO. 238
RECEPTION NO. 940013

W. 121ST PL.

△13 2171 △14

LOT 1
A AND B SUBDIVISION REPLAT B
RECEPTION NO. 2008001889
OWNER: WAL-MART STORES INC.

BROOMFIELD SELF-STORAGE
RECEPTION NO. B777262
OWNER: DOM A. AND ANA A. KICKBUSH

LOT 3
BROOMFIELD SELF-STORAGE
RECEPTION NO. B777262
OWNER: DELLACAVA PROPERTIES LLC

LOT 2
BLOCK 1
NORWEST FILING NO. 1, REPLAT B
RECEPTION NO. 2003011384

LOT 1
CHURCH OF CHRIST LUTHERAN CHURCH SUBDIVISION
PLAN FILE 17 MAP NO. 548
OWNER: CHURCH OF CHRIST LUTHERAN CHURCH

E LINE SE4 SECTION 31
W LINE SW4 SECTION 32

LOWELL BLVD.

△12

RECEPTION NO. 2005002197
OWNER: LEE D. HENSLEY

△4004

LOT 2
NORWEST FILING NO. 1, REPLAT D
RECEPTION NO. 2013013928
OWNER: AVENUE 120 HOLDINGS LLC

LOT 2
BLOCK 1
NORWEST FILING NO. 1, REPLAT C
RECEPTION NO. 2010008176

LOT 1
MARTIN SUBDIVISION
RECEPTION NO. C0737450
OWNER: CITY AND COUNTY OF BROOMFIELD

△4003

△4006 △4005

△15 △16

TRACT A
MARTIN SUBDIVISION
RECEPTION NO. C0737450
OWNER: CITY AND COUNTY OF BROOMFIELD

W. 121ST AVE.

LOT 5
A AND B SUBDIVISION REPLAT B
RECEPTION NO. 2008001889
OWNER: WAL-MART STORES INC.

TENNYSON WAY

E LINE SW4 SECTION 31
W LINE SE4 SECTION 31

HEATH'S SUBDIVISION
RECEPTION NO. B209063
OWNER: MSCS GREEN THINGS LLC

PERRY ST.

TRACT A
NORWEST FILING NO. 1, REPLAT D
RECEPTION NO. 2013013928
OWNER: CITY AND COUNTY OF BROOMFIELD

UNPLATTED
RECEPTION NO.C0492457 (ADAMS COUNTY)
OWNER: 120TH & PERRY LLC

△5

SOUTH QUARTER CORNER
SECTION 31
T.1S., R.68 W. OF THE 6TH P.M.

AMOCO STATION NO. 3051
RECEPTION NO B863152
OWNER: TODD W. AND HELEN R. BINFORD

AMOCO STATION NO. 3051
RECEPTION NO. B863152
OWNER: TWIN STAR ENERGY LLC

W. 120TH AVE.

SOUTHEAST CORNER
SECTION 31
T.1S., R.68 W. OF THE 6TH P.M.

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SURVEY CONTROL

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 3 OF 90

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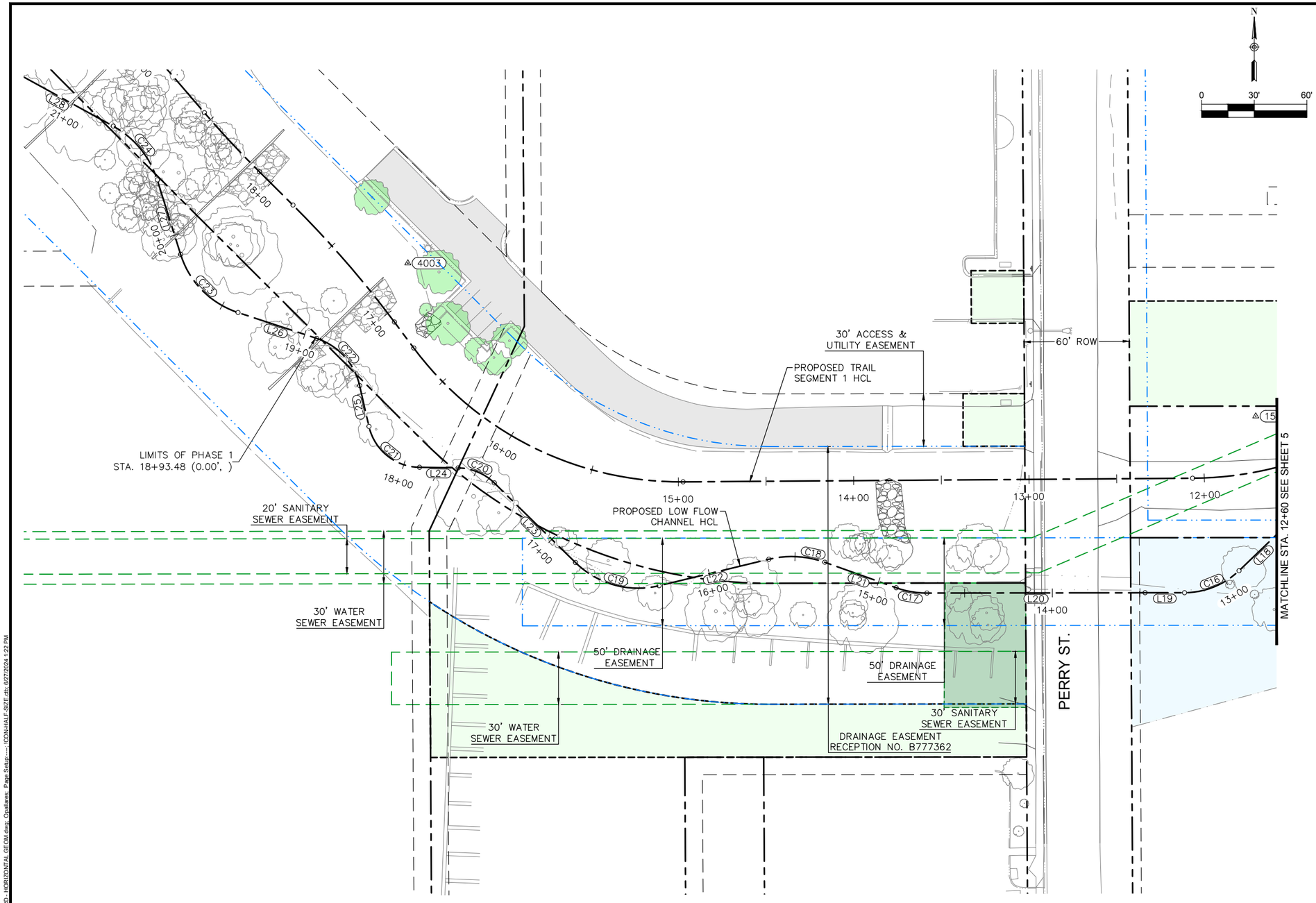

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- SURVEY CONTROL POINT AND POINT NUMBER

NOTES:

1. SEE SHEET 3 FOR SURVEY CONTROL AND PROPERTY OWNERSHIP.
2. SEE SHEET 7 FOR LOW FLOW CHANNEL LINE AND CURVE TABLES.
3. SEE SHEETS 14 THRU 17 FOR LOW FLOW CHANNEL PLAN AND PROFILES.
4. SEE SHEETS 18 THRU 21 FOR TRAIL DRAWINGS INCLUDING THE HCL LAYOUT.

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. DRUEY
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - HORIZONTAL CONTROL - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 4 OF 90

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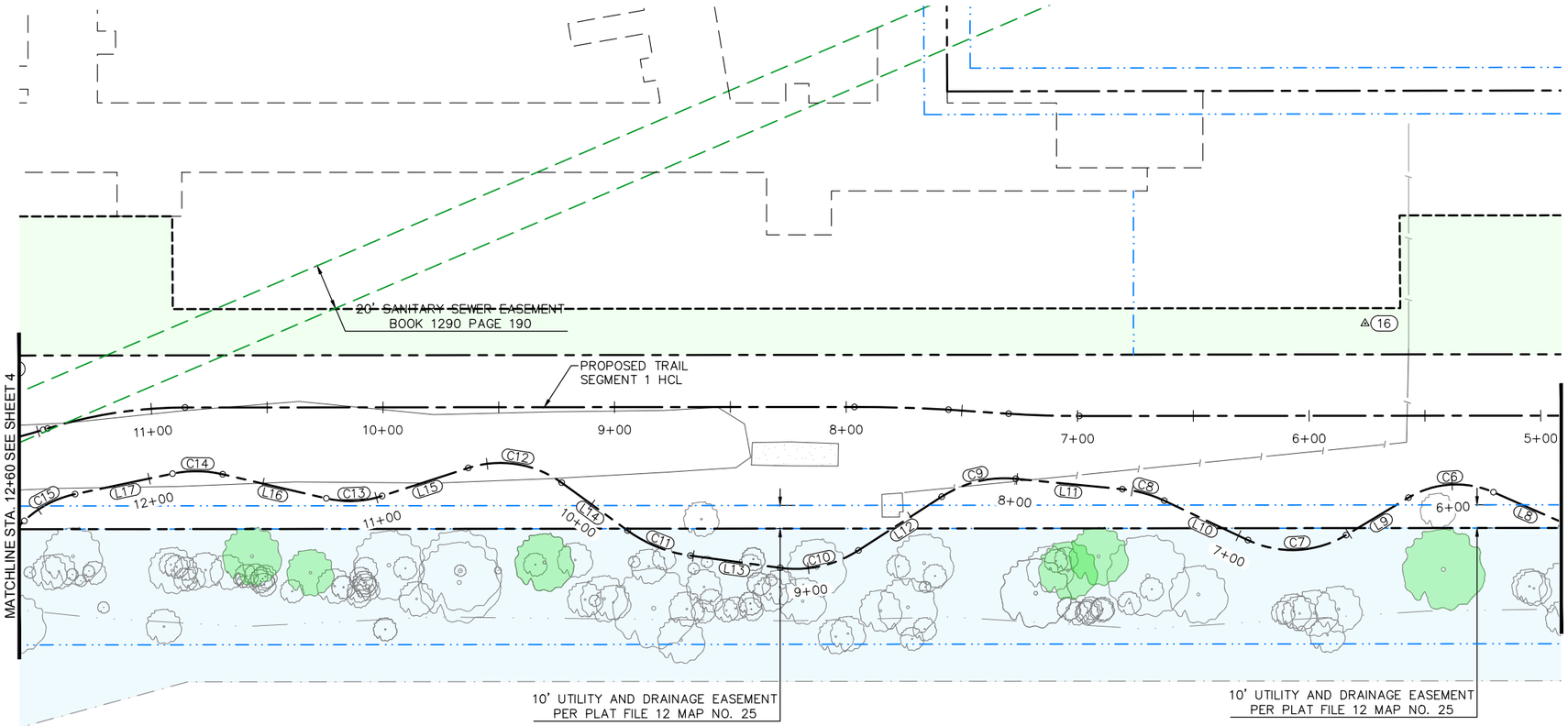

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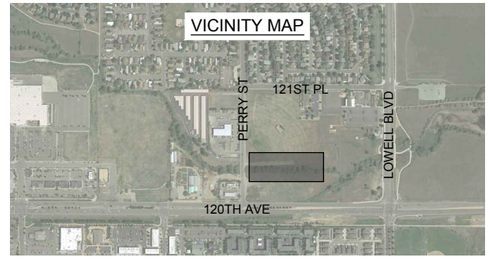

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- △39 SURVEY CONTROL POINT AND POINT NUMBER

NOTES:

1. SEE SHEET 3 FOR SURVEY CONTROL AND PROPERTY OWNERSHIP.
2. SEE SHEET 7 FOR LOW FLOW CHANNEL LINE AND CURVE TABLES.
3. SEE SHEETS 14 THRU 17 FOR LOW FLOW CHANNEL PLAN AND PROFILES.
4. SEE SHEETS 18 THRU 21 FOR TRAIL DRAWINGS INCLUDING THE HCL LAYOUT.

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED MATTHEW J. STRETT 25513 PROFESSIONAL ENGINEER 05-25-2024

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

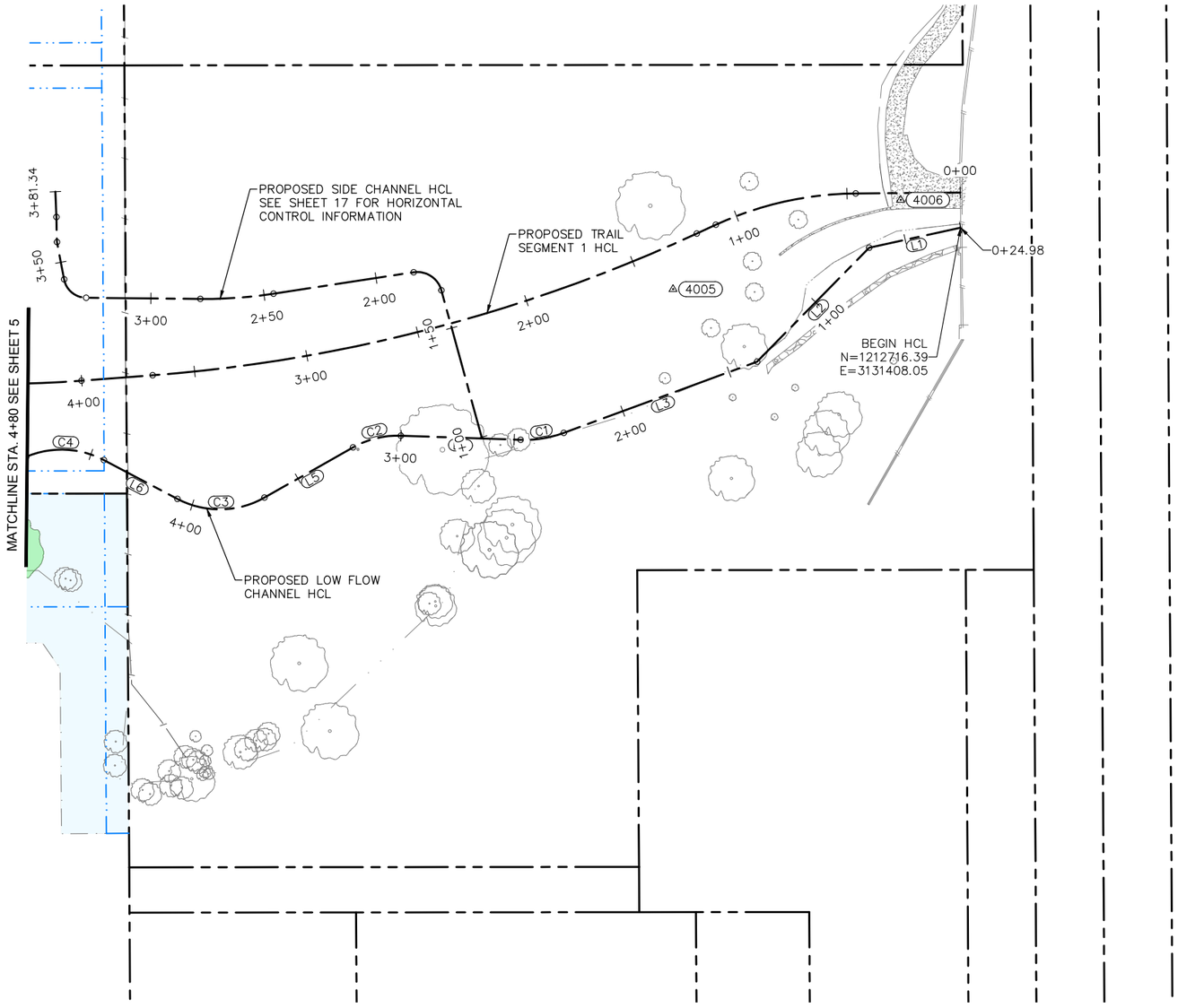
PREPARED BY: ICON ENGINEERING

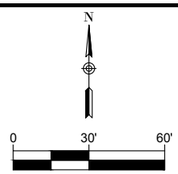
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

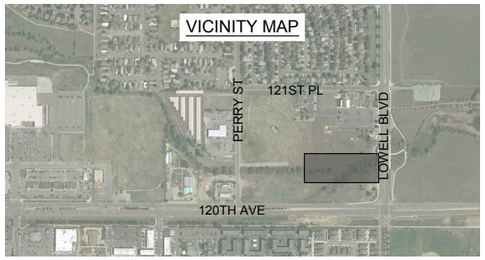
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - HORIZONTAL CONTROL - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 5 OF 90

p:\P17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - HORIZONTAL GEOM.dwg, Opstlares, Page Setup---- ICON-HALF-SIZE.ctb, 6/27/2024 1:22 PM







LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- SURVEY CONTROL POINT AND POINT NUMBER (△39)

NOTES:

1. SEE SHEET 3 FOR SURVEY CONTROL AND PROPERTY OWNERSHIP.
2. SEE SHEET 7 FOR LOW FLOW CHANNEL LINE AND CURVE TABLES.
3. SEE SHEETS 14 THRU 17 FOR LOW FLOW CHANNEL PLAN AND PROFILES.
4. SEE SHEETS 18 THRU 21 FOR TRAIL DRAWINGS INCLUDING THE HCL LAYOUT.

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — MATTHEW J. JUNGE — 25513 — PROFESSIONAL ENGINEER — 05-25-2024

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - HORIZONTAL CONTROL - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 6 OF 90

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CP-ALGN-CLIN-NRD									
NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L1		0+24.98 0+66.31	1212716.39 1212707.53	3131408.05 3131367.68	41.33'	S77°37'11"W			
L2		0+66.31 1+36.82	1212707.53 1212657.26	3131367.68 3131318.25	70.50'	S44°30'45"W			
L3		1+36.82 2+27.81	1212657.26 1212625.80	3131318.25 3131232.87	90.99'	S69°46'43"W			
C1	PC= PI= PT=	2+27.81 2+37.62 2+47.18	1212625.80 1212622.41 1212622.75	3131232.87 3131223.66 3131213.86	19.37'	S80°52'31"W	22°11'37"	9.81'	50.00'
L4		2+47.18 3+00.07	1212622.75 1212624.57	3131213.86 3131161.00	52.90'	N88°01'41"W			
C2	PC= PI= PT=	3+00.07 3+11.36 3+22.07	1212624.57 1212624.96 1212619.40	3131161.00 3131149.72 3131139.90	21.99'	S76°13'10"W	31°30'18"	11.28'	40.00'
L5		3+22.07 3+67.00	1212619.40 1212597.25	3131139.90 3131100.81	44.94'	S60°28'01"W			
C3	PC= PI= PT=	3+67.00 3+88.89 4+07.06	1212597.25 1212586.46 1212596.68	3131100.81 3131081.76 3131062.41	40.06'	S89°09'18"W	57°22'33"	21.89'	40.00'
L6		4+07.06 4+43.75	1212596.68 1212613.82	3131062.41 3131029.97	36.69'	N62°09'26"W			
C4	PC= PI= PT=	4+43.75 4+62.72 4+79.17	1212613.82 1212622.68 1212615.30	3131029.97 3131013.19 3130995.72	35.43'	N87°31'42"W	50°44'33"	18.97'	40.00'
L7		4+79.17 5+16.15	1212615.30 1212600.91	3130995.72 3130961.66	36.97'	S67°06'01"W			
C5	PC= PI= PT=	5+16.15 5+33.37 5+48.67	1212600.91 1212594.21 1212601.13	3130961.66 3130945.80 3130930.03	32.52'	N89°36'25"W	46°35'07"	17.22'	40.00'
L8		5+48.67 5+81.67	1212601.13 1212614.38	3130930.03 3130899.80	33.00'	N66°18'52"W			
C6	PC= PI= PT=	5+81.67 6+02.35 6+19.84	1212614.38 1212622.69 1212612.05	3130899.80 3130880.87 3130863.15	38.16'	S86°21'12"W	54°39'53"	20.67'	40.00'
L9		6+19.84 6+51.35	1212612.05 1212595.82	3130863.15 3130836.12	31.52'	S59°01'15"W			
C7	PC= PI= PT=	6+51.35 6+75.39 6+95.50	1212595.82 1212583.45 1212593.70	3130836.12 3130815.52 3130793.78	44.15'	S87°07'37"W	56°12'44"	24.03'	45.00'
L10		6+95.50 7+35.42	1212593.70 1212610.72	3130793.78 3130757.67	39.92'	N64°46'01"W			
C8	PC= PI= PT=	7+35.42 7+44.97 7+54.32	1212610.72 1212614.79 1212615.71	3130757.67 3130749.03 3130739.53	18.90'	N74°36'47"W	19°41'34"	9.55'	55.00'
L11		7+54.32 8+00.59	1212615.71 1212620.17	3130739.53 3130693.48	46.27'	N84°27'34"W			
C9	PC= PI= PT=	8+00.59 8+17.98 8+34.06	1212620.17 1212621.85 1212612.43	3130693.48 3130676.18 3130661.56	33.47'	S76°21'55"W	38°21'01"	17.39'	50.00'
L12		8+34.06 8+76.84	1212612.43 1212589.25	3130661.56 3130625.60	42.79'	S57°11'25"W			
C10	PC= PI= PT=	8+76.84 8+95.30 9+12.21	1212589.25 1212579.25 1212581.72	3130625.60 3130610.09 3130591.79	35.37'	S77°27'14"W	40°31'39"	18.46'	50.00'
L13		9+12.21 9+51.27	1212581.72 1212586.97	3130591.79 3130553.08	39.06'	N82°16'56"W			
C11	PC= PI= PT=	9+51.27 9+66.35 9+80.82	1212586.97 1212589.00 1212597.84	3130553.08 3130538.14 3130525.93	29.55'	N68°10'31"W	28°12'52"	15.08'	60.00'
L14		9+80.82 10+15.99	1212597.84 1212618.48	3130525.93 3130497.45	35.17'	N54°04'05"W			
C12	PC= PI= PT=	10+15.99 10+38.89 10+58.36	1212618.48 1212631.92 1212624.84	3130497.45 3130478.91 3130457.13	42.36'	N81°02'16"W	53°56'22"	22.90'	45.00'
L15		10+58.36 10+97.46	1212624.84 1212612.76	3130457.13 3130419.95	39.10'	S71°59'33"W			
C13	PC= PI= PT=	10+97.46 11+09.99 11+21.90	1212612.76 1212608.88 1212611.72	3130419.95 3130408.03 3130395.83	24.44'	S87°33'06"W	31°07'07"	12.53'	45.00'
L16		11+21.90 11+67.86	1212611.72 1212622.15	3130395.83 3130351.07	45.96'	N76°53'20"W			
C14	PC= PI= PT=	11+67.86 11+78.93 11+89.65	1212622.15 1212624.66 1212622.39	3130351.07 3130340.29 3130329.45	21.79'	N89°22'27"W	24°58'13"	11.07'	50.00'

CP-ALGN-CLIN-NRD									
NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L17		11+89.65 12+32.68	1212622.39 1212613.54	3130329.45 3130287.34	43.03'	S78°08'27"W			
C15	PC= PI= PT=	12+32.68 12+45.57 12+57.79	1212613.54 1212610.89 1212601.97	3130287.34 3130274.72 3130265.42	25.11'	S62°09'30"W	31°57'53"	12.89'	45.00'
L18		12+57.79 12+90.24	1212601.97 1212579.50	3130265.42 3130242.01	32.45'	S46°10'34"W			
C16	PC= PI= PT=	12+90.24 13+08.31 13+24.60	1212579.50 1212566.99 1212566.96	3130242.01 3130228.98 3130210.91	34.36'	S68°03'00"W	43°44'53"	18.07'	45.00'
L19		13+24.60 13+47.07	1212566.96 1212566.93	3130210.91 3130188.44	22.47'	S89°55'27"W			
L20		13+47.07 14+71.51	1212566.93 1212566.77	3130188.44 3130064.00	124.44'	S89°55'27"W			
C17	PC= PI= PT=	14+71.51 14+80.55 14+89.41	1212566.77 1212566.76 1212569.80	3130064.00 3130054.96 3130046.45	17.90'	N80°12'53"W	19°43'19"	9.04'	52.00'
L21		14+89.41 15+32.64	1212569.80 1212584.33	3130046.45 3130005.73	43.24'	N70°21'14"W			
C18	PC= PI= PT=	15+32.64 15+49.33 15+65.09	1212584.33 1212589.94 1212586.04	3130005.73 3129990.01 3129973.79	32.44'	N86°56'58"W	33°11'29"	16.69'	56.00'
L22		15+65.09 16+29.46	1212586.04 1212570.96	3129973.79 3129911.20	64.37'	S76°27'17"W			
C19	PC= PI= PT=	16+29.46 16+57.72 16+81.07	1212570.96 1212564.34 1212584.12	3129911.20 3129883.73 3129863.55	51.61'	N74°33'13"W	57°58'59"	28.26'	51.00'
L23		16+81.07 17+46.01	1212584.12 1212629.59	3129863.55 3129817.18	64.94'	N45°33'44"W			
C20	PC= PI= PT=	17+46.01 17+58.02 17+68.86	1212629.59 1212638.00 1212638.17	3129817.18 3129808.61 3129796.59	22.85'	N67°23'03"W	43°38'39"	12.01'	30.00'
L24		17+68.86 17+90.91	1212638.17 1212638.47	3129796.59 3129774.55	22.05'	N89°12'23"W			
C21	PC= PI= PT=	17+90.91 18+14.51 18+30.90	1212638.47 1212638.80 1212661.81	3129774.55 3129750.95 3129745.71	39.99'	N51°00'54"W	76°22'57"	23.60'	30.00'
L25		18+30.90 18+54.80	1212661.81 1212685.11	3129745.71 3129740.41	23.90'	N12°49'26"W			
C22	PC= PI= PT=	18+54.80 18+75.73 18+92.90	1212685.11 1212705.53 1212712.05	3129740.41 3129735.76 3129715.87	38.10'	N42°19'37"W	59°00'21"	20.94'	37.00'

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. JARRETT
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

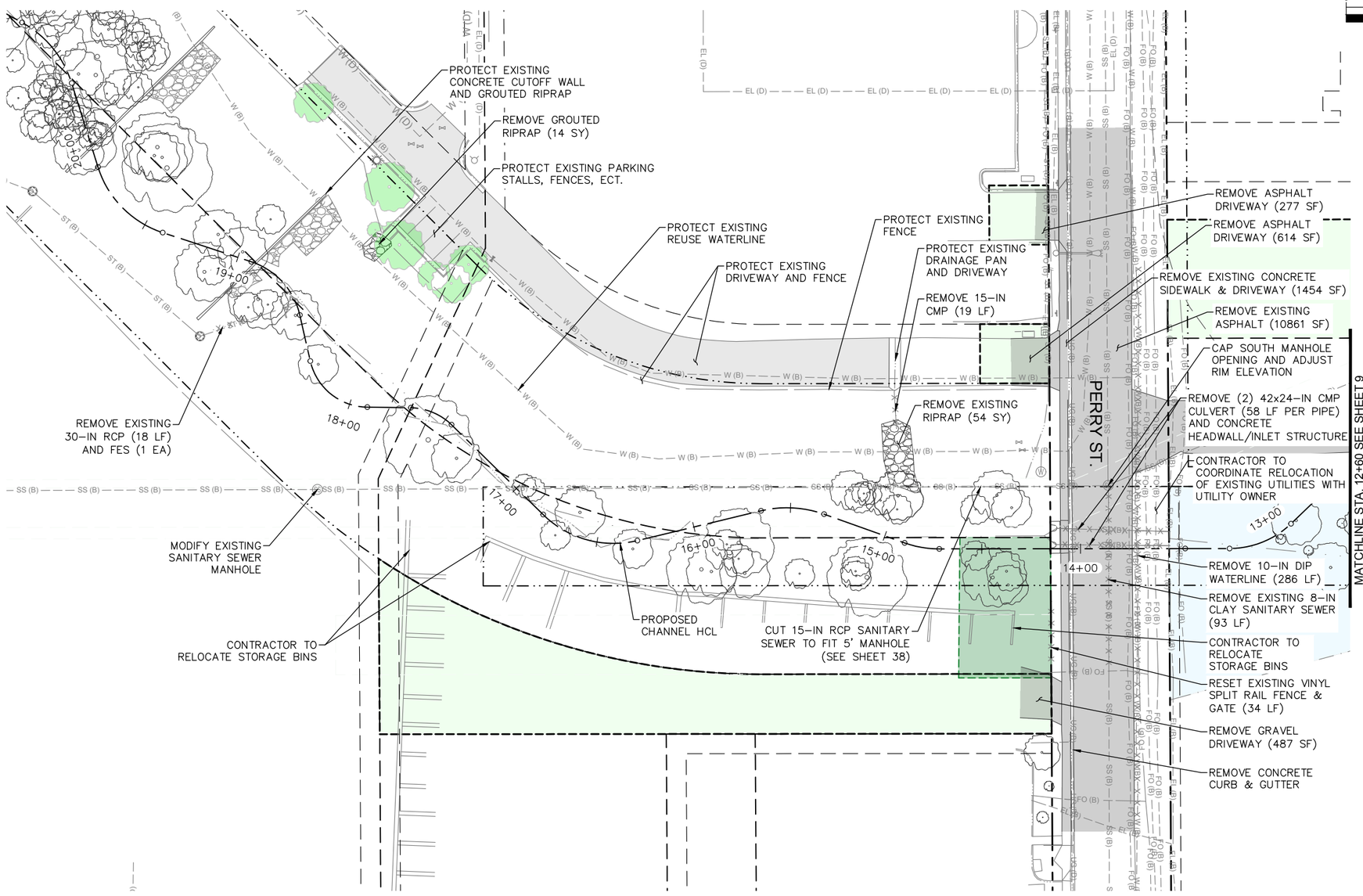
PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - HORIZONTAL CONTROL - 4
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 7 OF 90

p:\17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - HORIZONTAL GEOM.dwg, Opaltares, Page Setup:---- ICON-HALF-SIZE.ctb, 6/27/2024 1:22 PM



LEGEND

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- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- REMOVE IDENTIFIED ITEM
- REMOVE EXISTING PAVEMENT
- EXISTING TREE – TO REMAIN IN PLACE
- EXISTING TREE – TO BE REMOVED

NOTES:

1. SEE SHEETS 29 THRU 32 FOR UTILITY PLANS. SEE SUE DRAWINGS PREPARED BY LANDMARK ENGINEERING (SEE ATTACHED).
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
3. SANITARY SEWER MANHOLES IDENTIFIED AS 'MODIFY' IN THE PLANS SHALL BE LINED AND SEALED.
4. UTILITY LINES NOTED AS TO BE ABANDONED MAY BE REMOVED IF ENCOUNTERED DURING EARTHWORK OPERATIONS OR ARE IN CONFLICT WITH CONSTRUCTION. APPURTENANCES, FITTINGS, AND OTHER SUPPORTS SHALL ALSO BE REMOVED. IF THE CONTRACTOR ELECTS TO LEAVE THE UTILITY CONDUIT IN PLACE, IT SHALL BE FILLED WITH A CONTROLLED LOW-STRENGTH MATERIAL.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND ENGINEER SHALL IDENTIFY TREES WHICH SHALL BE SALVAGED. OTHER TREES REMOVED AND IDENTIFIED AS NON-NATIVE SHALL BE DISPOSED OF OFF SITE.
6. TREES IDENTIFIED TO REMAIN IN PLACE SHALL BE PROTECTED. THE CONTRACTOR SHALL MAKE EFFORT TO ENSURE THE TREE AND ROOT SYSTEM IS NOT DAMAGED DURING CONSTRUCTION.
7. MISCELLANEOUS RUBBLE, BOULDERS, LOGS, STUMPS DEBRIS, AND OTHER ITEMS SHALL BE REMOVED AND PAID FOR AS CLEARING & GRUBBING.
8. NON-GROUTED BOULDERS AND RIPRAP SHALL BE SALAVED AND STOCKPILED ON-SITE TO BE REUSED IN PROPOSED LOCATIONS.
9. IRRIGATION SYSTEMS SHALL BE RESET AND COORDINATED WITH THE PROPERTY OWNER.
10. REMOVAL OF CONCRETE DRIVEWAY SHALL BE INCLUDED IN THE BID ITEM FOR REMOVAL OF CONCRETE CURB, GUTTER, AND SIDEWALK.
11. REMOVAL OF GRAVEL DRIVEWAY IS INCIDENTAL TO CLEARING AND GRUBBING.

CITY & COUNTY OF BROOMFIELD APPROVALS

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CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. USSET
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

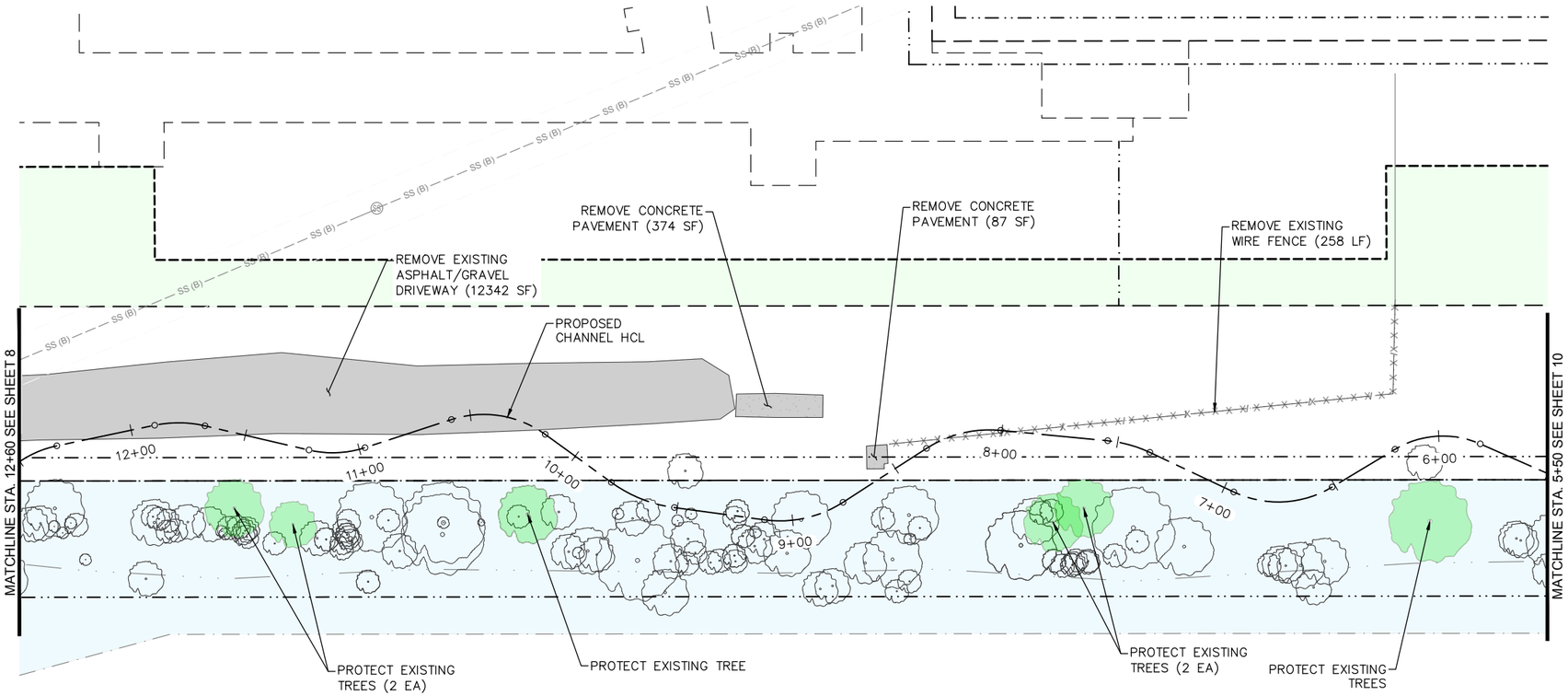
PREPARED BY: ICON ENGINEERING

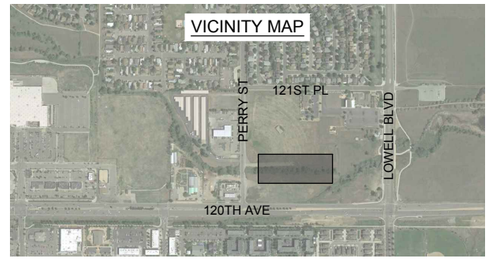
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - REMOVAL PLANS - DEMO - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 8 OF 90

p:\P17-029-nrd.s32 - nissen reservoir\06 dwg final design\05 final sheets\NRD - REMOVAL PLANS.dwg, OpalRes, Page Setup: ---, ICON-HALF-SIZE dtb, 6/27/2024 1:22 PM





LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
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- REMOVE IDENTIFIED ITEM
- REMOVE EXISTING PAVEMENT
- EXISTING TREE – TO REMAIN IN PLACE
- EXISTING TREE – TO BE REMOVED

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3. SANITARY SEWER MANHOLES IDENTIFIED AS 'MODIFY' IN THE PLANS SHALL BE LINED AND SEALED.
4. UTILITY LINES NOTED AS TO BE ABANDONED MAY BE REMOVED IF ENCOUNTERED DURING EARTHWORK OPERATIONS OR ARE IN CONFLICT WITH CONSTRUCTION. APPURTENANCES, FITTINGS, AND OTHER SUPPORTS SHALL ALSO BE REMOVED. IF THE CONTRACTOR ELECTS TO LEAVE THE UTILITY CONDUIT IN PLACE, IT SHALL BE FILLED WITH A CONTROLLED LOW–STRENGTH MATERIAL.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND ENGINEER SHALL IDENTIFY TREES WHICH SHALL BE SALVAGED. OTHER TREES REMOVED AND IDENTIFIED AS NON–NATIVE SHALL BE DISPOSED OF OFF SITE.
6. TREES IDENTIFIED TO REMAIN IN PLACE SHALL BE PROTECTED. THE CONTRACTOR SHALL MAKE EFFORT TO ENSURE THE TREE AND ROOT SYSTEM IS NOT DAMAGED DURING CONSTRUCTION.
7. MISCELLANEOUS RUBBLE, BOULDERS, LOGS, STUMPS DEBRIS, AND OTHER ITEMS SHALL BE REMOVED AND PAID FOR AS CLEARING & GRUBBING.
8. NON–GROUTED BOULDERS AND RIPRAP SHALL BE SALAVED AND STOCKPILED ON–SITE TO BE REUSED IN PROPOSED LOCATIONS.
9. IRRIGATION SYSTEMS SHALL BE RESET AND COORDINATED WITH THE PROPERTY OWNER.
10. REMOVAL OF CONCRETE DRIVEWAY SHALL BE INCLUDED IN THE BID ITEM FOR REMOVAL OF CONCRETE CURB, GUTTER, AND SIDEWALK.
11. REMOVAL OF GRAVEL DRIVEWAY IS INCIDENTAL TO CLEARING AND GRUBBING.

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — MATTHEW J. USELTON — 25513 — 05-28-2024 — PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig. 811

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

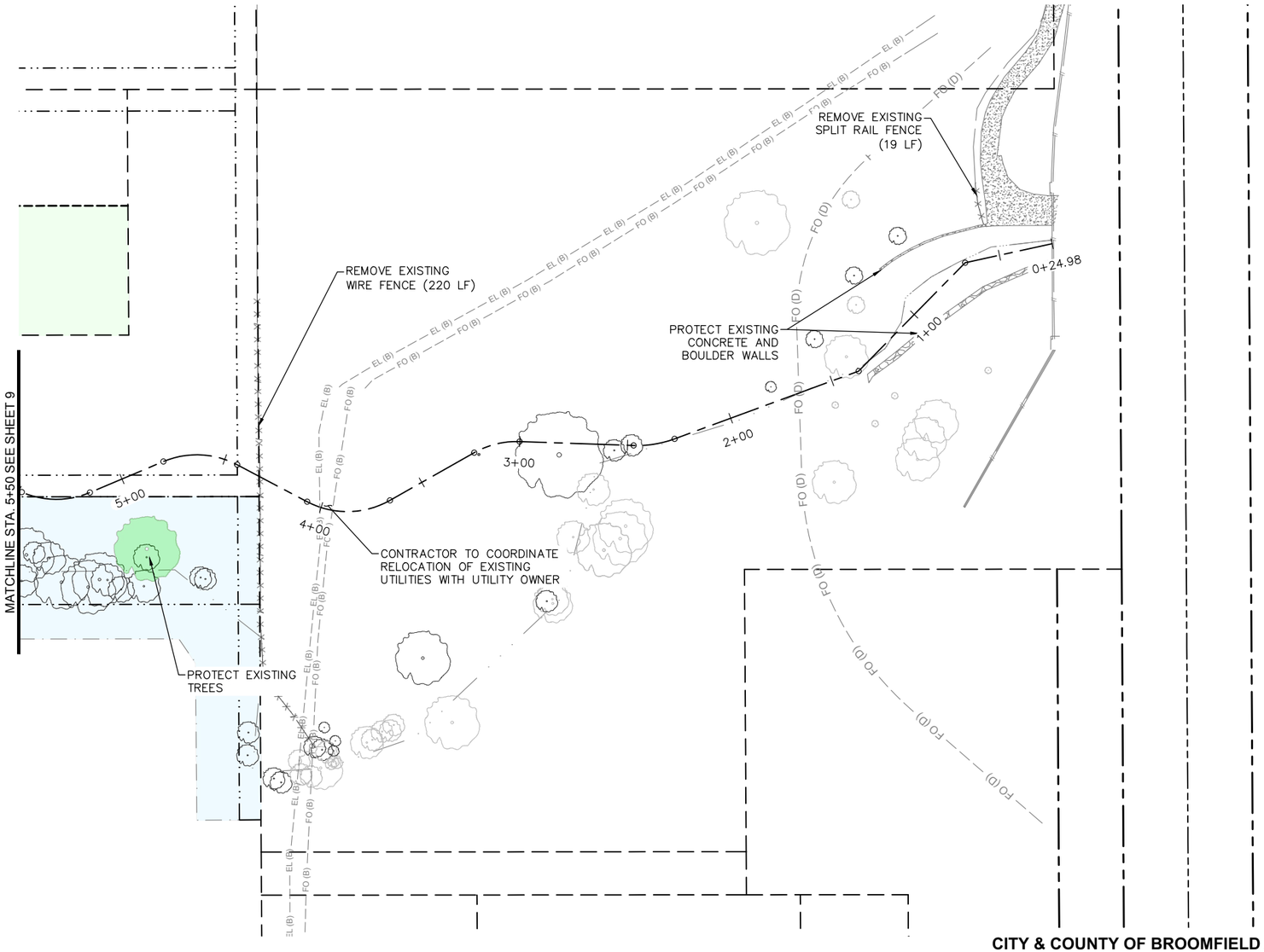
PREPARED BY: ICON ENGINEERING

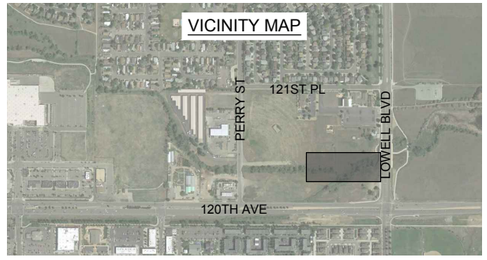
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - REMOVAL PLANS - DEMO - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 9 OF 90

p:\p17-029-nrd-302 - nissen reservoir\06 dwg final design\05 final sheets\NRD - REMOVAL PLANS.dwg, Opallares, Page Setup: ---- ICON-HALF-SIZE.ctb, 6/27/2024 1:23 PM





N

0 30' 60'

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- REMOVE IDENTIFIED ITEM
- REMOVE EXISTING PAVEMENT
- EXISTING TREE – TO REMAIN IN PLACE
- EXISTING TREE – TO BE REMOVED

NOTES:

1. SEE SHEETS 29 THRU 32 FOR UTILITY PLANS. SEE SUE DRAWINGS PREPARED BY LANDMARK ENGINEERING (SEE ATTACHED).
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
3. SANITARY SEWER MANHOLES IDENTIFIED AS 'MODIFY' IN THE PLANS SHALL BE LINED AND SEALED.
4. UTILITY LINES NOTED AS TO BE ABANDONED MAY BE REMOVED IF ENCOUNTERED DURING EARTHWORK OPERATIONS OR ARE IN CONFLICT WITH CONSTRUCTION. APPURTENANCES, FITTINGS, AND OTHER SUPPORTS SHALL ALSO BE REMOVED. IF THE CONTRACTOR ELECTS TO LEAVE THE UTILITY CONDUIT IN PLACE, IT SHALL BE FILLED WITH A CONTROLLED LOW–STRENGTH MATERIAL.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR AND ENGINEER SHALL IDENTIFY TREES WHICH SHALL BE SALVAGED. OTHER TREES REMOVED AND IDENTIFIED AS NON–NATIVE SHALL BE DISPOSED OF OFF SITE.
6. TREES IDENTIFIED TO REMAIN IN PLACE SHALL BE PROTECTED. THE CONTRACTOR SHALL MAKE EFFORT TO ENSURE THE TREE AND ROOT SYSTEM IS NOT DAMAGED DURING CONSTRUCTION.
7. MISCELLANEOUS RUBBLE, BOULDERS, LOGS, STUMPS DEBRIS, AND OTHER ITEMS SHALL BE REMOVED AND PAID FOR AS CLEARING & GRUBBING.
8. NON–GROUTED BOULDERS AND RIPRAP SHALL BE SALAVED AND STOCKPILED ON–SITE TO BE REUSED IN PROPOSED LOCATIONS.
9. IRRIGATION SYSTEMS SHALL BE RESET AND COORDINATED WITH THE PROPERTY OWNER.
10. REMOVAL OF CONCRETE DRIVEWAY SHALL BE INCLUDED IN THE BID ITEM FOR REMOVAL OF CONCRETE CURB, GUTTER, AND SIDEWALK.
11. REMOVAL OF GRAVEL DRIVEWAY IS INCIDENTAL TO CLEARING AND GRUBBING.

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
NATHEN J. JOSLIN
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - REMOVAL PLANS - DEMO - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 10 OF 90

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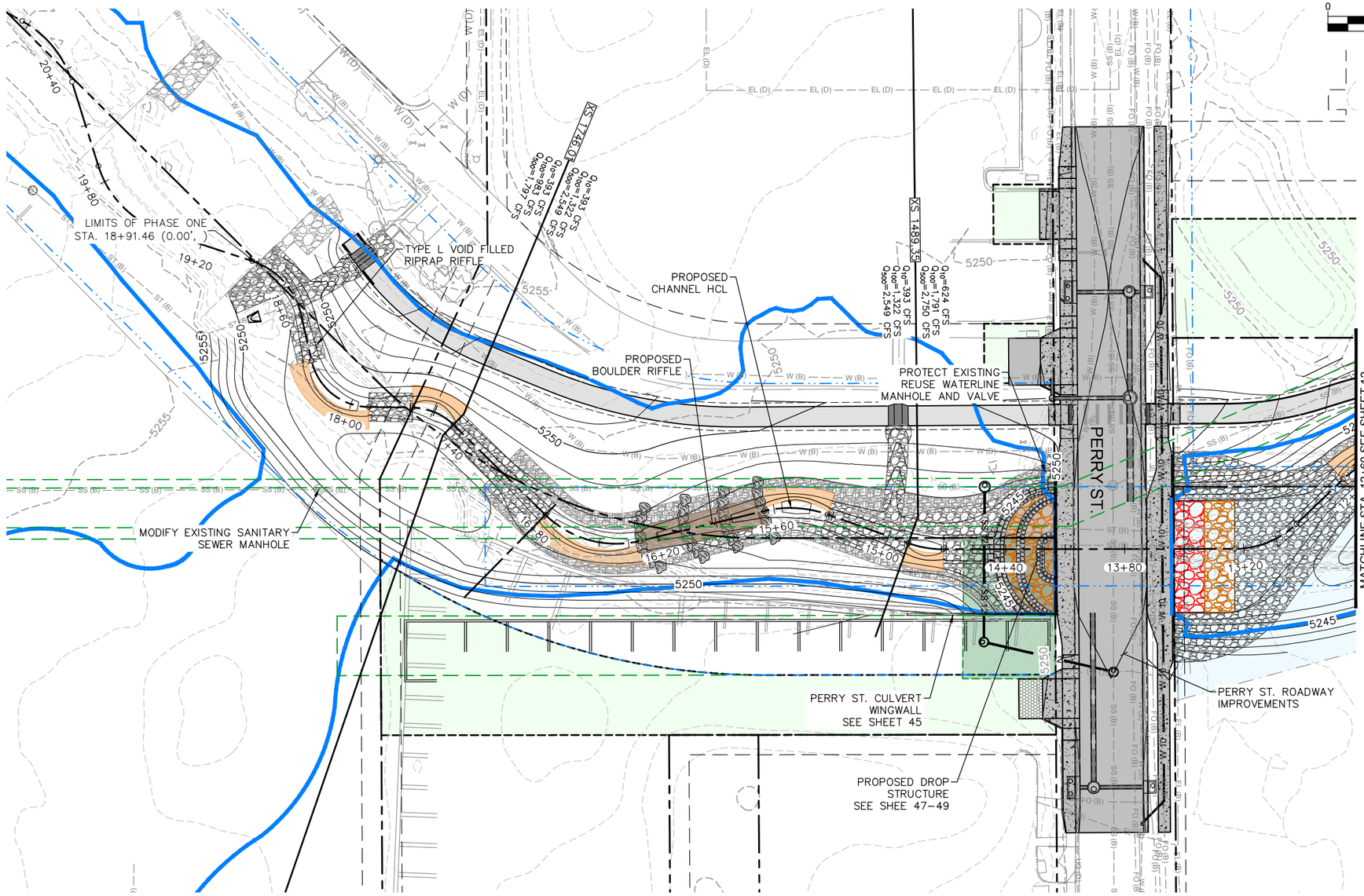

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10–IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12–IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- BANKFULL CHANNEL LIMITS
- POST–CONSTRUCTION 100–YR FLOODPLAIN
- PROPOSED BOULDER RIFFLE
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED ROCK TOE STREAM BANK STABILIZATION. SEE SHEET 52
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 29 THRU 32 FOR UTILITY DRAWINGS. SEE SUE DRAWINGS PREPARED BY LANDMARK ENGINEERING (SEE ATTACHED SHEETS).
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
3. SEE SHEETS 14 THRU 16 FOR LOW FLOW CHANNEL PLAN AND PROFILES.
4. SEE SHEETS 18 THRU 20 FOR TRAIL PLAN AND PROFILES.
5. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS.
6. SEE SHEETS 55 THRU 56 FOR CROSS SECTIONS.
7. GRADES SHALL NOT EXCEED 4:1 UNLESS OTHERWISE NOTED.
8. SANITARY SEWER MANHOLES IDENTIFIED AS 'MODIFY' IN THE PLANS SHALL BE LINED AND SEALED.

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — CHRISTOPHER T. CROSS — 25513 — PROFESSIONAL ENGINEER — 05-23-2024

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - CHANNEL GRADING - GRAD - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 11 OF 90

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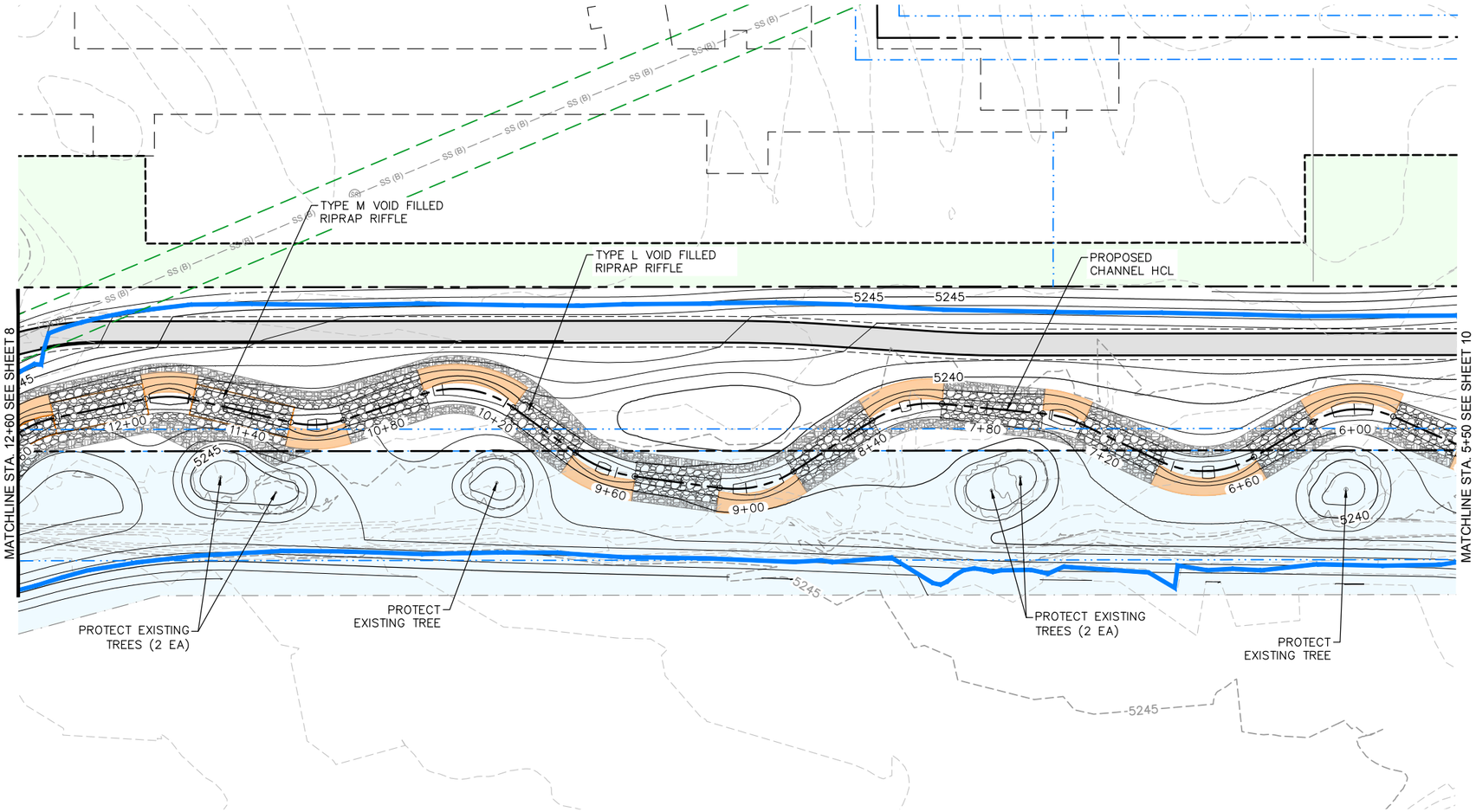

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
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- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED ROCK TOE STREAM BANK STABILIZATION. SEE SHEET 52
- PROPOSED PEDESTRIAN TRAIL

NOTES:

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CITY & COUNTY OF BROOMFIELD APPROVALS

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CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — STEVEN J. UNGER — 25513 — 05-28-2024 — PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - CHANNEL GRADING - GRAD - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 12 OF 90

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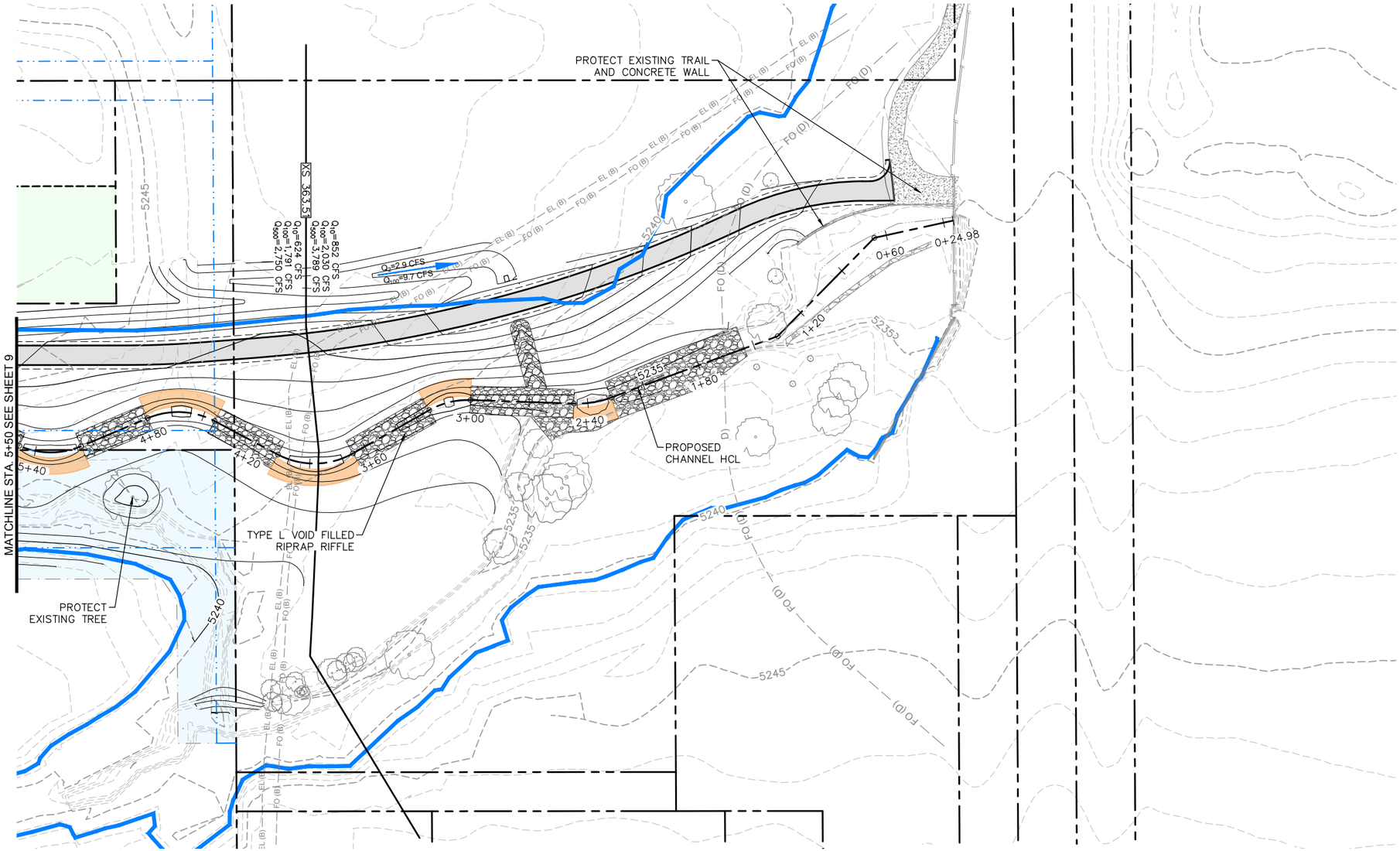

N

0 30' 60'

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
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- PROPOSED PEDESTRIAN TRAIL

NOTES:

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CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — MATTHEW J. STRETTY — 25513 — 05-28-2024 — PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
NRD - CHANNEL GRADING - GRAD - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 13 OF 90

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COLORADO LICENSED
MATTHEW J. UNGER
25513
05-25-2024
PROFESSIONAL ENGINEER

PROTECT EXISTING CUTOFF WALL

MATCH EXISTING GROUND
STA. 18+68.64 (0.00',)

LOW FLOW CHANNEL HCL

PERRY ST.

MATCHLINE STA. 12+90 SEE SHEET 15

PROPOSED RELOCATED LANDSCAPE BINS

RELOCATED SANITARY SEWER SEE SHEET 38

PERRY ST. CULVERT STRUCTURE SEE SHEET 45

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

N
0 30' 60'
10' 5' 0

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
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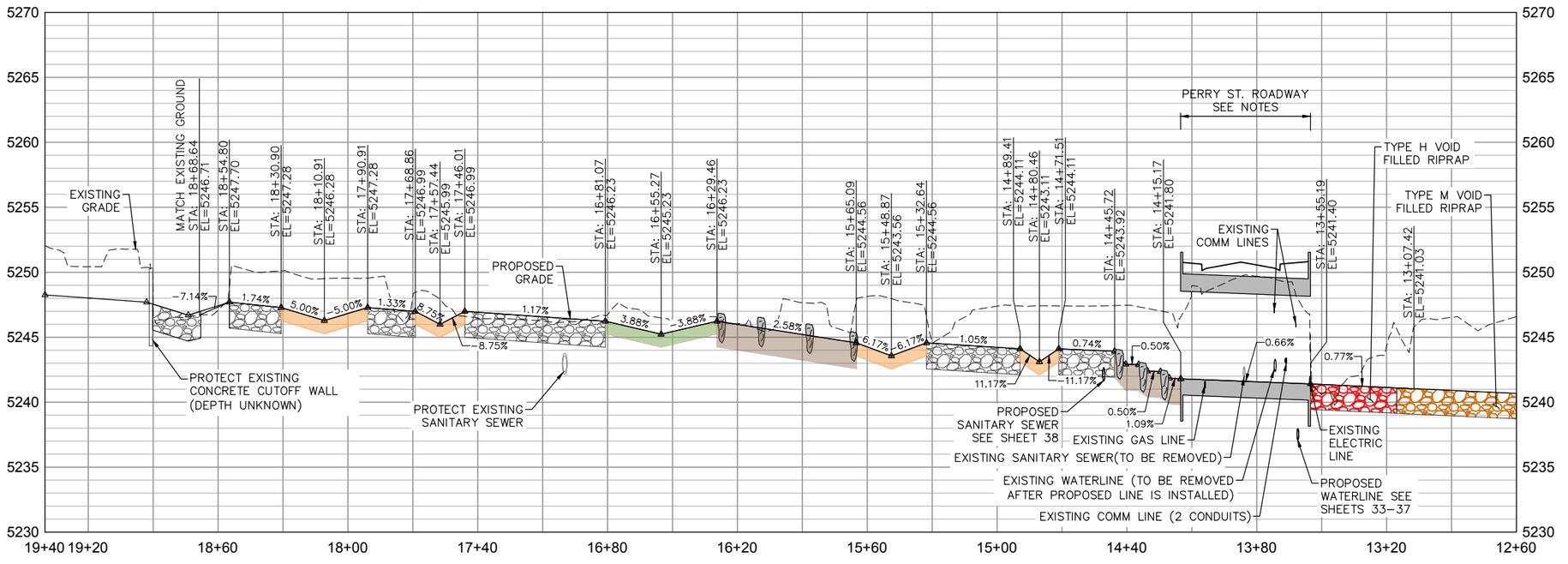
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED BOULDER RIFFLE (SEE SHEET 53)
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION (SEE SHEETS 48 & 49)
- PROPOSED PEDESTRIAN TRAIL



NOTES:

1. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
2. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
3. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
4. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS
5. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
6. SEE SHEET 45 & 46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
7. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
8. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.
9. PROFILE GRADE BREAKS LABELED AS POOL LOW POINTS ARE OFFSET HORIZONTALLY FROM THE HCL. SEE TYPICAL POOL SECTION ON SHEET 51.

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL PLAN & PROFILE - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 14 OF 90

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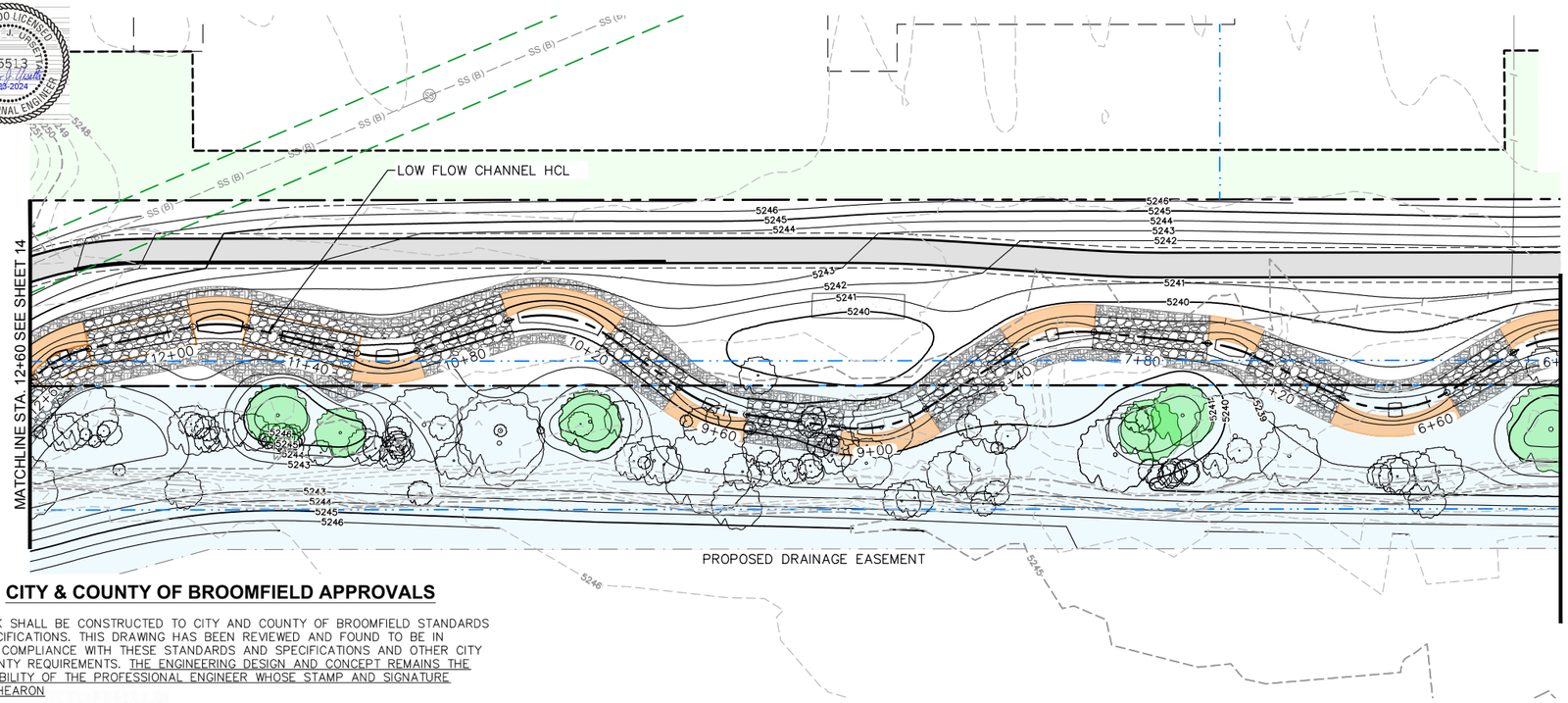
COLORADO LICENSED
MATTHEW J. UNRUH
25513
05-25-2024
PROFESSIONAL ENGINEER



CITY & COUNTY OF BROOMFIELD APPROVALS

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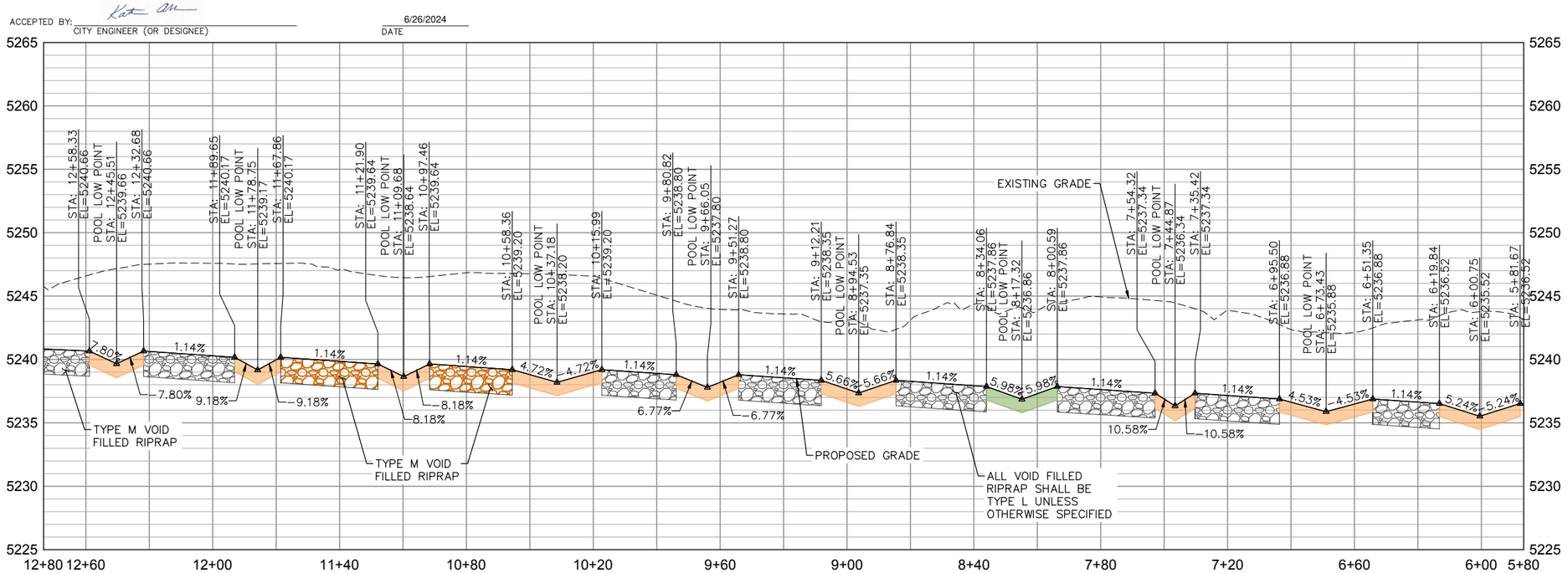

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
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- PROPOSED – TYPE M VOID FILLED RIPRAP
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- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION (SEE SHEETS 48 & 49)
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
2. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
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No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL PLAN & PROFILE - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 15 OF 90

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CITY & COUNTY OF BROOMFIELD APPROVALS

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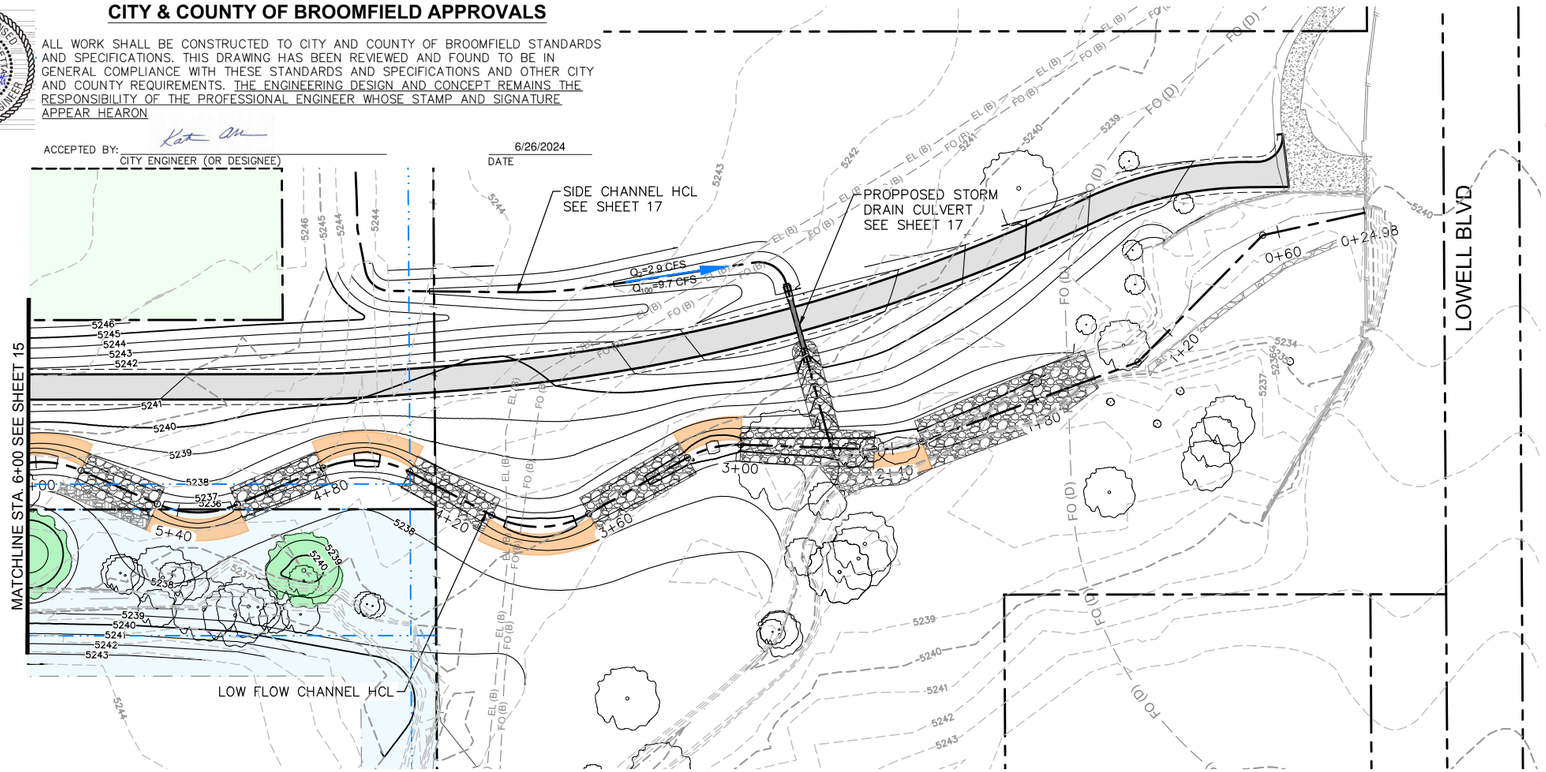
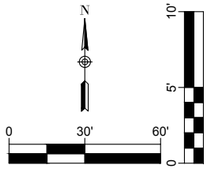
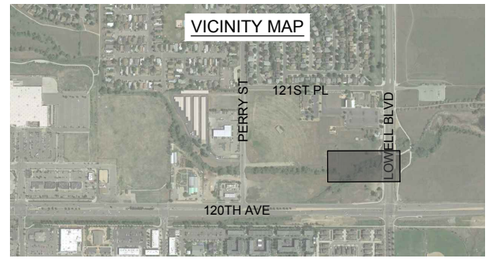
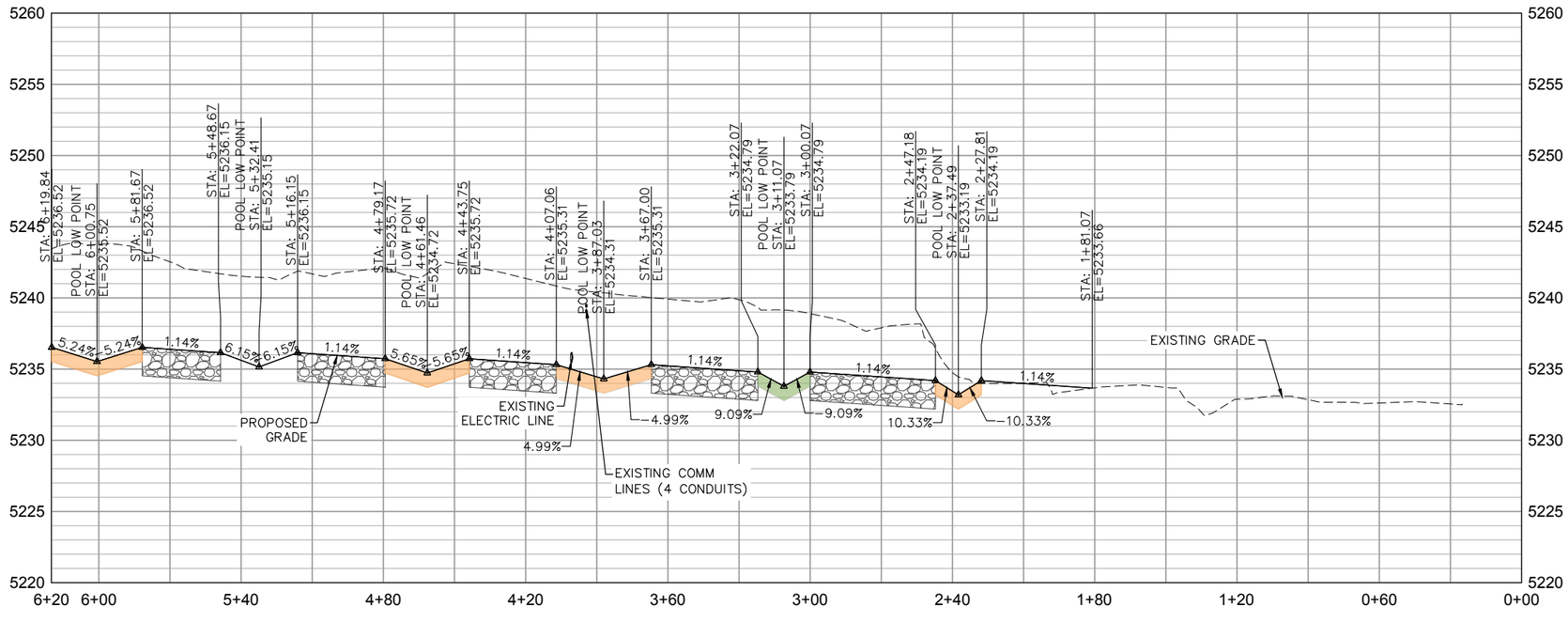
COLORADO LICENSED
MATTHEW J. URBANSKI
25513
05-25-2024
PROFESSIONAL ENGINEER

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE









LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10–IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12–IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED BOULDER RIFFLE (SEE SHEET 53)
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION (SEE SHEETS 48 & 49)
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
2. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
3. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
4. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS
5. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
6. SEE SHEET 45 & 46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
7. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
8. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.
9. PROFILE GRADE BREAKS LABELED AS POOL LOW POINTS ARE OFFSET HORIZONTALLY FROM THE HCL. SEE TYPICAL POOL SECTION ON SHEET 51.

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

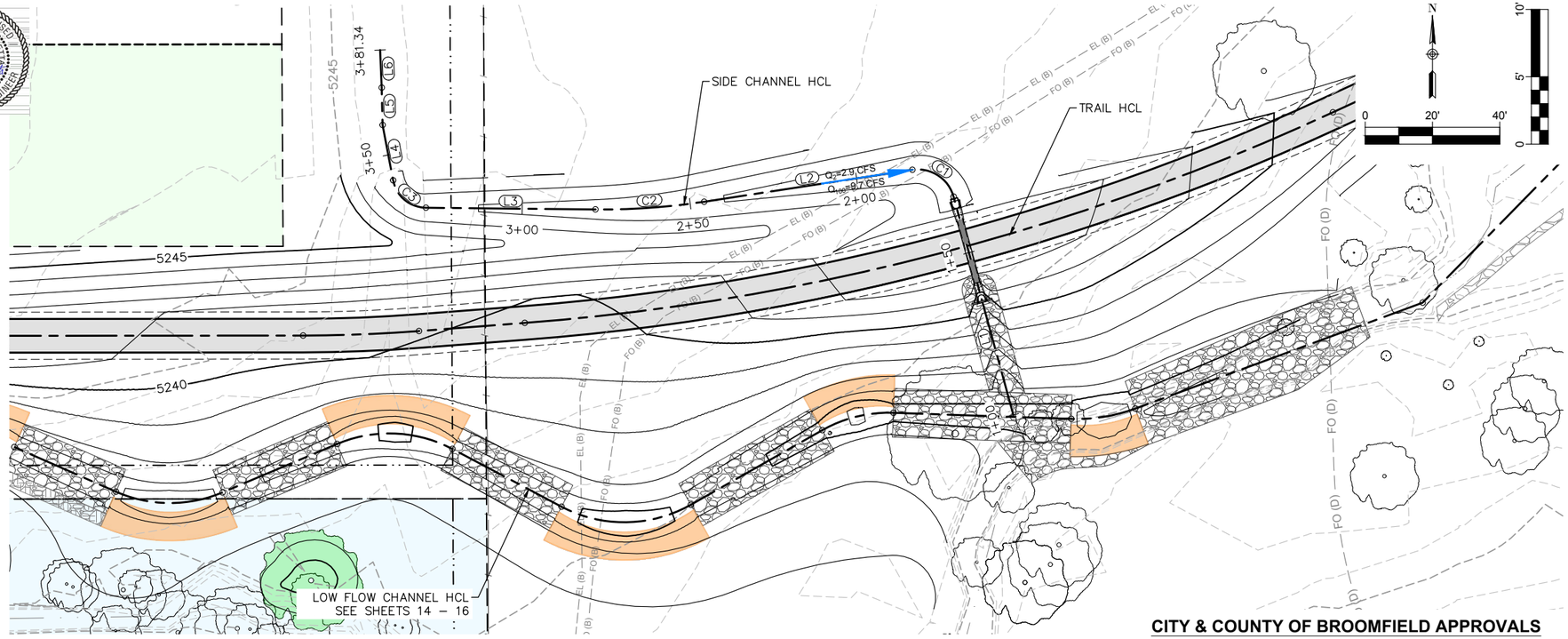
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL PLAN & PROFILE - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

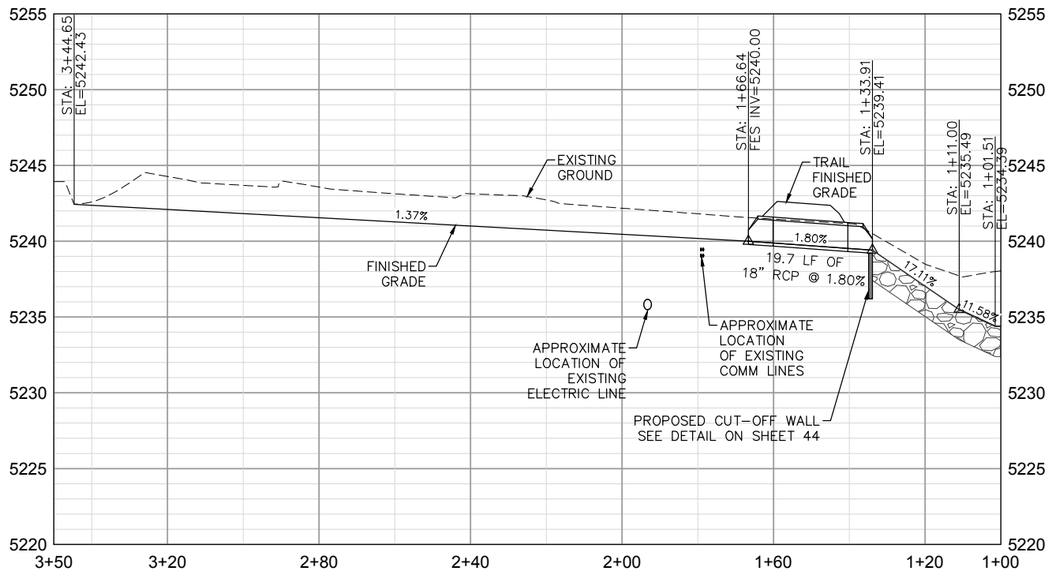
SHEET 16 OF 90

plt:17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - CHANNEL P&P.dwg Opallares, Page Setup:---ICON-HALF SIZE.ctb, 6/27/2024 1:26 PM



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W XX — PROPOSED XX–IN WATERLINE
- ST XX — PROPOSED XX–IN STORM SEWER
- SS XX — PROPOSED XX–IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED BOULDER RIFFLE (SEE SHEET 53)
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION
- PROPOSED PEDESTRIAN TRAIL



CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

SIDE CHANNEL									
NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L1		1+00.00 1+67.24	1212623.90 1212688.75	3131196.67 3131178.90	67.24'	N15°19'33"W			
C1	PC= PI= PT=	1+67.24 1+77.04 1+83.25	1212688.75 1212698.20 1212696.72	3131178.90 3131176.31 3131166.62	16.01'	N57°01'01"W	83°22'56"	9.80'	11.00'
L2		1+83.25 2+45.81	1212696.72 1212687.25	3131166.62 3131104.79	62.56'	S81°17'31"W			
C2	PC= PI= PT=	2+45.81 2+62.06 2+78.24	1212687.25 1212684.79 1212684.95	3131104.79 3131088.72 3131072.48	32.43'	S85°56'14"W	9°17'26"	16.25'	200.00'
L3		2+78.24 3+28.61	1212684.95 1212685.47	3131072.48 3131022.10	50.38'	N89°25'03"W			
C3	PC= PI= PT=	3+28.61 3+36.80 3+42.34	1212685.47 1212685.55 1212693.60	3131022.10 3131013.91 3131012.38	13.73'	N50°05'47"W	78°38'33"	8.19'	10.00'
L4		3+42.34 3+59.08	1212693.60 1212710.05	3131012.38 3131009.25	16.75'	N10°46'30"W			
L5		3+59.08 3+70.16	1212710.05 1212721.12	3131009.25 3131008.97	11.08'	N1°26'48"W			
L6		3+70.16 3+81.34	1212721.12 1212732.29	3131008.97 3131008.52	11.18'	N2°17'38"W			

NOTES:

1. SEE SHEETS 3 THRU 7 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
2. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
3. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
4. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS
5. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
6. SEE SHEET 46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
7. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
8. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.
9. PROFILE GRADE BREAKS LABELED AS POOL LOW POINTS ARE OFFSET HORIZONTALLY FROM THE HCL. SEE TYPICAL POOL SECTION ON SHEET 51.

COLORADO LICENSED MATTHEW J. UNSETH 25513 PROFESSIONAL ENGINEER 05-28-2024

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

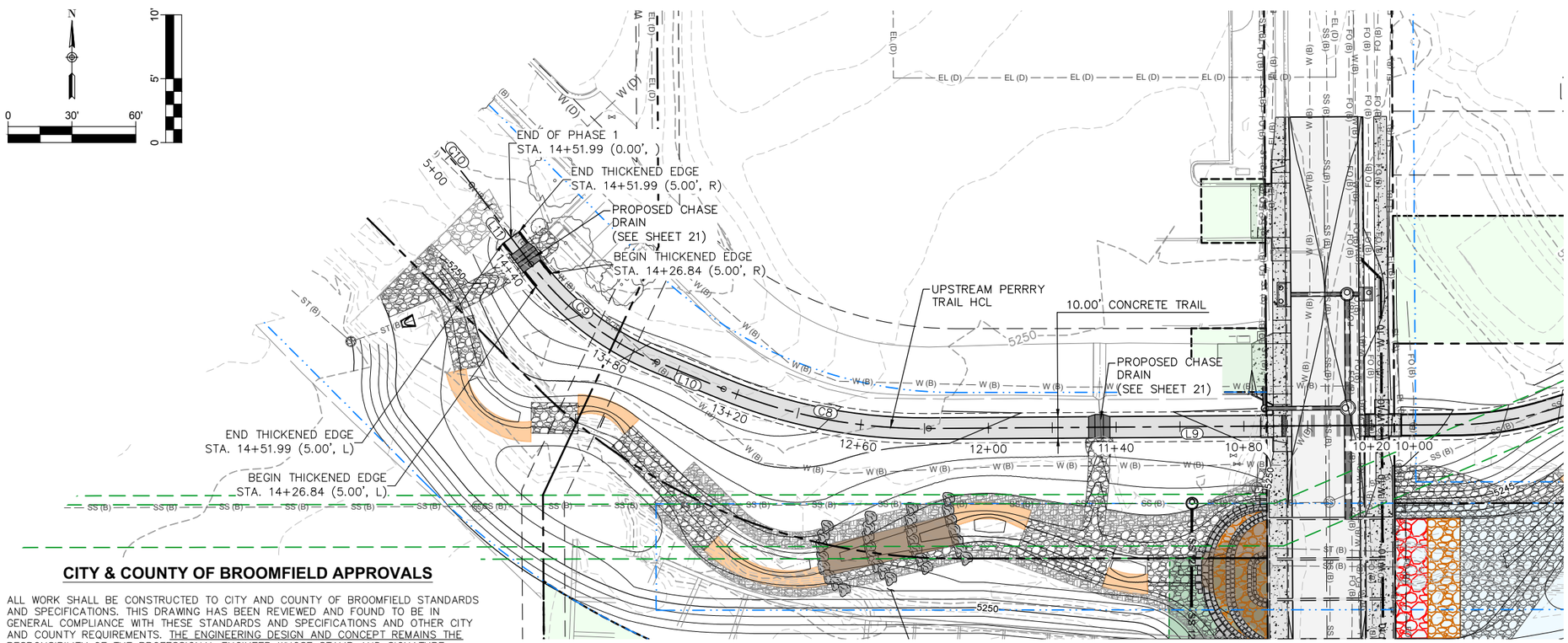
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

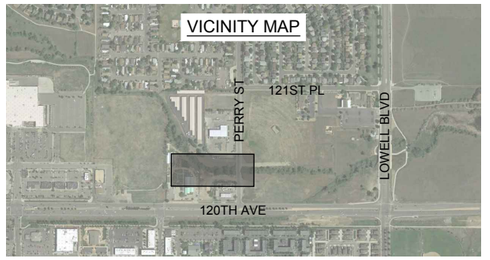
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SIDE CHANNEL PLAN & PROFILE
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 17 OF 90

p:\17-029-nrd\32 - nissen reservoir\09 dwg final design\05 final sheets\NRD - SIDE CHANNEL P&P.dwg, Opdlatres, Page Setup:---- ICON-HALF-SIZE.ctb, 6/27/2024 1:27 PM





LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
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- 5281 — PROPOSED MINOR CONTOUR
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- PROPOSED – TYPE L VOID FILLED RIPRAP
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- PROPOSED RIPRAP TOE BANK PROTECTION
- PROPOSED PEDESTRIAN TRAIL

CITY & COUNTY OF BROOMFIELD APPROVALS

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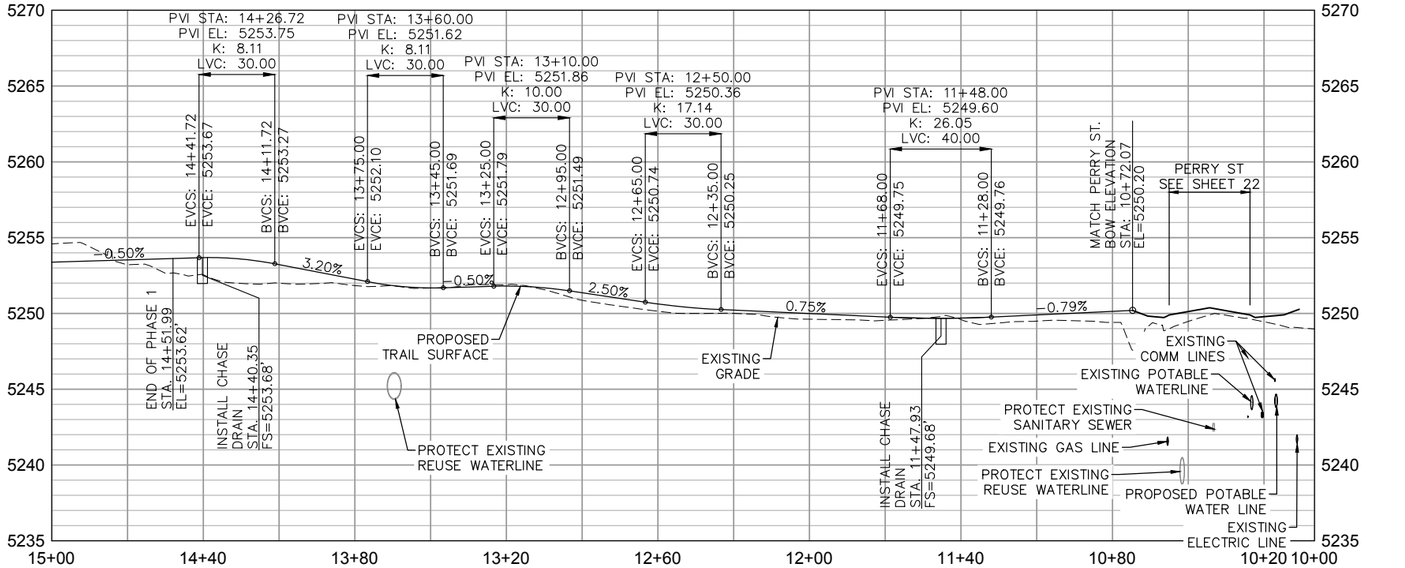
ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE



CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS FOR THE RELOCATION FOR ALL DRY UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS

NOTES:

1. REFER TO SHEET 21 FOR LINE/CURVE DATA TABLE AND TRAIL THICKENED EDGE DETAIL.
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
3. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
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5. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS
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7. SEE SHEETS 45–46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
8. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
9. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.

COLORADO LICENSED MATTHEW J. UHLER 25513 PROFESSIONAL ENGINEER 05-28-2024

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MILE HIGH FLOOD DISTRICT

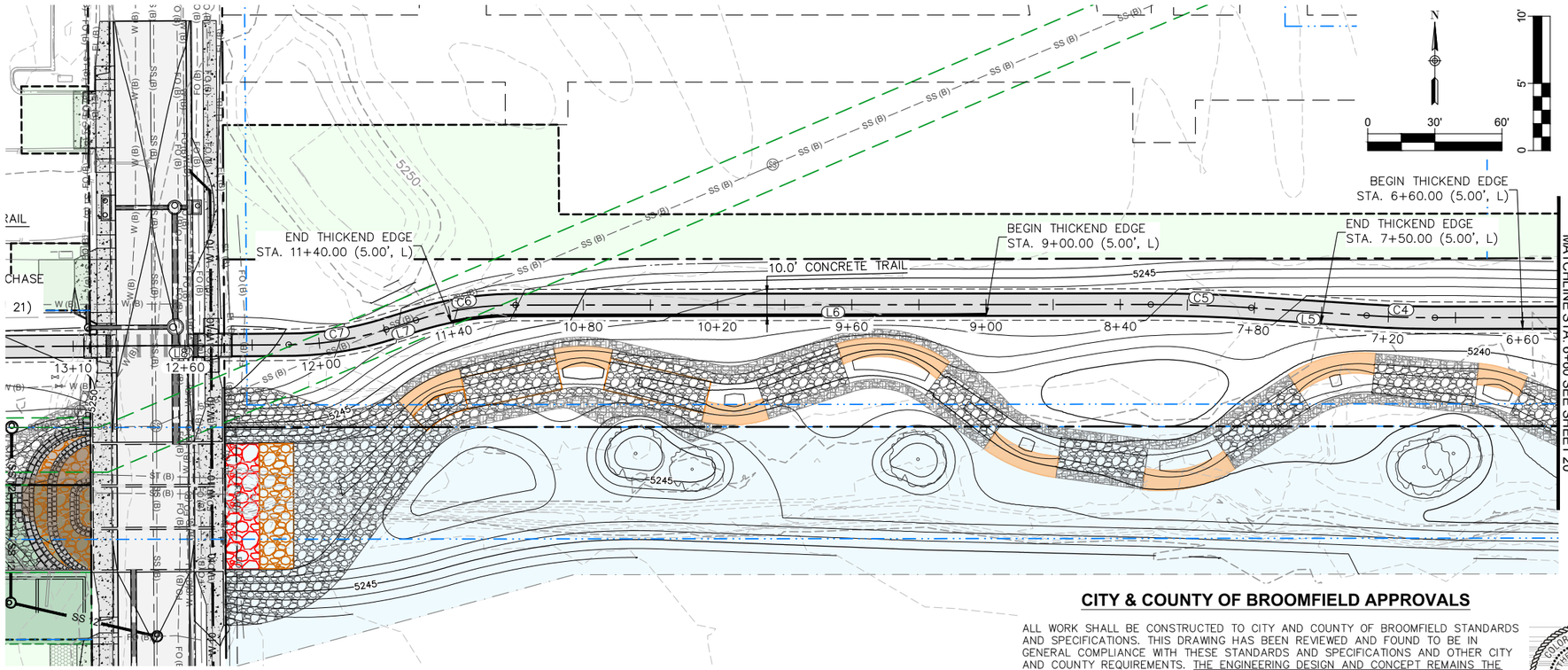
PREPARED BY: ICON ENGINEERING

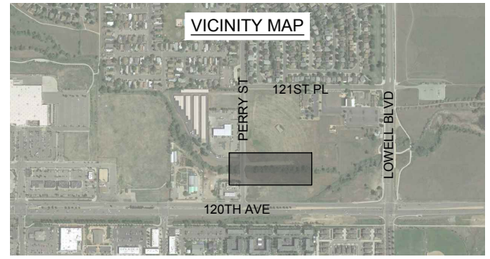
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PEDESTRIAN TRAIL PLAN & PROFILE - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 18 OF 90

plt:17-029-nrd-352 - nissen reservoir\06 dwg\ final design\05 final sheets\NRD - TRAIL P&P.dwg, Opdlaires, Pave Setup---- ICON-HALF-SIZE.ctb, 6/27/2024 1:27 PM





LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
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- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED BOULDER RIFFLE (SEE SHEET 53)
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION
- PROPOSED PEDESTRIAN TRAIL

CITY & COUNTY OF BROOMFIELD APPROVALS

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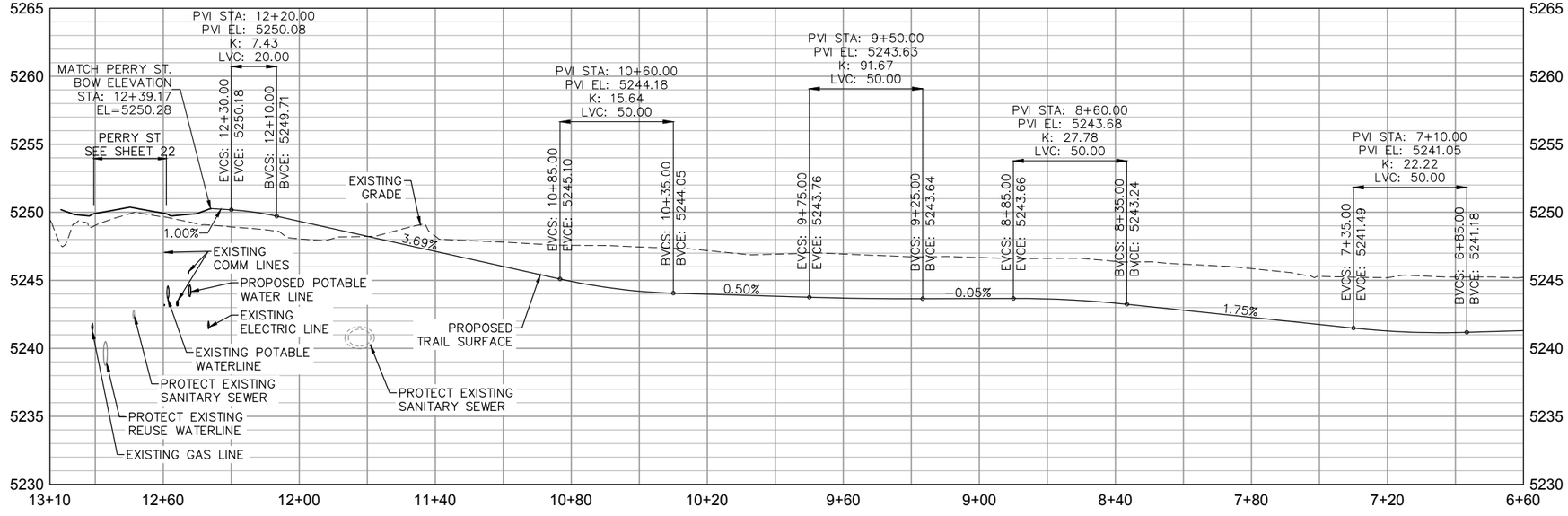
ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. HEALY
25513
05-23-2024
PROFESSIONAL ENGINEER



CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS FOR THE RELOCATION FOR ALL DRY UTILITIES THAT CONFLICT WITH THE PROPOSED IMPROVEMENTS

NOTES:

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7. SEE SHEETS 45–46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
8. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
9. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PEDESTRIAN TRAIL PLAN & PROFILE - 2

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 19 OF 90

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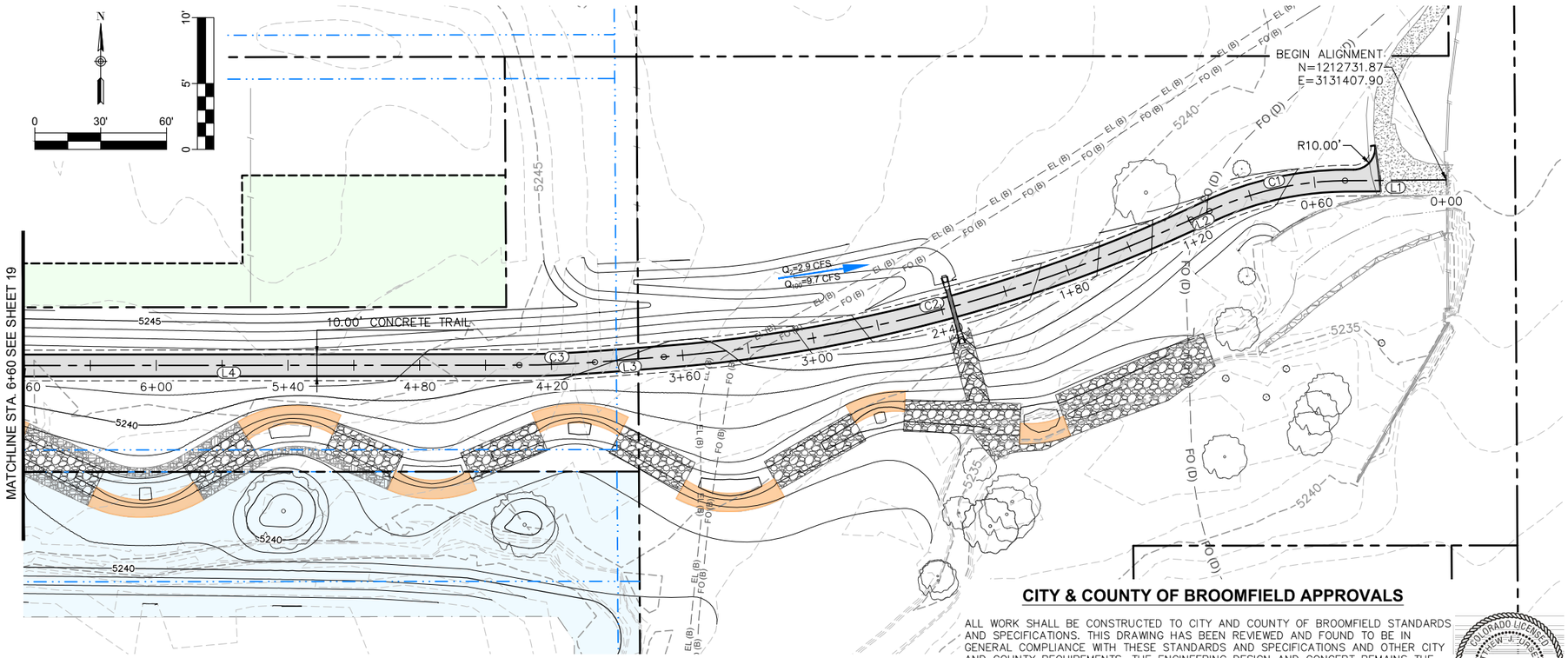

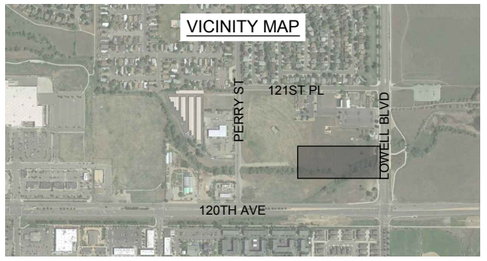

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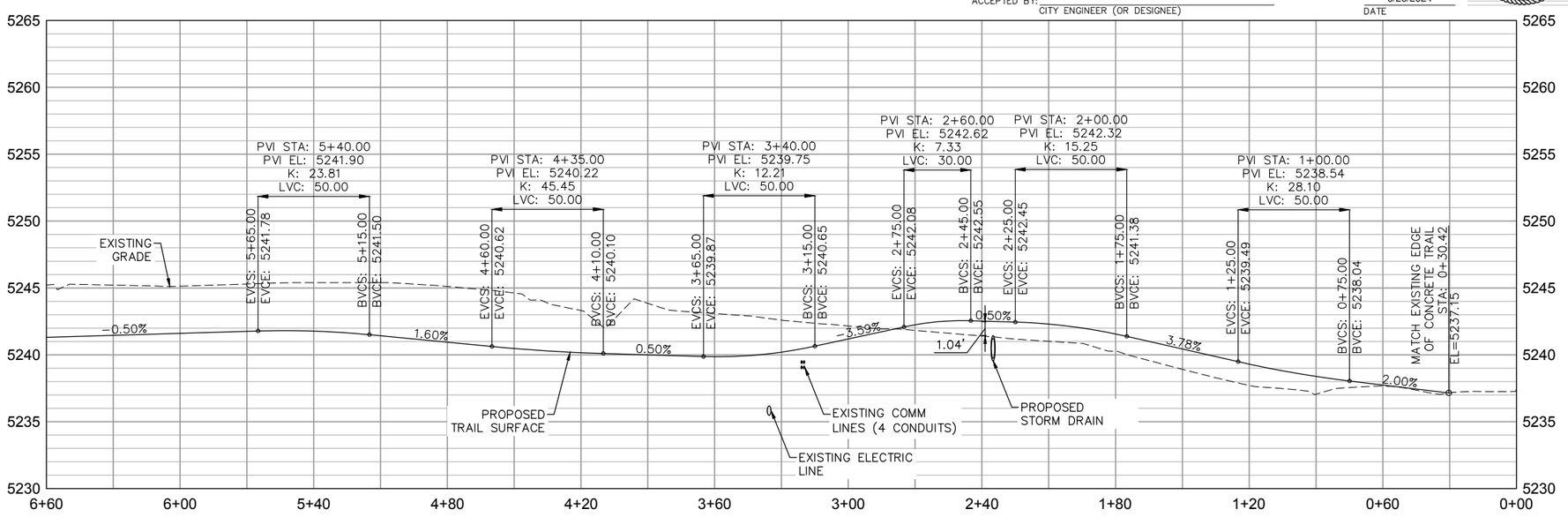
COLORADO LICENSED
MATTHEW J. UNGER
25513
05-28-2024
PROFESSIONAL ENGINEER



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
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NOTES:

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No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado / MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

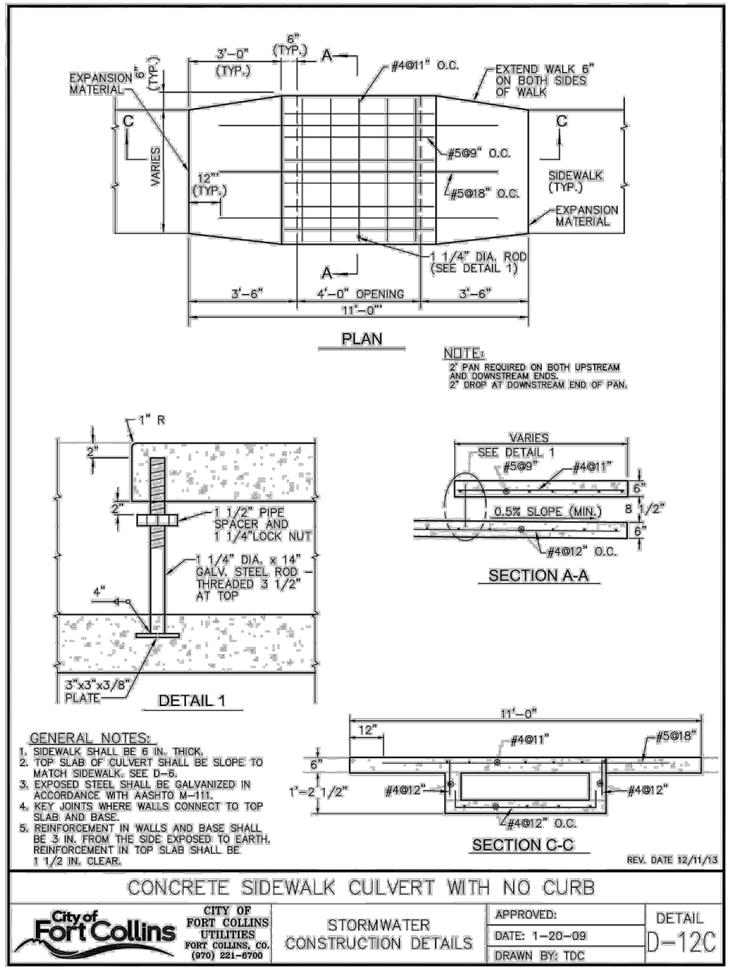
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PEDESTRIAN TRAIL PLAN & PROFILE - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 20 OF 90

p:\P17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - TRAIL P&P.dwg, Opstlarss, Page Setup:---- ICON HALF-SIZE.ctb, 6/27/2024 1:28 PM

MAIN TRAIL CL-US PERRY MAIN TRAIL CL-DS PERRY									
NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L11		14+36.32 14+82.86	1212710.61 1212747.92	3129774.49 3129746.66	46.54'	N36°43'30"W			
C9	PC= PI= PT=	13+60.44 13+99.34 14+36.32	1212664.73 1212679.44 1212710.61	3129833.76 3129797.75 3129774.49	75.88'	N52°15'09"W	31°03'18"	38.90'	140.00'
L10		13+26.79 13+60.44	1212652.00 1212664.73	3129864.91 3129833.76	33.65'	N67°46'48"W			
C8	PC= PI= PT=	12+28.05 12+78.08 13+26.79	1212633.44 1212633.09 1212652.00	3129961.23 3129911.22 3129864.91	98.74'	N79°05'40"W	22°37'45"	50.02'	250.00'
L9		10+00.00 12+28.05	1212635.07 1212633.44	3130189.28 3129961.23	228.05'	S89°35'28"W			
L8		12+13.68 13+10.00	1212635.21 1212634.52	3130208.71 3130112.39	96.32'	S89°35'28"W			
C7	PC= PI= PT=	11+69.42 11+91.71 12+13.68	1212642.00 1212635.37 1212635.21	3130252.28 3130231.00 3130208.71	44.25'	S81°08'21"W	16°54'14"	22.29'	150.00'
L7		11+55.48 11+69.42	1212646.15 1212642.00	3130265.59 3130252.28	13.94'	S72°41'14"W			
C6	PC= PI= PT=	11+10.28 11+33.05 11+55.48	1212652.95 1212652.93 1212646.15	3130310.10 3130287.33 3130265.59	45.20'	S81°19'12"W	17°15'55"	22.77'	150.00'
L6		8+26.43 11+10.28	1212653.18 1212652.95	3130593.95 3130310.10	283.85'	S89°57'09"W			
C5	PC= PI= PT=	7+81.46 8+03.95 8+26.43	1212651.71 1212653.20 1212653.18	3130638.89 3130616.45 3130593.95	44.98'	N88°07'28"W	3°50'46"	22.50'	670.00'
L5		7+29.78 7+81.46	1212648.29 1212651.71	3130690.45 3130638.89	51.67'	N86°12'05"W			
C4	PC= PI= PT=	6+99.24 7+14.52 7+29.78	1212647.29 1212647.27 1212648.29	3130720.98 3130705.70 3130690.45	30.54'	N88°07'28"W	3°50'46"	15.28'	455.00'
L4		4+34.62 6+99.24	1212647.51 1212647.29	3130985.60 3130720.98	264.62'	S89°57'09"W			
C3	PC= PI= PT=	4+00.15 4+17.39 4+34.62	1212648.84 1212647.52 1212647.51	3131020.03 3131002.84 3130985.60	34.47'	S87°46'55"W	4°20'27"	17.24'	455.00'
L3		3+68.63 4+00.15	1212651.25 1212648.84	3131051.46 3131020.03	31.52'	S85°36'42"W			
C2	PC= PI= PT=	1+19.16 2+45.23 3+68.63	1212713.79 1212660.90 1212651.25	3131291.60 3131177.17 3131051.46	249.47'	S75°24'07"W	20°25'09"	126.07'	700.00'
L2		1+09.91 1+19.16	1212717.67 1212713.79	3131300.00 3131291.60	9.25'	S65°11'33"W			
C1	PC= PI= PT=	0+46.14 0+78.51 1+09.91	1212731.51 1212731.26 1212717.67	3131361.76 3131329.38 3131300.00	63.77'	S77°22'16"W	24°21'26"	32.37'	150.00'
L1		0+00.00 0+46.14	1212731.87 1212731.51	3131407.90 3131361.76	46.14'	S89°32'59"W			



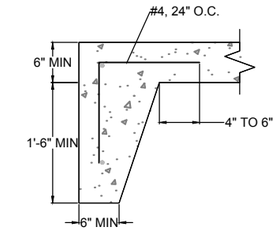
GENERAL NOTES:

1. SIDEWALK SHALL BE 6 IN. THICK.
2. TOP SLAB OF CULVERT SHALL BE SLOPE TO MATCH SIDEWALK. SEE D-6.
3. EXPOSED STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-111.
4. KEY JOINTS WHERE WALLS CONNECT TO TOP SLAB AND BASE.
5. REINFORCEMENT IN WALLS AND BASE SHALL BE 3 IN. FROM THE SIDE EXPOSED TO EARTH. REINFORCEMENT IN TOP SLAB SHALL BE 1 1/2 IN. CLEAR.

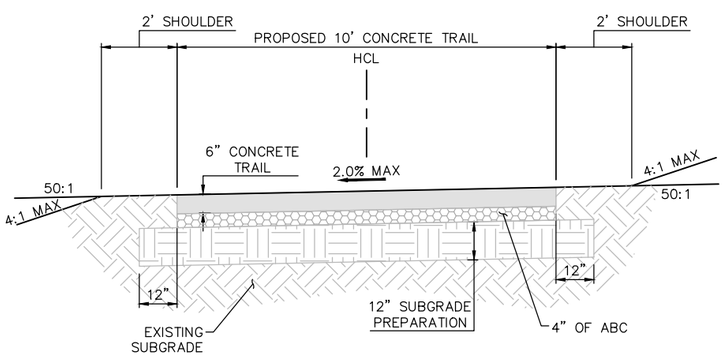
REV. DATE 12/11/13

CONCRETE SIDEWALK CULVERT WITH NO CURB

City of Fort Collins | CITY OF FORT COLLINS UTILITIES, FORT COLLINS, CO. (970) 221-6700 | STORMWATER CONSTRUCTION DETAILS | APPROVED: | DATE: 1-20-09 | DRAWN BY: TDC | DETAIL D-12C



THICKENED EDGE FOR CONCRETE TRAILS
N.T.S.



TRAIL TYPICAL SECTION A
STATION RANGES:
0+30 - 14+52
NTS

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

TRAIL NOTES:

1. REFER TO THE TYPICAL SECTIONS ON THIS SHEET FOR TYPICAL DIMENSIONS AND GRADES.
2. CONCRETE MIX SHALL BE CDOT CLASS B WITH A 28 DAY STRENGTH OF 4500 PSI WHEN TESTED IN ACCORDANCE WITH ASTM C31. CONCRETE MIX SHALL ALSO INCLUDE FIBERMESH REINFORCEMENT.
3. TRAILS AND SIDEWALKS SHALL BE CONSTRUCTED OF CONCRETE UNLESS OTHERWISE APPROVED BY THE CITY.
   - CONCRETE SHALL BE THREE-FOURTHS (3/4) INCH AGGREGATE.
   - SLUMP SHALL BE BETWEEN ONE (1) AND FOUR (4) INCHES.
   - FIVE (5) TO EIGHT (8) PERCENT AIR CONTENT.
   - A WATER/CEMENT RATIO OF NOT MORE THAN 0.45.
4. ALL CONCRETE SHALL HAVE AN APPROVED SYNTHETIC FIBER ADDED AT A RATE OF ONE AND ONE-HALF (1.5) POUNDS PER CUBIC YARD WITH THREE-FOURTHS (3/4) INCH TO ONE (1) INCH LENGTH FIBERS REQUIRED TO REDUCE CRACKING.
5. ALL CONCRETE CONTROL JOINTS SHALL BE SAW CUT NOT LESS THAN 25% AND NO MORE THAN 33% OF THE SLAB THICKNESS, AT REGULAR 10' INTERVALS OR AS DIRECTED. TOOL JOINTS NOT ALLOWED.
6. CONCRETE SURFACES SHALL RECEIVE A MEDIUM BROOM FINISH WITH THE DIRECTION OF BROOM STROKES BEING PERPENDICULAR TO THE LENGTH OF THE TRAIL.
7. EXPANSION JOINTS, INCLUDING FILLER AND SEALANT, SHALL BE PLACED AT A MAXIMUM OF 200-FT AS WELL AS LOCATIONS WHERE PAVEMENT ABUTS EXISTING PAVEMENTS OR STRUCTURES, AT ALL COLD JOINTS, OR AS DIRECTED.
8. BACKFILL EDGES OF TRAIL WITH ON-SITE MATERIAL AND SEED OR SOD PER PLANS.
9. SUBGRADE BELOW THE TRAIL SHALL BE SCARIFIED, RECONDITIONED, AND COMPACTED TO A DEPTH OF 12-INCHES BELOW BOTTOM OF TRAIL. SUBGRADE CONSTRUCTION SHALL EXTEND TO 12-INCHES BEYOND THE EDGE OF THE TRAIL. SOIL LIFT THICKNESSES SHALL NOT EXCEED 8-INCHES BEFORE COMPACTION.
10. COMPACTED SOIL SHALL BE PROOF ROLLED AND TESTED FOR COMPACTION AND MOISTURE CONTENT EVERY 250 LINEAR FEET OF TRAIL. SUBGRADE SHALL BE COMPACTED TO 95% OF THE PROCTOR DENSITY AS DETERMINED BY AASHTO T-99. MOISTURE CONTENT SHALL BE 0 TO +2 PERCENT OF OPTIMUM MOISTURE CONTENT.

COLORADO LICENSED
KEVIN J. JUNGE
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado | MHFD MILE HIGH FLOOD DISTRICT

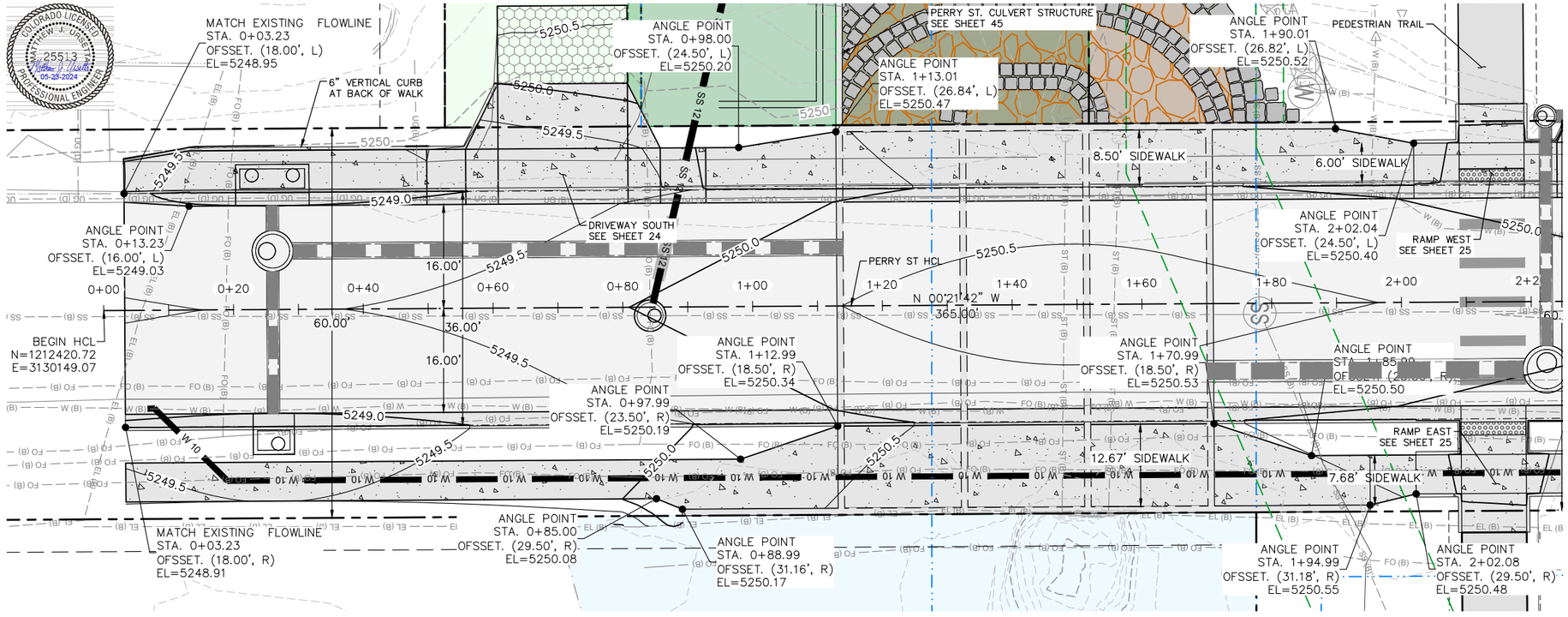
PREPARED BY: ICON ENGINEERING

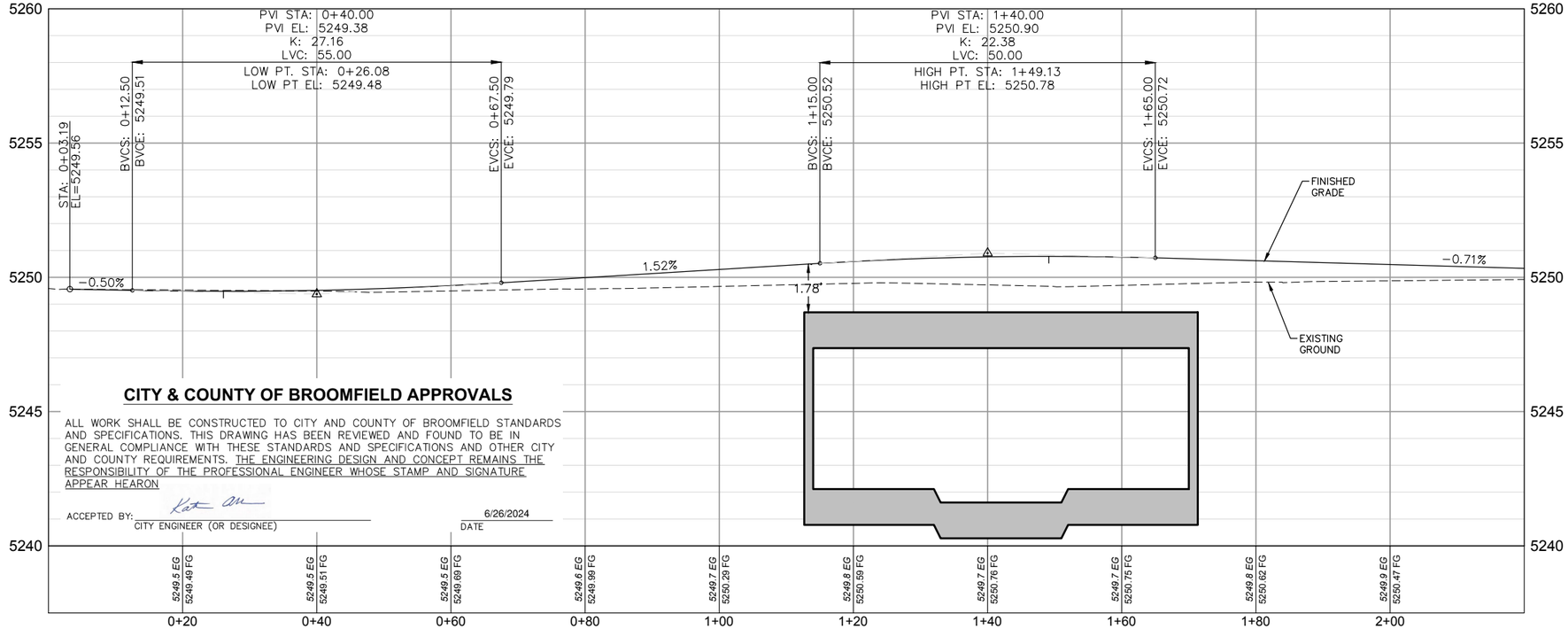
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PEDESTRIAN TRAIL DETAILS
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 21 OF 90

p:\P\17-029-nrd-352 - nissen reservoir\05 dwn final design\05 final sheets\NRD - TRAIL P&P dwn Opaltares, Page Setup: ---- ICON-HALF-SIZE etb 6/27/2024 1:28 PM





CITY & COUNTY OF BROOMFIELD APPROVALS

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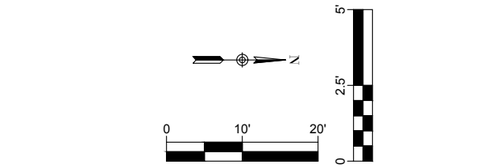
ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
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- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
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- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
2. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
3. SEE SHEET 28 FOR ROADWAY SECTION AND ASPHALT PAVEMENT INFORMATION.
4. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
5. SEE SHEETS 45-46 FOR PERRY ST. CULVERT STRUCTURE DETAILS.
6. SEE SHEETS 26 THRU 27 FOR ROADWAY CROSS SECTIONS.
7. DRIVEWAY SHALL HAVE AGGREGATE BASE COURSE AND SHALL BE 6" THICK OF CLASS 6 MATERIAL COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY.
8. CURB, GUTTER AND SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY AND COUNTY OF BROOMFIELD DETAIL 800-4 AND SHALL HAVE 4" OF CLASS 6 AGGREGATE BASE COURSE. THE WIDTH OF ALL SIDEWALKS SHALL BE 5-FT WIDE UNLESS OTHERWISE NOTED. DETAIL 800-4 CAN BE FOUND ON SHEET 28.

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

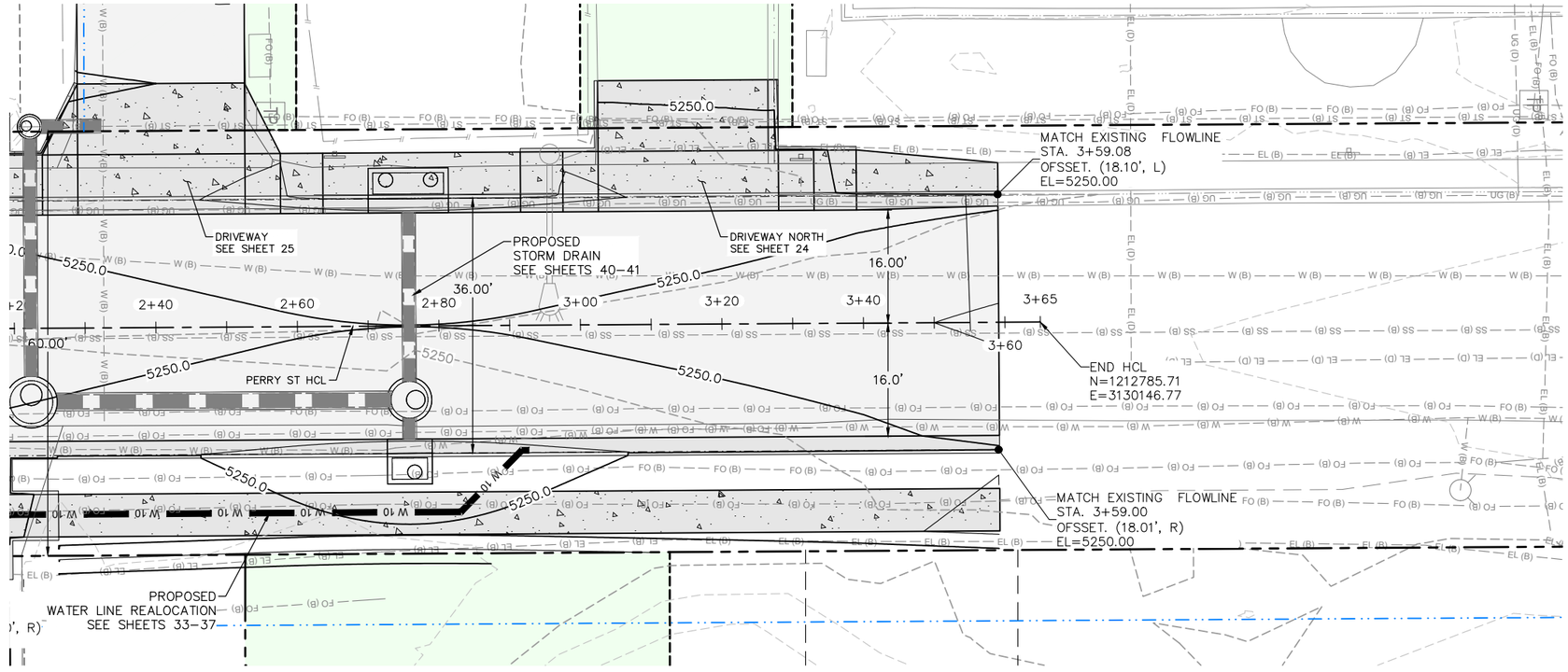
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PERRY STREET PLAN & PROFILE - 1

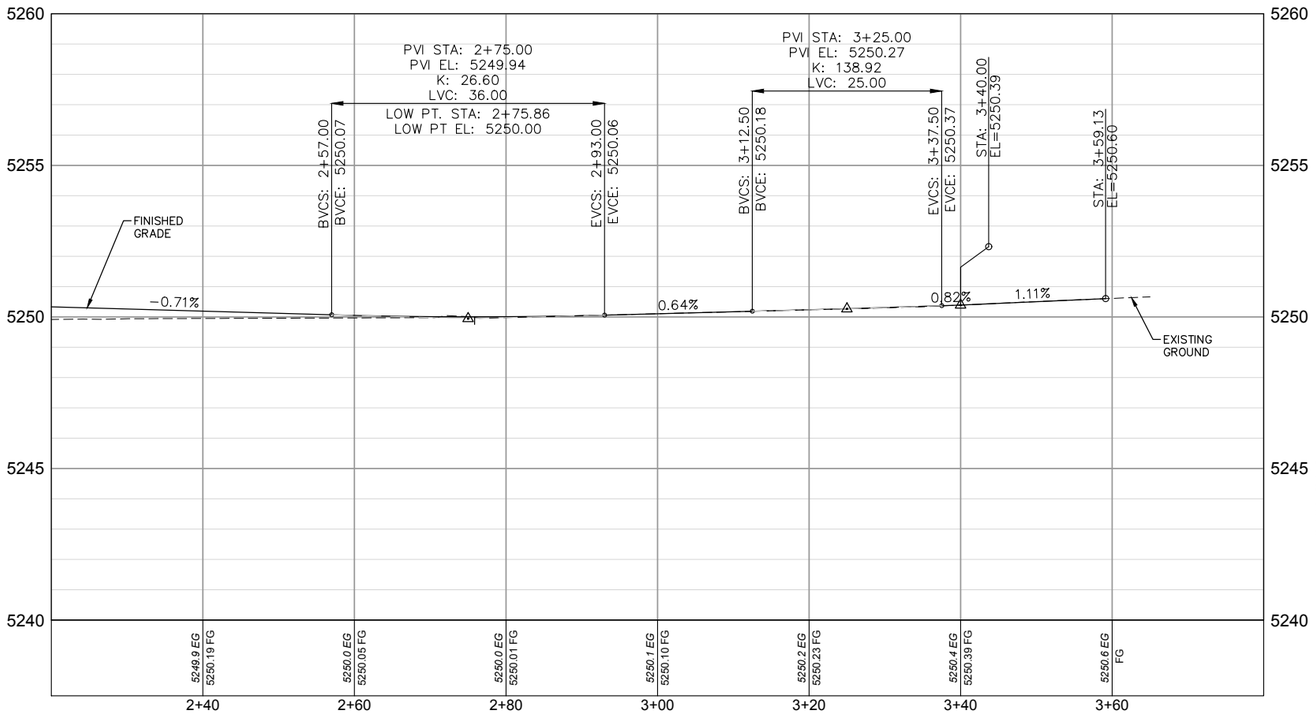
ICON PROJECT No. 17-029-NRD

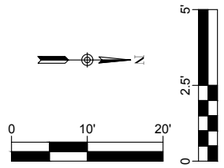
DATE MAY 2024

SHEET 22 OF 90

p:\p17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - ROADWAY dwg, Outlaters, Page Setup: ---- ICON-HALF-SIZE, rdb, 6/27/2024 1:29 PM







LEGEND

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CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
STEPHEN J. URSICH
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PERRY STREET PLAN & PROFILE - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 23 OF 90

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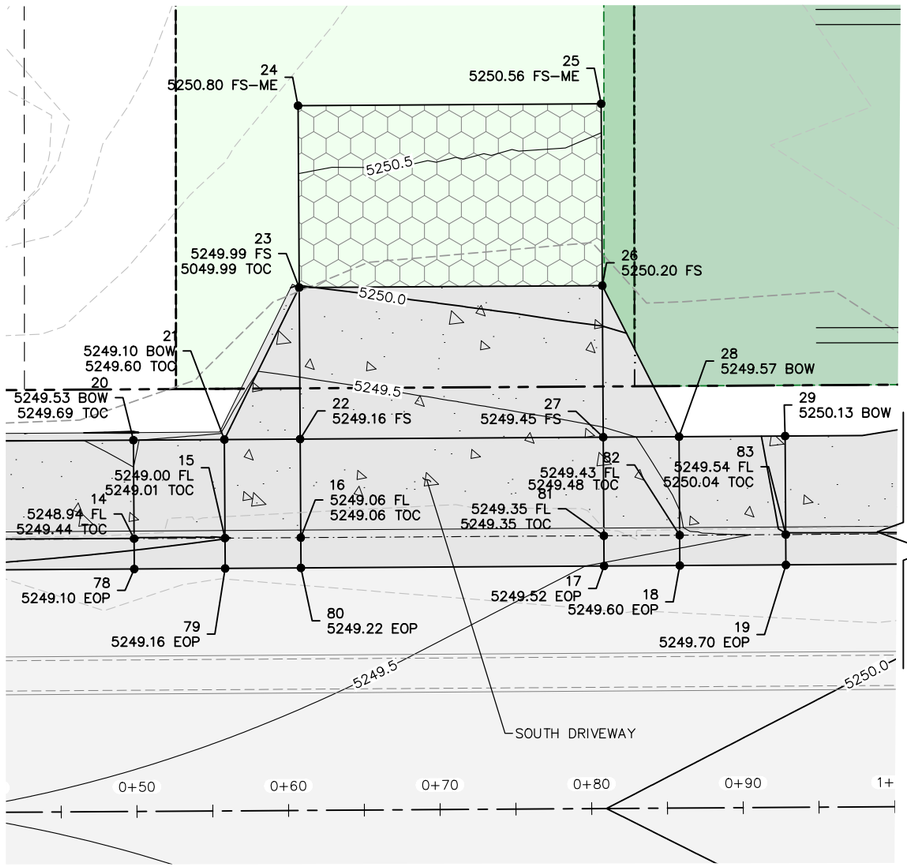

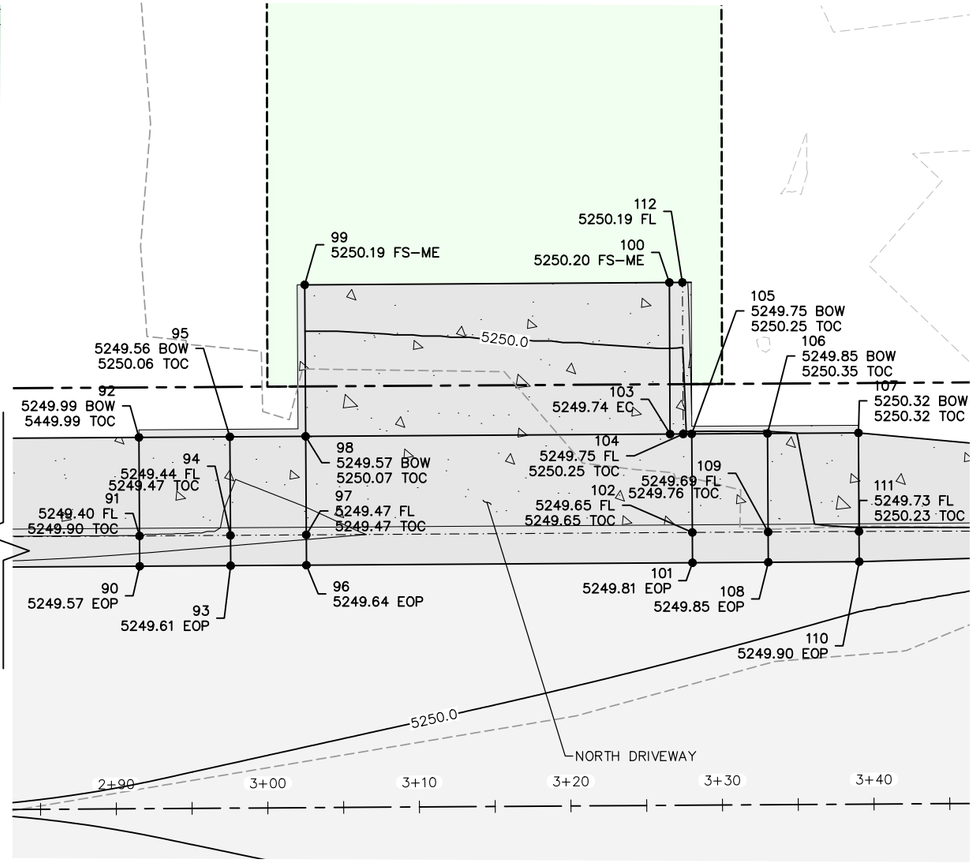

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LEGEND

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- PROPOSED PEDESTRIAN TRAIL

POINT TABLE - DRIVEWAY SOUTH				
POINT #	NORTHING	EASTING	STATION	OFFSET
14	1212470.52	3130130.75	0+49.92	18.00L
15	1212476.52	3130130.72	0+55.92	18.00L
16	1212481.52	3130130.68	0+60.92	18.00L
17	1212501.53	3130132.56	0+80.92	16.00L
18	1212506.53	3130132.53	0+85.92	16.00L
19	1212513.53	3130132.48	0+92.92	16.00L
20	1212470.48	3130124.25	0+49.92	24.50L
21	1212476.48	3130124.22	0+55.92	24.50L
22	1212481.48	3130124.18	0+60.92	24.50L
23	1212481.42	3130114.18	0+60.92	34.50L
24	1212481.34	3130102.19	0+60.92	46.50L
25	1212501.34	3130102.06	0+80.92	46.50L

POINT TABLE - DRIVEWAY SOUTH				
POINT #	NORTHING	EASTING	STATION	OFFSET
26	1212501.42	3130114.06	0+80.92	34.50L
27	1212501.48	3130124.06	0+80.92	24.50L
28	1212506.48	3130124.03	0+85.92	24.50L
29	1212513.48	3130123.98	0+92.92	24.50L
78	1212470.54	3130132.75	0+49.92	16.00L
79	1212476.54	3130132.72	0+55.92	16.00L
80	1212481.54	3130132.68	0+60.92	16.00L
81	1212501.52	3130130.56	0+80.92	18.00L
82	1212506.52	3130130.53	0+85.92	18.00L
83	1212513.52	3130130.48	0+92.92	18.00L

POINT TABLE - DRIVEWAY NORTH				
POINT #	NORTHING	EASTING	STATION	OFFSET
90	1212712.26	3130131.23	2+91.65	16.00L
91	1212712.25	3130129.23	2+91.65	18.00L
92	1212712.21	3130122.73	2+91.65	24.50L
93	1212718.26	3130131.19	2+97.65	16.00L
94	1212718.25	3130129.19	2+97.65	18.00L
95	1212718.21	3130122.69	2+97.65	24.50L
96	1212723.26	3130131.16	3+02.65	16.00L
97	1212723.25	3130129.16	3+02.65	18.00L
98	1212723.21	3130122.66	3+02.65	24.50L
99	1212723.14	3130112.66	3+02.65	34.50L
100	1212747.21	3130112.51	3+26.71	34.50L
101	1212748.74	3130131.00	3+28.12	16.00L

POINT TABLE - DRIVEWAY NORTH				
POINT #	NORTHING	EASTING	STATION	OFFSET
102	1212748.73	3130129.00	3+28.12	18.00L
103	1212747.25	3130122.51	3+26.69	24.50L
104	1212748.12	3130122.50	3+27.56	24.50L
105	1212748.68	3130122.50	3+28.12	24.50L
106	1212753.68	3130122.47	3+33.12	24.50L
107	1212759.68	3130122.43	3+39.12	24.50L
108	1212753.74	3130130.97	3+33.12	16.00L
109	1212753.73	3130128.97	3+33.12	18.00L
110	1212759.74	3130130.93	3+39.12	16.00L
111	1212759.73	3130128.93	3+39.12	18.00L
112	1212748.07	3130112.50	3+27.57	34.50L

CITY & COUNTY OF BROOMFIELD APPROVALS

COLORADO LICENSED MATTHEW J. JUNGET 25513 PROFESSIONAL ENGINEER 05-25-2024

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

NOMENCLATURE	
EC	EDGE OF CONCRETE
FS	FINISHED SURFACE
EOP	EDGE OF PAVEMENT
FL	FLOW LINE
TOC	TOP OF CURB
BOW	BACK OF WALK
ME	MATCH EXISTING

NOTES:

1. SEE SHEETS 3 THRU 7 FOR PROPERTY AND EASEMENT INFORMATION.
2. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
3. SEE SHEET 28 FOR ROADWAY SECTION AND ASPHALT PAVEMENT INFORMATION.
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No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

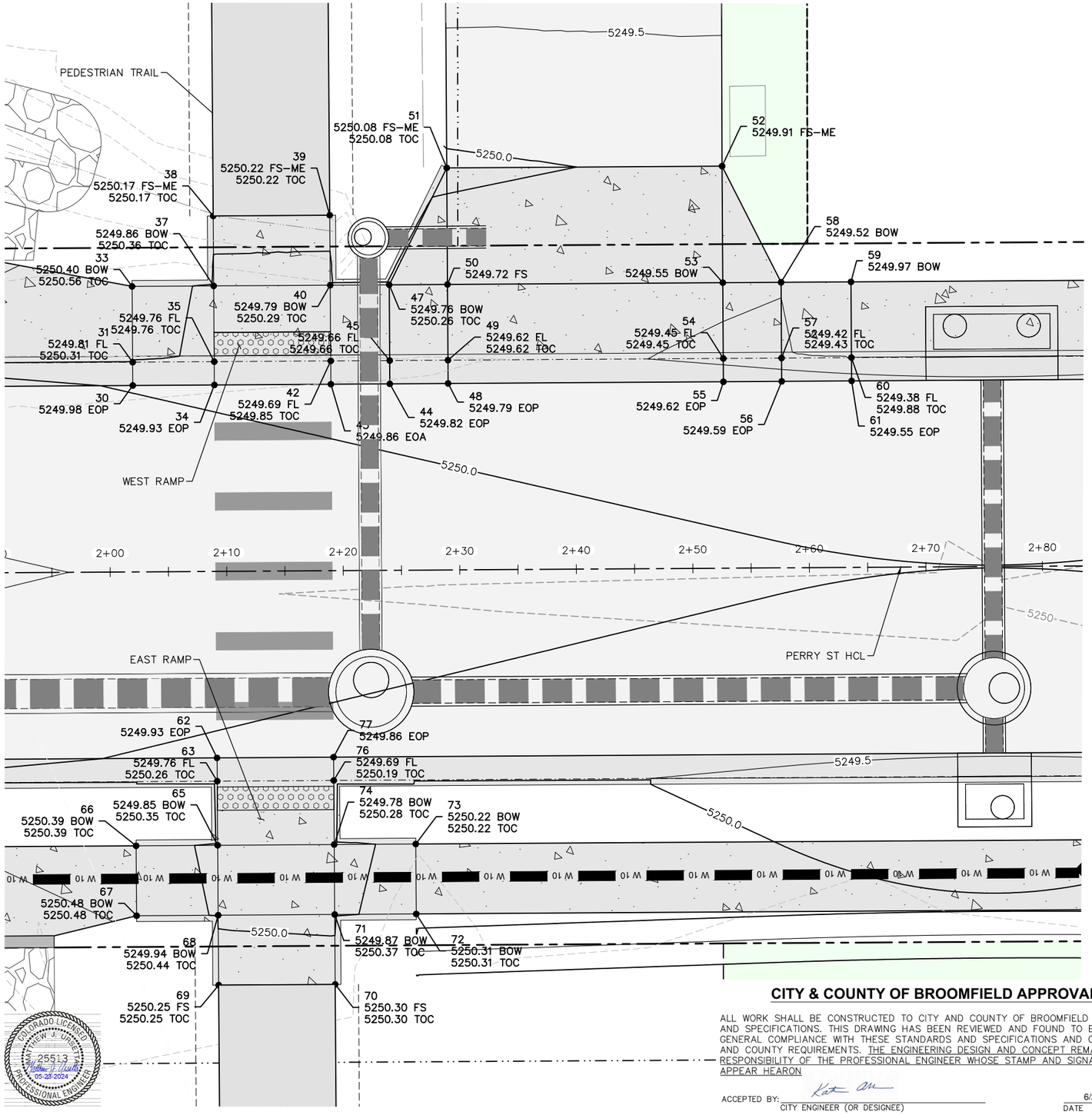
PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
DRIVEWAY & RAMP PLANS - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 24 OF 90

p:\P-17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - ROADWAY DRIVEWAY AND RAMP DETAILS.dwg, Orattaes, Page Setup: --- ICON-HALF-SIZE.ctb, 6/27/2024 1:30 PM



POINT TABLE - WEST RAMP AND DRIVEWAY				
POINT #	NORTHING	EASTING	STATION	OFFSET
30	1212622.66	3130131.79	2+02.04	16.00L
31	1212622.65	3130129.79	2+02.04	18.00L
33	1212622.60	3130123.29	2+02.04	24.50L
34	1212629.66	3130131.75	2+09.04	16.00L
35	1212629.65	3130129.75	2+09.04	18.00L
37	1212629.60	3130123.25	2+09.04	24.50L
38	1212629.56	3130117.25	2+09.03	30.50L
39	1212639.56	3130117.19	2+19.03	30.50L
40	1212639.60	3130123.19	2+19.04	24.50L
42	1212639.64	3130129.69	2+19.04	18.00L
43	1212639.66	3130131.69	2+19.04	16.00L
44	1212644.72	3130131.65	2+24.10	16.00L
45	1212644.70	3130129.65	2+24.10	18.00L
47	1212644.66	3130123.15	2+24.10	24.50L
48	1212649.72	3130131.62	2+29.10	16.00L
49	1212649.70	3130129.62	2+29.10	18.00L
50	1212649.66	3130123.12	2+29.10	24.50L
51	1212649.60	3130113.12	2+29.10	34.50L
52	1212673.22	3130112.97	2+52.73	34.50L
53	1212673.29	3130122.97	2+52.73	24.50L
54	1212673.33	3130129.47	2+52.73	18.00L
55	1212673.34	3130131.47	2+52.73	16.00L
56	1212678.34	3130131.44	2+57.73	16.00L
57	1212678.33	3130129.44	2+57.73	18.00L
58	1212678.29	3130122.94	2+57.73	24.50L
59	1212684.29	3130122.90	2+63.73	24.50L
60	1212684.33	3130129.40	2+63.73	18.00L
61	1212684.34	3130131.40	2+63.73	16.00L

POINT TABLE - EAST RAMP				
POINT #	NORTHING	EASTING	STATION	OFFSET
62	1212629.89	3130163.75	2+09.07	16.00R
63	1212629.90	3130165.75	2+09.07	18.00R
65	1212629.94	3130171.25	2+09.08	23.50R
66	1212622.94	3130171.29	2+02.08	23.50R
67	1212622.98	3130177.29	2+02.08	29.50R
68	1212629.98	3130177.25	2+09.08	29.50R
69	1212630.03	3130183.25	2+09.09	35.50R
70	1212640.03	3130183.19	2+19.09	35.50R
71	1212639.98	3130177.19	2+19.08	29.50R
72	1212646.98	3130177.14	2+26.08	29.50R
73	1212646.94	3130171.14	2+26.08	23.50R
74	1212639.94	3130171.19	2+19.08	23.50R
76	1212639.90	3130165.69	2+19.07	18.00R
77	1212639.89	3130163.69	2+19.07	16.00R

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

NOMENCLATURE	
EC	EDGE OF CONCRETE
FS	FINISHED SURFACE
EOP	EDGE OF PAVEMENT
FL	FLOW LINE
TOC	TOP OF CURB
BOW	BACK OF WALK
ME	MATCH EXISTING

0 5' 10'

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 3 THRU 7 FOR PROPERTY AND EASEMENT INFORMATION.
2. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
3. SEE SHEET 28 FOR ROADWAY SECTION AND ASPHALT PAVEMENT INFORMATION.
4. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
5. SEE SHEET 46 FOR PERRY ST. CULVERT STRUCTURE DETAILS.
6. SEE SHEETS 26 THRU 27 FOR ROADWAY CROSS SECTIONS.
7. DRIVEWAY SHALL HAVE AGGREGATE BASE COURSE AND SHALL BE 6" THICK OF CLASS 6 MATERIAL COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY.
8. CURB, GUTTER AND SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY AND COUNTY OF BROOMFIELD DETAIL 800-4. THE WIDTH OF ALL SIDEWALKS SHALL BE 5-FT WIDE UNLESS OTHERWISE NOTED. DETAIL 800-4 CAN BE FOUND ON SHEET 28.

COLORADO LICENSED — STEVEN J. USHER — 25513 — 05-25-2024 — PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MILE HIGH FLOOD DISTRICT

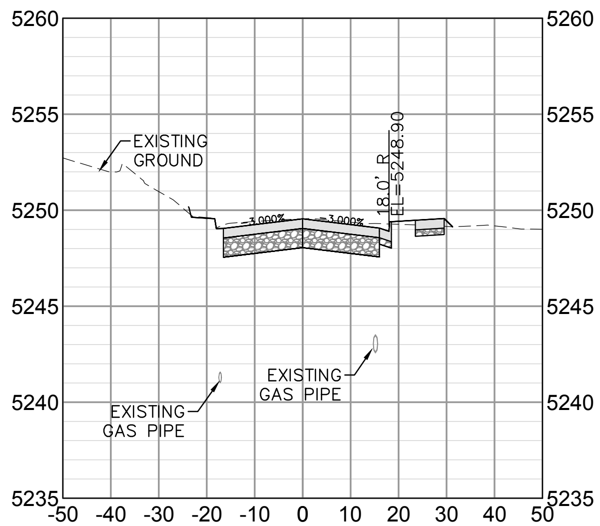
PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
DRIVEWAY & RAMP PLANS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 25 OF 90

P:\P17-029-nrd\352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - ROADWAY DRIVEWAY AND RAMP DETIALS.dwg, Qualtaire, Page Setup: --- ICON-HALF-SIZE.dtb, 6/27/2024 1:30 PM



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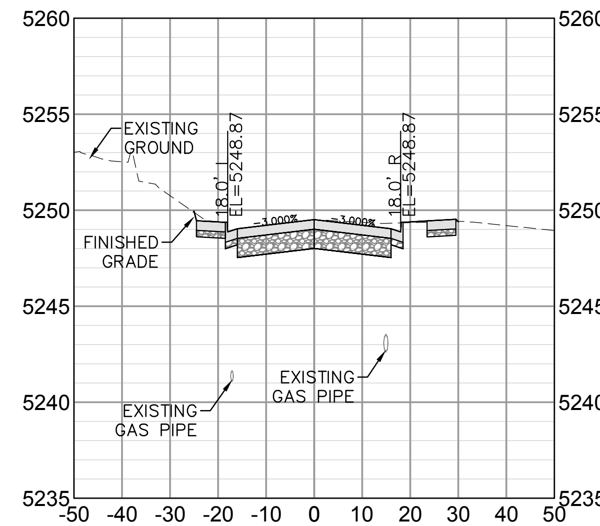

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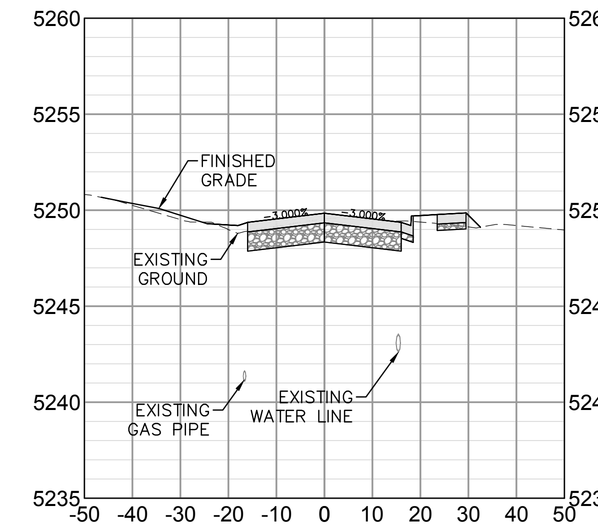

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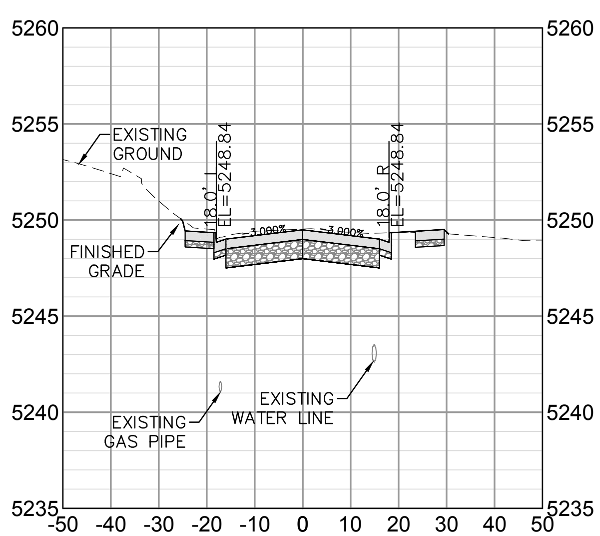

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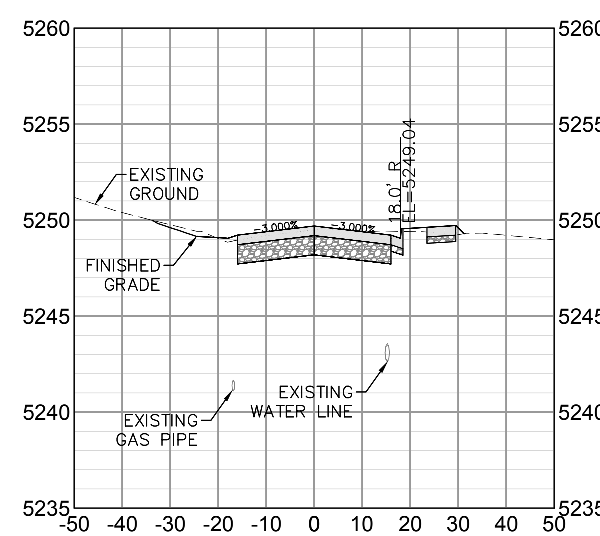

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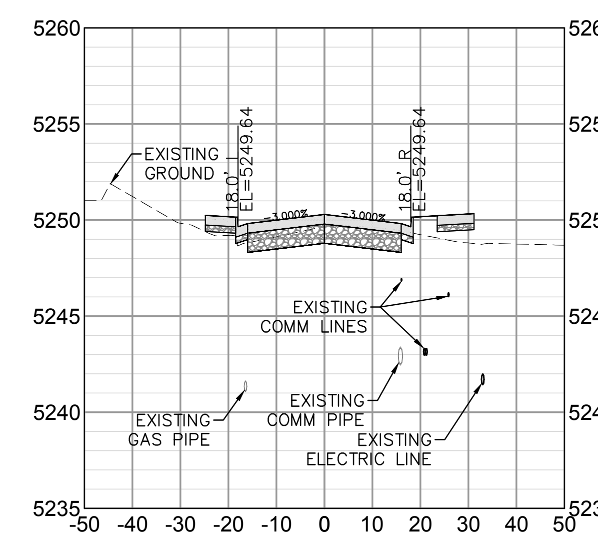

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CITY & COUNTY OF BROOMFIELD APPROVALS

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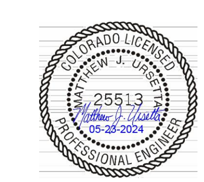
ACCEPTED BY: ____ CITY ENGINEER (OR DESIGNEE) 6/26/2024 DATE



No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN	
DRAWN	BSC / JMRKZ
DESIGNED	BSC / TJD
CHECKED	MJU

NISSEN RESERVOIR DRAINAGEWAY

PHASE 1

PERRY STREET CROSS SECTIONS - 1

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

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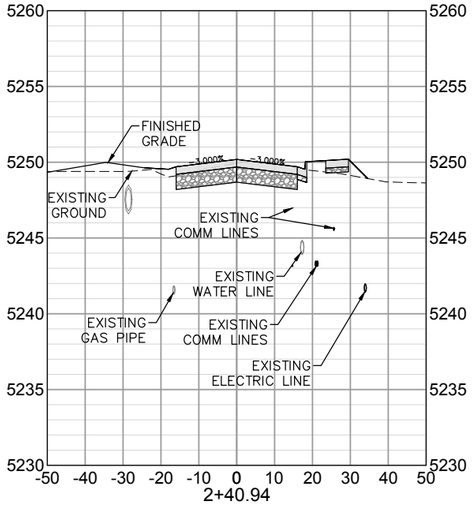

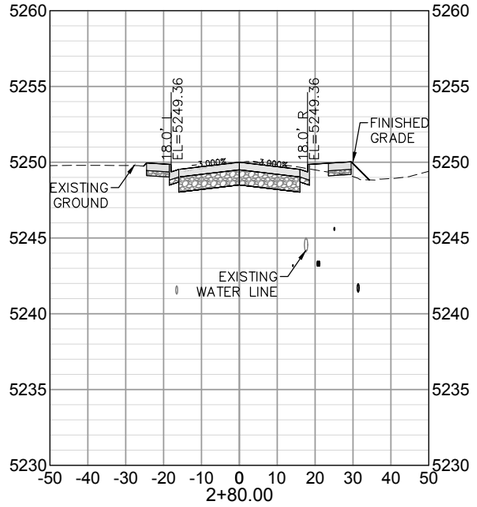

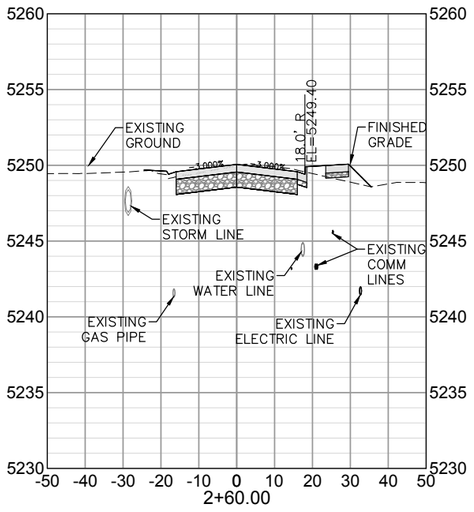

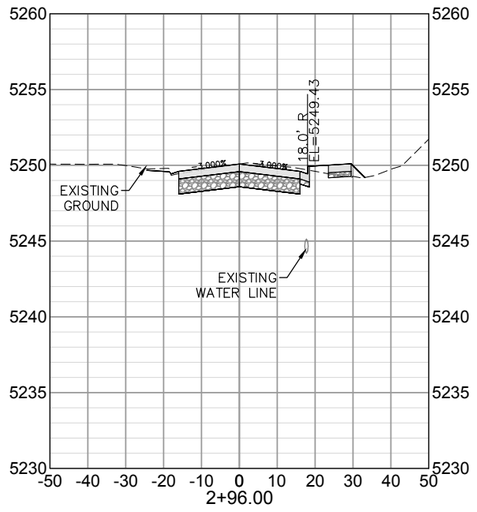

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — MATTHEW J. ULLRICH — 25513 — PROFESSIONAL ENGINEER — 05-23-2024

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PERRY STREET CROSS SECTIONS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 27 OF 90

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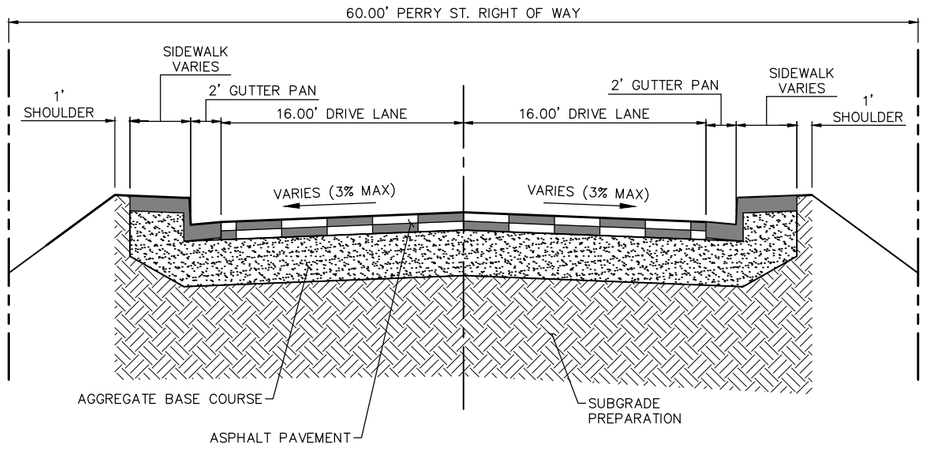
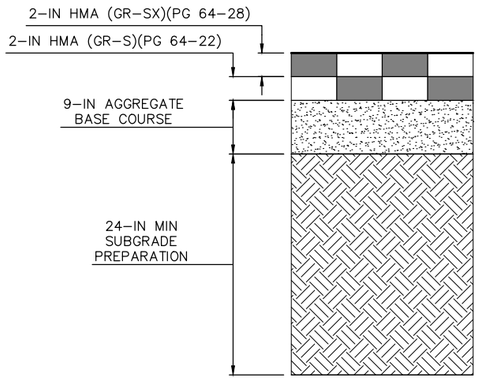
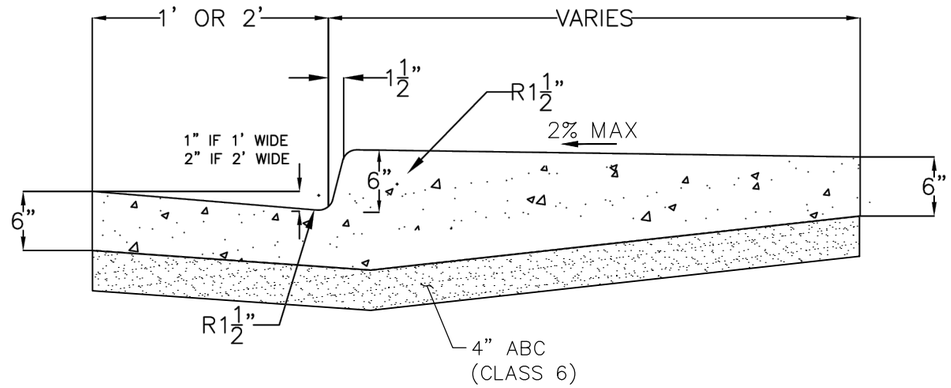




COMPOSITE HMA
PAVEMENT SECTION
N.T.S.

NOTES:

1. SEE SHEETS 26-27 FOR ROADWAY CROSS SECTIONS.
2. AGGREGATE BASE COURSE MATERIAL SHALL MEET THE CRITERIA OF CDOT CLASS 6 AGGREGATE BASE COURSE. BASE COURSE SHALL BE PLACED IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS AND COMPACTED TO AT LEAST 95% OF THE MODIFIED PROCTOR AND WITHIN 2% OPTIMUM MOISTURE CONTENT.
3. SUBGRADE PREPARATION SHALL INCLUDE MOISTURE CONDITIONING AND COMPACTING TO 95% OF THE MODIFIED PROCTOR AND WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT ACCORDING TO AASHTO T180. SUBGRADE SHALL BE COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS.
4. IMMEDIATELY PRIOR TO PAVING, THE SUBGRADE SHALL BE PROOF ROLLED WITH A HEAVILY LOADED, PNEUMATIC TIRED VEHICLE. AREAS SHOWING EXCESSIVE DEFLECTION SHALL BE EXCAVATED AND REPLACED AND/OR STABILIZED. THE CITY SHALL BE NOTIFIED PRIOR TO PAVING TO INSPECT PROOF ROLLING ACTIVITIES.
5. CURB, GUTTER AND SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY AND COUNTY OF BROOMFIELD DETAIL 800-4. THE WIDTH OF ALL SIDEWALKS SHALL BE 5-FT WIDE MINIMUM.



VERTICAL CATCH CURB WITH ATTACHED WALK

NOTES:

1. ALL CONCRETE TO BE 4000 PSI PER SECTION 822.00 OF CITY STANDARDS.
2. SUBGRADE TO BE COMPACTED TO 95% MODIFIED PROCTOR.
3. TRANSITION BETWEEN CURB & GUTTER TYPES SHALL BE DONE OVER A 10' MINIMUM LENGTH.
4. FOR USE IN RESIDENTIAL AREAS OF LOCAL COLLECTORS ONLY.

CITY & COUNTY OF BROOMFIELD APPROVALS

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COLORADO LICENSED — THOMAS J. JARVIS — 25513 — 05-28-2024 — PROFESSIONAL ENGINEER

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: MONOLITHIC INTEGRAL CURBWALK
DETAIL DRAWING NUMBER: 800-4
DATE: 2018

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
ROADWAY DETAILS
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 28 OF 90

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UTILITY GENERAL NOTES:

1. THE CONTRACTOR ASSUMES RESPONSIBILITY FOR THE PROTECTION OF ALL UTILITIES DURING THE WORK. REPAIR OF DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. IT IS ESTIMATED THAT 24 HOURS OF POTHOLING WILL BE REQUIRED ON THIS PROJECT. USE OF THE TERM "POTHOLING" SHALL NOT BE CONSTRUED TO IMPLY ANY PARTICULAR METHOD OF PROSPECTING. POTHOLING OF AN AREA SHALL TAKE PLACE AT LEAST 10 CALENDAR DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION OPERATIONS IN THAT AREA. HOURS APPROVED FOR PAYMENT UNDER THIS PAY ITEM SHALL BE AT THE DISCRETION OF THE CITY. PAYMENT FOR THIS SHALL BE MADE BY THE HOUR CONSISTENT WITH THE SPECIFICATIONS.
3. THE CONTRACTOR SHALL VERIFY AND DOCUMENT THE CONDITIONS OF EXISTING UTILITIES (VISIBLE FACILITIES) WITH THE ENGINEER AND REPRESENTATIVES FROM THE UTILITY COMPANIES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
4. EXISTING UTILITIES ARE SHOWN ON THESE PLANS IN ACCORDANCE WITH THEIR ACHIEVED "QUALITY LEVELS" AS DEFINED BELOW AND BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS DOCUMENT ASCE 38, "STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." EXISTING UTILITY LOCATIONS ARE SHOWN ACCORDING TO THE BEST AVAILABLE DATA AND REPRESENT CONDITIONS AT THE TIME OF DATA COLLECTION. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING ALL APPLICABLE UTILITY DAMAGE PREVENTION STATUTES AND PROCEDURES DURING CONSTRUCTION. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL CONTACT COLORADO 811 AT 1-800-922-1987 AND FOLLOW-UP WITH ALL UTILITY COMPANIES TO LOCATE ALL EXISTING UTILITIES WITHIN CONTRACTOR'S PLANNED WORK AREAS. CONTRACTOR SHALL VERIFY EXISTENCE, SIZE, LOCATION, AND ELEVATION OF EXISTING UTILITIES AND VERIFY THE ENGINEER'S INTENDED COURSE OF ACTION FOR EACH UTILITY AS NOTED ON THE PLANS, AND ANY DISCREPANCY FOUND SHALL BE PRESENTED TO THE CITY AND ENGINEER PRIOR TO BEGINNING CONSTRUCTION. ALL COSTS ASSOCIATED WITH FIELD VERIFICATION OF LOCATION AND DEPTHS OF EXISTING UTILITIES FOR DAMAGE PREVENTION SHALL BE BORNE BY THE CONTRACTOR AND SHALL BE COMPLETED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
5. THE OPINION OF QUALITY AND RELIABILITY OF THE UTILITY INFORMATION SHOWN ON THESE PLANS IS EXPRESSED IN TERMS OF "QUALITY LEVELS" IN ACCORDANCE WITH THE FOLLOWING:
   - 5.1. QUALITY LEVEL A (QL-A) – PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, AT THE SPECIFIC POINT SHOWN ON THESE PLANS.
   - 5.2. QUALITY LEVEL B (QL-B) – INFORMATION OBTAINED THROUGH THE APPLICATION OF SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. THIS INFORMATION WAS SURVEYED AND REDUCED ONTO THESE PLANS.
   - 5.3. QUALITY LEVEL C (QL-C) – INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.
   - 5.4. QUALITY LEVEL D (QL-D) – INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.
6. THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND STRUCTURES IN PLACE UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL RE-ESTABLISH ANY UTILITIES OR SERVICES DAMAGED BY EXECUTION OF THE WORK AT THE CONTRACTOR'S EXPENSE.
8. CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADJUSTMENTS TO PUBLICLY OWNED MANHOLES OR VALVE BOXES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING UTILITY ADJUSTMENTS TO ELIMINATE CONFLICT WITH PROGRESS OF THE WORK. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT ALL UTILITIES OWNERS TO COORDINATE SCHEDULING. SHOULD ANY CONFLICTS, RECONSTRUCTION, OR OTHER INTERRUPTIONS IN SERVICE BE REQUIRED, CONTRACTOR SHALL COORDINATE UTILITY SCHEDULING WITH ALL AFFECTED PARTIES.
10. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT ALL UTILITIES OWNER TO COORDINATE SCHEDULING. SHOULD ANY CONFLICTS, RECONSTRUCTION, OR OTHER INTERRUPTIONS IN SERVICE BE REQUIRED, CONTRACTOR SHALL COORDINATE UTILITY SCHEDULING WITH ALL AFFECTED PARTIES.
11. CONTRACTOR IS RESPONSIBLE FOR ALL MANHOLE, VALVE BOX, HAND HOLE, ECT. ADJUSTMENTS TO FINISHED GRADE. ADJUSTMENTS ARE CONSIDERED INCIDENTAL TO PROJECT CONSTRUCTION AND SHALL NOT BE PAID FOR SEPARATELY.
12. UTILITIES MAY HAVE BEEN INSTALLED, RELOCATED OR ABANDONED WITHIN THE PROJECT AREA SINCE THE DATE OF FINAL UTILITY DATA COLLECTION WORK ON NOVEMBER 23, 2019.

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EL (D) — EXISTING ELECTRIC (QL-D)
- EL (B) — EXISTING ELECTRIC (QL-B)
- UG (D) — EXISTING GAS (QL-D)
- UG (B) — EXISTING GAS (QL-B)
- SS (B) — EXISTING SANITARY SEWER (QL-B)
- ST (D) — EXISTING STORM SEWER (QL-D)
- ST (B) — EXISTING STORM SEWER (QL-B)
- FO (D) — EXISTING COMMUNICATION LINE (QL-D)
- FO (B) — EXISTING COMMUNICATION LINE (QL-B)
- W (B) — EXISTING REUSE WATERLINE (QL-B)
- W (D) — EXISTING POTABLE WATERLINE (QL-D)
- W (C) — EXISTING POTABLE WATERLINE (QL-C)
- W (B) — EXISTING POTABLE WATERLINE (QL-B)
- W 10 — PROPOSED 10-IN POTABLE WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- X X X X X X X X — REMOVE IDENTIFIED ITEM
- SEWER ENCASEMENT (SEE NOTES)
- EXISTING ELECTRIC (QL-A)
- EXISTING GAS (QL-A)
- EXISTING SANITARY SEWER (QL-A)
- EXISTING COMMUNICATION LINE (QL-A)
- EXISTING REUSE WATERLINE (QL-A)
- EXISTING POTABLE WATERLINE (QL-A)

NOTES:

1. SEE SHEETS 3-6 FOR PROPERTY AND EASEMENT INFORMATION.

TESTHOLE LOG (TESTHOLES PERFORMED BY BT CONSTRUCTION ON NOVEMBER 23, 2019)

TH#	UTILITY	OWNER	SIZE	MATERIAL	DATE TEST HOLED	LOCATION	DEPTH TO TOP (INCHES)	DEPTH TO BOTTOM (INCHES)	NORTHING	EASTING	SURFACE ELEVATION (FT)	TOP OF UTILITY ELEVATION (FT)	Note	Disposition
14A	REUSE	CCB	14"	PVC	1/5/2018	~110 ft West of Perry St.	85	N/A	1212614.904	3130015.907	5248.81	5241.73	20" DIP in Broomfield notes, see footnote 1	Protect existing waterline
14B	REUSE	CCB	14"	PVC	1/4/2018	West Perry St.	100	N/A	1212615.14	3130119.852	5248.76	5240.43	20" DIP in Broomfield notes, see footnote 1	
15	SANITARY	CCB	8"	STEEL	1/4/2018	West Perry St.	87	N/A	1212598.315	3130118.742	8249.03	8241.78	Utility may be sanitary or waterline	
16	GAS	?	DNF	DNF	1/12/2018	West Perry St.	DNF	DNF	1212600.951	3130130.398	-	-	Not Found	
17A	GAS	?	DNF	DNF	1/4/2018	West Perry St.	DNF	DNF	1212557.416	3130131.598	-	-	Not Found	
18	COMM	?	1"	PLASTIC	1/5/2018	East Perry St. - North of Culvert	30	N/A	1212588.137	3130163.646	5249.57	5247.07		To be relocated by utility owners
19	WATER	CCB	14"	STEEL	1/5/2018	East Perry St. - North of Culvert	69	N/A	1212588.115	3130164.767	5249.35	5243.60	10" DIP in Broomfield notes, see footnote 2	Contractor to remove existing water line
20	COMM	?	2 x 4"	PLASTIC	1/5/2018	East Perry St. - North of Culvert	65	N/A	1212583.991	3130169.796	5248.89	5243.47		To be relocated by utility owners
21	COMM	?	2"	PLASTIC	1/5/2018	East Perry St. - North of Culvert	39	N/A	1212589.246	3130172.691	5248.94	5245.69		To be relocated by utility owners
23	COMM	?	DNF	DNF	1/5/2018	East Perry St. - North of Culvert	DNF	DNF	1212602.882	3130185.698	-	-	Not Found	
27	COMM	?	1"	PLASTIC	1/3/2018	Perry St - South of Culvert	30	N/A	1212553.974	3130164.534	5249.43	5246.93	See footnote 2	To be relocated by utility owners
28	WATER	CCB	14"	STEEL	1/3/2018	Perry St - South of Culvert	79	N/A	1212554.218	3130165.217	5249.35	5242.77	10" DIP in Broomfield notes, see footnote 2	Contractor to remove existing water line
29	COMM	?	2 x 4"	PLASTIC	1/3/2018	Perry St - South of Culvert	68	N/A	1212550.859	3130171.44	5248.98	5243.31		To be relocated by utility owners
30	COMM	?	3 x 1/2"	PLASTIC	1/3/2018	Perry St - South of Culvert	33	N/A	1212553.293	3130174.463	5248.95	5246.20		To be relocated by utility owners
31	ELECTRIC	XCEL	6"	PLASTIC	1/3/2018	Perry St - South of Culvert	76	N/A	1212551.524	3130179.952	5248.29	5241.96		To be relocated by utility owners
33	COMM	?	DNF	DNF	1/3/2018	Perry St - South of Culvert	DNF	DNF	1212548.065	3130185.787	-	-	N/A	
115	SANITARY	CCB	12"	CONCRETE	9/20/2019	West Perry St.	73	85	1212597.89	3129863.657	5249.81	5243.73	See footnote 3	
116	SANITARY	CCB	12"	CONCRETE	9/20/2019	West Perry St.	84	96	1212597.893	3130085.332	5249.81	5242.81	See footnote 3	
117	GAS	XCEL	6"	STEEL	9/19/2019	Perry St.	87	93	1212514.62	3130132.255	5249.07	5241.82		
118	SANITARY	CCB	8"	CLAY	9/19/2019	Perry St.	80	88	1212505.068	3130150.223	5249.84	5243.17	See footnote 4	
119	WATER	CCB	DNF	DNF	9/19/2019	Perry St.	DNF	DNF	1212505.133	3130159.303	5249.76	DNF	10" DIP in Broomfield notes, see footnote 2	Contractor to remove existing water line
119A	WATER	CCB	12"	STEEL	9/20/2019	Perry St.	70	82	1212505.091	3130164.119	5249.76	5243.93	10" DIP in Broomfield notes, see footnote 2	Contractor to remove existing water line
120	WATER	CCB	12"	DIP	9/24/2019	Perry St.	55	67	1212617.989	3130164.766	5250.05	5245.47	10" DIP in Broomfield notes, see footnote 2	Contractor to remove existing water line
121	ELECTRIC	XCEL	8"	PVC	9/23/2019	West of Lowell	78	86	1212636.801	3131070.182	5242.66	5236.16		To be relocated by utility owners
122	COMM	ZAYO/CL	4 x 2"	PVC	9/23/2019	West of Lowell	32	37	1212633.582	3131079.866	5242.21	5239.54		To be relocated by utility owners

TESTHOLE FOOTNOTES:

1. REUSE WATERLINE IS 20-IN DIP ACCORDING TO RECORD DRAWINGS AND CCB.
2. POTABLE WATERLINE IN PERRY ST. ROW IS 10-IN DIP ACCORDING TO CCB.
3. CCB CONFIRMED SANITARY SEWER IS 15-IN RCP.
4. CCB CONFIRMED SANITARY SEWER IS 8-IN CLAY.

UTILITIES NOTICE TO CONTRACTOR AND UTILITY OWNERS & OPERATORS:

IN ACCORDANCE WITH COLORADO REVISED STATUTES 2018, TITLE 9, ARTICLE 1.5-103:

1) THE CONTRACTOR SHALL NOTIFY CO 811 PRIOR TO EXCAVATION WORK AND ABIDE BY ALL OTHER APPLICABLE STATUTES TO PROTECT UTILITIES. THE CONTRACTOR SHALL PROTECT UTILITIES NOT SHOWN ON THESE PLANS, AND MAY BE HELD RESPONSIBLE FOR DAMAGES TO UTILITIES.

2) UTILITY OWNERS AND OPERATORS SHALL RESPOND TO CONTRACTOR'S NOTIFICATION OF A PLANNED EXCAVATION AND ABIDE BY ALL OTHER APPLICABLE STATUTES. A UTILITY OWNER AND/OR OPERATOR WHO FAILS TO RESPOND TO THE CONTRACTOR'S NOTIFICATION OF PLANNED EXCAVATION, MAY BE DEEMED RESPONSIBLE FOR DAMAGES TO UTILITIES. IN THE EVENT OF DAMAGE TO AN UNDERGROUND UTILITY FACILITY, THE EXCAVATOR, OWNER AND OPERATOR SHALL COOPERATE AND FOLLOW ALL APPLICABLE STATUTES TO MITIGATE THE DAMAGES.

3) THE CITY & COUNTY OF BROOMFIELD, THE MILE HIGH FLOOD DISTRICT, AND THE ENGINEER OF RECORD WILL NOT BE RESPONSIBLE FOR ANY DAMAGES TO UTILITIES AND/OR ANY OTHER DELAYS OR COSTS ASSOCIATED WITH DAMAGES TO UTILITIES.

PROJECT CONTACT LIST

ORGANIZATION	NAME	PHONE NUMBER
AT&T	BRIAN HOLT	303-898-6666
CDOT	JAMES OLSEN	970-218-8225
CENTURYLINK	MARINA GRIDINSKAYA	720-578-3712
CITY AND COUNTY OF BROOMFIELD	MERCEDES MOON	303-464-5174
COMCAST	TERRY HERRING	720-951-3571
XCEL	JEREMY HUTAFF	303-425-3823
ZAYO	JAMES BLACK	719-216-8508

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: [signature] CITY ENGINEER (OR DESIGNEE) 6/26/2024 DATE

COLORADO LICENSED PROFESSIONAL ENGINEER — MATTHEW J. URBETT — 25513 — 05-28-2024

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN — DRAWN: BSC / JMRKZ — DESIGNED: BSC / TJD — CHECKED: MJU

NISSEN RESERVOIR DRAINAGEWAY

PHASE 1

UTILITY PLANS - COVER

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

CITY & COUNTY OF BROOMFIELD APPROVALS

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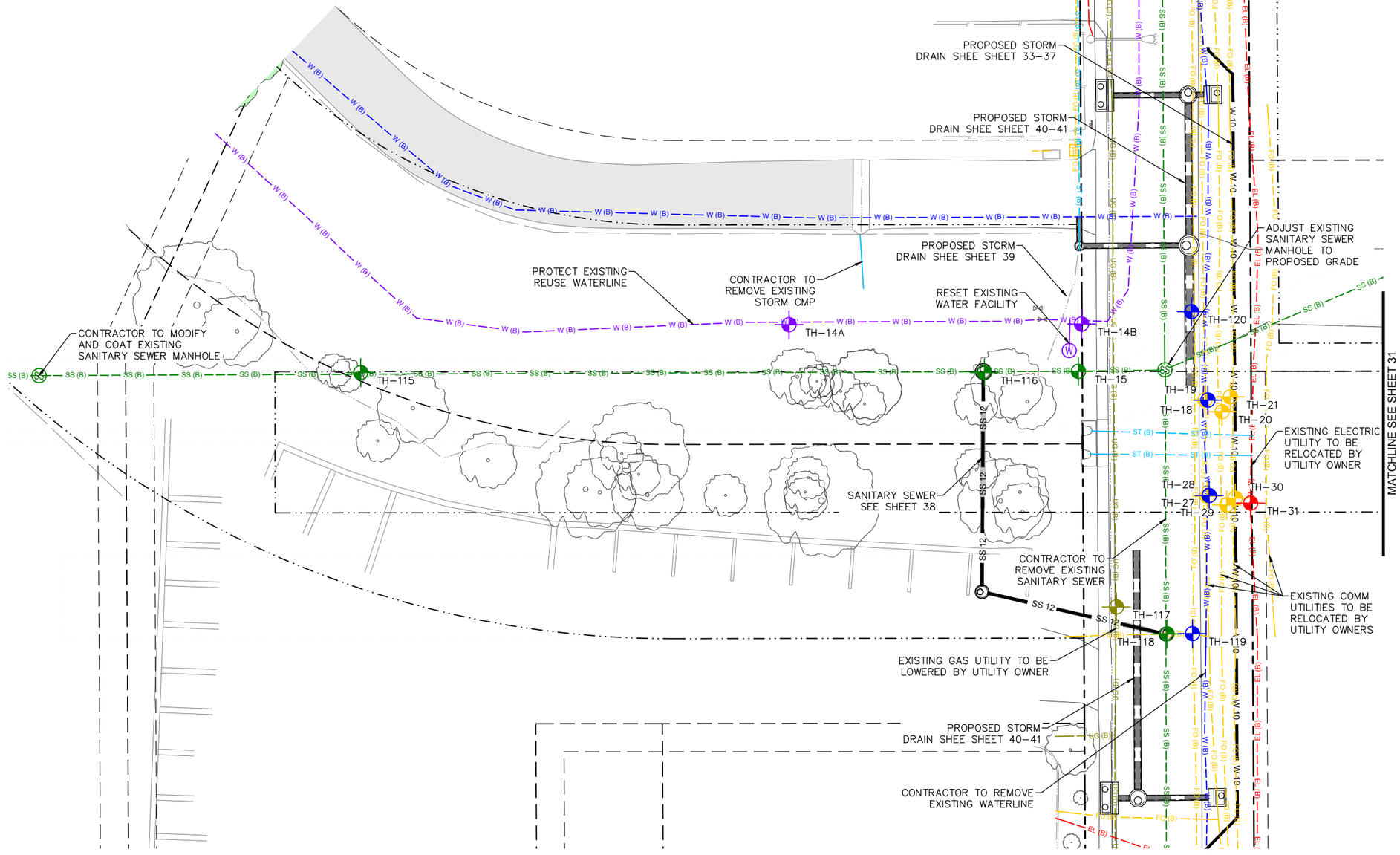
ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — MATTHEW J. URBANSKI — 25513 — 05-25-2024 — PROFESSIONAL ENGINEER



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EL (D) — EXISTING ELECTRIC (QL–D)
- EL (B) — EXISTING ELECTRIC (QL–B)
- UG (D) — EXISTING GAS (QL–D)
- UG (B) — EXISTING GAS (QL–B)
- SS (B) — EXISTING SANITARY SEWER (QL–B)
- ST (D) — EXISTING STORM SEWER (QL–D)
- ST (B) — EXISTING STORM SEWER (QL–B)
- FO (D) — EXISTING COMMUNICATION LINE (QL–D)
- FO (B) — EXISTING COMMUNICATION LINE (QL–B)
- W (B) — EXISTING REUSE WATERLINE (QL–B)
- W (D) — EXISTING POTABLE WATERLINE (QL–D)
- W (C) — EXISTING POTABLE WATERLINE (QL–C)
- W (B) — EXISTING POTABLE WATERLINE (QL–B)
- W 10 — PROPOSED 10–IN POTABLE WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12–IN SANITARY SEWER
- REMOVE IDENTIFIED ITEM
- SEWER ENCASEMENT (SEE NOTES)
- EXISTING ELECTRIC (QL–A)
- EXISTING GAS (QL–A)
- EXISTING SANITARY SEWER (QL–A)
- EXISTING COMMUNICATION LINE (QL–A)
- EXISTING REUSE WATERLINE (QL–A)
- EXISTING POTABLE WATERLINE (QL–A)

NOTES:

1. SEE SHEETS 3–6 FOR PROPERTY AND EASEMENT INFORMATION.
2. SEE SHEETS 8 THRU 10 FOR REMOVAL PLANS.
3. SANITARY SEWER MANHOLES IDENTIFIED AS 'MODIFY' IN THE PLANS SHALL BE LINED AND SEALED.
4. UTILITY LINES NOTED AS TO BE ABANDONED MAY BE REMOVED IF ENCOUNTERED DURING CONSTRUCTION. APPURTENANCES, FITTINGS, AND OTHER SUPPORTS SHALL ALSO BE REMOVED.
5. WHERE VERTICAL SEPARATION BETWEEN SANITARY SEWERS AND WATERLINES IS LESS THAN 18–INCHES, A CONCRETE ENCASEMENT SHALL BE CONSTRUCTED. SEE DETAILS ON SHEETS 35 – 37.
6. PRIVATE UTILITIES WERE NOT LOCATED OR SURVEYED AND SHALL BE INVESTIGATED AND LOCATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
7. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH UTILITY OWNERS FOR RELOCATION OF ALL DRY UTILITIES THAT INTERFERE WITH CONSTRUCTION

No.	DATE	REVISIONS	APPR.

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PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
UTILITY PLANS - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 30 OF 90

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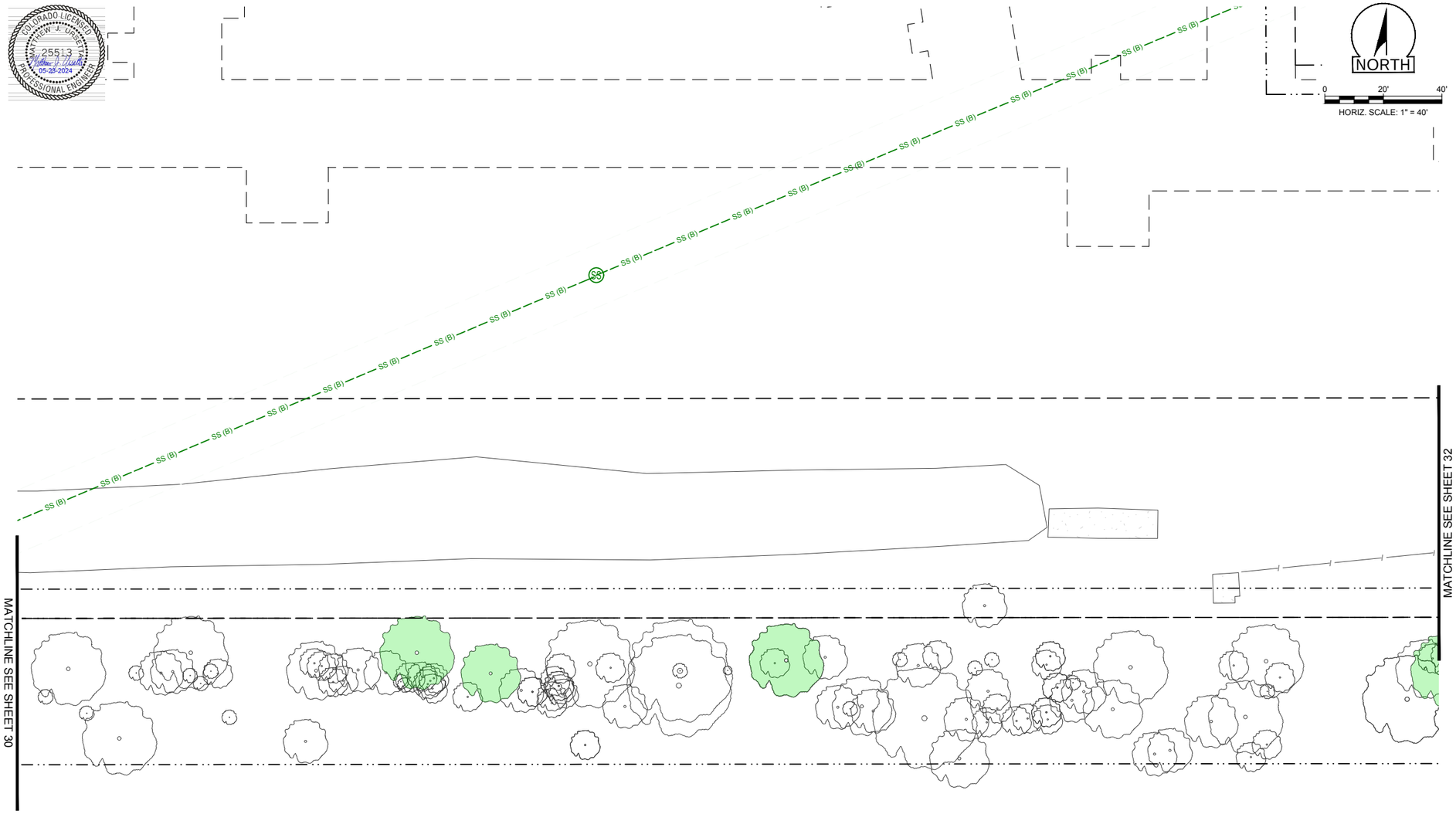
COLORADO LICENSED
MATTHEW J. UNGER
25513
PROFESSIONAL ENGINEER
05-23-2024

NORTH

0 20' 40'
HORIZ. SCALE: 1" = 40'



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- SECTION LINE
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- FO (B) — EXISTING COMMUNICATION LINE (QL–B)
- W (B) — EXISTING REUSE WATERLINE (QL–B)
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CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
UTILITY PLANS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 31 OF 90

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COLORADO LICENSED
MATTHEW J. UNGER
25513
PROFESSIONAL ENGINEER
05-28-2024

NORTH

0 20' 40'
HORIZ. SCALE: 1" = 40'

MATCHLINE SEE SHEET 31

TH-121
TH-122

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- EL (D) — EXISTING ELECTRIC (QL-D)
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PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
UTILITY PLANS - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 32 OF 90

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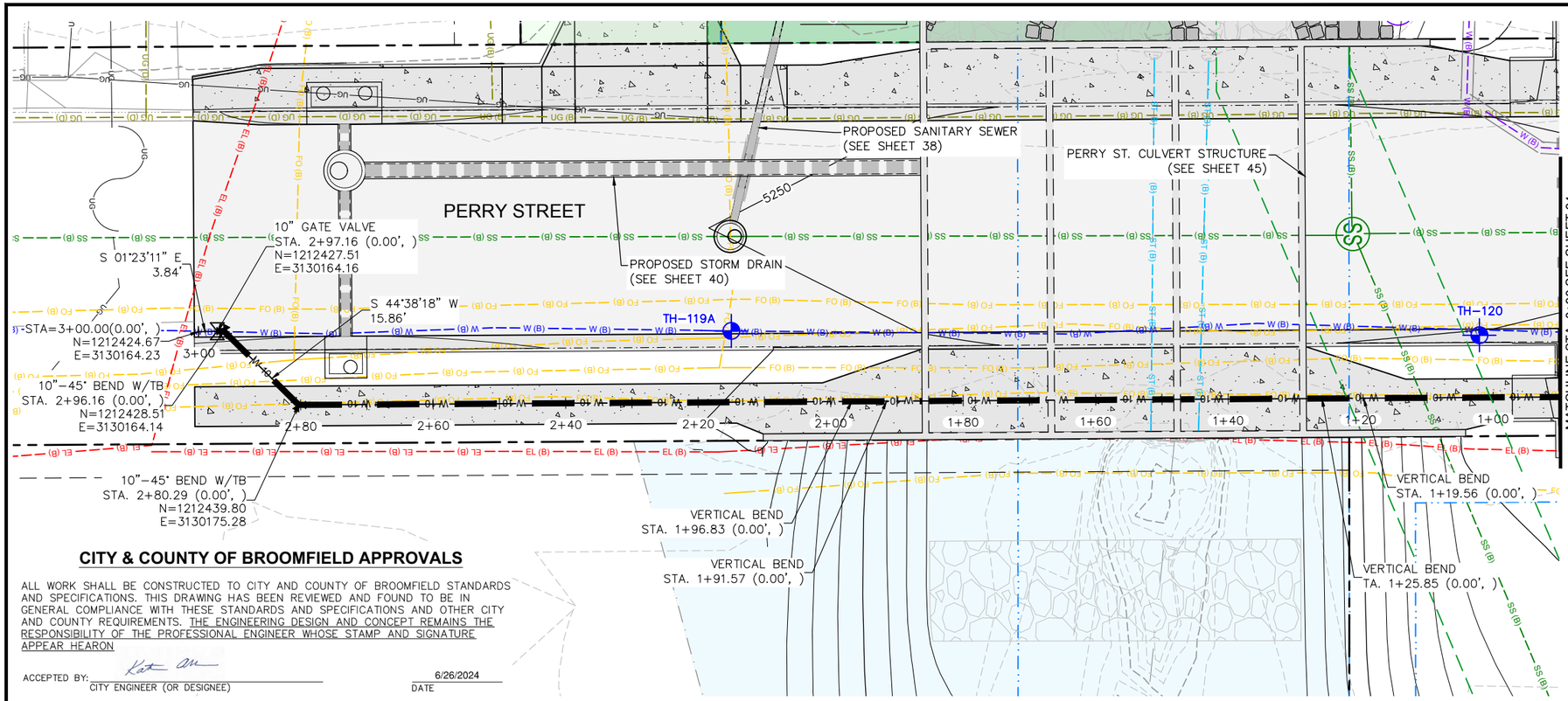

CITY & COUNTY OF BROOMFIELD APPROVALS

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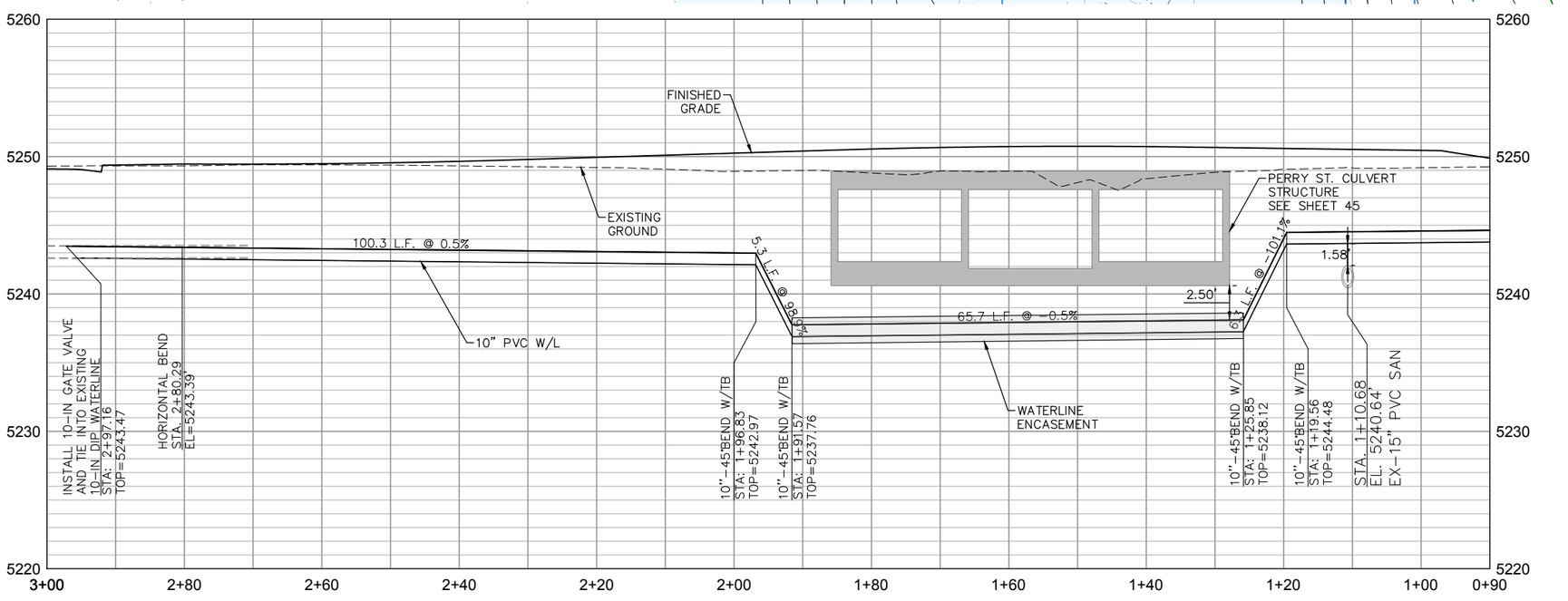

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 35 THRU 37 FOR WATERLINE NOTES AND DETAILS.
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
3. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN.
4. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
5. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS.
6. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION.
7. SEE SHEETS 45 THRU 46 FOR PERRY STREET CULVERT STRUCTURE DETAILS.

COLORADO LICENSED — MATTHEW J. JOSEPH — 25513 — PROFESSIONAL ENGINEER — 05-28-2024

0 10' 20' — 0 5' 10'

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

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PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
POTABLE WATERLINE PLAN & PROFILE - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 33 OF 90

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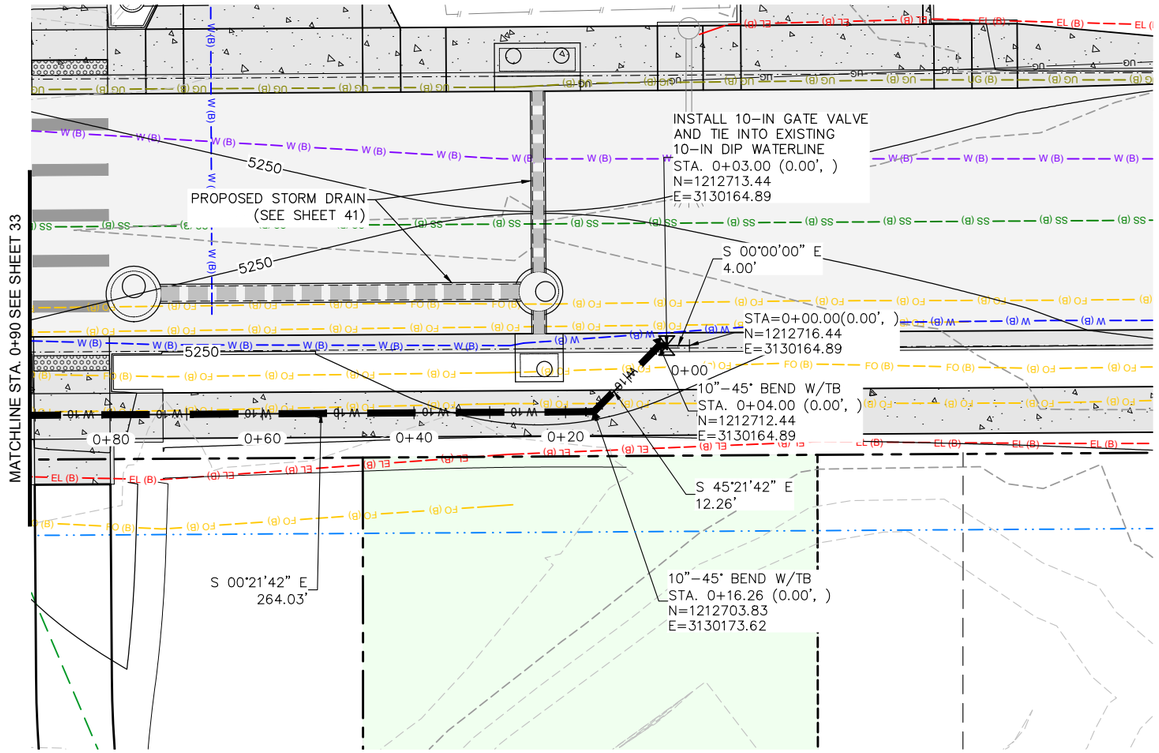

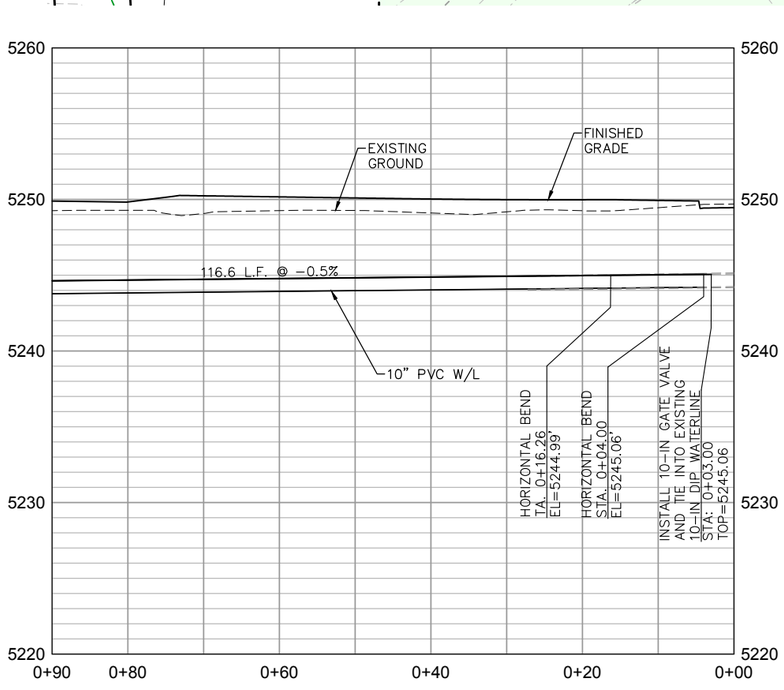

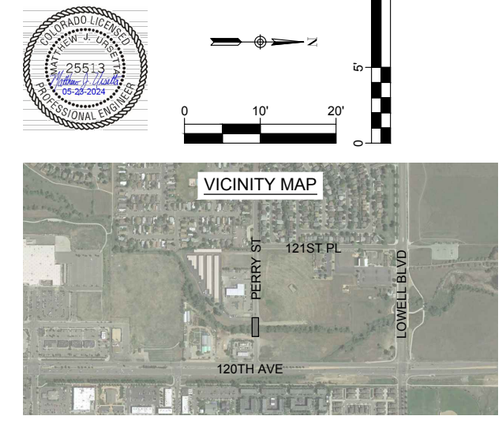

LEGEND

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- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 35 THRU 37 FOR WATERLINE NOTES AND DETAILS.
2. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION.
3. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN.
4. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
5. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS.
6. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION.
7. SEE SHEETS 45 THRU 46 FOR PERRY STREET CULVERT STRUCTURE DETAILS.

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

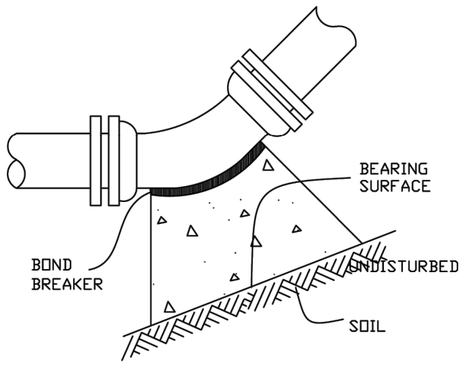
PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

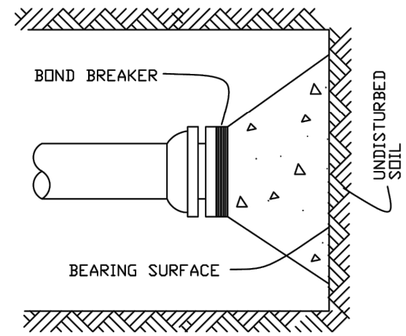
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
POTABLE WATERLINE PLAN & PROFILE - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 34 OF 90

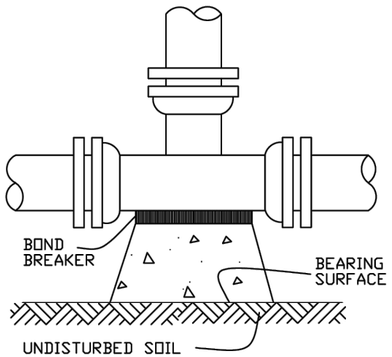
p:\p17-029-nrd-352_nissen reservoir\06_dwg final design\05_final_sheets\NRD_UTILITY_WATER P&P.dwn, OpaBares, Page Setup ---, ICON-HALF-SIZE, dtb, 6/27/2024 1:32 PM



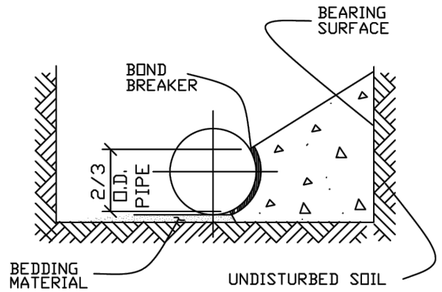
11-1/4°, 22-1/2°
45° AND 90° BENDS



DEAD END



TEE



TYPICAL CROSS SECTION

NOTES:

1. BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
2. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER. 4",6",8" AND 12" WATER HAMMER=110 P.S.I. 16",20' AND 24" WATER HAMMER =70 P.S.I.
3. BASED ON 3,000 pfs SOIL BEARING CAPACITY.
4. NA = NOT APPLICABLE.

MINIMUM BEARING SURFACE AREA
(IN SQUARE FEET)

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4"	1.00	1.00	1.00	N.A.	1.50
6"	1.00	1.25	2.25	N.A.	3.00
8"	1.00	2.00	4.00	N.A.	5.25
12"	2.25	4.50	8.75	N.A.	11.25
16"	3.75	7.50	14.50	27.00	19.00
20"	5.00	10.00	19.50	35.50	25.00
24"	7.00	14.00	27.75	51.00	36.00

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: THRUST BLOCKING
DETAIL DRAWING NUMBER:400-19
DATE: 2018

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. UNTIEDT
25513
05-28-2024
PROFESSIONAL ENGINEER

POTABLE AND REUSE WATERLINE NOTES:

1. WATERLINES SHALL BE CONSTRUCTED TO MEET CITY AND COUNTY OF BROOMFIELD STANDARDS SECTION 400.
2. HORIZONTAL AND VERTICAL ALIGNMENTS OF WATERLINES MAY BE DEFLECTED AT PIPE JOINTS UP TO A MAXIMUM OF ONE DEGREE (1°).
3. WATERLINES SHALL HAVE A MINIMUM SEPARATION OF EIGHTEEN INCHES (18-IN) VERTICALLY AND TEN FEET (10-FT) HORIZONTALLY FROM ALL UTILITIES.
4. WATERLINES WHERE VERTICAL SEPARATION FROM SEWERS IS LESS THAN EIGHTEEN INCHES (18-IN), A CONCRETE ENCASEMENT SHALL BE CONSTRUCTED AROUND THE SEWER. THE CONCRETE ENCASEMENT SHALL MEET CCB DETAIL 400-28 (ON THIS SHEET). ENCASEMENT SHALL EXTEND 10-FT BEYOND EITHER SIDE OF THE WATERLINE AND TO A SEWER PIPE JOINT.
5. WATERLINE TRENCHES SHALL MEET CCB DETAIL 400-21 AND INCLUDE A WARNING TAPE, TRACER WIRE, AND BEDDING. MISCELLANEOUS PARTS SHALL BE INCIDENTAL TO THE INSTALLATION OF THE WATERLINE.
6. WATERLINE MATERIALS SHALL MEET THE FOLLOWING:
   - POTABLE WATERLINE: BOTH 12-IN AND 10-IN WATERLINES SHALL BE PVC AND COMPLY TO AWWA C900, PRESSURE CLASS 200 PSI AND WALL THICKNESS DIMENSION RATIO FOURTEEN (DR-14) MINIMUM.
   - REUSE WATERLINE: 20-IN WATERLINES SHALL BE PVC AND COMPLY WITH AWWA C900, PRESSURE RATING 235 PSI AND WALL THICKNESS DIMENSION RATIO EIGHTEEN (DR-18) MINIMUM. REUSE WATERLINE SHALL ALSO BE PURPLE IN COLOR. IF PURPLE PIPE MATERIAL IS NOT AVAILABLE, THE PIPE SHALL BE WRAPPED IN A PURPLE POLYETHYLENE WRAP.
7. FITTINGS SHALL BE DUCTILE IRON AND COMPLY WITH AWWA C110 AND/OR C153. JOINTS SHALL BE MECHANICALLY RESTRAINED AND SHALL BE WEDGE ACTION, SELF-ACTUATING, SUCH AS "MEGALUGS" OR APPROVED EQUAL.
8. ALL GATE VALVES FOR POTABLE WATERLINES SHALL BE INSTALLED SUCH THAT THE VALVES OPEN LEFT (COUNTER-CLOCKWISE). GATE VALVES FOR REUSE WATERLINES SHALL OPEN RIGHT (CLOCKWISE).
9. WATERLINES SHALL USE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS AT ALL VALVES, BENDS, FITTINGS WITH MECHANICAL CONNECTIONS, AND DEAD ENDS IN ACCORDANCE WITH DETAILS 400-19 AND 400-20 (ON THIS SHEET). TIE RODS SHALL NOT BE USED.

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado / MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
WATER DETAILS - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 35 OF 90

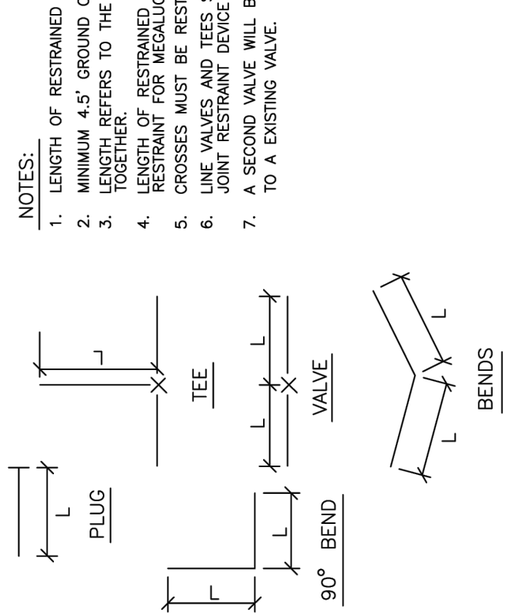
plP17-029-nrd-352 - nissen reservoir\06 dwn final design\05 final sheets\NRD - UTILITY - WATER P&P.dwg, Opallares, Page Setup: ---- ICON-HALF-SIZE, obr, 6/27/2024 1:32 PM

LENGTH OF RESTRAINED PIPE

PIPE SIZE	4"	6"	8"	12"	16"	20"	24"
FITTING	L	L	L	L	L	L	L
90° BEND TEE, PLUG	30'	45'	60'	86'	108'	132'	155'
VALVE	—	—	—	—	108'	132'	155'
45° BEND	9'	13'	18'	25'	32'	39'	45'
$22\frac{1}{2}$° BEND	1'	4'	5'	7'	8'	10'	12'
$11\frac{1}{4}$° BEND	—	—	1'	2'	2'	3'	3'

NOTES:

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS.
2. MINIMUM 4.5' GROUND COVER REQUIRED.
3. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER.
4. LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS.
5. CROSSES MUST BE RESTRAINED IN ALL APPLICABLE DIRECTIONS.
6. LINE VALVES AND TEES SHALL HAVE A MECHANICAL JOINT RESTRAINT DEVICE ON EACH SIDE OF THE FITTING OR VALVE.
7. A SECOND VALVE WILL BE REQUIRED TO BE CLOSED WHEN EXCAVATING NEXT TO A EXISTING VALVE.



City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: LENGTH OF RESTRAINED PIPE
DETAIL DRAWING NUMBER:400–20
DATE: 2018

CITY & COUNTY OF BROOMFIELD APPROVALS

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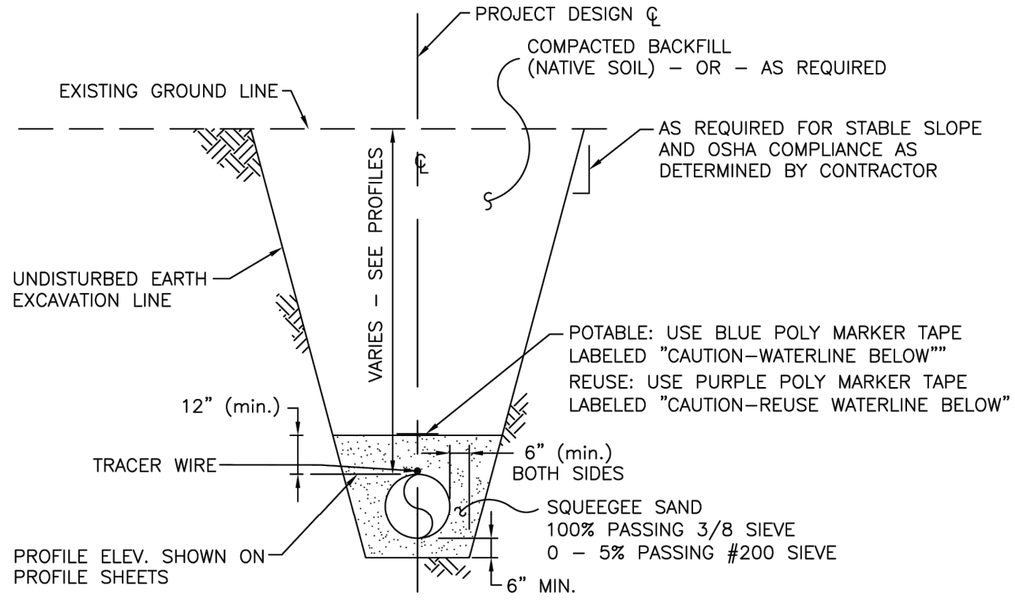

TYPICAL SECTION

(N.T.S.)

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: WATERLINE TRENCH DETAIL
DETAIL DRAWING NUMBER:400–21
DATE: 2018

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig. 811

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PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
WATER DETAILS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 36 OF 90

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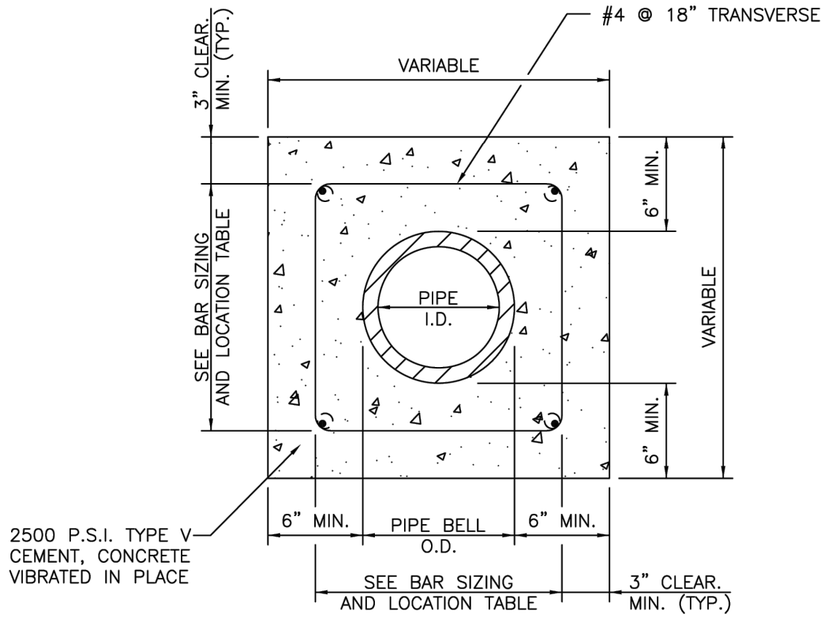

REINFORCEMENT STEEL

PIPE I.D.	LONGITUDINAL BARS	—	LOCATION
6 IN.	4—NO. 4 BARS	1 EACH	CORNER
8 IN.	4—NO. 4 BARS	1 EACH	CORNER
10 IN.	8—NO. 4 BARS	3 EACH	SIDE
12 IN.	8—NO. 4 BARS	3 EACH	SIDE
15 IN.	8—NO. 4 BARS	3 EACH	SIDE
18 IN.	8—NO. 4 BARS	3 EACH	SIDE
21 IN.	12—NO. 4 BARS	4 EACH	SIDE
24 IN.	12—NO. 4 BARS	4 EACH	SIDE
27 IN.	12—NO. 4 BARS	4 EACH	SIDE
30 IN.	12—NO. 4 BARS	4 EACH	SIDE
33 IN.	12—NO. 4 BARS	4 EACH	SIDE
36 IN.	16—NO. 4 BARS	5 EACH	SIDE

NOTE:
BROOMFIELD SHALL REVIEW THIS DETAIL FOR USE ON A CASE BY CASE BASIS. SPECIAL ENCASEMENTS MAY BE REQUIRED AT CREEK CROSSINGS AND CONDUIT CROSSINGS.

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: CONCRETE ENCASEMENT DETAIL
DETAIL DRAWING NUMBER:400—28
DATE: 2018

CITY & COUNTY OF BROOMFIELD APPROVALS

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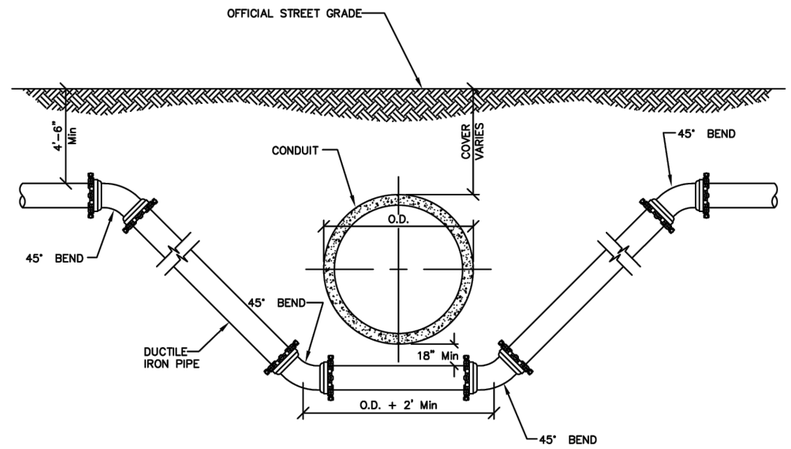
ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED MATTHEW J. UNSELL 25513 PROFESSIONAL ENGINEER 05-23-2024

PARALLEL PIPE SHALL BE INSTALLED WHEN DEPTHS GREATER THAN 10' ARE ENCOUNTERED AND/OR AS DIRECTED BY CCOB ENGINEER



NOTES:

1. ALL BENDS TO BE RESTRAINED PER DETAIL DRAWINGS 400—19 & 400—20.
2. IF CONDUIT IS STORM SEWER OR SANITARY SEWER, ADDITIONAL REQUIREMENTS APPLY.
3. IF LESS THAN 18" OF SEPARATION, WATERLINE TO BE INSULATED WITH SPECIALTY PRODUCTS AND INSULATION COMPANIES "FOAMGLAS® PIPE INSULATION" — SEE DETAIL 400—34.
4. NO TAPS, VALVES, FIRE SERVICE LINES SHALL BE DONE IN LOWERED SECTION.

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: WATER LINE LOWERING— DEPTH < 10 FEET
DETAIL DRAWING NUMBER:400—30
DATE: 2018

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

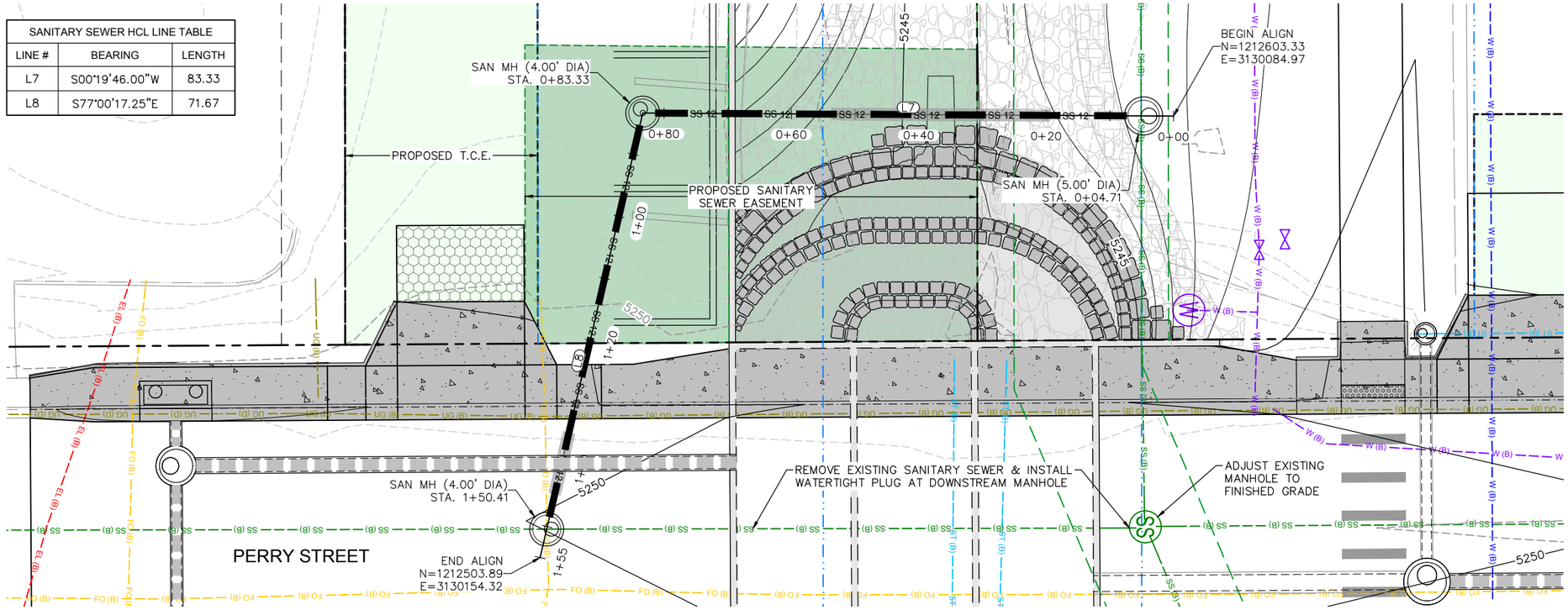
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

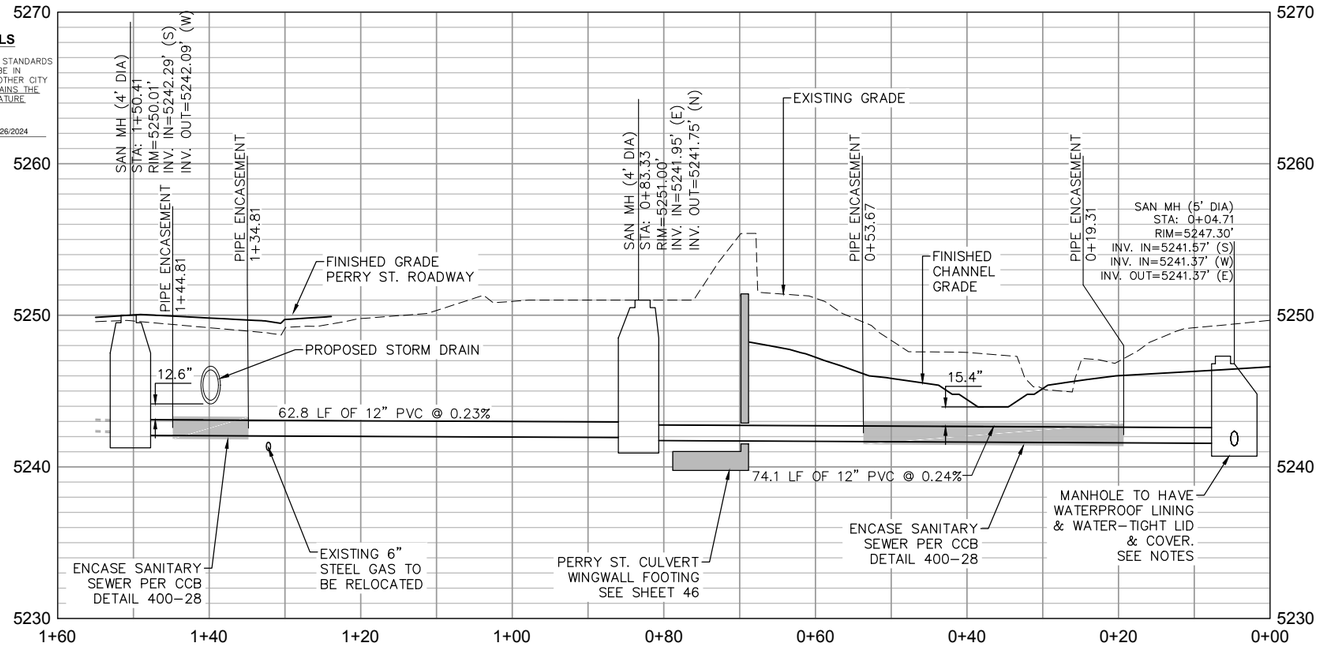
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
WATER DETALIS - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 37 OF 90

G:\P\17-029-nrd-352 - nissen reservoir\06 dwn final design\05 finall sheets\NRD - UTILITY - WATER P&P.dwg, Opallares, Page Setup: ---- ICON-HALF-SIZE, cth, 6/27/2024 1:32 PM

SANITARY SEWER HCL LINE TABLE		
LINE #	BEARING	LENGTH
L7	S00°19'46.00"W	83.33
L8	S77°00'17.25"E	71.67





CITY & COUNTY OF BROOMFIELD APPROVALS

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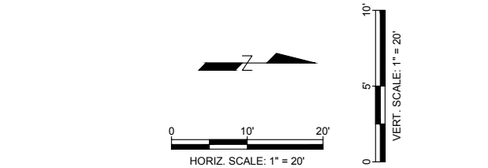
ACCEPTED BY: _____ CITY ENGINEER (OR DESIGNEE)

DATE: 6/26/2024



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SANITARY SEWER CONSTRUCTION AND MATERIALS SHALL MEET THE STANDARDS AND SPECIFICATIONS PROVIDED IN SECTION 500 – SANITARY SEWER FACILITIES, OF THE CITY AND COUNTY OF BROOMFIELD'S 2020 STANDARDS AND SPECIFICATIONS.
2. SEE SHEETS 35 THRU 37 FOR WATERLINE NOTES AND DETAILS.
3. SEE SHEETS 3 THRU 7 FOR PROPERTY AND EASEMENT INFORMATION.
4. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN.
5. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
6. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS.
7. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION.
8. SEE SHEETS 45 THRU 46 FOR PERRY STREET CULVERT STRUCTURE DETAILS.

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

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PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / TJD
DESIGNED BSC / TJD
CHECKED MJU

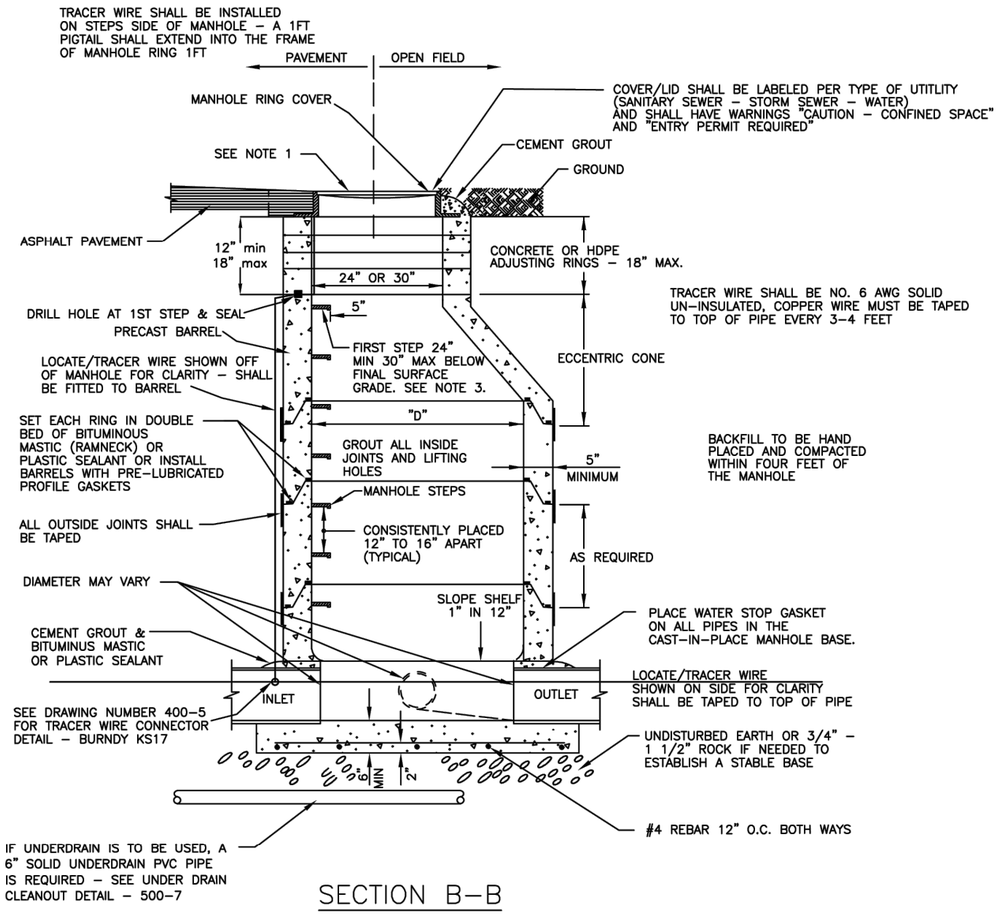
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SANITARY SEWER PLAN & PROFILE

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 38 OF 90

plt:17-029-nrd-352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - UTILITY P&Ps.dwg, Opdlaires, Page Setup:---- ICON HALF-SIZE.ctb, 6/27/2024 1:33 PM



SECTION B–B

NOTES:

1. FINAL GRADE OF MANHOLE COVERS SHALL BE A MINIMUM OF 1/4" LOWER AND A MAXIMUM OF 1/2" THAN FINAL STREET GRADE.
2. ALL SIDE CHANNELS FLOWING INTO THE MAIN CHANNEL OF THE SEWER SHALL BE HAND FORMED TO MAKE A SMOOTH TRANSITION INTO THE MAIN CHANNEL
3. STEPS SHOULD BE PLACED OVER THE SHELF, NOT OVER THE FLOW. NO STEPS ALLOWED IN THE ADJUSTING RING AREA.
4. PRECAST CONCRETE SECTIONS SHALL CONFORM TO ASTM C–478.
5. PIPE STUBS FOR FUTURE CONNECTIONS, WHEN APPROVED, SHALL EXTEND A MAX. OF 6" PAST MANHOLE O.D. AND BE SATISFACTORILY PLUGGED AND SEALED.
6. BENCH MUST HAVE A BRUSHED, NON–SKID SURFACE.
7. BENCH IS TO BE EVEN WITH TOP OF PIPES
8. ALL SANITARY SEWER MANHOLES TO INLCUDE A CORROSION RESISTANT LINER. SEE SEC. 514.02 MANHOLES FOR ADDITIONAL INFORMATION.

City and County of Broomfield
ENGINEERING DEPARTMENT

TITLE: STANDARD MANHOLE SECTION
DETAIL DRAWING NUMBER:500–2
DATE: 2022

CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. MULLE
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

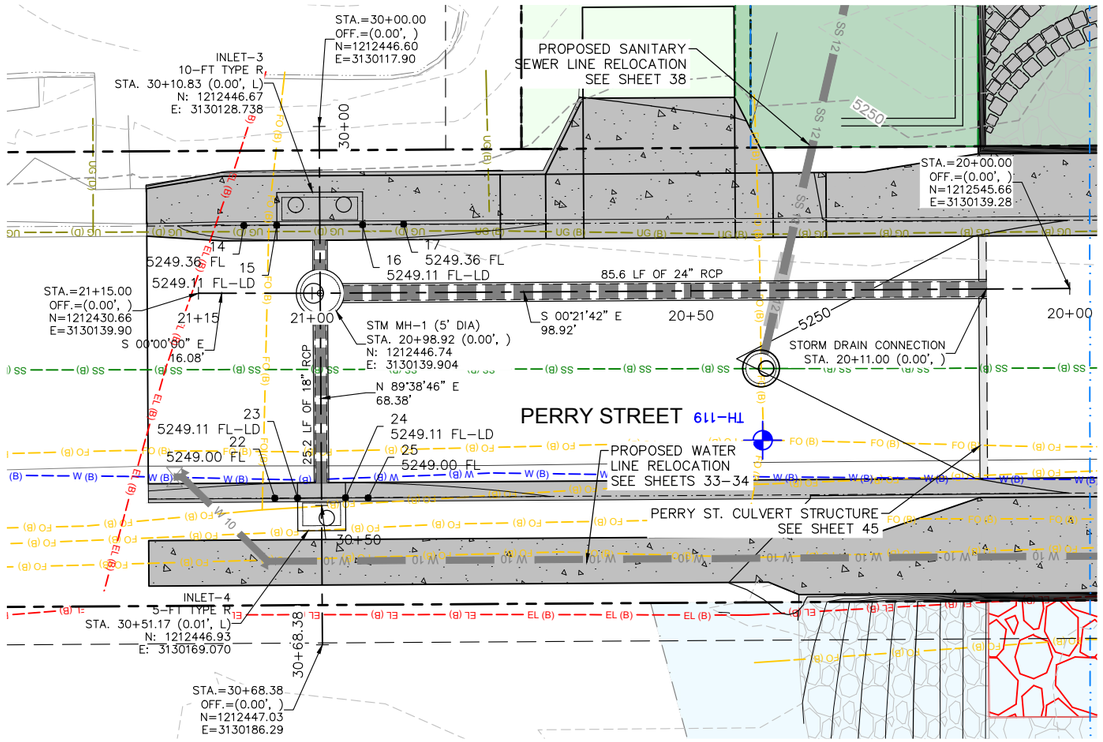
PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SANITARY SEWER DETAILS
ICON PROJECT No. 17-029-NRD

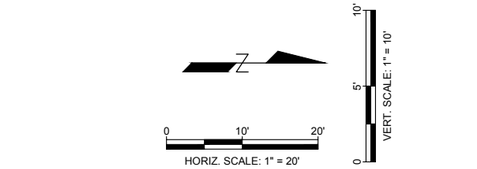
DATE MAY 2024

SHEET 39 OF 90

p:\P\17-029-nrd-352 - nissen reservoir\06 dwg final design\06 final sheets\NRD - UTILITY P&Ps dwg, Opaliares, Page Setup:----; ICON-HALF-SIZE.ctb, 6/27/2024 1:33 PM

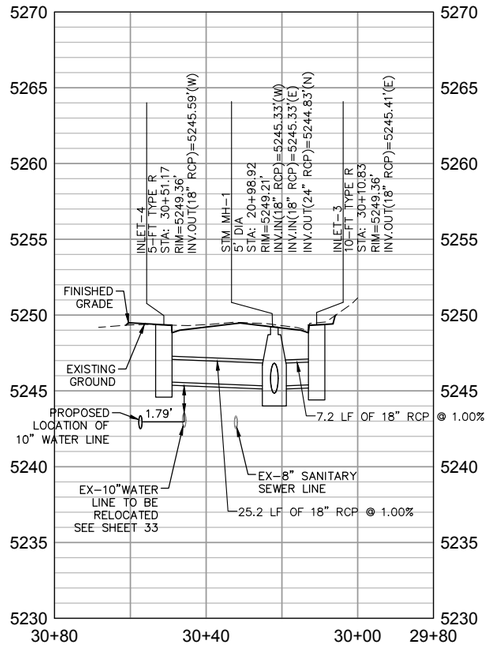


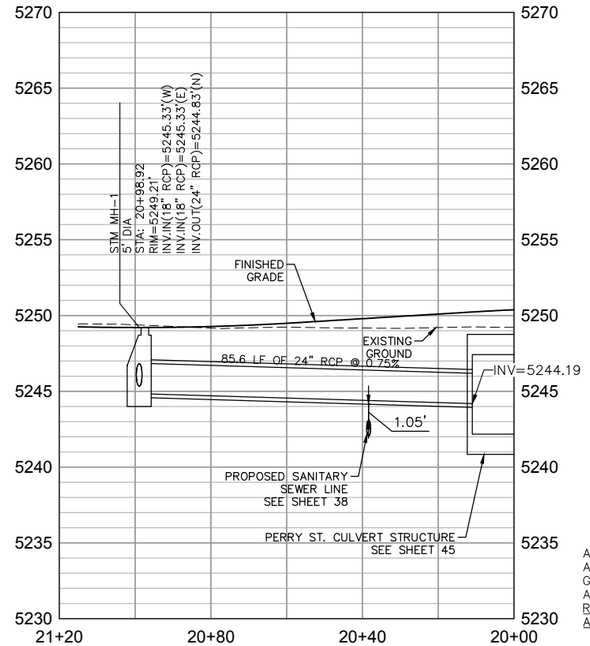
POINT TABLE						
POINT #	ELEVATION	NORTHING	EASTING	STATION	OFFSET	DESCRIPTION
14	5249.36	1212436.66	3130130.97	30+13.00	10.02R	FL
15	5249.36	1212440.99	3130130.94	30+13.00	5.69R	FL-LD
16	5249.36	1212452.33	3130130.87	30+13.00	5.64L	FL-LD
17	5249.36	1212457.74	3130130.80	30+12.96	11.06L	FL
22	5249.00	1212440.75	3130166.94	30+49.00	6.16R	FL
23	5249.36	1212443.75	3130166.92	30+49.00	3.16R	FL-LD
24	5249.36	1212450.08	3130166.88	30+49.00	3.17L	FL-LD
25	5249.00	1212453.06	3130166.91	30+49.04	6.16L	FL



LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED ASPHALT PAVEMENT
- PROPOSED AGGREGATE BASE DRIVEWAY
- PROPOSED CURB, GUTTER, SIDEWALK & DRIVEWAY
- PROPOSED PEDESTRIAN TRAIL





NOTES:

1. STORM DRAIN CONSTRUCTION AND MATERIALS SHALL MEET THE STANDARDS AND SPECIFICATIONS PROVIDED IN SECTION 600 – STORM DRAINAGE FACILITIES, OF THE CITY AND COUNTY OF BROOMFIELD'S 2020 STANDARDS AND SPECIFICATIONS.
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5. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
6. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS.
7. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION.
8. SEE SHEETS 45 THRU 46 FOR PERRY STREET CULVERT STRUCTURE DETAILS.

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. CULLEN
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
STORM DRAIN PLAN & PROFILE - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 40 OF 90

p:\P17-029-nrd.s82 - nissen reservoir\06 dwg final design\05 final sheets\NRD - UTILITY - STORM DRAIN P&P dwn. Opdates, Page Setup--- ICON-HALF-SIZE.dtn 6/27/2024 1:34 PM

COLORADO LICENSED
KEVIN J. USSER
25513
05-23-2024
PROFESSIONAL ENGINEER

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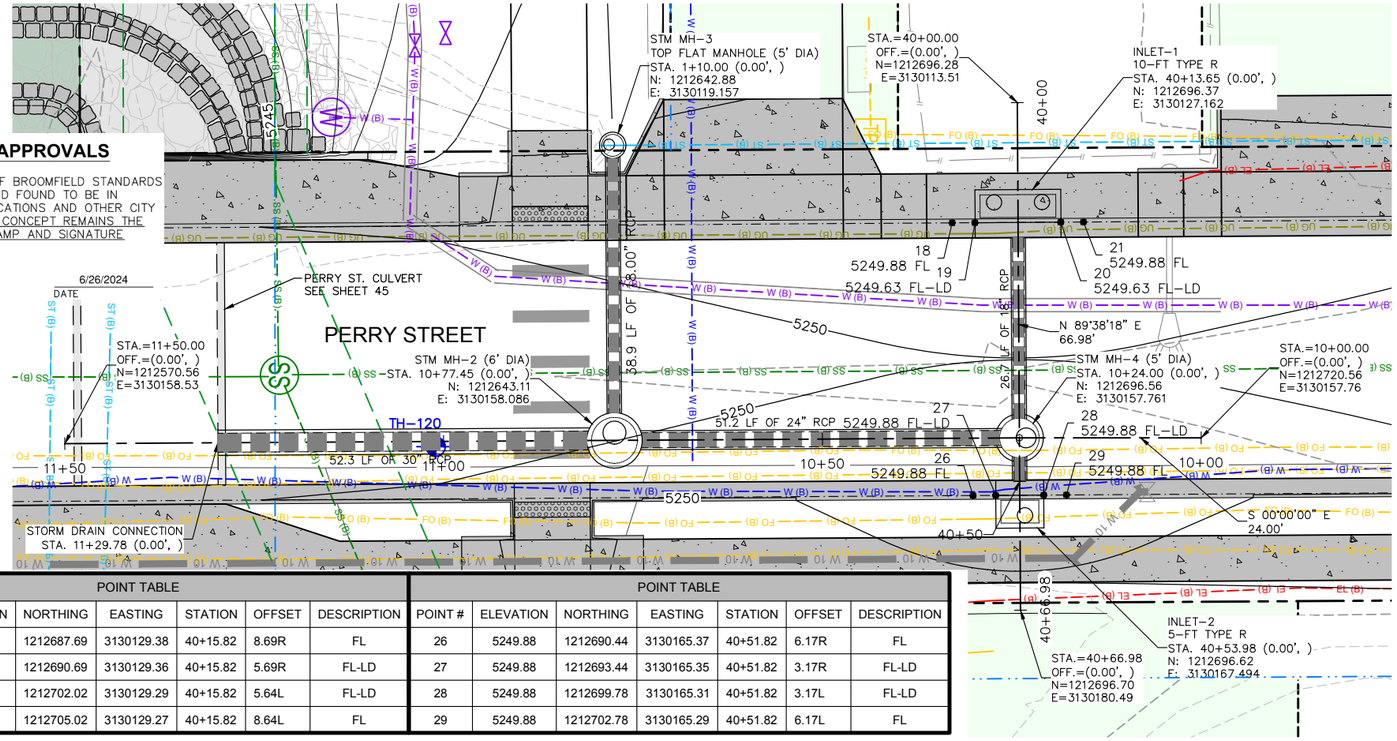
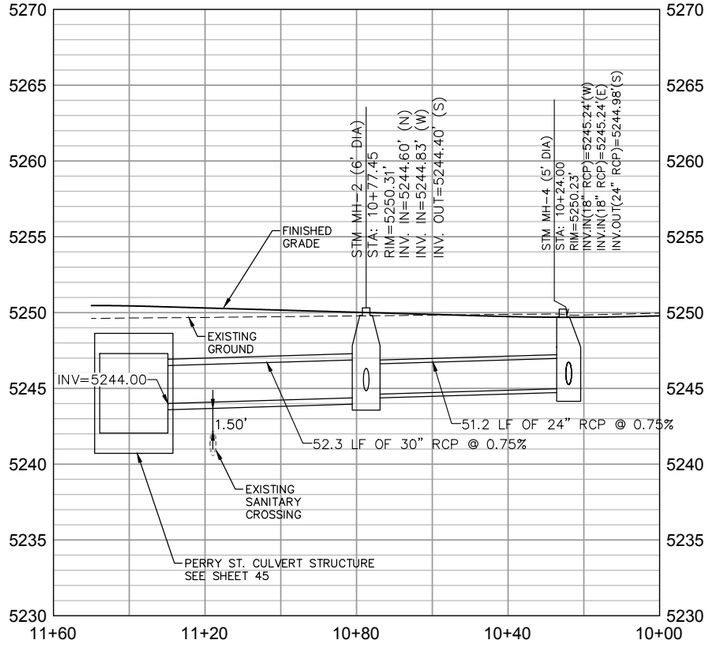
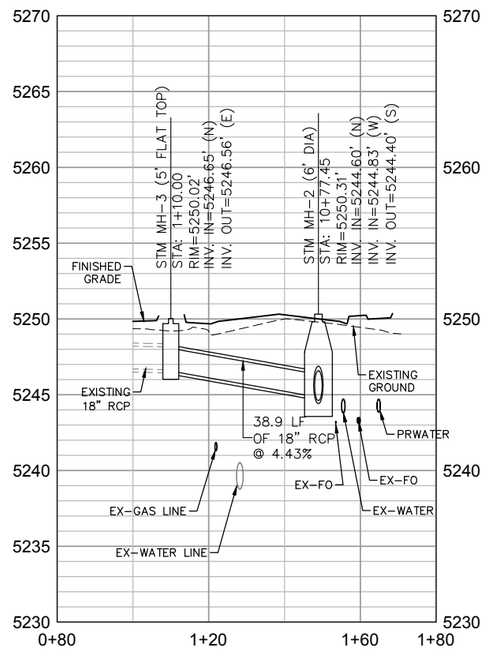
6/26/2024
DATE

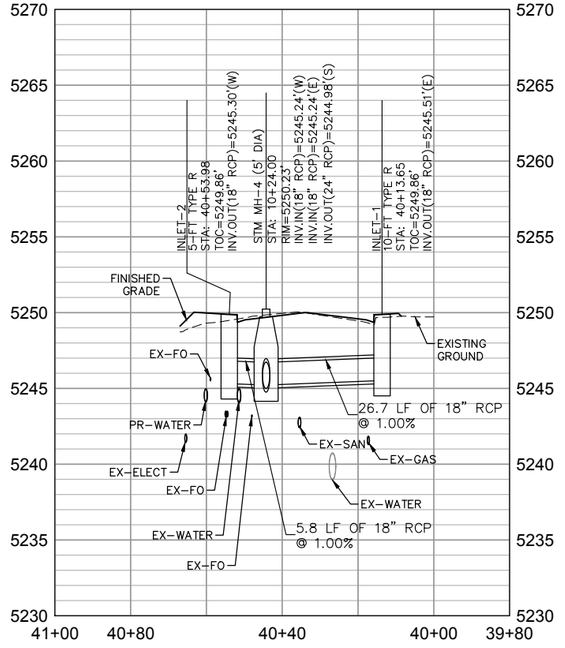


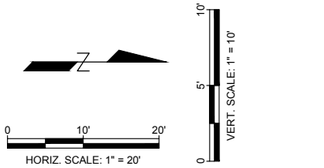
POINT TABLE						
POINT #	ELEVATION	NORTHING	EASTING	STATION	OFFSET	DESCRIPTION
18	5249.88	1212687.69	3130129.38	40+15.82	8.69R	FL
19	5249.88	1212690.69	3130129.36	40+15.82	5.69R	FL-LD
20	5249.88	1212702.02	3130129.29	40+15.82	5.64L	FL-LD
21	5249.88	1212705.02	3130129.27	40+15.82	8.64L	FL

POINT TABLE						
POINT #	ELEVATION	NORTHING	EASTING	STATION	OFFSET	DESCRIPTION
26	5249.88	1212690.44	3130165.37	40+51.82	6.17R	FL
27	5249.88	1212693.44	3130165.35	40+51.82	3.17R	FL-LD
28	5249.88	1212699.78	3130165.31	40+51.82	3.17L	FL-LD
29	5249.88	1212702.78	3130165.29	40+51.82	6.17L	FL









VICINITY MAP

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
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No.	DATE	REVISIONS	APPR.

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PREPARED BY: ICON ENGINEERING

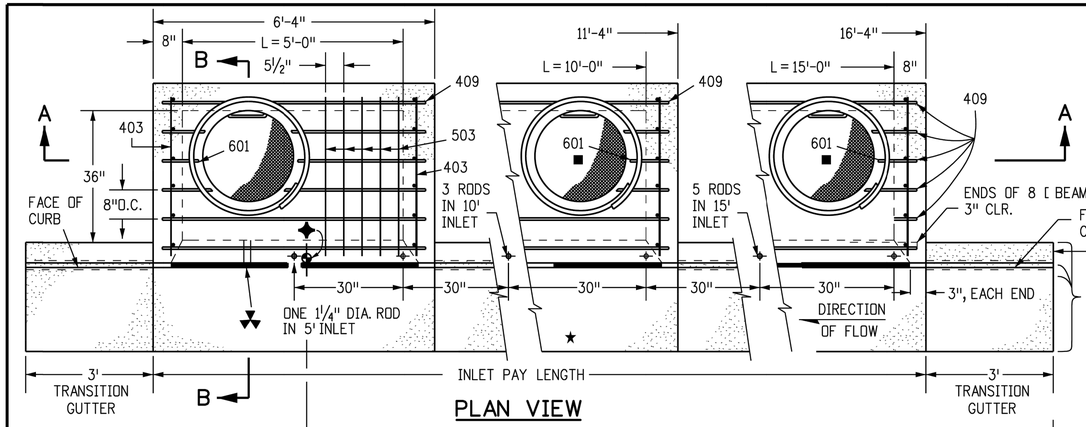
PLAN
DRAWN BSC / JMRKZ
DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
STORM DRAIN PLAN & PROFILE - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 41 OF 90

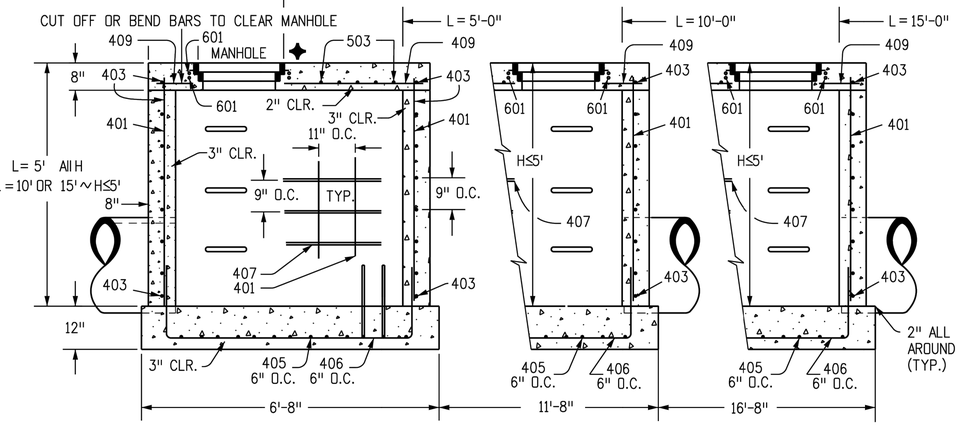
plt:17-029-nrd-332 - nissen reservoir\06 dwg final design\05 final sheets\NRD - UTILITY - STORM DRAIN P&P.dwg - Dialtarea - Page Setup: --- ICON-HALF-SIZE.ctb 6/27/2024 1:34 PM



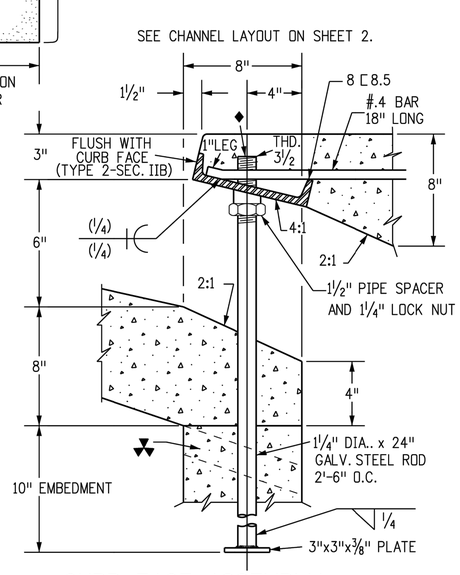
PLAN VIEW

★ FOR LENGTH (L) 10 FT. OR MORE, PROVIDE MAINTENANCE ACCESS AT BOTH ENDS WITH AN ADDITIONAL MANHOLE RING AND COVER. CUT REINFORCEMENT BAR ACCORDINGLY.

✦ STATION POINT AT MIDPOINT OF INLET ALONG FLOWLINE

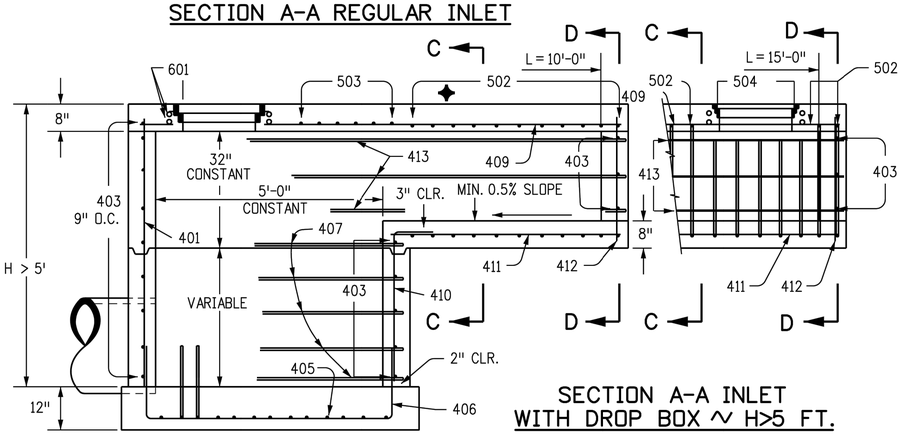


SECTION A-A REGULAR INLET

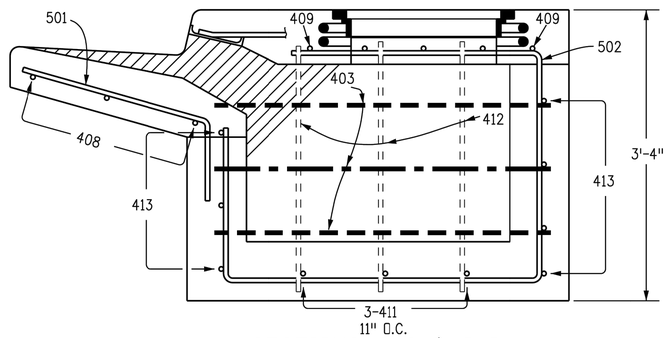


CURB FACE ASSEMBLY

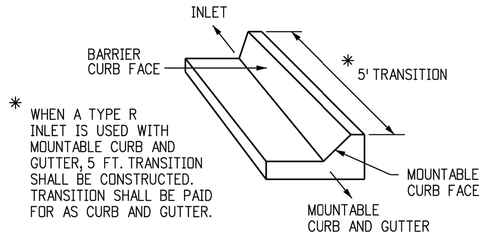
◆ PLACE ENTIRE ASSEMBLY BEFORE POURING CONCRETE.



SECTION A-A INLET WITH DROP BOX ~ H>5 FT.



SECTIONS C-C & D-D (DOTTED BARS ARE IN SECTION D-D)

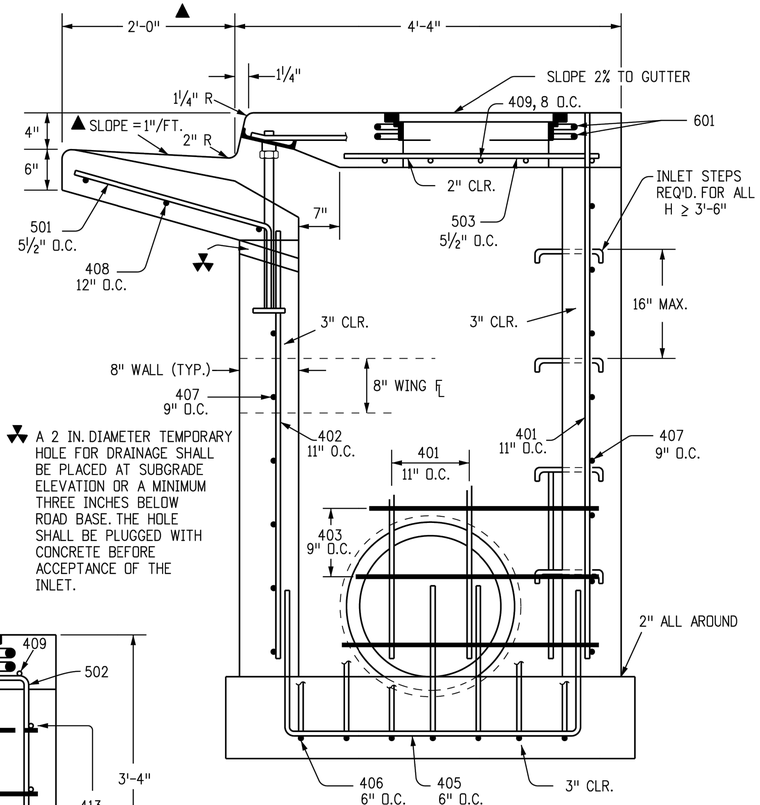


TRANSITION CURB

GENERAL NOTES:

SEE SHEET 2.

▲ - FOR A 1'-0" PAN SLOPE 2" PER FT.



SECTION B-B END VIEW

NOTE: MANHOLE RING AND COVER, STATION POINT AND OUTFLOW PIPE SHALL BE LOCATED AT THE SAME END OF THE INLET.

▲ A 2 IN. DIAMETER TEMPORARY HOLE FOR DRAINAGE SHALL BE PLACED AT SUBGRADE ELEVATION OR A MINIMUM THREE INCHES BELOW ROAD BASE. THE HOLE SHALL BE PLUGGED WITH CONCRETE BEFORE ACCEPTANCE OF THE INLET.

COLORADO LICENSED — STEPHEN J. ORSBY — 25513 — PROFESSIONAL ENGINEER — 05.28.2024

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Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB INLET TYPE R

Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-604-12
Standard Sheet No. 1 of 2
Project Sheet Number:

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
STORM DRAIN DETAILS - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 42 OF 90

p:\P17-029-nrd-332 - nissen reservoir\06 dwg final design\05 final sheets\STORM DRAIN DETAILS.dwg Opallares, Page Setup: ---ICON-HALF-SIZE.ctb, 6/27/2024 1:34 PM

MARK	BAR # OR SIZE	O.C. SPACING	TYPE	ALL INLETS L = 5 FT.		INLETS: H ≤ 5 FT. L = 10 FT.		INLETS: H ≤ 5 FT. L = 15 FT.		INLETS: H > 5 FT. L = 10 FT.		INLETS: H > 5 FT. L = 15 FT.	
				NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH	NO. REQ'D.	LENGTH
401	4	11"	II	15	*	21	*	26	*	11	*	11	*
402	4	11"	II	7	*	13	*	18	*	7	*	7	*
403	4	9"	II	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"	*	4'-0"
405	4	6"	VI	11	6'-10"	21	6'-10"	31	6'-10"	11	6'-10"	11	6'-10"
406	4	6"	VIII	7	8'-10"	7	13'-10"	7	18'-10"	7	8'-10"	7	8'-10"
407	4	9"	II	*	5'-10"	*	10'-10"	*	15'-10"	*	5'-10"	*	5'-10"
408	4	12"	II	3	6'-10"	3	11'-10"	3	16'-0"	3	11'-10"	3	16'-0"
409	4	8"	II	6	5'-10"	6	10'-10"	6	15'-10"	6	10'-10"	6	15'-10"
410	4	11"	VII							3		3	*
411	4	11"	II							3	5'-2"	3	10-2"
412	4	11"	II							3	2'-9"	3	2'-9"
413	4	9"	II							7	10'-10"	7	15'-10"
501	5	5½"	IV	11	3'-4"	22	3'-4"	33	3'-4"	22	3'-4"	33	3'-4"
502	5	5½"	III							11	11'-5"	17	11'-5"
503	5	5½"	II	5	3'-6"	16	3'-6"	27	3'-6"	6	3'-6"	6	3'-6"
504	5	5½"	IX									5	8'-4"
601	6	2½"	V	2	8'-10"	2	8'-10"	2	8'-10"	2	8'-10"	4	8'-10"
■8[8.5				1	5'-10"	1	10'-10"	1	15'-10"	1	10'-10"	1	15'-10"
				2 BARS, 1 RODS	——	4 BARS, 3 RODS	——	8 BARS, 5 RODS	——	4 BARS, 3 RODS	——	8 BARS, 5 RODS	——

* VARIABLE REFER TO TABLE TWO.

■ INCLUDE #4, 18 IN. BARS (SEE CHANNEL LAYOUT).

REGULAR INLETS

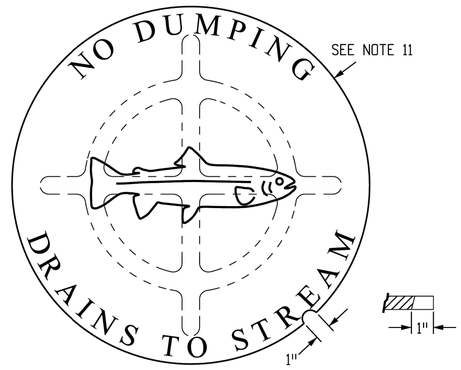
DROP BOX INLETS

TABLE ONE ~ BAR LIST FOR CURB INLETS, TYPE "R"

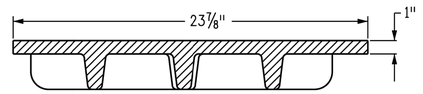
"H"	LENGTH 401	LENGTH 402	LENGTH 410	NO. REQ'D. REGULAR 403	NO. REQ'D. REGULAR 407	NO. REQ'D. DROP BOX 403	NO. REQ'D. DROP BOX 407	L = 5 FT. CONC. CU. YDS.	L = 5 FT. STEEL LBS.	L = 10 FT. CONC. CU. YDS.	L = 10 FT. STEEL LBS.	L = 15 FT. CONC. CU. YDS.	L = 15 FT. STEEL LBS.
3'-0"	2'-8"	1'-8"		10	7			3.2	285	5.3	497	7.4	706
3'-6"	3'-2"	2'-2"		10	7			3.4	305	5.7	528	7.9	747
4'-0"	3'-8"	2'-8"		12	9			3.7	326	6.0	559	8.4	786
4'-6"	4'-2"	3'-2"		12	9			3.9	334	6.4	571	8.8	803
5'-0"	4'-8"	3'-8"		14	11			4.1	354	6.7	602	9.3	844
5'-6"	5'-2"	4'-2"	3'-5"	16	13	15	6	4.4	375	6.0	607	7.4	850
6'-0"	5'-8"	4'-8"	3'-11"	16	13	16	6	4.6	382	6.2	616	7.6	860
6'-6"	6'-2"	5'-2"	4'-5"	18	15	18	8	4.8	402	6.4	637	7.8	880
7'-0"	6'-8"	5'-8"	4'-11"	20	17	19	10	5.0	423	6.6	654	8.0	897
7'-6"	7'-2"	6-2"	5'-5"	20	17	20	10	5.3	430	6.9	664	8.3	907
8'-0"	7'-8"	6'-8"	5'-11"	22	19	22	12	5.5	451	7.1	684	8.5	927
8'-6"	8'-2"	7'-2"	6'-5"	24	21	23	14	5.7	471	7.3	702	8.7	944
9'-0"	8'-8"	7'-8"	6'-11"	24	21	24	14	6.0	479	7.6	711	9.0	954
9'-6"	9'-2"	8'-2"	7'-5"	26	23	26	16	6.2	499	7.8	732	9.2	974
10'-0"	9'-8"	8'-8"	7'-11"	28	25	27	18	6.4	520	8.0	749	9.4	992
10'-6"	10'-2"	9'-2"	8'-5"	28	25	28	18	6.7	527	8.3	759	9.7	1001
11'-0"	10'-8"	9'-8"	8'-11"	30	27	30	20	6.9	547	8.5	779	9.9	1022

NOTES: FOR L = 5 FT., L = 10 FT., AND L = 15 FT.
REGULAR INLETS: TOTAL QUANTITIES NEEDED ARE OUTSIDE THE HEAVY BLACK LINE.
DROP BOX INLETS: TOTAL QUANTITIES NEEDED ARE INSIDE THE HEAVY BLACK LINE.
STEEL WEIGHTS DO NOT INCLUDE STRUCTURAL STEEL CHANNEL.

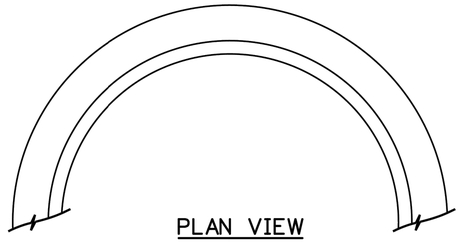
TABLE TWO ~ BARS AND QUANTITIES VARIABLE WITH "H"



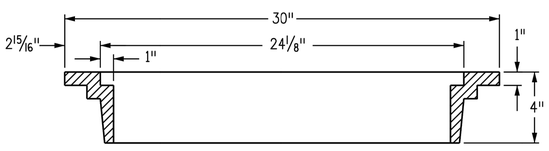
PLAN VIEW



ELEVATION VIEW
MANHOLE COVER (TYP.)



PLAN VIEW

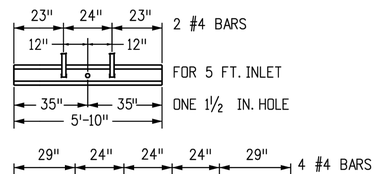


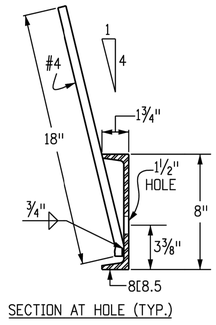
ELEVATION VIEW
MANHOLE RING (TYP.)

WEIGHTS: COVER = 125 LBS.
+ RING = 135 LBS.
TOTAL = 260 LBS.

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. CONCRETE WALLS SHALL BE FORMED ON BOTH SIDES AND SHALL BE 8 INCHES THICK.
3. INLET STEPS SHALL BE IN CONFORMANCE WITH AASHTO M 199.
4. CURB FACE ASSEMBLY SHALL BE GALVANIZED AFTER WELDING.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ OF A INCH. CURB AND GUTTER CORNERS SHALL BE FINISHED TO MATCH THE EXISTING CURB AND GUTTER BEYOND THE TRANSITION GUTTER.
6. REINFORCING BARS SHALL BE DEFORMED AND SHALL HAVE A 2 INCH MINIMUM CLEARANCE. ALL REINFORCING BARS SHALL BE GRADE 60 AND EPOXY COATED.
7. DIMENSIONS AND WEIGHTS OF TYPICAL MANHOLE RING AND COVER ARE NOMINAL.
8. MATERIAL FOR MANHOLE RINGS AND COVERS SHALL BE GRAY OR DUCTILE CAST IRON IN ACCORDANCE WITH SUBSECTION 712.06.
9. SINCE PIPE ENTRIES INTO THE INLET ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK. QUANTITIES INCLUDE VOLUMES OCCUPIED BY PIPES.
10. STRUCTURAL STEEL SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
11. ALL MANHOLE COVERS SHALL BE CAST WITH A "NO DUMPING DRAINS TO STREAM" MESSAGE AND A FISH SYMBOL. THE SURFACE OF THE MANHOLE COVER SHALL HAVE A NON-SLIP PATTERN.

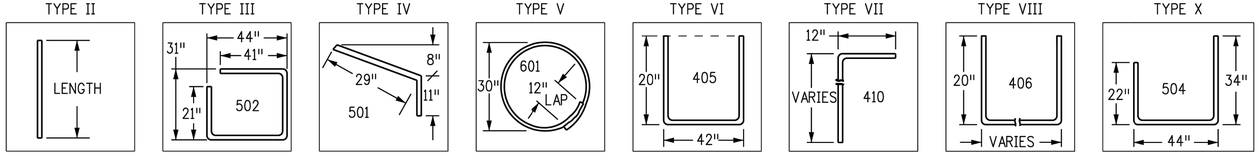




SECTION AT HOLE (TYP.)

CHANNEL LAYOUT DETAILS

SEE CURB FACE ASSEMBLY ON SHEET 1.



BAR BENDING DIAGRAMS ~ (DIMENSIONS ARE OUT-TO-OUT OF BAR)

Computer File Information		Sheet Revisions	
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Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

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Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-604-12
Standard Sheet No. 2 of 2
Project Sheet Number:

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PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

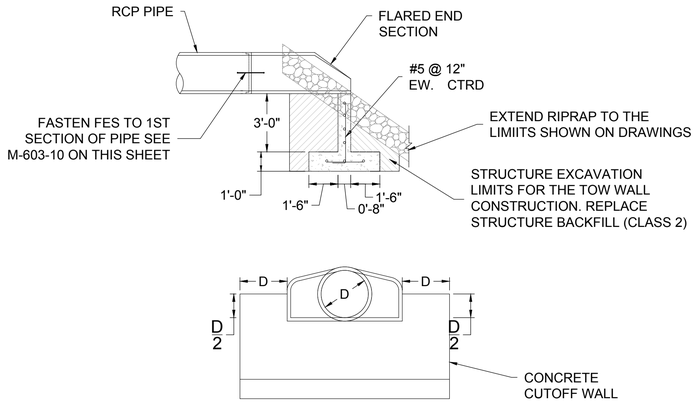
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
STORM DRAIN DETAILS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

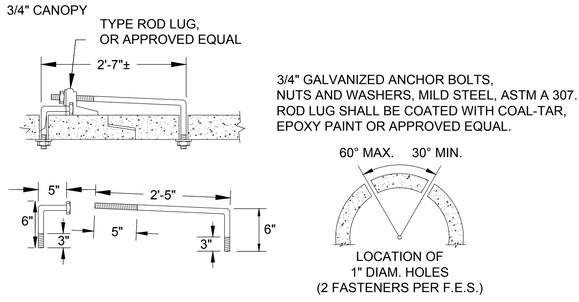
SHEET 43 OF 90

p:\P\17-029-nrd-352 - nissen reservoir\06 - dwg final design\06 - final sheets\STORM DRAIN DETAILS.dwg, Opallares, Page Setup---- ICON-HALF-SIZE.ctb, 6/27/2024 1:36 PM

COLORADO LICENSED
NATHEN J. ORSEN
25513
PROFESSIONAL ENGINEER
05-28-2024



CONCRETE CUTOFF WALL DETAIL
NTS



M-603-10

CITY & COUNTY OF BROOMFIELD APPROVALS

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
STORM DRAIN DETAILS - 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 44 OF 90

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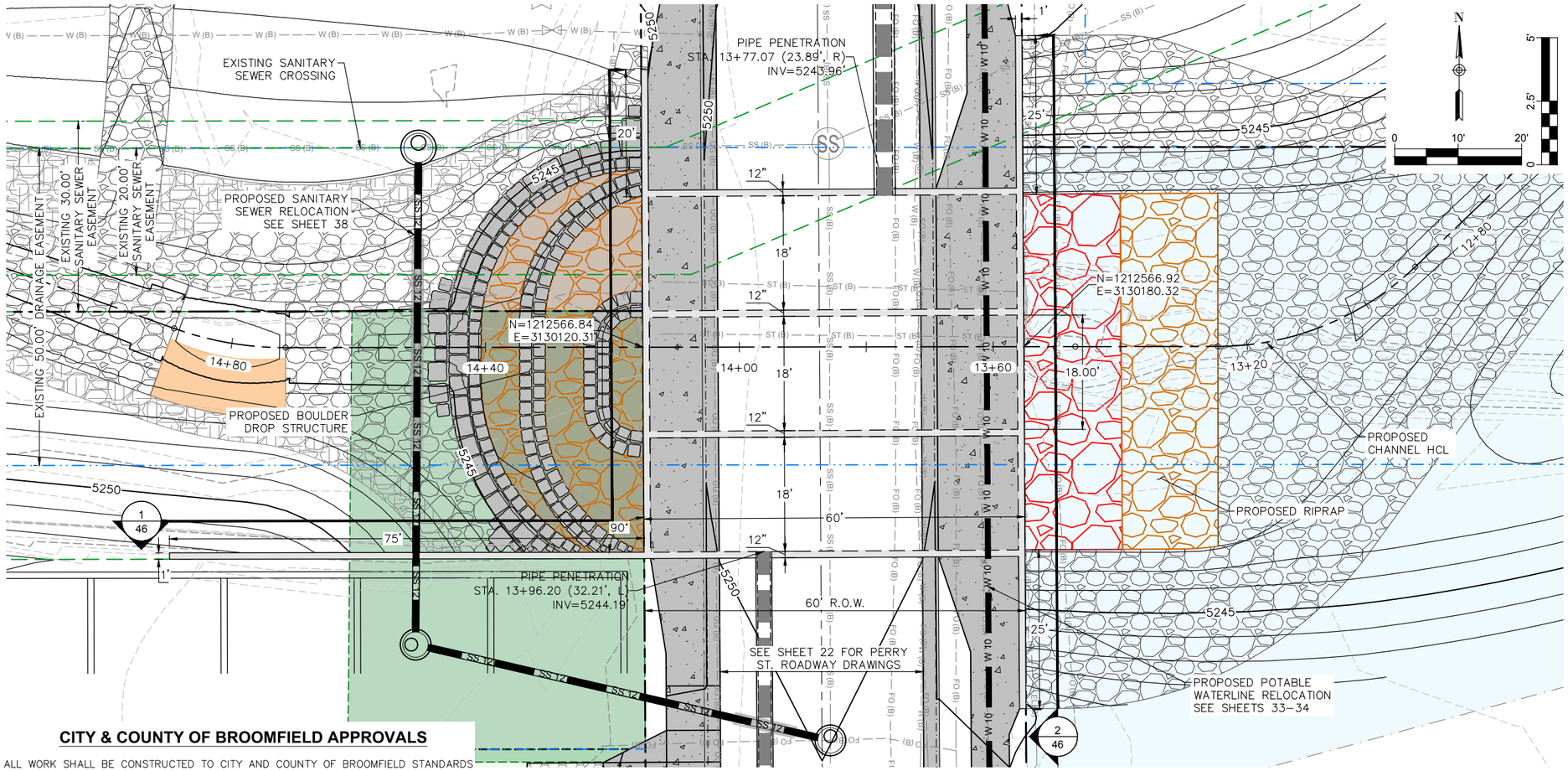

LEGEND

- SECTION LINE
- EXISTING RIGHT OF WAY
- EXISTING PROPERTY/LOT LINE
- EXISTING DRAINAGE EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING UTILITY &/OR ACCESS EASEMENT
- PROPOSED HCL
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED DRAINAGE EASEMENT
- PROPOSED SANITARY SEWER EASEMENT
- W 10 — PROPOSED 10-IN WATERLINE
- PROPOSED STORM SEWER
- SS 12 — PROPOSED 12-IN SANITARY SEWER
- 5280 — PROPOSED MAJOR CONTOUR
- 5281 — PROPOSED MINOR CONTOUR
- 5280 — EXISTING MAJOR CONTOUR
- 5281 — EXISTING MINOR CONTOUR
- PROPOSED BOULDER RIFFLE (SEE SHEET 53)
- PROPOSED – TYPE L VOID FILLED RIPRAP
- PROPOSED – TYPE M VOID FILLED RIPRAP
- PROPOSED – TYPE H VOID FILLED RIPRAP
- PROPOSED – BURIED TYPE L SOIL RIPRAP
- PROPOSED RIPRAP TOE BANK PROTECTION
- PROPOSED PEDESTRIAN TRAIL

NOTES:

1. SEE SHEETS 3 THRU 6 FOR PROPERTY AND EASEMENT INFORMATION, AS WELL AS LAYOUT GEOMETRY FOR THE LOW FLOW CHANNEL HCL.
2. SEE SHEETS 11 THRU 13 FOR THE CHANNEL GRADING PLAN
3. SEE SHEETS 18 THRU 21 FOR TRAIL PLAN AND PROFILES.
4. SEE SHEETS 22 THRU 28 FOR ROADWAY DRAWINGS
5. SEE SHEETS 29 THRU 32 FOR DRY UTILITY INFORMATION..
6. SEE SHEET 46 FOR PERRY ST. CULVERT STRUCTURE DETAILS
7. SEE SHEETS 55 THRU 56 FOR CHANNEL CROSS SECTIONS.
8. SEE SHEETS 50 THRU 54 FOR BANKFULL DETAILS INCLUDING BOULDER RIFFLES, BANKFULL RIFFLES, TOE STABILIZATION.
9. PROFILE GRADE BREAKS LABELED AS POOL LOW POINTS ARE OFFSET HORIZONTALLY FROM THE HCL. SEE TYPICAL POOL SECTION ON SHEET 51.

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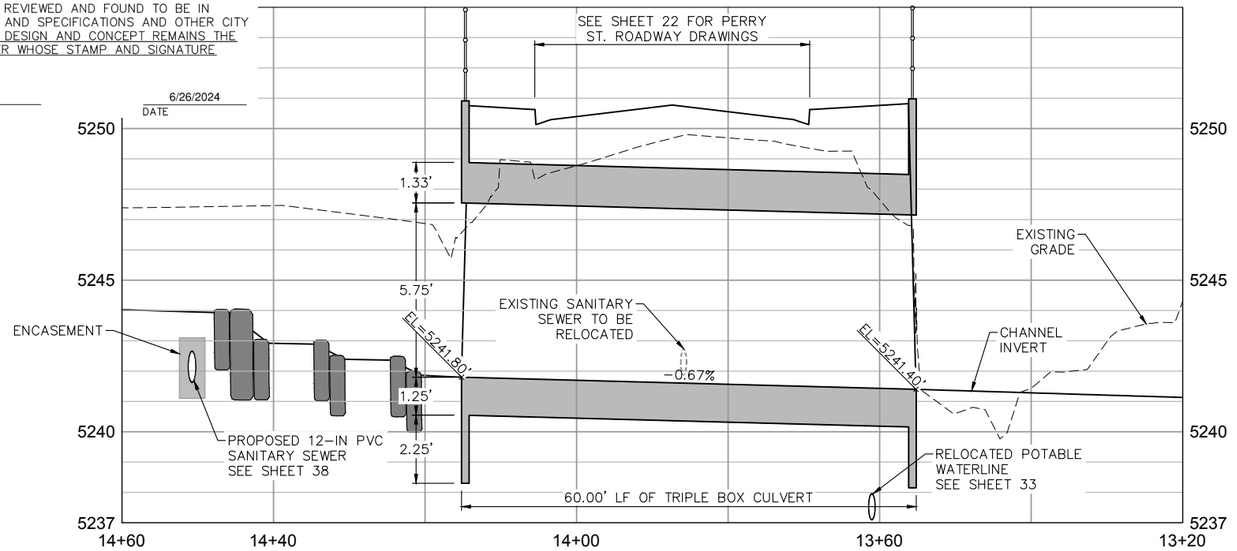

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PLAN
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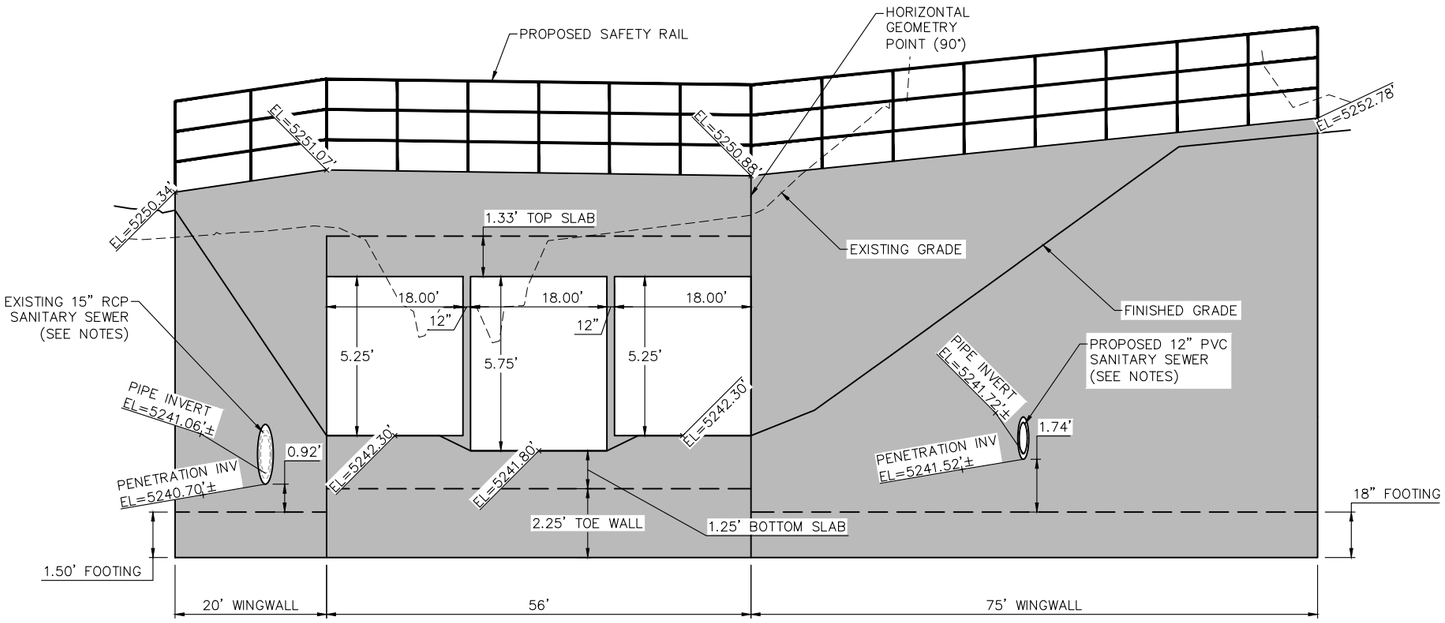
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PERRY STREET CULVERT PLAN & PROFILE

ICON PROJECT No. 17-029-NRD

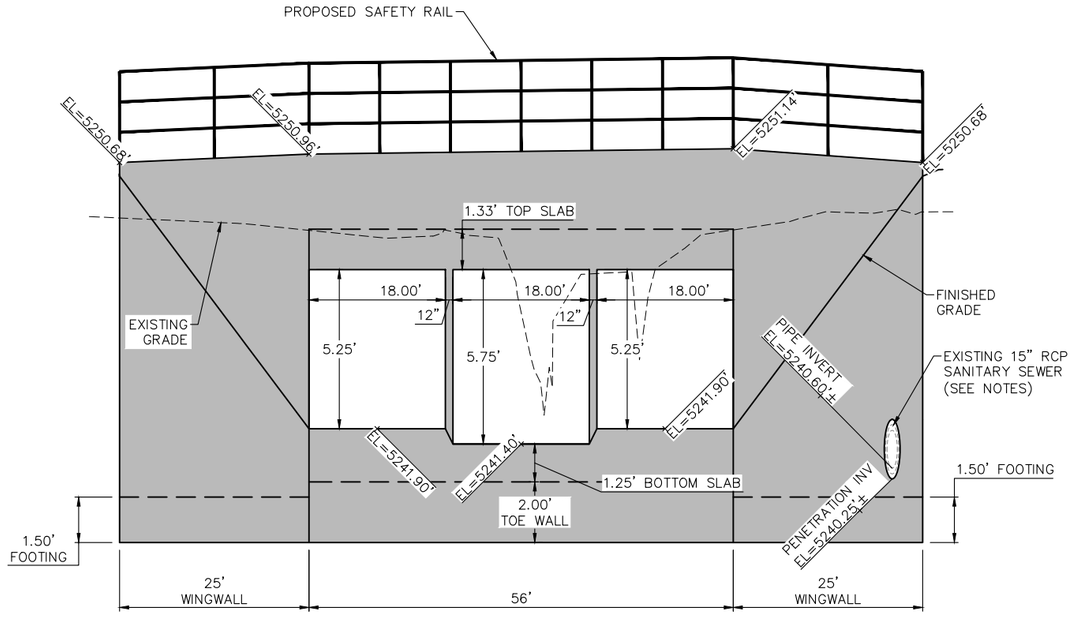
DATE MAY 2024

SHEET 45 OF 90

p:\17-029-nrd-sbp - nissen reservoir\06 dwg\ final design\05 final sheets\NRD - PERRY CULVERT.dwg, Opaltaste, Page Setup: --- ICON-HALF-SIZE.ctb, 6/27/2024 1:36 PM



1/45 UPSTREAM HEADWALL AND WINGWALL ELEVATION VIEW



2/45 DOWNSTREAM HEADWALL AND WINGWALL ELEVATION VIEW

0 10' 20'
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 5'

NOTES:

1. SEE SHEET 45 FOR PLAN VIEW AND LAYOUT OF CULVERT STRUCTURE.
2. UTILITIES SHOWN IN THE WINGWALLS SHALL BE CASED WITH A STEEL SLEEVE WITH THE DIAMETER BEING 4-IN LARGER THAN THE UTILITY OUTSIDE DIAMETER. THE VOID SHALL BE PROTECTED TO PREVENT MATERIAL FROM FILLING THE SPACE TO ALLOW THE WALL AND UTILITY TO SETTLE INDEPENDENTLY.
3. REFER CONTRACTOR TO STRUCTURAL DRAWINGS

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
PERRY STREET CULVERT ELEVATION PLANS
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 46 OF 90

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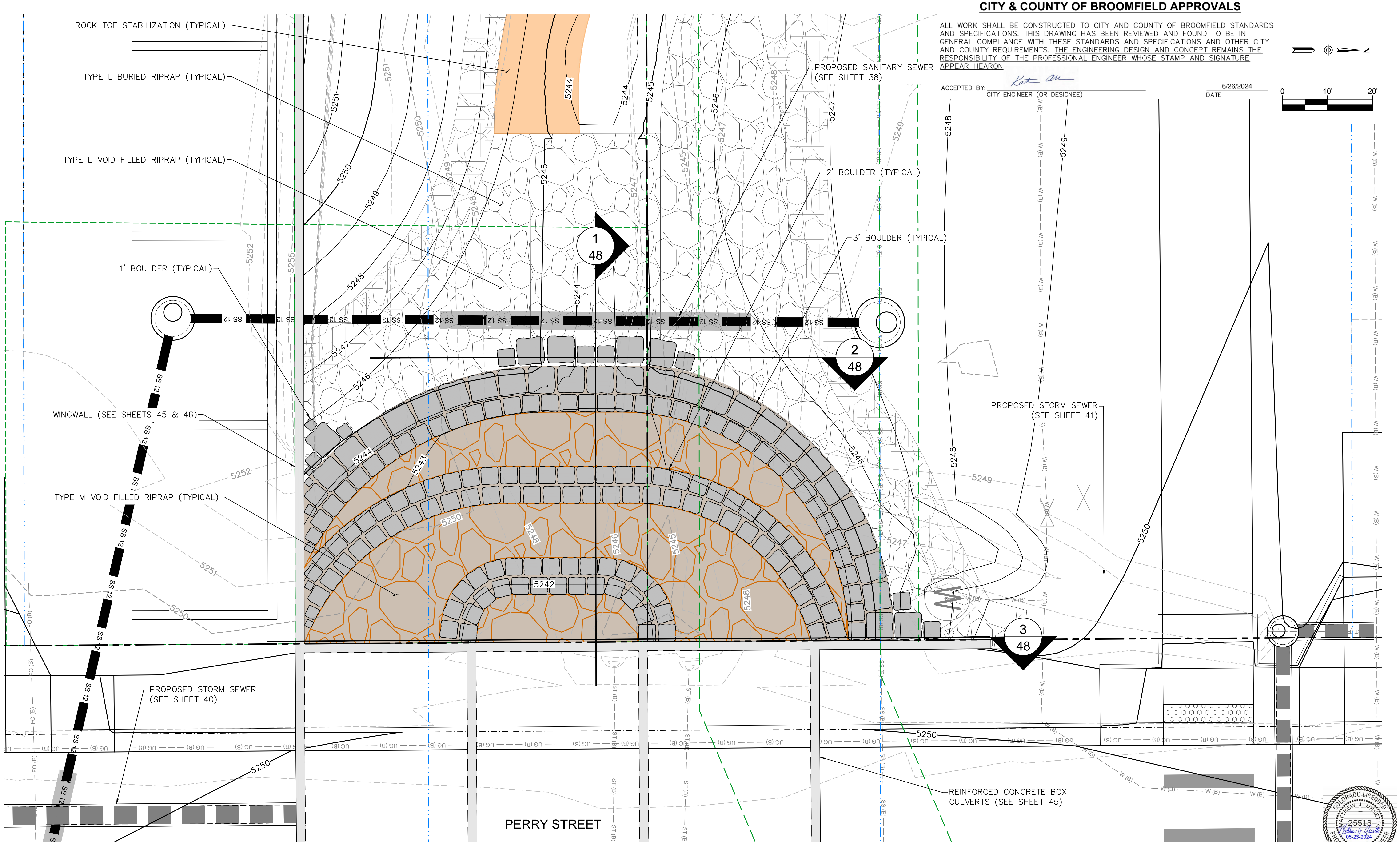

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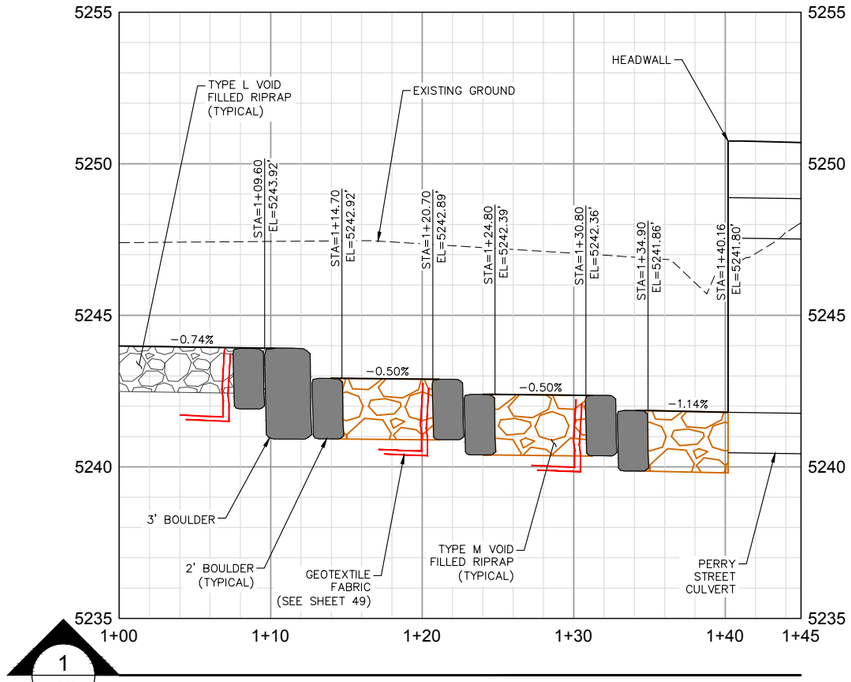
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
DROP STRUCTURE - PLAN

ICON PROJECT No. 17-029-NRD

DATE MAY 2024



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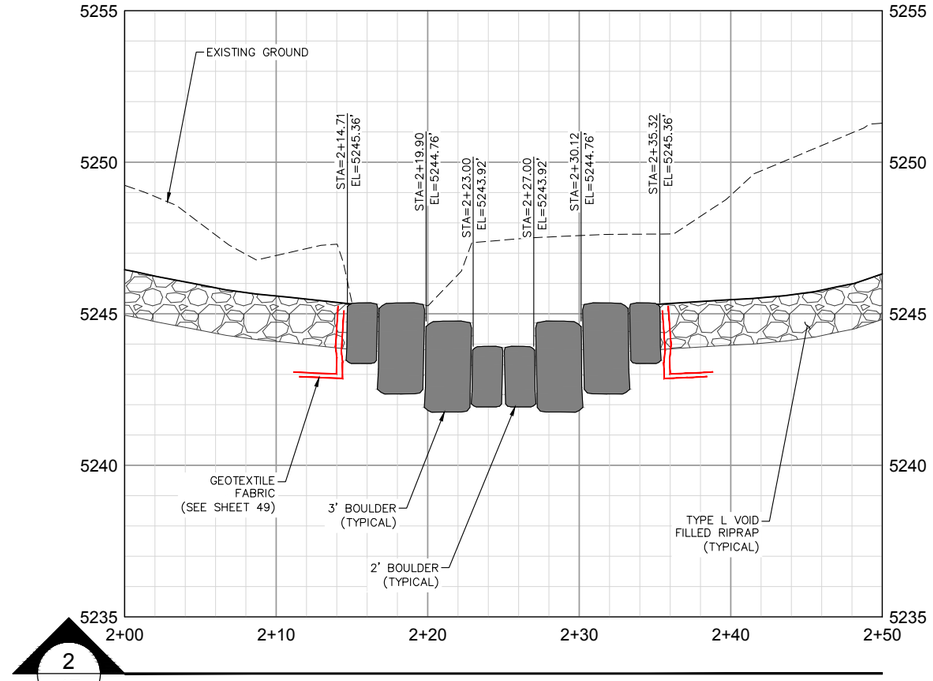
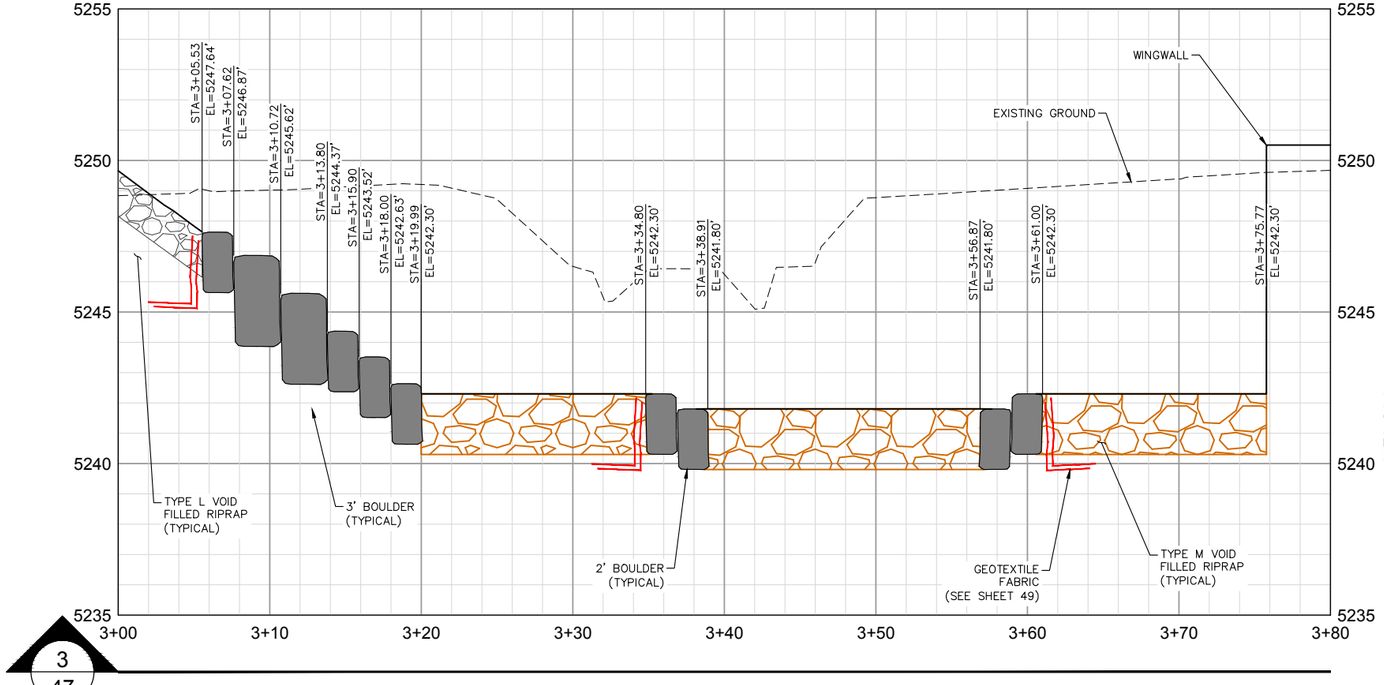
47



2
47



3
47

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25513
PROFESSIONAL ENGINEER
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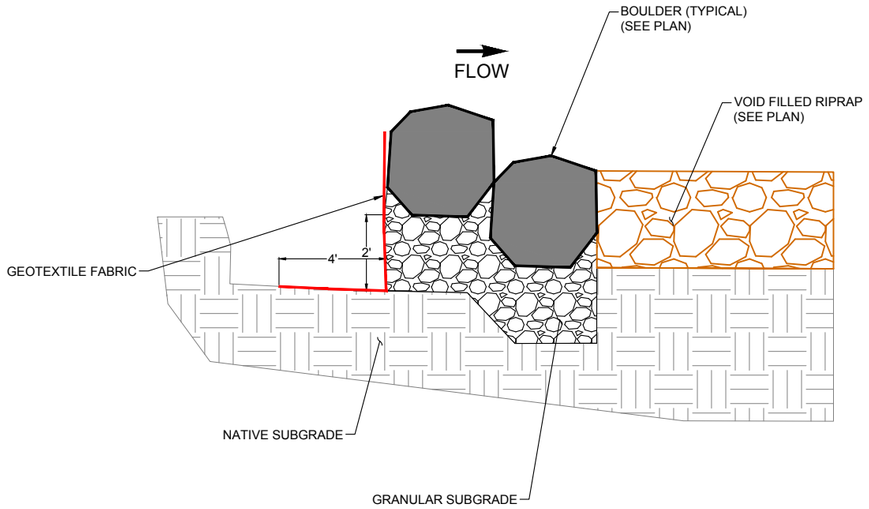
NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
DROP STRUCTURE - SECTIONS
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

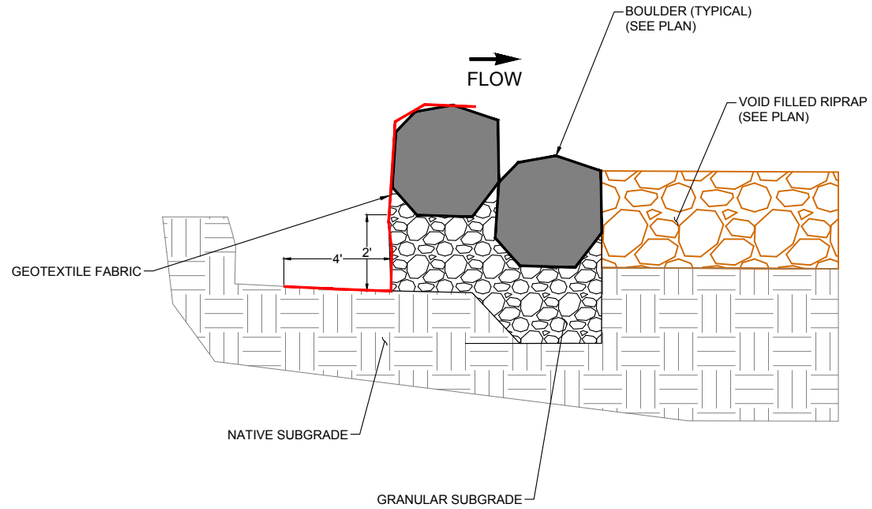
SHEET 48 OF 90

p:\P17-029-nrd-SR2 - nissen reservoir\08 dwg final design\05 final sheets\NRD - DROP STRUCTURE.dwg, Options: Page Setup: ---- ICON-HALF-SIZE.ctb, 6/27/2024 1:36 PM

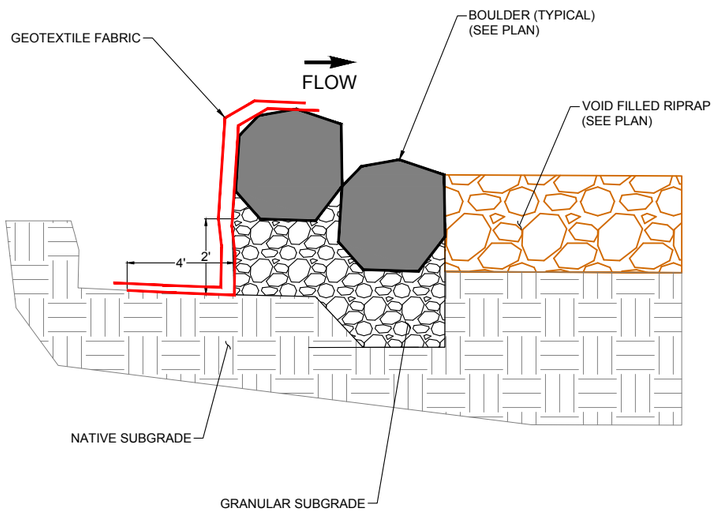
STEP 1: EXCAVATE UPSTREAM OF BOULDER CREST.
LINE EXCAVATION WITH GEOTEXTILE FABRIC.
TRENCH IN GEOTEXTILE FABRIC.



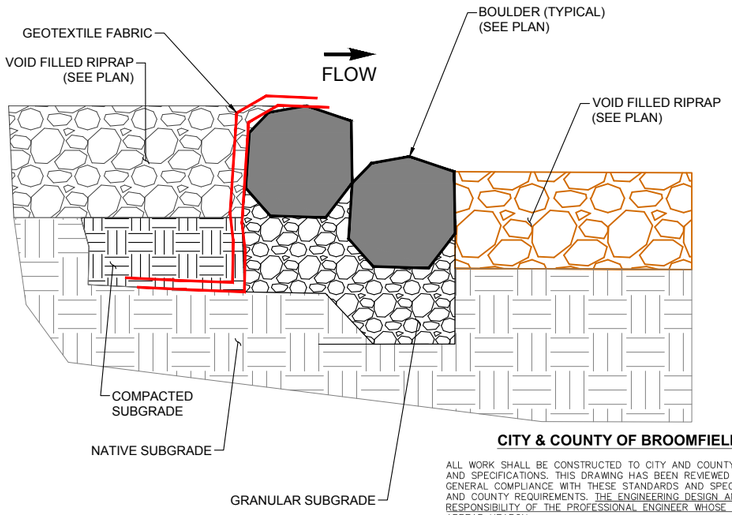
STEP 2: ROLL FABRIC DOWNSTREAM AND ON TOP OF
BOULDER SILL. PUSH FABRIC INTO ALL CRACKS IN BOULDERS,
LEAVING SLACK IN FABRIC.



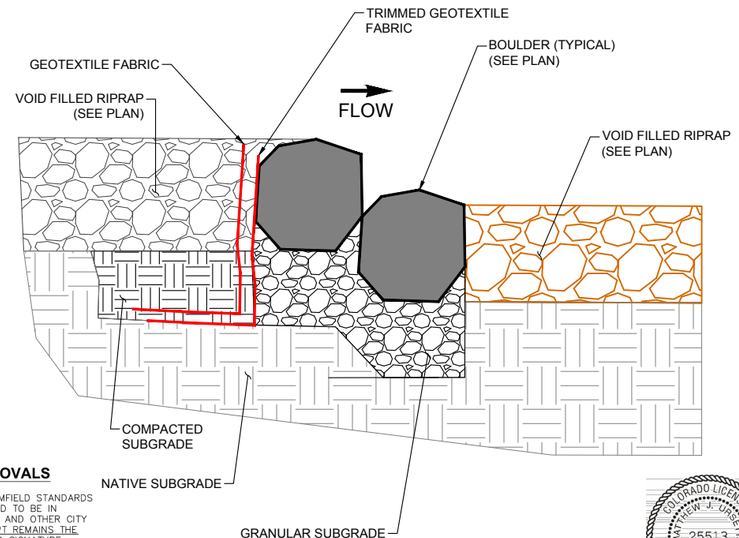
STEP 3: COMPLETE 2ND LAYER OF GEOTEXTILE FABRIC.
BACKFILL TRENCH.



STEP 4: BACKFILL WITH COMPACTED EARTH AND VOID FILLED
RIPRAP PER PLAN.



STEP 5: TRIM EXCESS GEOTEXTILE FABRIC TO
2" BELOW FLOWLINE USING KNIFE.



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25513
05-28-2024
PROFESSIONAL ENGINEER

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
DROP STRUCTURE - DETAILS
ICON PROJECT No. 17-029-NRD

DATE
MAY 2024

SHEET
49 OF 90

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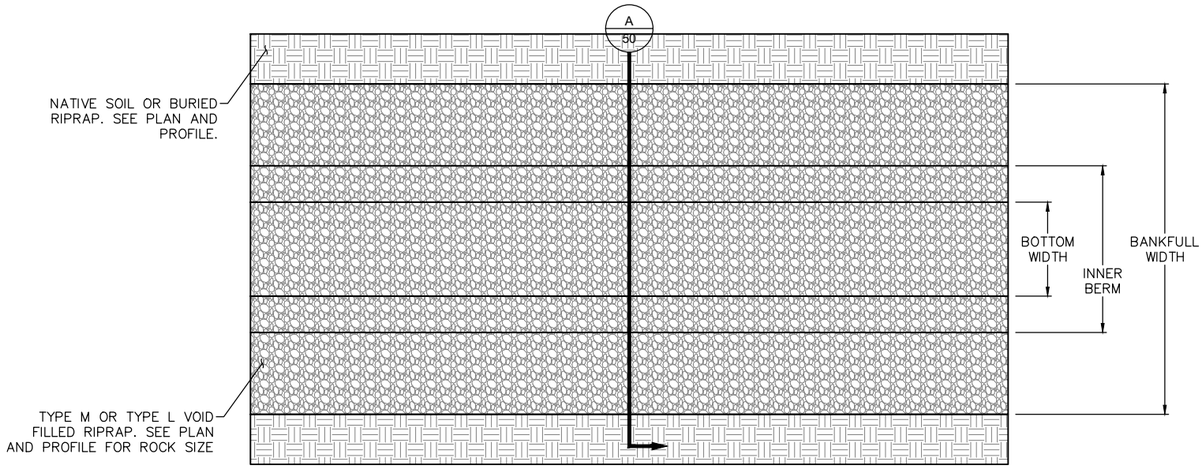
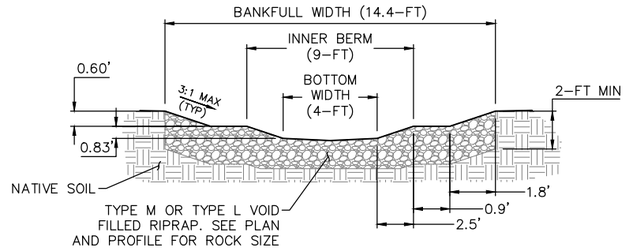
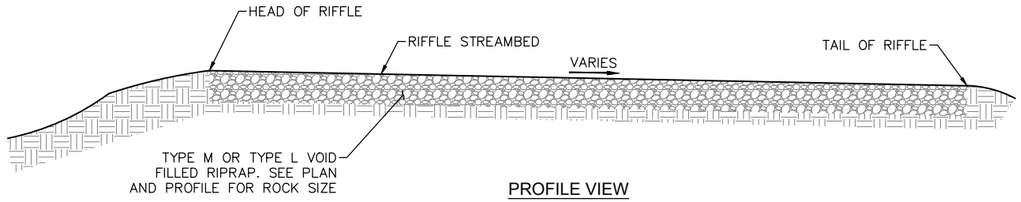


PLAN VIEW



SECTION A



PROFILE VIEW

NOTES:

1. RIFFLE MATERIAL SHALL BE PLACED IN UNIFORM THICKNESS
2. THE SELECT RIFFLE MATERIAL SHALL BE PLACED SUCH THAT, IN CROSS–SECTION, ITS LOWEST ELEVATION OCCURS IN THE CENTER OF THE CHANNEL AS SHOWN IN THIS DETAIL.
3. CHANNEL INVERTS SHALL BE SET AT ELEVATIONS SHOWN IN THE PROFILES ON SHEETS 14 THRU 16.
4. THE SURFACE OF THE RIFFLE STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS–SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.1–FT OF THE GRADES AND ELEVATIONS INDICATED.
5. RE–DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN–STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.

VOID FILLED RIPRAP RIFFLE DETAIL
SCALE: NTS

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL DETAILS - RIFFLE
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 50 OF 90

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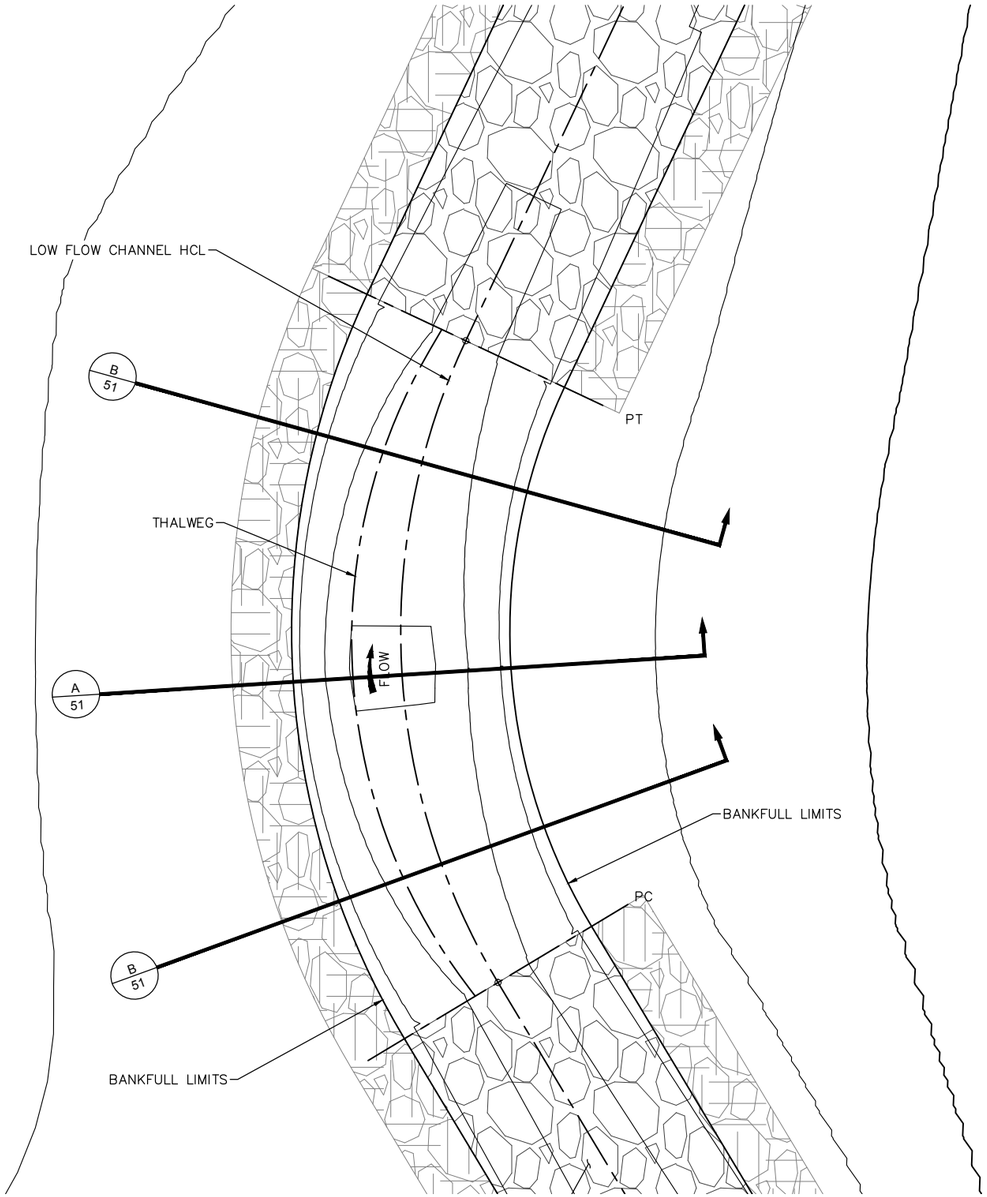
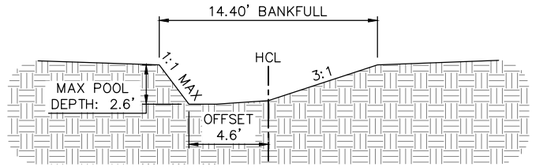
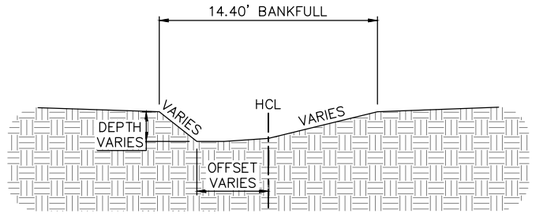


0 5' 10'

HORIZ. SCALE: 1" = 10'



A
51
MIDDLE POOL TYPICAL DETAIL
SCALE: NTS



B
51
POOL TRANSITION TYPICAL DETAIL
SCALE: NTS

NOTES:

1. SECTIONS SHOWN ARE TYPICAL OF ALL LEFT POOLS. RIGHT POOLS ARE SIMILAR AND MIRRORED ABOUT THE HCL.
2. SEE CHANNEL PLAN AND PROFILE SHEETS FOR HCL ELEVATIONS AT THE PT AND PC POINTS. (SHEETS 14 THRU 16)
3. POOL DEPTH VARIES AS THE POOL TRANSITIONS FROM A RIFFLE, TO SECTION B AND TO SECTION A.
4. SEE SHEET 52 FOR MORE POOL DETAILS

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25513
PROFESSIONAL ENGINEER
05-28-2024

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL DETAILS - TYPICAL SECTIONS
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 51 OF 90

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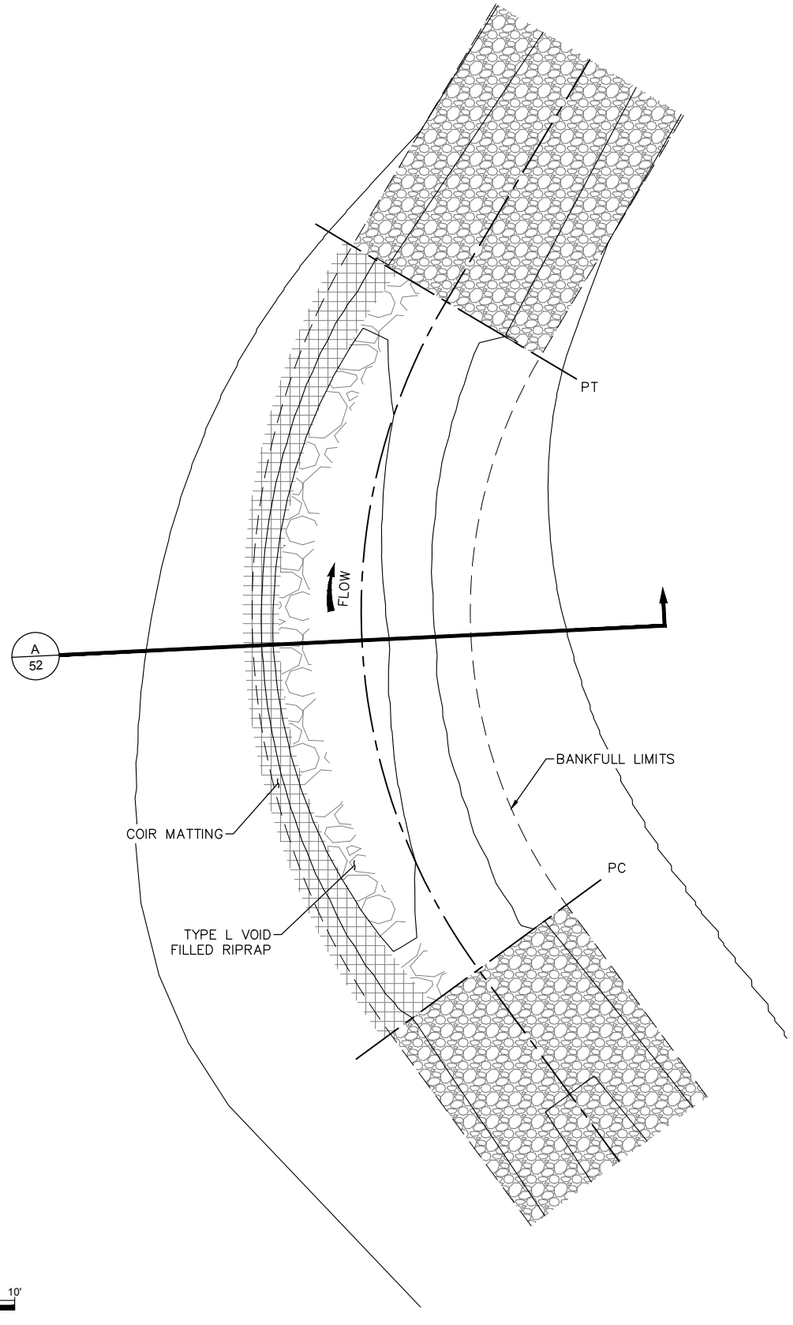

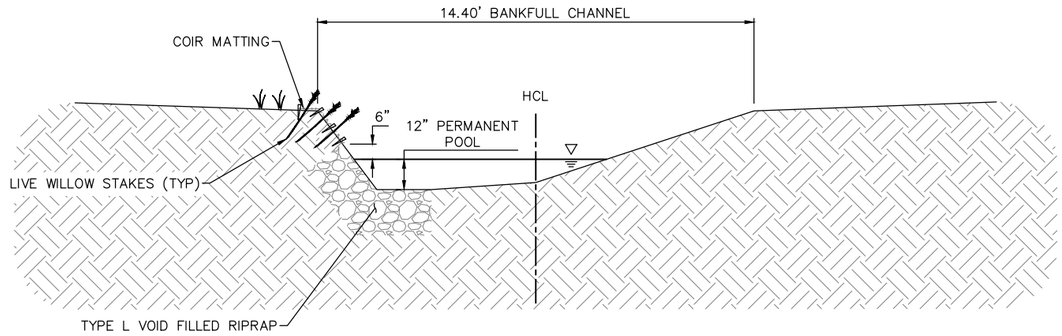

A
52
ROCK TOE STREAMBANK STABILIZATION DETAIL
SCALE: NTS

NOTES:
1. THE MAXIMUM ELEVATION OF THE DOWNSTREAM RIFFLE SHALL BE KNOWN AS THE BASEFLOW ELEVATION FOR A GIVEN POOL.
2. ROCKY TOE SHALL EXTEND 6" ABOVE BASEFLOW ELEVATION
3. WILLOW STAKES SHALL BE INSERTED TO BASEFLOW ELEVATION.
4. COIR MATTING SHALL EXTEND FROM ABOVE BANKFULL ELEVATION DOWN TO BASEFLOW ELEVATION.

CITY & COUNTY OF BROOMFIELD APPROVALS

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CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. UNDA
25513
05-28-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

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PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL DETAILS - PROTECTION-ROCK
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 52 OF 90

p:\P17-029-nrd\352 - nissen reservoir\06 dwg final design\05 final sheets\NRD - CHANNEL DETAILS.dwg, Qsaltaes, Page Setup:---, ICON-HALF-SIZE, dtv, 6/27/2024 1:37 PM

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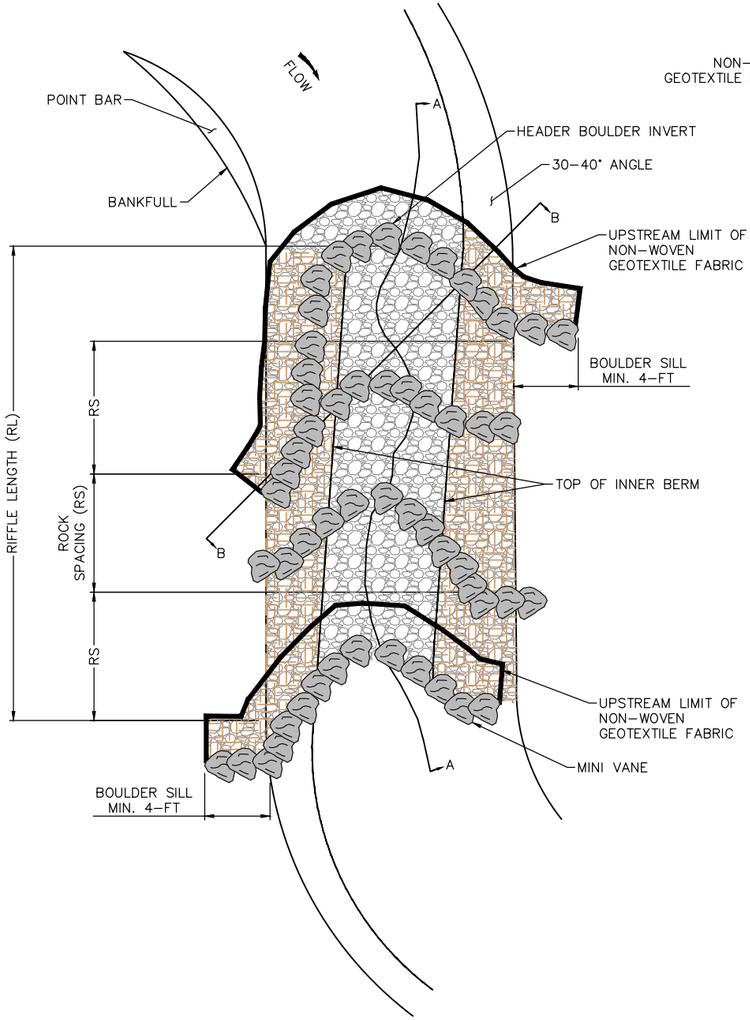
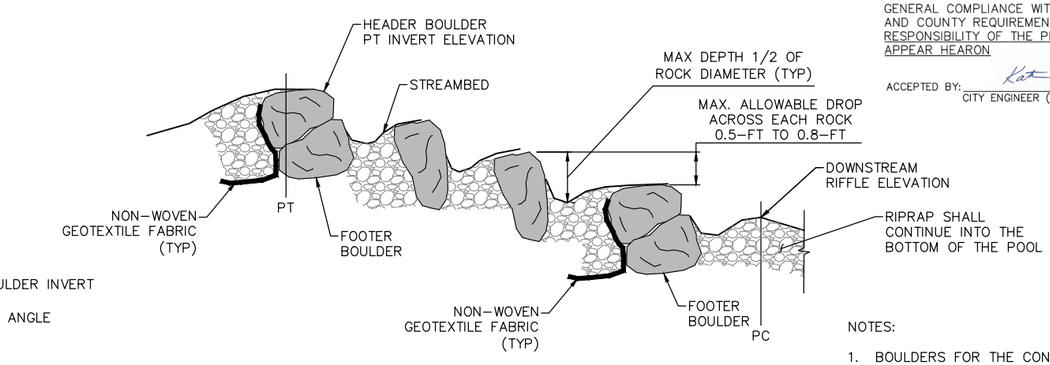
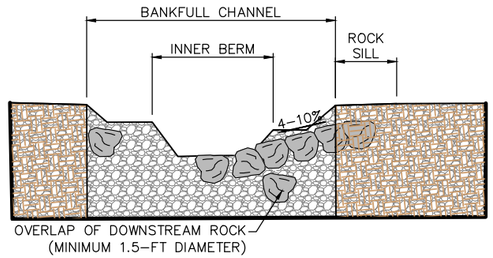
COLORADO LICENSED MATTHEW J. CUTLIP 25513 PROFESSIONAL ENGINEER 05-23-2024



PLAN VIEW
NTS



SECTION A



SECTION B

LEGEND

- RIFFLE BEDFORM MATERIAL – TYPE M VOID FILLED RIPRAP
- TYPE M BURIED VOID FILLED RIPRAP

NOTES:

1. BOULDERS FOR THE CONSTRUCTED RIFFLE MUST BE A MINIMUM DIAMETER OF 2FT.
2. THE UPSTREAM AND DOWNSTREAM HEADER BOULDERS SHALL BE UNDERLAIN BY FOOTER BOULDERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. HEADER BOULDERS ARE THE TOP MOST BOULDERS USED IN EACH STRUCTURE. HEADER BOULDERS FOR THIS STRUCTURE ARE ONLY VISIBLE BETWEEN THE INNER BERMS.
4. HEADER BOULDERS SHALL BE OFFSET SLIGHTLY UPSTREAM OF THE FOOTER BOULDERS. FOOTER BOULDERS SHALL BE INSTALLED BEFORE THE HEADER BOULDERS.
5. SET INVERTS AT ELEVATIONS SHOWN ON THE PLAN AND PROFILE SHEETS. INVERTS AND ELEVATIONS WILL BE PROVIDED TO THE CONTRACTOR AS A 2020 FORMAT DWG FILE. NO ELEVATIONS OF THE CONSTRUCTED RIFFLE ARMS MAY VARY FROM THE PLAN LOCATIONS WITHOUT DIRECTION FROM THE ENGINEER.
6. THE DROP IN ELEVATION ACROSS THE STRUCTURE SHALL NOT EXCEED 0.5FT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. MINI–VANES WILL BE SPACED IN THE RIFFLE AS A FUNCTION OF THE RIFFLE LENGTH.
8. THE MOST UPSTREAM RIFFLE MINI–VANE ARM SHALL BE PLACED SUCH THAT THE BANK TIE–IN IS ON THE SAME SIDE AS THE NEXT UPSTREAM OUTSIDE BEND IN ORDER TO SERVE AS A VANE AND HELP DIRECT STREAM FLOW AWAY FROM THE PREVIOUS OUTSIDE BEND. LOCATION OF ALL RIFFLE VANE ARMS ARE SHOWN ON THE PLAN AND PROFILE SHEETS.
9. THE MOST DOWNSTREAM MINI–VANE ARM SHALL BE PLACED SUCH THAT THE HIGH POINT IS ON THE SAME SIDE AS THE NEXT DOWNSTREAM OUTSIDE BEND IN ORDER TO HELP DIRECT STREAM FLOW FROM THE NEXT OUTSIDE BEND.
10. THE VERTICAL SLOPE OF EACH MINI–VANE ARM SHALL NOT EXCEED 10% UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE SLOPES WILL BE DICTATED BY THE WIDTH–TO–DEPTH RATIO OF THE REACH, TYPICAL RIFFLE INNER BERM CHANNEL, VERTICAL DROP OVER THE LOG, AND LOG DIAMETER.
11. ALL GAPS/VOIDS LARGER THAN 2–IN BETWEEN THE HEADER AND FOOTER BOULDERS SHALL BE HAND CHINKED WITH COBBLE AND GRAVEL ON THE UPSTREAM SIDE PRIOR TO PLACEMENT OF THE GEOTEXTILE. ALL CHINKING SHALL BE APPROVED BY THE ENGINEER BEFORE THE MINI–VANES ARE BACKFILLED.
12. THE UPSTREAM SIDE OF THE FIRST AND LAST MINI–VANE ARM REQUIRE A LAYER OF NON–WOVEN GEOTEXTILE FABRIC THAT SHALL BE PLACED AS SHOWN IN THE GEOTEXTILE PLACEMENT DETAIL THE ENTIRE LENGTH OF THE MINI–VANE.
13. BACKFILL VANES WITH SELECT BACKFILL MATERIAL AS SHOWN AND DEFINED IN THE CONSTRUCTED RIFFLE DETAIL.
14. SELECT BACKFILL AND SOIL BACKFILL MATERIAL SHALL BE COMPACTED SUCH THAT FUTURE SETTLEMENT OF THE MATERIAL IS KEPT TO A MINIMUM..
15. THE SURFACE OF THIS STRUCTURE SHALL BE FINISHED TO A SMOOTH AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES, AND CROSS–SECTIONS OR ELEVATIONS SHOWN ON THE DRAWINGS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.1FT OF THE GRADES AND ELEVATIONS INDICATED, PROVIDED ANY HEIGHT DOES NOT EXCEED MAXIMUM ALLOWABLE DROP OF 0.5FT – 0.8FT FOR THESE STRUCTURES.
16. RE–DRESSING OF CHANNEL AND BANKFULL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN–STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
17. FOOTER DEPTH ON ALL STRUCTURES REQUIRING FOOTERS SHALL BE 6 TIMES GREATER THAN THE DROP BETWEEN THE STRUCTURE AND THE FOOTERED STRUCTURE DIRECTLY UPSTREAM.

CONSTRUCTED BOULDER RIFFLE
SCALE: NTS

No.	DATE	REVISIONS	APPR.

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL DETAILS - BOULDER RIFFLE
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 53 OF 90

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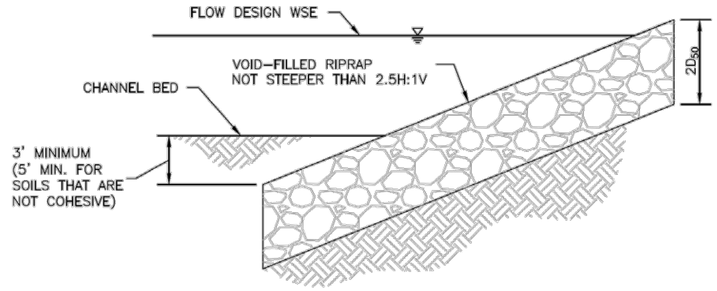

TABLE 1. MIX REQUIREMENTS FOR TYPE VL AND L VOID–FILLED RIPRAP (D_{50} = 6 TO 9 INCH)		
APPROPRIATE PROPORTIONS (BY VOLUME)	MATERIAL TYPE	MATERIAL DESCRIPTION
6 PARTS	RIPRAP	D_{50} = 6 INCH (TYPE VL) OR D_{50} = 9 INCH (TYPE L), SEE TABLE 3
1 PART	VOID–FILL MATERIAL	VTC (VEHICLE TRACKING CONTROL) ROCK (CRUSHED ROCK WITH 100% PASSING 4–INCH SIEVE, 50–70% PASSING 3–INCH SIEVE, 0–10% PASSING 2–INCH SIEVE)
1 PART	VOID–FILL MATERIAL	4–INCH MINUS PIT RUN SURGE (ROUND RIVER ROCK AND SAND, WELL GRADED, 90–100% PASSING 4–INCH SIEVE, 70–80% PASSING 1½–INCH SIEVE, 40–60% PASSING ⅜–INCH SIEVE, 10–30% PASSING #16 SIEVE)
1 PART	VOID–FILL MATERIAL	TYPE II BEDDING (CRUSHED ROCK WITH 100% PASSING 3–INCH SIEVE, 20–90% PASSING ¾–INCH SIEVE, 0–20% PASSING #4 SIEVE, 0–3% PASSING #200 SIEVE)
½ TO 1 PART	VOID–FILL MATERIAL	NATIVE TOPSOIL

VOID–FILLED RIPRAP PLACEMENT AND GRADATION

Figure 8-35. Void-filled riprap placement and gradation (part 1 of 3)

TABLE 2. MIX REQUIREMENTS FOR TYPE M AND H VOID–FILLED RIPRAP (D_{50} = 12 TO 18 INCH)		
APPROPRIATE PROPORTIONS (BY VOLUME)	MATERIAL TYPE	MATERIAL DESCRIPTION
6 PARTS	RIPRAP	D_{50} = 12–INCH (TYPE M) OR D_{50} = 18–INCH (TYPE H), SEE TABLE 3
2 PART	VOID–FILL MATERIAL	7–INCH MINUS CRUSHED ROCK SURGE (100% PASSING 7–INCH SIEVE, 80–100% PASSING 6–INCH SIEVE, 35–50% PASSING 3–INCH SIEVE, 10–20% PASSING 1½–INCH SIEVE)
1 PART	VOID–FILL MATERIAL	VTC (VEHICLE TRACKING CONTROL) ROCK (CRUSHED ROCK WITH 100% PASSING 4–INCH SIEVE, 50–70% PASSING 3–INCH SIEVE, 0–10% PASSING 2–INCH SIEVE)
1 PART	VOID–FILL MATERIAL	4–INCH MINUS PIT RUN SURGE (ROUND RIVER ROCK AND SAND, WELL GRADED, 90–100% PASSING 4–INCH SIEVE, 70–80% PASSING 1½–INCH SIEVE, 40–60% PASSING ⅜–INCH SIEVE, 10–30% PASSING #16 SIEVE)
1 PART	VOID–FILL MATERIAL	TYPE II BEDDING (CRUSHED ROCK WITH 100% PASSING 3–INCH SIEVE, 20–90% PASSING ¾–INCH SIEVE, 0–20% PASSING #4 SIEVE, 0–3% PASSING #200 SIEVE)
½ TO 1 PART	VOID–FILL MATERIAL	NATIVE TOPSOIL

TABLE 3. VOID–FILLED RIPRAP PLACEMENT AND GRADATION			
RIPRAP DESIGNATION	% SMALLER THAN GIVEN SIZE BY WEIGHT	INTERMEDIATE ROCK DIMENSION (INCHES)	D_{50}* (INCHES)
TYPE VL	70 – 100 50 – 70 35 – 50 2 – 10	12 9 6 2	6
TYPE L	70 – 100 50 – 70 35 – 50 2 – 10	15 12 9 3	9
TYPE M	70 – 100 50 – 70 35 – 50 2 – 10	21 18 12 4	12
TYPE H	70 – 100 50 – 70 35 – 50 2 – 10	30 24 18 6	18
*D_{50} = MEAN ROCK SIZE			

NOTE: MIX ON SITE AND PRIOR TO PLACEMENT

Figure 8-35. Void-filled riprap placement and gradation (part 2 of 3)

VOID–FILLED RIPRAP PLACEMENT AND GRADATION NOTES:

1. WHERE "VOID–FILLED RIPRAP" IS DESIGNATED ON THE CONTRACT DRAWINGS, RIPRAP SHALL BE MIXED WITH THE MATERIALS AND ASSOCIATED PROPORTIONS LISTED IN TABLE 1 OR TABLE 2 TO FILL THE VOIDS OF THE RIPRAP.
2. THE MIX PROPORTIONS PROVIDED IN TABLE 1 AND TABLE 2 ARE APPROXIMATE AND ARE SUBJECT TO ADJUSTMENT BY THE ENGINEER.
3. THE RIPRAP AND VOID–FILLED MATERIALS SHALL BE STOCKPILED SEPERATELY AND THOROUGHLY MIXED PRIOR TO PLACEMENT AND SHALL BE INSTALLED AND COMPACTED SO THAT A DENSE, INTERLOCKED LAYER OF RIPRAP AND VOID–FILL MATERIAL IS PROVIDED WITH RIPRAP VOIDS COMPLETELY FILLED. THE LOOSE MATERIAL SHALL BE PLACED IN A SINGLE LIFT OF SUFFICIENT HEIGHT SUCH THAT FINAL GRADE WILL BE ACHIEVED UPON COMPACTED. IF THE COMPACTED MATERIAL IS BELOW FINAL GRADE, PLACEMENT OF ONLY THE SMALLER VOID–FILL MATERIALS TO ACHIEVE FINAL GRADE IS NOT PERMITTED. IN SUCH CASES IT IS NECESSARY TO ADD MORE STANDARD SIZED VOID–FILLED RIPRAP AND REMIX THE ENTIRE THICKNESS OF ROCK TO ACHIEVE THE DESIGN SECTION. SEGREGATION OF MATERIALS SHALL BE AVOIDED AND IN NO CASE SHALL THE COMBINED MATERIAL CONSIST PRIMARILY OF THE VOID–FILL MATERIALS. THE DENSITY AND INTERLOCKING NATURE OF RIPRAP IN THE MIXED MATERIAL SHALL ESSENTIALLY BE THE SAME AS IF THE RIPRAP WAS PLACED WITHOUT FILLING THE VOIDS.
4. COMPACTION OF THE VOID–FILLED RIPRAP SHALL BE PERFORMED BY WHEEL ROLLING WITH HEAVY RUBBER–TIRED EQUIPMENT (E.G. FRONT END LOADER). THE MOISTURE CONTENT OF THE MIXTURE SHALL BE AT OPTIMUM CONDITIONS PRIOR TO COMPACTION AND WATER SHALL BE ADDED, AS NECESSARY, AT THE DIRECTION OF THE ENGINEER.
5. WHERE INDICATED ON THE DRAWINGS, A SURFACE LAYER OF MOIST TOPSOIL SHALL BE PLACED OVER THE VOID–FILLED RIPRAP. THE TOPSOIL SURFACE LAYER SHALL BE COMPACTED TO APPROXIMATELY 85% OF MAXIMUM DENSITY AND WITHIN TWO PERCENTAGE POINTS OF OPTIMUM MOISTURE IN ACCORDANCE WITH ASTM D698. TOPSOIL SHALL BE ADDED TO ANY AREAS THAT SETTLE.
6. ALL VOID–FILLED RIPRAP THAT IS BURIED WITH TOPSOIL SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO ANY TOPSOIL PLACEMENT.

Figure 8-35. Void-filled riprap placement and gradation (part 3 of 3)

COLORADO LICENSED
ARTHUR J. ICON
25513
PROFESSIONAL ENGINEER
05-28-2024

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NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL DETAILS - RIPRAP
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 54 OF 90

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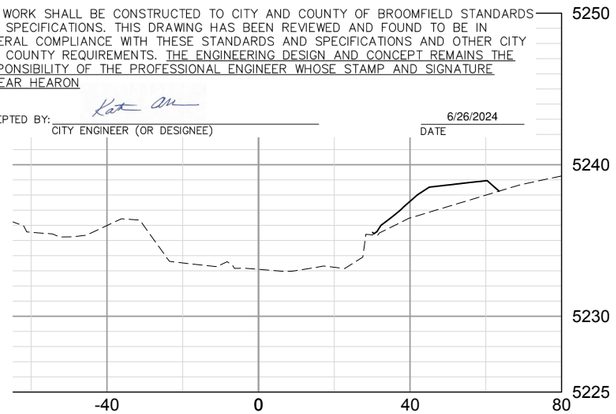

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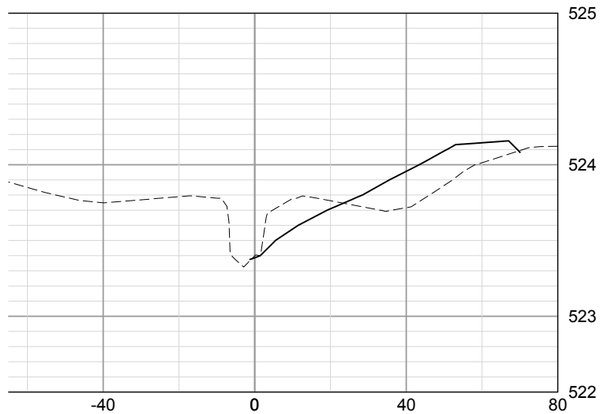

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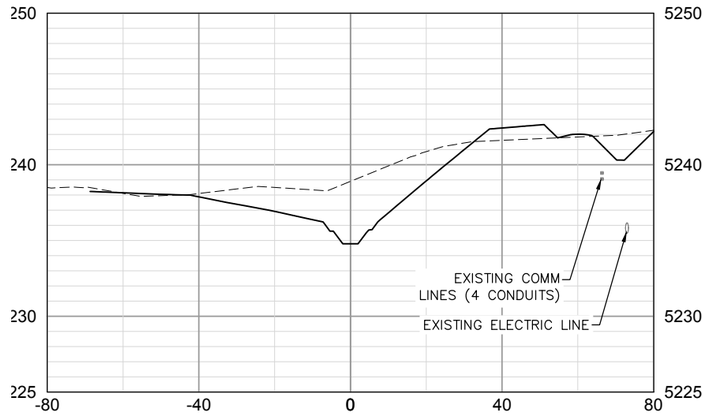

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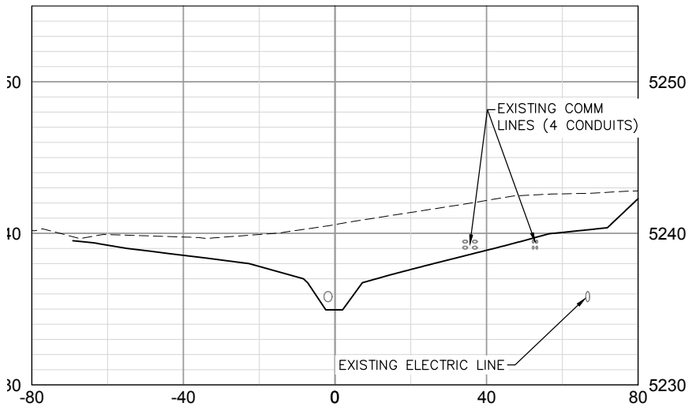

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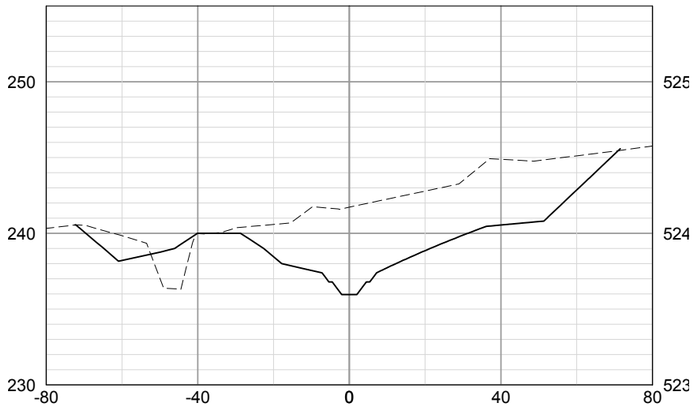

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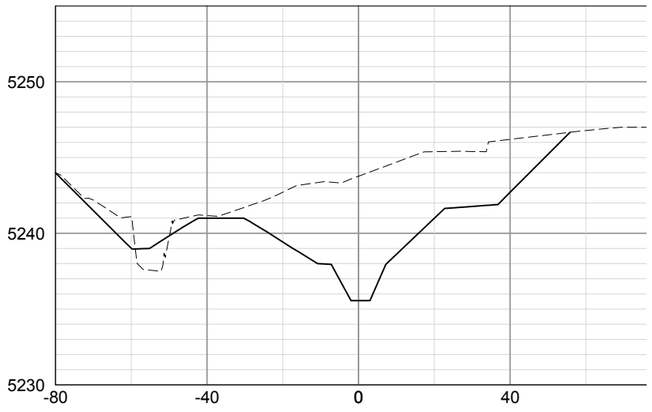

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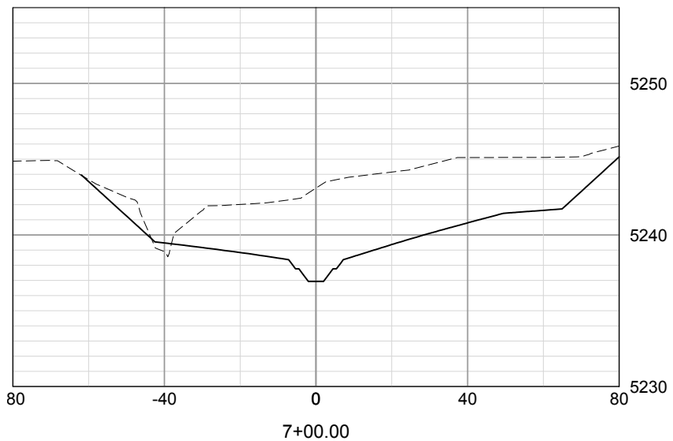

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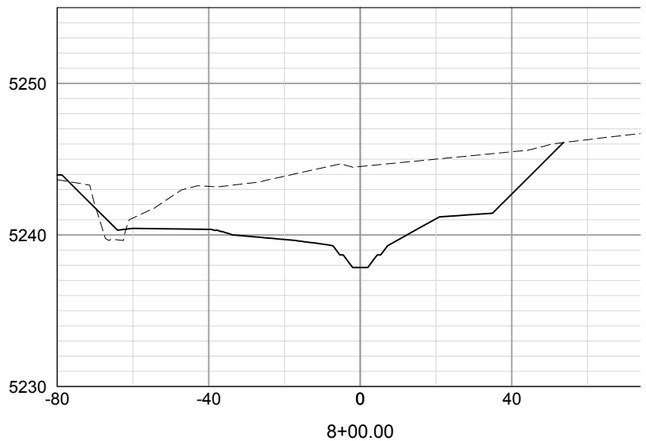

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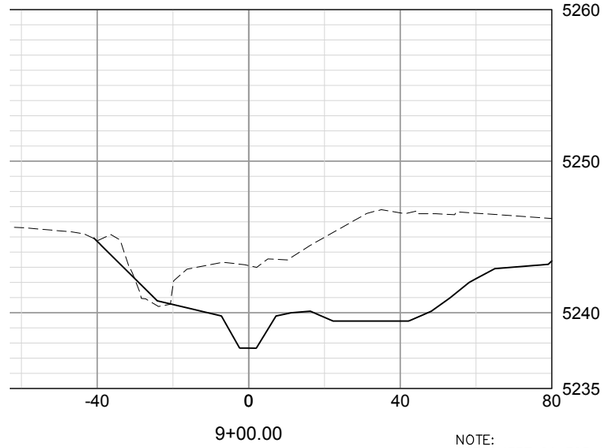

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NOTE:
SEE SHEET 29 FOR UTILITY INFORMATION.

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PREPARED BY: ICON ENGINEERING

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DESIGNED BSC / TJD
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
CHANNEL CROSS SECTIONS - 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024
SHEET 55 OF 90

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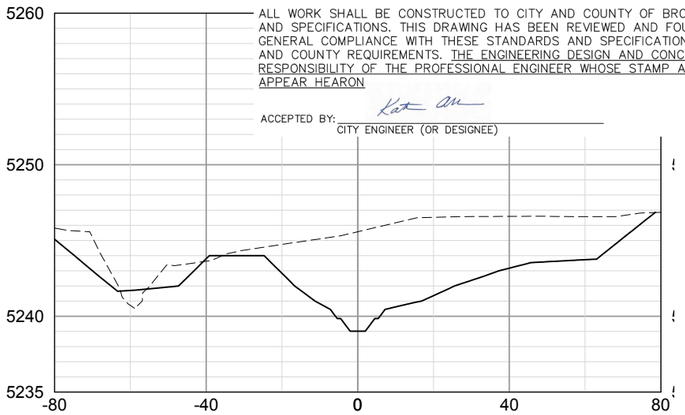

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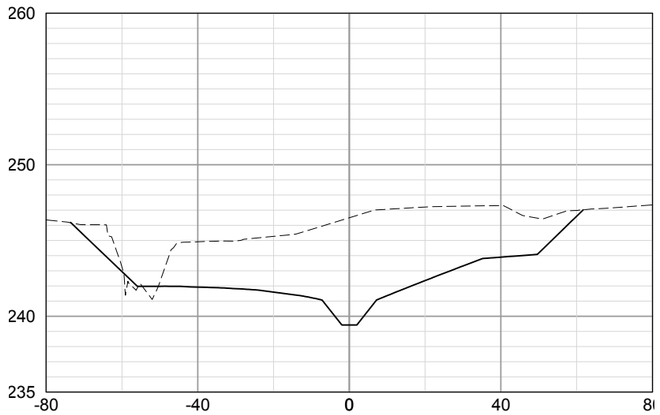

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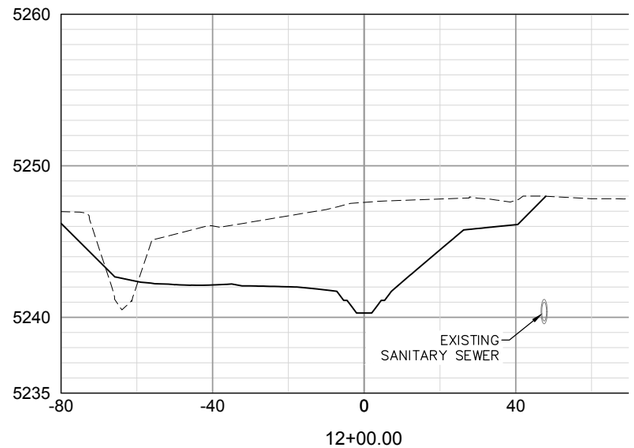

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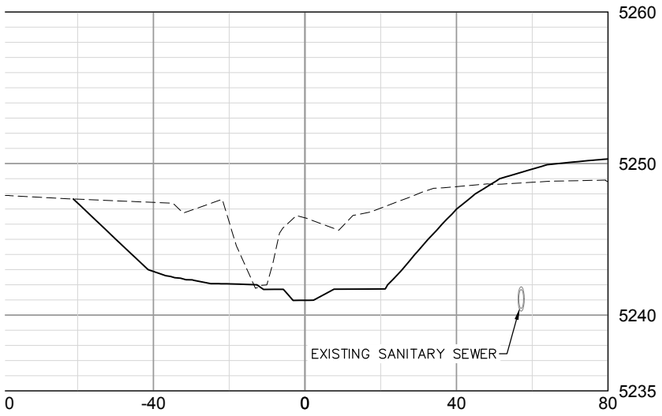

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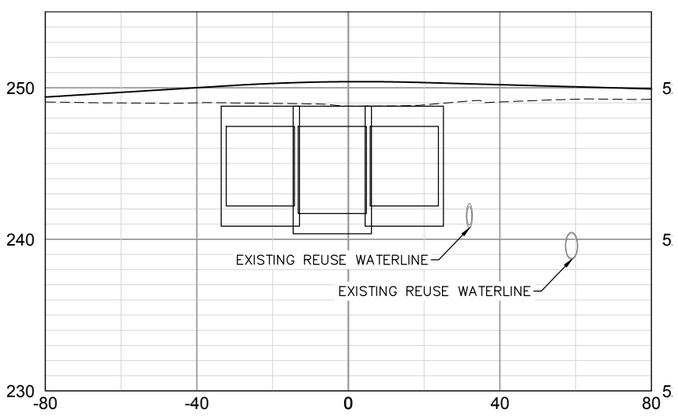

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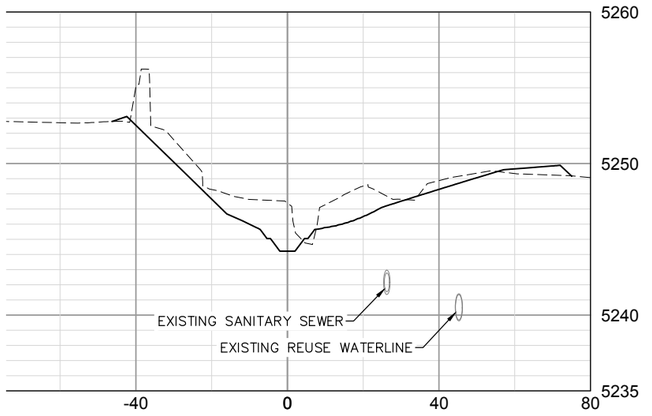

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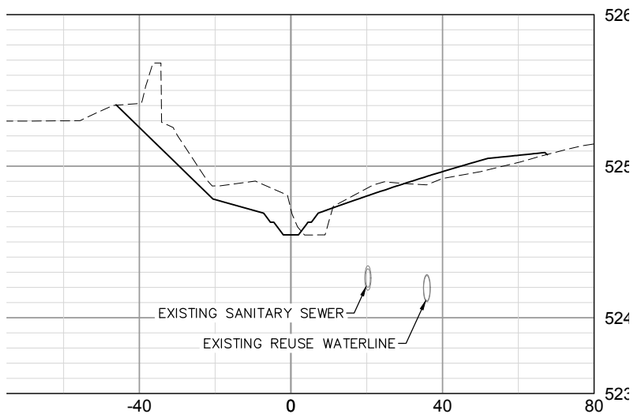

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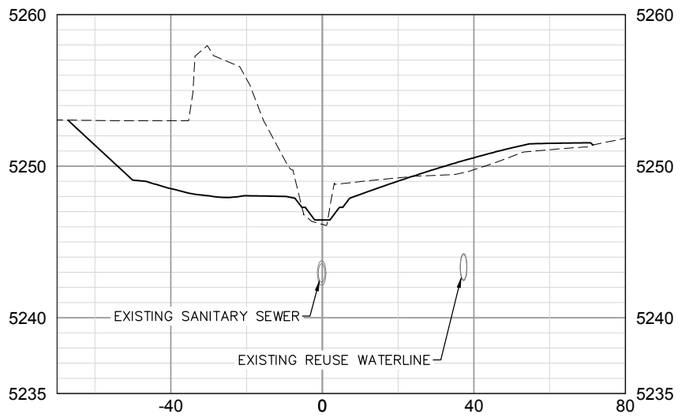

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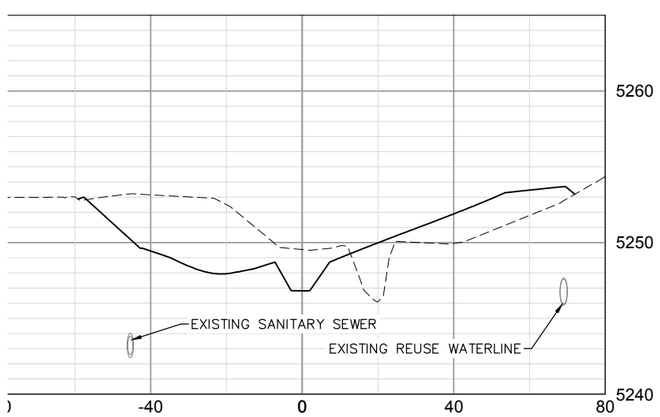

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MATTHEW J. USSELL
25513
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PROFESSIONAL ENGINEER

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PHASE 1
CHANNEL CROSS SECTIONS - 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

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CITY AND COUNTY OF BROOMFIELD

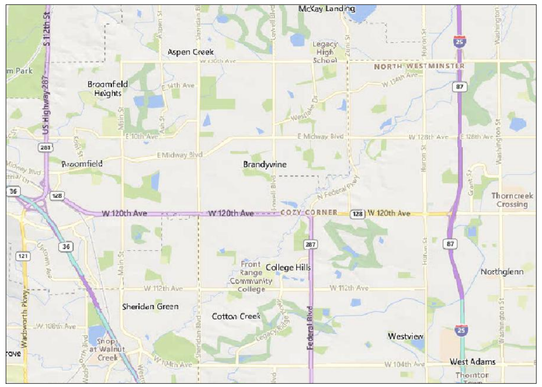
NISSEN RESERVOIR DRAINAGEWAY - PHASE 1

CONSTRUCTION PLANS

PHASE 1

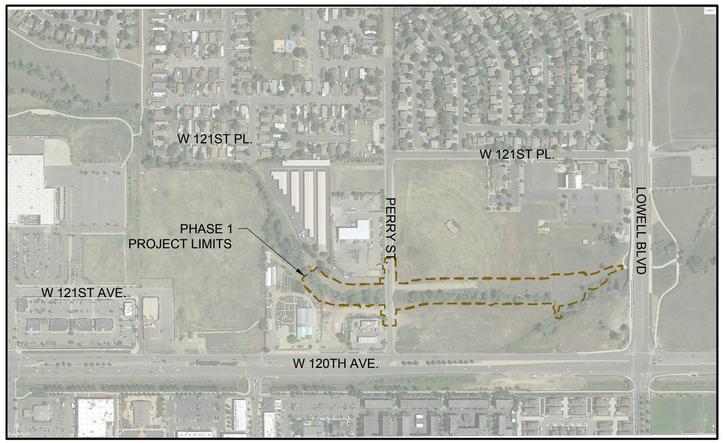
MAY 2024

STORMWATER MANAGEMENT PLAN (SWMP)



VICINITY MAP

1" = 1 MILE



LOCATION MAP

1" = 400'

MILE HIGH FLOOD DISTRICT APPROVALS

CHARLIE PAJARES, PE, CFM — PROJECT ENGINEER — Date

DAN HILL, PE, CFM — PROJECT MANAGER — Date

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024

CITY ENGINEER (OR DESIGNEE) — DATE

UTILITY NOTICE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

Know what's **below.**
Call before you dig.

FOR AND ON BEHALF OF
ICON ENGINEERING, INC.

7000 S YOSEMITE ST, SUITE 120
CENTENNIAL, CO 80112
303-221-0802

MATT URSETTA, PE — PRINCIPAL & PROJECT MANAGER — Date

TAYLOR DOMIN, PE — PROJECT ENGINEER — Date

ENGINEER OF RECORD

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF COLORADO. FOR AND ON BEHALF OF ICON ENGINEERING, INC.

NAME

COLORADO LICENSED
MATTHEW J. URSETTA
25513
05-28-2024
PROFESSIONAL ENGINEER

ADAMS COUNTY EROSION CONTROL PLAN - GENERAL NOTES:

ALL CONSTRUCTION PROJECTS, REGARDLESS OF THE SIZE, SHALL INSTALL, MAINTAIN AND REPAIR STORMWATER POLLUTION CONTROL MEASURES (CMs) TO EFFECTIVELY MINIMIZE EROSION, SEDIMENT TRANSPORT, AND THE RELEASE OF POLLUTANTS RELATED TO CONSTRUCTION ACTIVITY. CMs EXAMPLE INCLUDE: SEDIMENT CONTROL LOGS (SCL), SILT FENCE (SF), DIKES/SWALES, SEDIMENT TRAPS (ST), INLET PROTECTION (IP), OUTLET PROTECTION (OP), CHECK DAMS (CD), SEDIMENT BASINS (SB), TEMPORARY/PERMANENT SEEDING AND MULCHING (MU), SOIL ROUGHENING, MAINTAINING EXISTING VEGETATION AND PROTECTION OF TREES. CMS MUST BE SELECTED, DESIGNED, ADEQUATELY SIZED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH GOOD ENGINEERING, HYDROLOGIC AND POLLUTION CONTROL PRACTICES. CMS/BMPS INSTALLATION AND MAINTENANCE DETAILS SHALL CONFORM TO URBAN DRAINAGE FLOOD CONTROL CRITERIA MANUAL VOLUME 3, OR THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) ITEM CODE BOOK. CMS MUST FILTER, SETTLE, CONTAIN OR STRAIN POLLUTANTS FROM STORMWATER FLOWS IN ORDER TO PREVENT BYPASS OF FLOWS WITHOUT TREATMENT. CMS MUST BE APPROPRIATE TO TREAT THE RUNOFF FROM THE AMOUNT OF DISTURBED AREA, THE EXPECTED FLOW RATE, DURATION, AND FLOW CONDITIONS (I.E., SHEET OR CONCENTRATED FLOW). CMS/BMPS SHALL BE SPECIFIED IN THE SWMP (IF APPLICABLE), AND THE LOCATIONS SHOWN ON THE EC PLAN.

1. PRIOR TO CONSTRUCTION, PROJECTS DISTURBING 1 OR MORE ACRES OF LAND, OR ANY PROJECT BELONGING TO A COMMON PLAN OF DEVELOPMENT DISTURB 1 OR MORE ACRES, MUST OBTAIN:
   - 1.1. A GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, AND
   - 1.2. AN ADAMS COUNTY STORMWATER QUALITY PERMIT WITHIN THE UNINCORPORATED ADAMS COUNTY MS4 AREA.
2. PERMITTED PROJECTS SHALL DEVELOP A STORMWATER MANAGEMENT PLAN (SWMP), AKA EROSION AND SEDIMENT CONTROL PLAN (ESCP), IN COMPLIANCE WITH CDPHE MINIMUM REQUIREMENTS. THE APPROVED SWMP, INCLUDING EROSION CONTROL (EC) PLAN (SITE MAP), SHALL BE KEPT ON SITE AND UPDATED AT ALL TIMES. THE QUALIFIED STORMWATER MANAGER IS RESPONSIBLE FOR IMPLEMENTING THE SWMP AND CMS (AKA BMPS) DURING CONSTRUCTION.
3. PERMITTED PROJECTS SHALL PERFORM REGULAR STORMWATER INSPECTIONS EVERY 7 CALENDAR DAYS; OR EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY PRECIPITATION OR SNOWMELT EVENT THAT CAUSES SURFACE EROSION. INSPECTION FREQUENCY CAN BE REDUCED FOR POST-STORM EVENT INSPECTIONS AT TEMPORARILY IDLE SITES AND ALSO FOR STORMWATER INSPECTIONS AT COMPLETED SITES WAITING FOR FINAL STABILIZATION. INSPECTION REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE.
4. TRACKING OF DIRT ONTO PAVED PUBLIC OR PRIVATE PAVED ROADS IS NOT ALLOWED. THE USE OF DIRT RAMPS TO ENTER/EXIT FROM AN UNPAVED INTO A PAVED AREA IS PROHIBITED. VEHICLE TRACKING CONTROLS SHALL BE IMPLEMENTED, OTHERWISE ENTRANCE AREA MUST DRAIN THRU A CM TOWARDS THE PRIVATE SITE.
5. TRUCK LOADS OF FILL MATERIAL IMPORTED TO OR CUT MATERIAL EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORTATION ON PUBLIC ROW. HAUL ROUTES MUST BE PERMITTED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT APPLICABLE PERMITS.
6. CONTROL MEASURES DESIGNED FOR CONCRETE WASHOUT WASTE MUST BE IMPLEMENTED. THIS INCLUDES WASHOUT WASTE DISCHARGED TO THE GROUND AND WASHOUT WASTE FROM CONCRETE TRUCKS AND MASONRY OPERATIONS.
7. TEMPORARY CMS/BMPS SHALL BE REMOVED AFTER THE SITE HAS REACHED FINAL STABILIZATION.
8. DEWATERING OPERATIONS DISCHARGING OFF-SITE INTO ANY WATERS CONVEYANCE SYSTEMS INCLUDING WETLANDS, IRRIGATION DITCHES, CANALS, RIVERS, STREAMS OR STORM SEWER SYSTEMS, REQUIRE A STATE CONSTRUCTION DEWATERING PERMIT.
9. PERMITTED PROJECTS SHALL KEEP THE CDPHE'S STORMWATER DISCHARGE PERMIT, STORMWATER MANAGEMENT PLAN (SWMP) AND INSPECTION LOGS AVAILABLE ON SITE THROUGHOUT THE DURATION OF THE PROJECT, AND FOR AN ADDITIONAL 3 YEARS AFTER PERMIT CLOSE-OUT.
10. PERMITTED LANDOWNER AND/OR CONTRACTOR SHALL CLOSE THE STATE AND CITY/COUNTY PERMIT ONCE FINAL STABILIZATION IS REACHED. STORMWATER INSPECTIONS SHALL CONTINUE UNTIL INACTIVATION NOTICE IS FILED WITH CDPHE.

PERFORMANCE STANDARD NOTES:

1. STORMWATER RUNOFF FROM DISTURBED AREAS MUST FLOW TO AT LEAST ONE (1) CM TO MINIMIZE SEDIMENT IN THE DISCHARGE. DO NOT ALLOW SEDIMENT TO LEAVE THE SITE. THE BEST WAY TO PREVENT SEDIMENT OR POLLUTANTS FROM ENTERING THE STORM SEWER SYSTEM IS TO STABILIZE THE SITE AS QUICKLY AS POSSIBLE, PREVENTING EROSION AND STOPPING SEDIMENT RUNOFF AT ITS SOURCE.
2. PHASE CONSTRUCTION TO MINIMIZE DISTURBED AREAS, INCLUDING DISTURBANCE OF STEEP SLOPES. (I.E. THE ENTIRE PROJECT SITE SHOULD NOT BE DISTURBED IF CONSTRUCTION WILL ONLY BE OCCURRING IN ONE PARTICULAR SECTION OF THE SITE). LIMIT SOIL EXPOSURE TO THE SHORTEST POSSIBLE PERIOD OF TIME. PROTECT NATURAL FEATURES AND EXISTING VEGETATION WHENEVER POSSIBLE. REMOVAL OF EXISTING VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS. MAINTAIN PRE EXISTING VEGETATION (OR EQUIVALENT CMS) FOR AREAS WITHIN 50 HORIZONTAL FT OF RECEIVING WATERS.
3. SOIL COMPACTION MUST BE MINIMIZED FOR AREAS WHERE INFILTRATION CMS WILL OCCUR OR WHERE FINAL STABILIZATION WILL BE ACHIEVED THROUGH VEGETATIVE COVER.
4. ALL SOIL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT.
5. DUST EMISSIONS RESULTING FROM GRADING ACTIVITIES OR WIND SHALL BE CONTROLLED.
6. INSTALL CONSTRUCTION FENCE (ORANGE) TO PROTECT WETLANDS AND OTHER SENSITIVE AREAS AND TO PREVENT ACCESS, AND TO DELINEATE THE LIMITS OF CONSTRUCTION. DO NOT USE SILT FENCE TO PROTECT WETLANDS SINCE TRENCHING MAY IMPACT THESE AREAS.
7. CMS INTENDED TO CAPTURE OVERLAND, LOW VELOCITY SHEET FLOW AT A FAIRLY LEVEL GRADE SHALL ONLY BE INSTALLED ALONG CONTOURS.
8. INSTALL CMS, SUCH AS CHECK DAMS, PERPENDICULAR TO THE CONCENTRATED FLOWS TO REDUCE FLOW VELOCITY.
9. STORM DRAIN INLETS WITHIN AND ADJACENT TO THE CONSTRUCTION SITE MUST BE PROTECTED. ANY PONDING OF STORMWATER AROUND INLET PROTECTION MUST NOT CAUSE EXCESSIVE FLOODING OR DAMAGE ADJACENT AREAS OR STRUCTURES.
10. INSTALL VEHICLE TRACKING CONTROL (VTC) TO ENTER/EXIT UNPAVED AREA. DO NOT USE RECYCLED CRUSHED CONCRETE OR ASPHALT MILLINGS FOR VEHICLE TRACKING PADS.
11. STRAW BALES SHALL NOT BE USED FOR PRIMARY EROSION OR SEDIMENT CONTROL (I.E. STRAW BALES MAY BE USED FOR REINFORCEMENT BEHIND ANOTHER BMP SUCH AS SILT FENCE).
12. OUTLETS SYSTEMS (SUCH AS SKIMMER OR PERFORATED RISER PIPE) SHALL BE INSTALLED TO WITHDRAW WATER FROM OR NEAR THE SURFACE LEVEL WHEN DISCHARGING FROM BASINS. WATER CANNOT DRAIN FROM THE BOTTOM OF THE POND.
13. TEMPORARY STABILIZATION MUST BE IMPLEMENTED FOR EARTH DISTURBING ACTIVITIES ON ANY PORTION OF THE SITE WHERE LAND DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED (FOR MORE THAN 14 CALENDAR DAYS). TEMPORARY STABILIZATION METHODS EXAMPLES: TARPS, SOIL TACKIFIER, AND HYDROSEED. TEMPORARY STABILIZATION REQUIREMENT MAY EXCEED THE 14 DAY SCHEDULE WHEN EITHER THE FUNCTION OF THE SPECIFIC AREA REQUIRES IT TO REMAIN DISTURBED, OR, PHYSICAL CHARACTERISTICS OF THE TERRAIN AND CLIMATE PREVENT STABILIZATION AS LONG AS THE CONSTRAINTS AND ALTERNATIVE SCHEDULE IS DOCUMENTED ON THE SWMP, AND LOCATIONS ARE IDENTIFIED ON THE EC PLAN (SITE MAP).
14. RUNOFF FROM STOCKPILE AREA MUST BE CONTROLLED. SOILS THAT WILL BE STOCKPILED FOR MORE THAN 30 DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN 14 DAYS OF STOCKPILE CONSTRUCTION. INSTALL CMS/BMPS 5 FT AWAY FROM THE TOE OF THE STOCKPILE'S SLOPE.
15. WATER USE TO CLEAN CONCRETE TRUCKS SHALL BE DISCHARGED INTO A CONCRETE WASHOUT AREA (CWA). THE PREDEFINED CONTAINMENT AREA MUST BE IDENTIFIED WITH A SIGN, AND SHALL ALLOW THE LIQUIDS TO EVAPORATE OR DRY OUT. CWA DISCHARGES THAT MAY REACH GROUNDWATER MUST FLOW THROUGH SOIL THAT HAS BUFFERING CAPACITY PRIOR TO REACHING GROUNDWATER. THE CONCRETE WASHOUT LOCATION SHALL BE NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT AND WOULD RESULT IN BUFFERING CAPACITY NOT BEING ADEQUATE, SUCH AS NEAR NATURAL DRAINAGES, SPRINGS, OR WETLANDS. IN THIS CASE, A LINER UNDERNEATH IS NEEDED FOR AREAS WITH HIGH GROUNDWATER LEVELS. CWA SHALL NOT BE PLACED IN LOW AREAS, DITCHES OR ADJACENT TO STATE WATERS. PLACE CWA 50 FT AWAY FROM STATE WATERS.
16. WASTE, SUCH AS BUILDING MATERIALS, WORKERS TRASH AND CONSTRUCTION DEBRIS, MUST BE PROPERLY MANAGED TO PREVENT STORMWATER POLLUTION.
17. INSTALL STABILIZED STAGING AREA (SSA) TO STORE MATERIALS, CONSTRUCTION TRAILER, ETC.
18. IF CONDITIONS IN THE FIELD WARRANT ADDITIONAL CMS/BMPS TO THE ONES ORIGINALLY APPROVED ON THE SWMP OR EC PLAN (CIVIL DRAWING), THE LANDOWNER OR CONTRACTOR SHALL IMPLEMENT MEASURES DETERMINED NECESSARY, AS DIRECTED BY THE COUNTY.
19. PERMANENT CMS/BMPS FOR SLOPES, CHANNELS, DITCHES, OR DISTURBED LAND AREA SHALL BE PERFORMED IMMEDIATELY AFTER FINAL GRADING. CONSIDER THE USE EROSION CONTROL BLANKETS ON SLOPES 3:1 OR STEEPER AND AREAS WITH CONCENTRATED FLOWS SUCH AS SWALES, LONG CHANNELS AND ROADSIDE DITCHES.
20. THE DISCHARGE OF SANITARY WASTE INTO THE STORM SEWER SYSTEM IS PROHIBITED. PORTABLE TOILETS MUST BE PROVIDED, SECURED AND PLACED ON PERMEABLE SURFACES, AWAY FROM THE CURBSIDE, STORM INLETS AND/OR DRAINAGE WAYS.
21. REMOVE TEMPORARY CMS/BMPS ONCE FINAL STABILIZATION IS REACHED, UNLESS OTHERWISE AUTHORIZED.
22. FINAL STABILIZATION MUST BE IMPLEMENTED. FINAL STABILIZATION IS REACHED WHEN ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED, AND EITHER A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED WITH AN INDIVIDUAL PLANT DENSITY OF AT LEAST 70% OF PRE DISTURBANCE LEVELS, OR EQUIVALENT PERMANENT ALTERNATIVE METHOD HAS BEEN IMPLEMENTED.
23. PROVIDE SPILL PREVENTION AND CONTAINMENT MEASURES FOR CONSTRUCTION MATERIALS, WASTE AND FUEL STORAGE AREAS. BULK STORAGE (55 GALLONS OR GREATER) OF PETROLEUM PRODUCTS AND LIQUID CHEMICALS MUST HAVE SECONDARY CONTAINMENT, OR EQUIVALENT PROTECTION, IN ORDER TO CONTAIN SPILLS AND TO PREVENT SPILLED MATERIAL FROM ENTERING STATE WATERS.
24. REPORT SPILLS OR RELEASES OF CHEMICAL, OIL, PETROLEUM PRODUCT, SEWAGE, ETC., WHICH MAY REACH THE STORM SEWER OR ENTER STATE WATERS WITHIN 24-HOURS FROM TIME OF DISCOVERY. GUIDANCE AVAILABLE AT WWW.CDPHE.STATE.CO.US/EMP/SPILLSANDRELEASED.HTM. STATE OF COLORADO SPILL-LINE: 1-877-518-5608. ADAMS COUNTY STORMWATER HOTLINE: 720-523-6400; PUBLIC WORKS 303-453-8787 AND THE TRI-COUNTY HEALTH DEPARTMENT AT 303-220-9200.

MAINTENANCE STANDARD NOTES:

1. MAINTAIN AND REPAIR CMS ACCORDING TO APPROVED EROSION CONTROL PLAN (CIVIL DRAWING) TO ASSURE THEY CONTINUE PERFORMING AS ORIGINALLY INTENDED.
2. CMS/BMPS REQUIRING MAINTENANCE OR ADJUSTMENT SHALL BE REPAIRED IMMEDIATELY AFTER OBSERVATION OF THE FAILING BMP.
3. CMS SHALL BE CLEANED WHEN SEDIMENT LEVELS ACCUMULATE TO HALF THE DESIGN UNLESS OTHERWISE SPECIFIED.
4. SWMP AND EC PLAN SHALL BE CONTINUOUSLY UPDATED TO REFLECT NEW OR REVISED CMS/BMPS DUE TO CHANGES IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE, TO ACCURATELY REFLECT THE ACTUAL FIELD CONDITIONS. A NOTATION SHALL BE MADE IN THE SWMP, INCLUDING DATE OF CHANGES IN THE FIELD, IDENTIFICATION OF THE CMS REMOVED, MODIFIED OR ADDED, AND THE LOCATIONS OF THOSE CMS. UPDATES MUST BE MADE WITHIN 72-HOURS FOLLOWING THE CHANGE.
5. MAINTAIN VEHICLE TRACKING CONTROL (VTC), IF SEDIMENT TRACKING OCCURS, CLEAN-UP IMMEDIATELY. SWEEP BY HAND OR THE USE STREET SWEEPERS (WITH VACUUM SYSTEM). FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.
6. CWA MUST BE CLEANED ONCE WASTE ACCUMULATION REACHES ⅔ OF THE WET STORAGE CAPACITY OF THE STRUCTURE. LEGALLY DISPOSED OF CONCRETE WASTE. DO NOT BURY ON-SITE.
7. CLEAN-UP SPILLS IMMEDIATELY AFTER DISCOVERY, OR CONTAIN UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED. FOLLOW MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP, ALONG WITH PROPER DISPOSAL METHODS. RECORDS OF SPILLS, LEAKS, OR OVERFLOWS THAT RESULT IN DISCHARGE OF POLLUTANTS MUST BE DOCUMENTED AND MAINTAINED.
8. REMOVE SEDIMENT FROM STORM SEWER INFRASTRUCTURE (PONDS, STORM PIPES, OUTLETS, INLETS, ROADSIDE DITCHES, ETC.), AND RESTORE VOLUME CAPACITY UPON COMPLETION OF PROJECT OR PRIOR TO INITIAL ACCEPTANCE OF PUBLIC IMPROVEMENTS (IF APPLICABLE). DO NOT FLUSH SEDIMENT OFFSITE, CAPTURE ON SITE AND DISPOSED OF AT AN APPROVED LOCATION.

UPLAND AREA SEED MIX - LOAMY TO CLAY SOILS

Common Name	Scientific Name	Growth Season	Growth Form	% Mix	Lb/ac (PLS)
Grasses					
Blue grama	Bouteloua gracilis	Warm	Sod	25	3.6
Sand dropseed	Sporobolus cryptandrus	Warm	Bunch	20	0.4
Sideoats grama	Bouteloua curtipendula	Warm	Sod	20	12.6
Western wheatgrass	Pascopyrum smithii	Cool	Sod	15	16.4
Buffalograss	Bouteloua dactyloides	Warm	Sod	10	21.4
Inland saltgrass	Distichlis spicata	Warm	Sod	5	1.2
Herbaceous/Wildflowers					
Pasture sage	Artemisia frigida			1	0.02
Blanket flower	Gaillardia aristata			1	1
Prairie coneflower	Ratibida columnifera			1	0.2
Purple prairieclover	Dalea (Petalostemum) purpurea			1	0.6
Blue flax	Linum lewisii			1	0.8
TOTAL PLS POUNDS/ACRE				**100**	**58.22**

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED — STEPHEN J. ORSER — 25513 — PROFESSIONAL ENGINEER — 05-28-2024

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP GENERAL NOTES

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 58 OF 90

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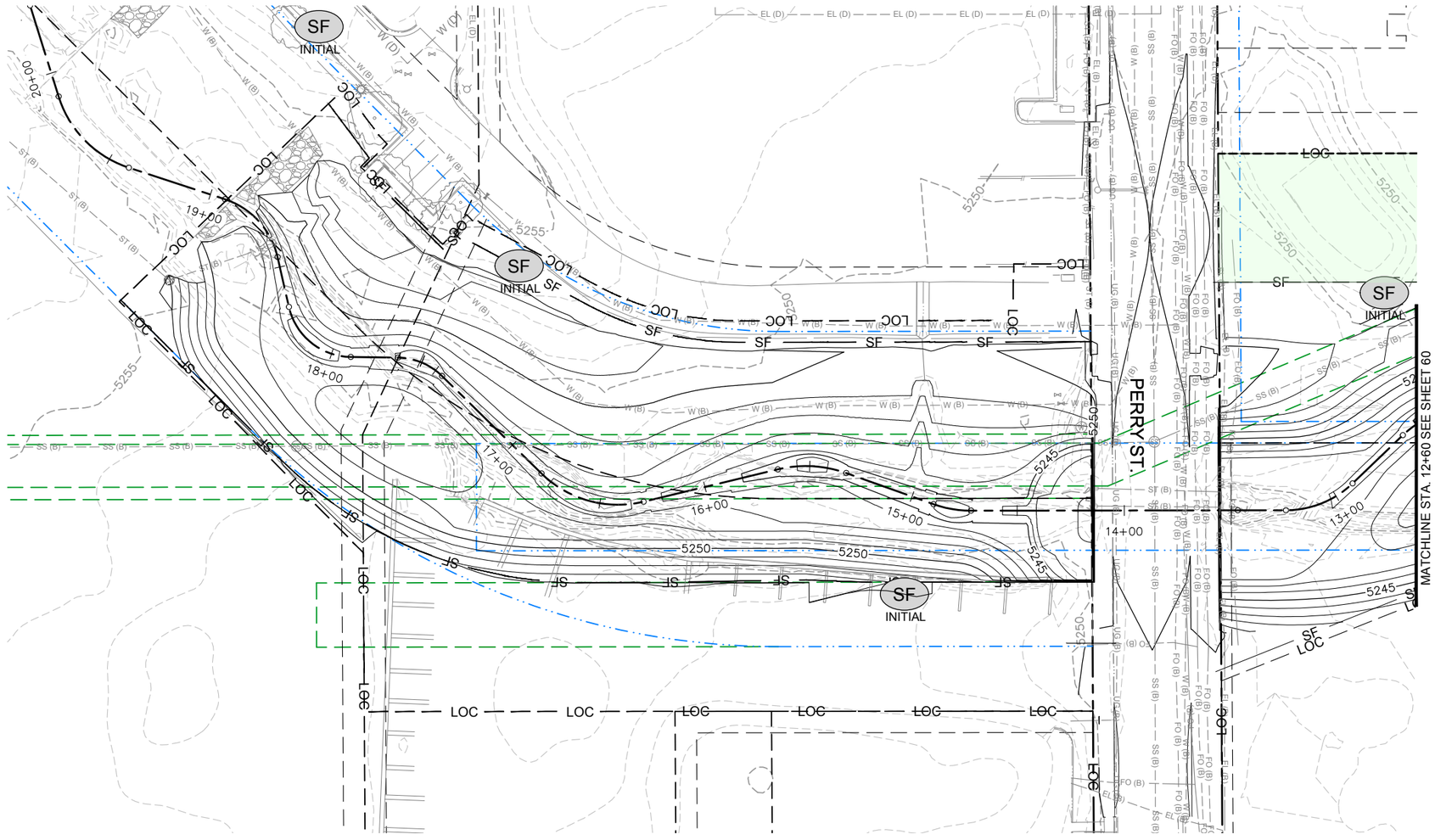

N

0 30' 60'

BMP LEGEND

	CD	CHECK DAM
	CB	COMPOST BLANKET
	CFB	COMPOST FILTER BERM
	CWA	CONCRETE WASHOUT AREA
	CF	CONSTRUCTION FENCE
	CM	CONSTRUCTION MARKER
	DW	DEWATERING
	DD	DIVERSION DITCH
	ECB	EROSION CONTROL BLANKET
	IP	INLET PROTECTION
	RCD	REINFORCED CHECK DAM
	RRB	REINFORCED ROCK BERM
	RRC	RRB FOR CULVERT PROTECTION
	SB	SEDIMENT BASIN
	WC	WATER CONTROL
	SCL	SEDIMENT CONTROL LOG
	ST	SEDIMENT TRAP
	SM	SEEDING AND MULCHING
SF	SF	SILT FENCE
	SSA	STABILIZED STAGING AREA
	SR	SURFACE ROUGHENING
	TSD	TEMPORARY SLOPE DRAIN
	TSC	TEMPORARY STREAM CROSSING
	TER	TERRACING
	VTC	VEHICLE TRACKING CONTROL
	WW	VTC WITH WHEEL WASH
		ROCK AND RIPRAP GRADATIONS
LOC	LOC	LIMITS OF CONSTRUCTION
LOD	LOD	LIMITS OF DISTURBANCE

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SHEET 59 OF 90

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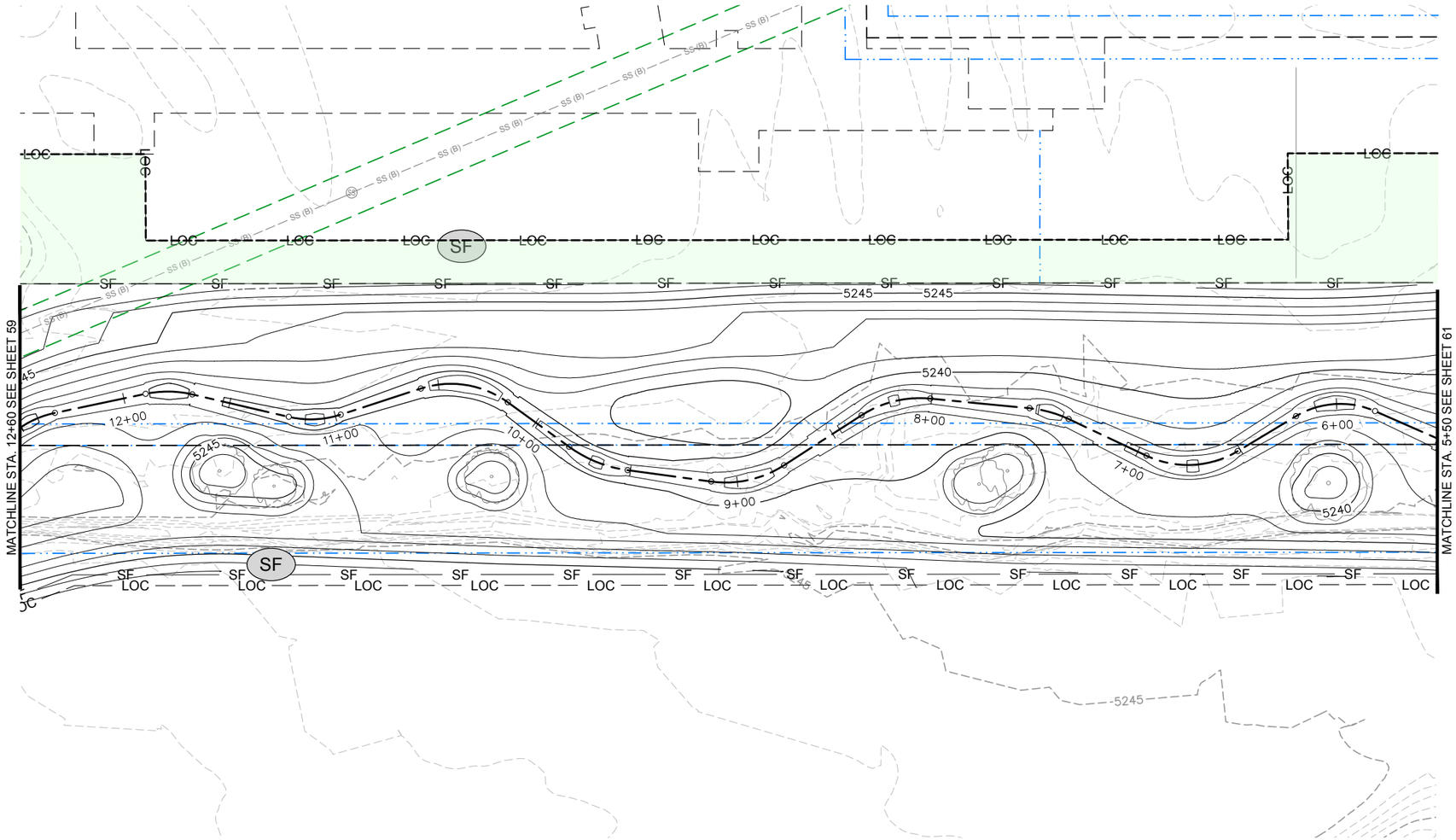

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NISSEN RESERVOIR DRAINAGEWAY
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ICON PROJECT No. 17-029-NRD

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SHEET 60 OF 90

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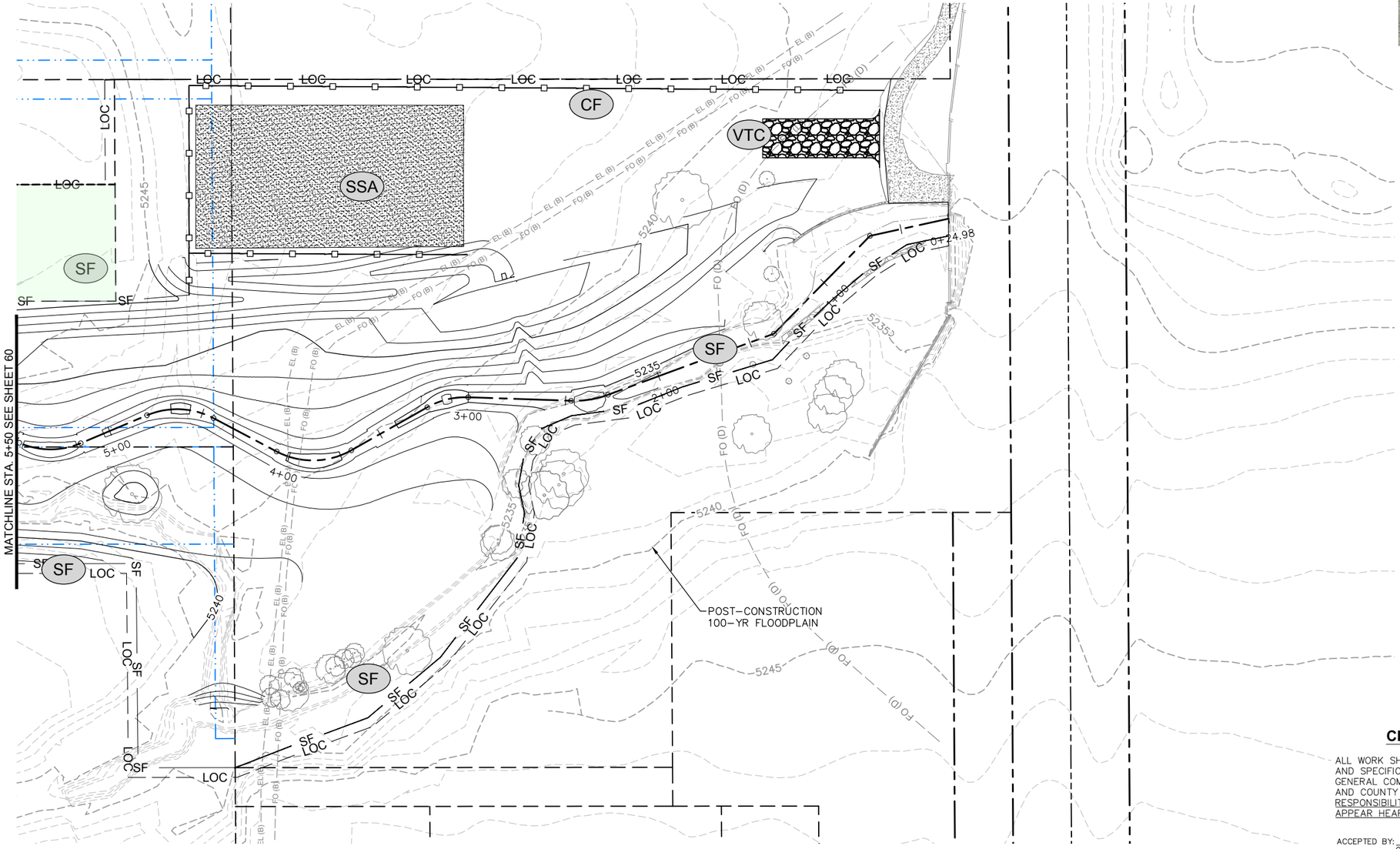

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ST	SEDIMENT TRAP
SM	SEEDING AND MULCHING
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
TER	TERRACING
VTC	VEHICLE TRACKING CONTROL
WW	VTC WITH WHEEL WASH
	ROCK AND RIPRAP GRADATIONS
LOC	LIMITS OF CONSTRUCTION
LOD	LIMITS OF DISTURBANCE

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. UNSETH
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP INITIAL 3

ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 61 OF 90

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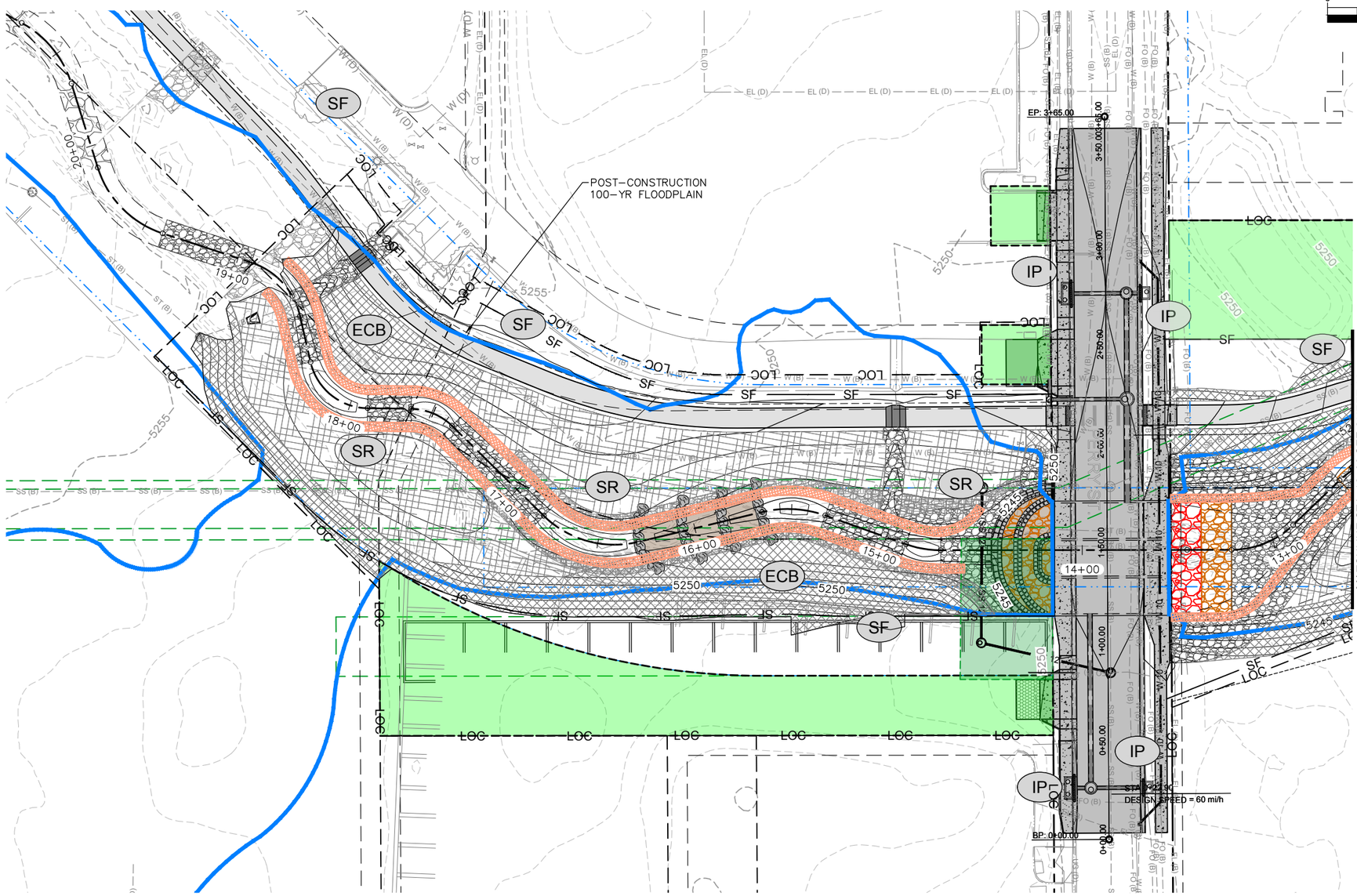

N

0 30' 60'

BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
CF	CONSTRUCTION FENCE
CM	CONSTRUCTION MARKER
DW	DEWATERING
DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
	COIR MAT
IP	INLET PROTECTION
RCD	REINFORCED CHECK DAM
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
SB	SEDIMENT BASIN
WC	WATER CONTROL
SCL	SEDIMENT CONTROL LOG
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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. DRETTE
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP INTERIM 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 62 OF 90

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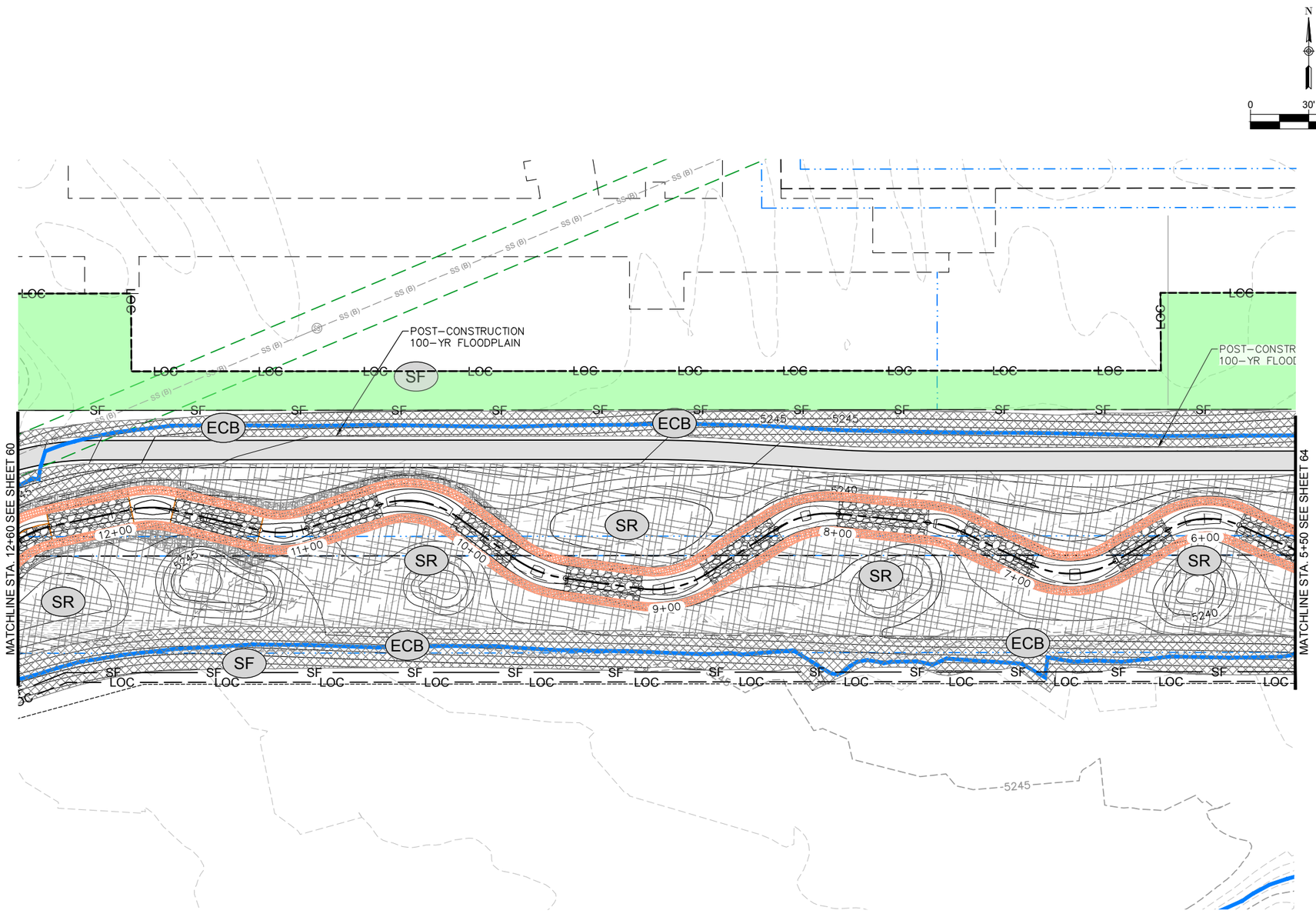

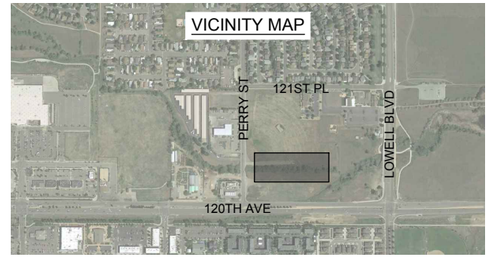

BMP LEGEND

CD	CHECK DAM
CB	COMPOST BLANKET
CFB	COMPOST FILTER BERM
CWA	CONCRETE WASHOUT AREA
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CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. CRESS
25513
PROFESSIONAL ENGINEER
05-25-2024

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP INTERIM 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 63 OF 90

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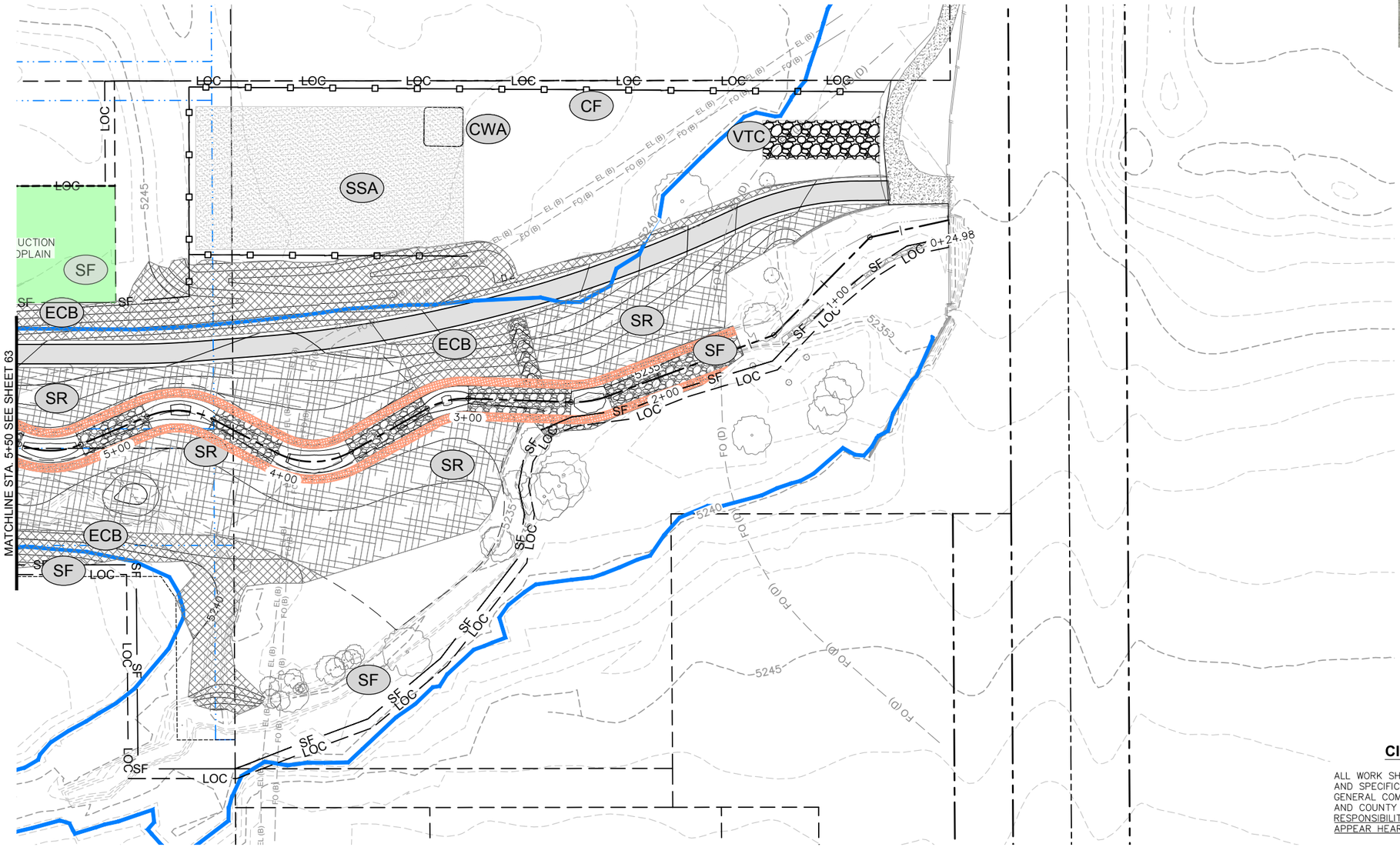

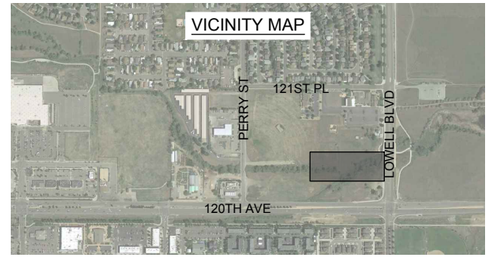

N

0 30' 60'

BMP LEGEND

CD	CHECK DAM	
CB	COMPOST BLANKET	
CFB	COMPOST FILTER BERM	
CWA	CONCRETE WASHOUT AREA	
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CITY & COUNTY OF BROOMFIELD APPROVALS

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED MATTHEW J. USSET 25513 05-25-2024 PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig. 811

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP INTERIM 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 64 OF 90

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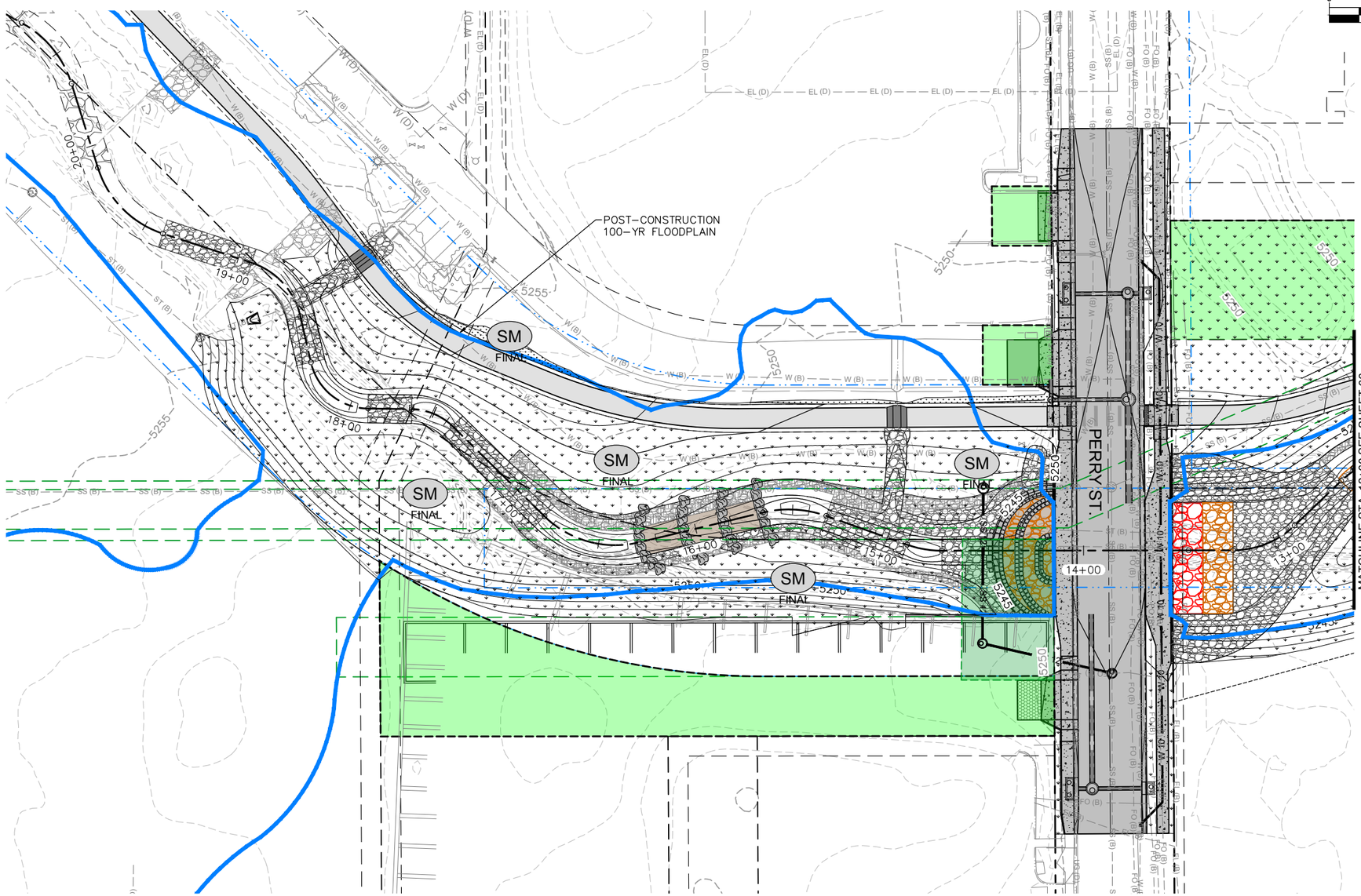

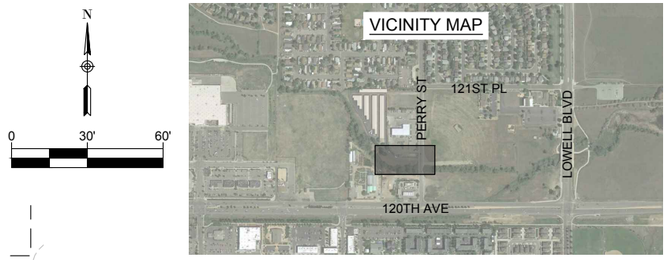

N

0 30' 60'

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CD	CHECK DAM
CB	COMPOST BLANKET
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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. URSETH
25513
05-23-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP FINAL 1
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 65 OF 90

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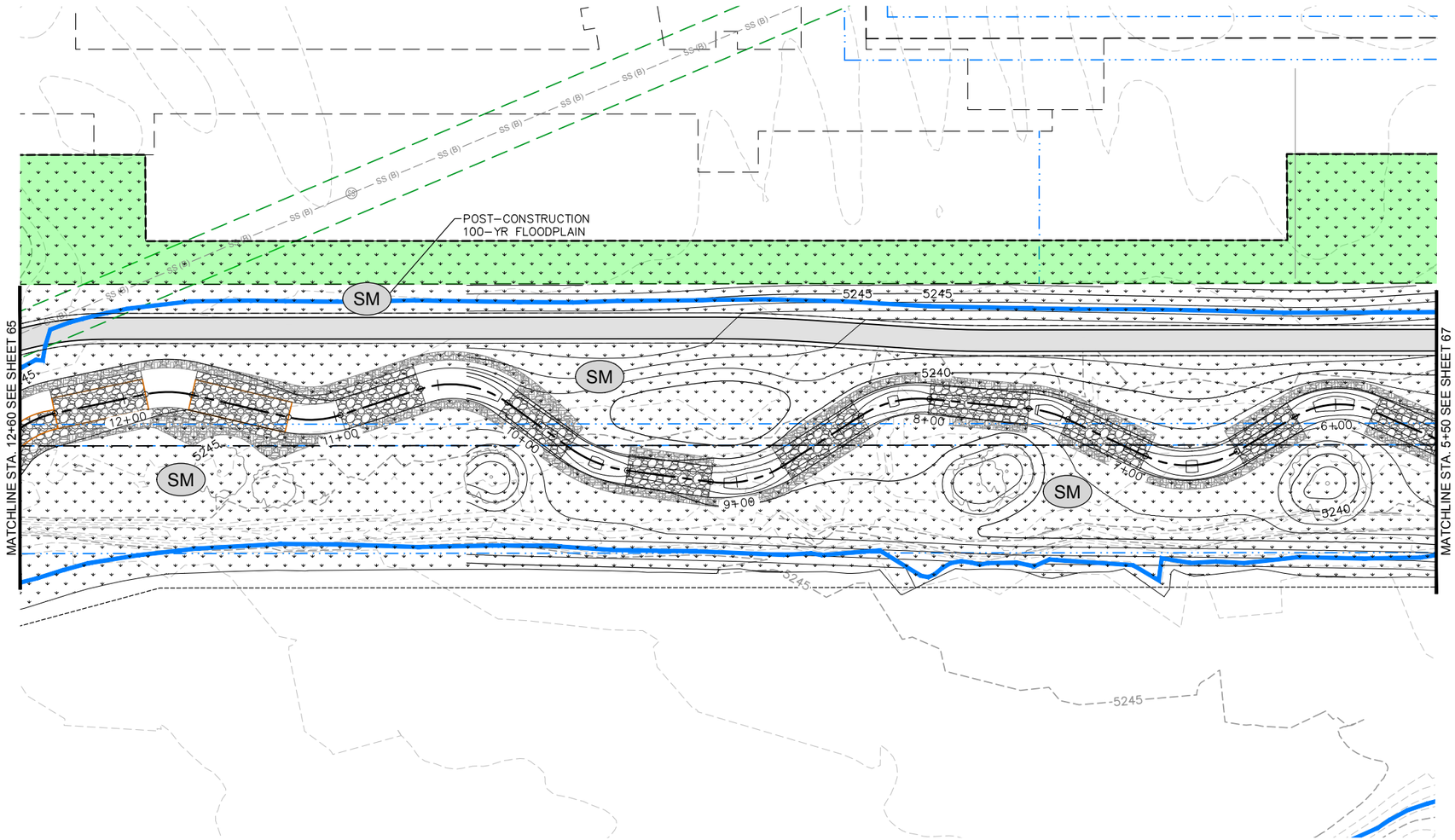

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ACCEPTED BY: _____ 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
MATTHEW J. URSETTI
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP FINAL 2
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 66 OF 90

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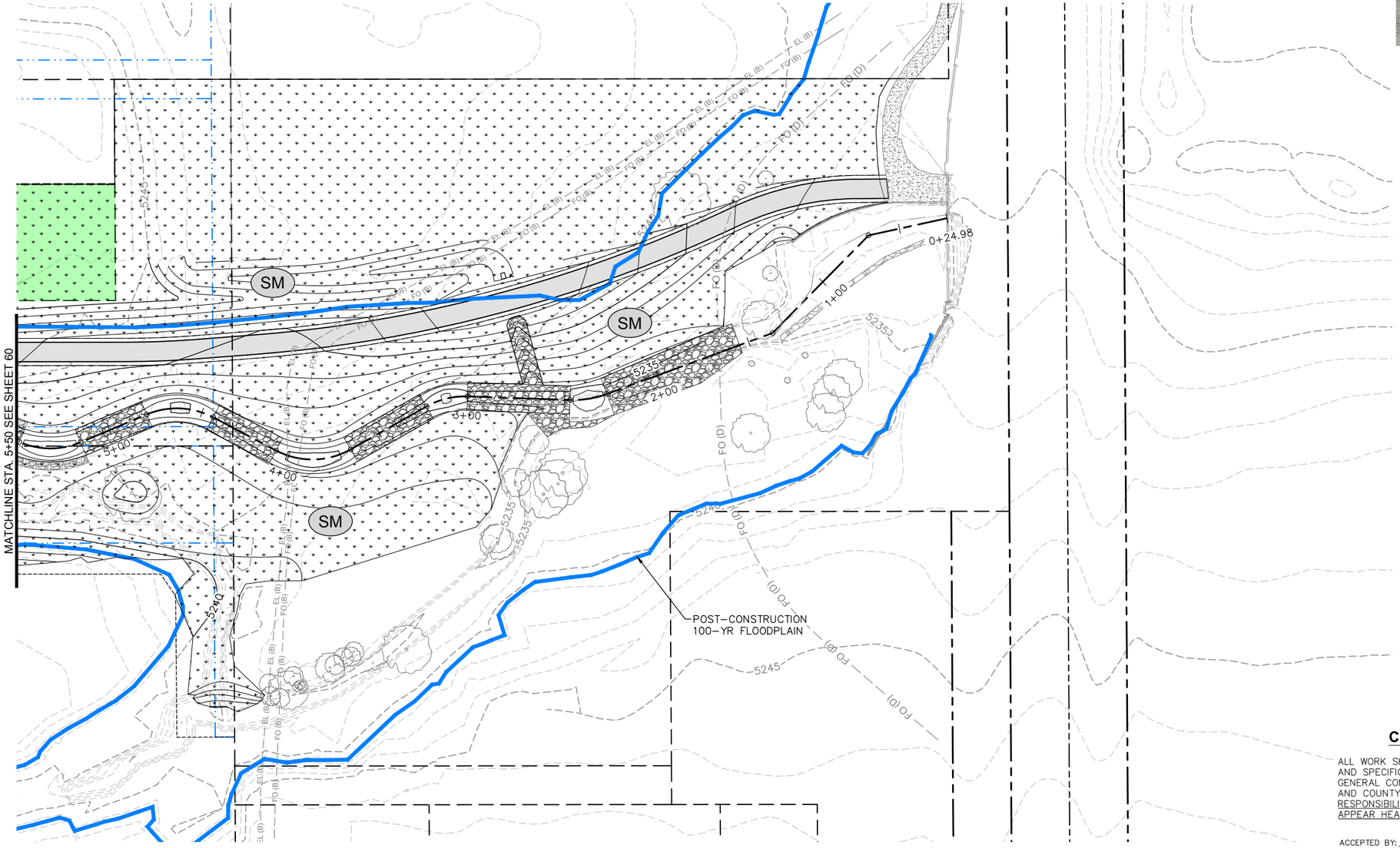

BMP LEGEND

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CITY ENGINEER (OR DESIGNEE) DATE

COLORADO LICENSED
THIEN J. DINH
25513
05-25-2024
PROFESSIONAL ENGINEER

No.	DATE	REVISIONS	APPR.

Know what's below. Call before you dig.

PREPARED FOR: BROOMFIELD Colorado — MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING

PLAN
DRAWN BSC
DESIGNED BSC
CHECKED MJU

NISSEN RESERVOIR DRAINAGEWAY
PHASE 1
SWMP FINAL 3
ICON PROJECT No. 17-029-NRD

DATE MAY 2024

SHEET 67 OF 90

p:\P-17-029-nrd-352 - nissen reservoir\06_dwg final design\05_final_sheets\NRD - GESC FINAL.dwg, Opaltarex, Page Setup:---, ICON-HALF-SIZE.ctb, 6/27/2024 1:40 PM

ZONE 1: CHANNEL ZONE

ZONE 2: SUBMERGENT ZONE
−6" – 6" ABOVE CHANNEL

ZONE 3: RIPARIAN EMERGENT ZONE
6" – 2' ABOVE CHANNEL

ZONE 4: RIPARIAN FLOODPLAIN/NATIVE GRASS ZONE
2' – 5' ABOVE CHANNEL

ZONE 5: UPLAND/XERIC FLOODPLAIN ZONE

LEGEND

- PLAINS COTTONWOOD STAKES
- WILLOW STAKES
- SHRUBS
- DECIDUOUS TREES
- TREE PROTECTION FENCING
- BOULDER TOE EDGE
- NATIVE LOGS
- WILLOW FASCINE
- EXISTING TREES TO REMAIN

40 WILLOWS STAKES
@ 2' O.C. – 2 ROWS
1 – PLAINS COTTONWOOD
3 – PLAINS COTTONWOOD 5GAL
5 – WOODS ROSE
5 PLAINS COTTONWOOD STAKES

20 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 – CHOKECHERRY
2 – BOX ELDER
3 – WESTERN SNOWBERRY
3 – GOLDEN CURRANT
3 – WAX CURRANT
1 – PLAINS COTTONWOOD
5 – PAWNEE BUTTES SAND CHERRY
5 PLAINS COTTONWOOD STAKES

3 – PLAINS COTTONWOOD 5GAL
5 PLAINS COTTONWOOD STAKES
1 – PLAINS COTTONWOOD

5 – CHOKCHERRY
30 WILLOW STAKES
@ 2' O.C. – 2 ROWS
1 – PLAINS COTTONWOOD
5 PLAINS COTTONWOOD STAKES
1 – PEACH LEAF WILLOW
1 – PEACH LEAF WILLOW
5 – REDOSIER DOGWOOD
5 PLAINS COTTONWOOD STAKES
1 – PLAINS COTTONWOOD

20 WILLOW STAKES
@ 2' O.C. – 2 ROWS
3 – PLAINS COTTONWOOD 5GAL
(2 / LS4) NATIVE LOGS IN STREAM – 30 LF
20 WILLOW STAKES
@ 2' O.C. – 2 ROWS

30 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 – GOLDEN CURRANT
10 PLAINS COTTONWOOD STAKES
70 WILLOW STAKES
@ 2' O.C. – 2 ROWS
3 – PLAINS COTTONWOOD 5GAL
40 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 – WAX CURRANT
1 – PLAINS COTTONWOOD
3 – PLAINS COTTONWOOD 5GAL
5 – WOODS ROSE

3 – PLAINS COTTONWOOD 5GAL
40 WILLOW STAKES
2' O.C. – 2 ROWS
1 – PLAINS COTTONWOOD
3 – BOX ELDER
40 WILLOW STAKES
2' O.C. – 2 ROWS

(2 / LS4) NATIVE LOGS IN STREAM – 40 LF
5 PLAINS COTTONWOOD STAKES
1 – PLAINS COTTONWOOD
3 – CHOKECHERRY
5 – PAWNEE BUTTES SAND CHERRY
2 – PEACH LEAF WILLOW
(1 / LS4) BOULDER TOE EDGE
(1 / LS5) TREE PROTECTION FENCE

MATCH LINE: SEE SHEET LS-2

"All work shall be constructed to City and County of Broomfield STANDARDS AND SPECIFICATIONS.
This drawing has been reviewed and found to be in general compliance with these STANDARDS AND SPECIFICATIONS and other Broomfield requirements. THE ENGINEERING DESIGN AND CONCEPT
REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON . "

City Engineer (or Designee) — Date: 8/9/24

"All work shall be constructed to City and County of Broomfield STANDARDS AND SPECIFICATIONS.
This drawing has been reviewed and found to be in general compliance with these STANDARDS AND SPECIFICATIONS and other Broomfield requirements. THE DESIGN AND CONCEPT REMAINS THE
RESPONSIBILITY OF THE PROFESSIONAL LANDSCAPE AND IRRIGATION SYSTEM DESIGNER WHOSE SIGNATURE APPEARS HEREON."

Ryan J Jensen — Parks Maintenance Superintendent (or Designee) — Date: 8-9-2024

SCALE 1"=40'-0"

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: The City and County of Broomfield / MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: DHM DESIGN

PLAN
DRAWN TS/BP
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
LANDSCAPE PLANS — LS–1
ICON PROJECT No.

DATE APRIL 2024

SHEET OF

\\panzuradm\DHMPROJ\Denver\NISSEN RESERVOIR-172667 CD\CAD\Sheets\1-DHM_ECOLOGICAL-Phase I.dwg, Tawanson, Page Setup: ---, ICON.stb, 4/18/2024 11:06 AM

ZONE 1: CHANNEL ZONE

ZONE 2: SUBMERGENT ZONE
–6" – 6" ABOVE CHANNEL

ZONE 3: RIPARIAN EMERGENT ZONE
6" – 2' ABOVE CHANNEL

ZONE 4: RIPARIAN FLOODPLAIN/NATIVE GRASS ZONE
2' – 5' ABOVE CHANNEL

ZONE 5: UPLAND/XERIC FLOODPLAIN ZONE

LEGEND

- PLAINS COTTONWOOD STAKES
- WILLOW STAKES
- SHRUBS
- DECIDUOUS TREES
- TREE PROTECTION FENCING
- BOULDER TOE EDGE
- NATIVE LOGS
- WILLOW FASCINE
- EXISTING TREES TO REMAIN

MATCH LINE: SEE SHEET LS–1

40 WILLOW STAKES
@ 2' O.C. – 2 ROWS
3 – CHOKECHERRY
3 – PLAINS COTTONWOOD 5GAL
5 – REDOSIER DOGWOOD
5 – GOLDEN CURRANT
2 – BOX ELDER

5 – WOODS ROSE
2 – BOX ELDER
40 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 – WESTERN SNOWBERRY
1 – PLAINS COTTONWOOD
50 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 PLAINS COTTONWOOD STAKES
5 – WAX CURRANT
3 – PLAINS COTTONWOOD 5GAL
3 – WOODS ROSE

NATIVE LOG IN STREAM (2/LS4)
40 LF

50 WILLOW STAKES
@ 2' O.C. – 2 ROWS
80 WILLOW STAKES
@ 2' O.C. – 2 ROWS
3 – PLAINS COTTONWOOD 5GAL
5 PLAINS COTTONWOOD STAKES
1 – PLAINS COTTONWOOD

40 WILLOW STAKES
@ 2' O.C. – 2 ROWS
50 WILLOW STAKES
@ 2' O.C. – 2 ROWS
1 – PLAINS COTTONWOOD
5 PLAINS COTTONWOOD STAKES

30 WILLOW STAKES
@ 2' O.C. – 2 ROWS
3 – PEACH LEAF WILLOW
1 – PLAINS COTTONWOOD

NATIVE LOG IN STREAM (2/LS4)
40 LF

1 – PLAINS COTTONWOOD
5 PLAINS COTTONWOOD STAKES
3 – PLAINS COTTONWOOD 5GAL

2 – BOX ELDER
5 – WESTERN SNOWBERRY
5 – GOLDEN CURRANT
3 – PLAINS COTTONWOOD 5GAL
TREE PROTECTION FENCE (1/LS3)

5 PLAINS COTTONWOOD STAKES
TREE PROTECTION FENCE (1/LS3)
3 – PLAINS COTTONWOOD
15 WILLOW STAKES
@ 2' O.C. – 2 ROWS
BOULDER TOE EDGE (1/LS4)
NATIVE LOG IN STREAM – 20 LF (2/LS4)
BOULDER TOE EDGE (1/LS4)
15 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 PLAINS COTTONWOOD STAKES
3 – WOODS ROSE
6 – PLAINS COTTONWOOD 5GAL
TREE PROTECTION FENCE (1/LS3)

1 – BOX ELDER
TREE PROTECTION FENCE (1/LS3)
1 – PEACH LEAF WILLOW
1 – PLAINS COTTONWOOD
5 PLAINS COTTONWOOD STAKES
NATIVE LOGS IN STREAM – 30 LF (2/LS4)

TREE PROTECTION FENCE (1/LS3)
BOULDER TOE EDGE (1/LS4)
NATIVE LOG IN STREAM – 50 LF (2/LS4)
100 WILLOW STAKES
@ 2' O.C. – 2 ROWS
5 PLAINS COTTONWOOD STAKES

0 20 40 80
SCALE 1"=40'–0"

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: The City and County of Broomfield; MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: DHM DESIGN

PLAN
DRAWN TS/BP
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
LANDSCAPE PLANS LS–2
ICON PROJECT No.

DATE APRIL 2024

SHEET OF

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GENERAL PLANTING NOTES:

1. BASED ON SOIL ASSESSMENT AND RECOMMENDATIONS REPORT (DHM 4–17–2024), FOR AREAS DISTURBED BY RESTORATION ACTIVITIES, THE SOIL AND TOPSOIL SHALL BE AMENDED WITH THE FOLLOWING APPLICATION RATES:

   ELEMENTAL SULFUR 1500 LBS/ACRE
   MANGANESE SULFATE 25 LBS/ACRE (MANGANESE SULFATE DRY FERTILIZER AT 24% Mn)
   MYCORRHIZAE 5 LBS/ACRE
   ORGANIC FERTILIZERS (8–5–1) 450 LBS/ACRE

2. CONTRACTOR WILL DELINEATE APPROXIMATE HYDROLOGIC ZONE LINES TO BE VERIFIED BY THE LANDSCAPE OVERSIGHT TEAM.

3. ALL ACCESS CORRIDORS, STAGING AREAS, STOCKPILE SITES SHALL BE SCALPED (REMOVE AND BURY OR EXPORT 3–4" OF WEED STUBBLE AND WEED SEED CONTAMINATED SOILS). SOME OF THIS MATERIAL MAY BE DISPOSED OF AT THE CENTER OF AREAS TO BE BURIED UNDER UPLAND BERMS COMPOSED OF EXCESS FILL.

4. ALL AREAS TO BE GRADED SHALL FIRST BE SCALPED TO A DEPTH OF 3–4". (REMOVE AND BURY ON SITE OR EXPORT 3–4" OF WEEDY STUBBLE AND WEED CONTAMINATED SURFACE SOIL).

5. ALL AREAS TO BE FILLED SHALL FIRST HAVE UPPER EDGES SCALPED AND EXPORTED OR PUSHED INTO CENTER OF FILL AREA AT START OF OPERATION TO LIMIT SPREAD OF WEED SEEDS. PLACE TOE BERM OF CLEAN FILL TO CONTAIN WEEDY SCALPED SOILS. COVER WEEDY SCALPED SOILS COMPLETELY WITH CLEAN WEED FREE FILL MATERIALS.

6. IN GRADED AREAS, ONCE SURFACE SOILS HAVE BEEN SCALPED AND REMOVED, BETTER QUALITY FILL SOILS SHALL BE SALVAGED FOR USE AS UPPER LEVEL FILL SOIL, SOILS FOR TOP OF NEW BERM, AND EXCESS FILL MATERIAL BERM SOILS.

7. CONTRACTOR SHALL GIVE ECOLOGIST OR OVERSIGHT TEAM 72 HOURS' NOTICE FOR PRE–INSPECTION OF PLANT MATERIALS AT NURSERY OR ON SITE PRIOR TO PLANTING.

8. "BACK FILL MIX" FOR TREE AND SHRUB PLANTING SHALL CONSIST ENTIRELY OF WEED FREE INGREDIENTS: 4 PARTS LOAM OR CLAY LOAM TOPSOIL, 2 PARTS FINE SAND (0.10 TO 0.25MM), 1 PART APPROVED ORGANIC COMPOST. AS "BACKFILL MIX" IS PLACED MIX INTO IT A SMALL AMOUNT OF FERTILIZER AND MYCORRHIZAL INOCULANT CALLED ROCKY MOUNTAIN PLANTER'S KIT (RMPK) OR ITS EQUIVALENT (SEE BELOW) AT THE FOLLOWING RATES: 1.5 CUPS FOR EACH #5 TREE OR SHRUB, 2 CUPS FOR EACH 2" CALIPER B&B TREE AND 3 CUPS FOR EACH 3" DIAMETER TREE. TAKE CARE THAT THIS ADDITIONAL FERTILIZER IS MIXED WELL INTO BACKFILL AND PLACED AROUND ROOT BALL AND NEAR THE BURIED STEMS OR TRUNK. EQUIVALENT BULK MIX TO RMPK CONSISTS OF (20 BIOSOL FORTE, 10 # MENEFEE HUMATE, AND 1/2# 'MYCO APPLY' OR EQUIVALENT (ENDO–MYCORRHIZAL INOCULANT).

9. WOODY PLANTINGS WILL BE FIELD ADJUSTED BY CONTRACTOR WITH ECOLOGIST/LANDSCAPE OVERSIGHT TEAM. PLEASE GIVE ECOLOGIST 48 HOURS' NOTICE PRIOR TO EACH PLANT INSTALLATION PHASE.

10. DORMANT SANDBAR WILLOW LIVE STAKES SHALL BE CUT WHILE STILL DORMANT WITHIN ONE WEEK OF INSTALLATION. STAKES SHALL BE LONG ENOUGH TO REACH 6–8 INCHES INTO THE SEASONAL LOW WATER TABLE FOR PLANTING LOCATIONS. CUT LOWER ENDS OF STAKES SHALL BE PLACED IMMEDIATELY (WITHIN 1 MINUTE) INTO WATER. STAKES SHALL BE KEPT IN WATER N A SHADED COOL LOCATION UNTIL INSTALLED. USE REBAR TO PRE–DRILL PLANTING HOLES. BACKFILL HOLES WITH SOIL. TAMP ON EITHER SIDE TO SECURE STAKES. TRIM TO 6–8 INCH HEIGHT. WATER WELL IMMEDIATELY. WILLOW STAKES SHALL BE COLLECTED FROM STAND LOCATED BY CONTRACTOR AND PRE–APPROVED BY ECOLOGIST

11. TOPSOIL SHALL BE PLACED 4–6 INCHES DEEP IN FILL AREAS TO IMPROVE SEEDBED, AS REQUIRED, WHERE FILL SOIL QUALITY NEEDS IMPROVEMENT: ON CHANNEL SIDE SLOPES, POND BANKS, EXCESS FILL MATERIAL BERMS IN UPLANDS, TRAIL EDGES AND OTHER INSTALLATIONS IN THE UPLANDS. ECOLOGIST SHOULD BE CONSULTED TO HELP EVALUATE QUALITY OF FILL SOIL AND NEED FOR TOP SOIL PLACEMENT.

12. NO TOPSOILING, SEEDBED PREPARATION OR SEEDING SHALL BE DONE IF THE SOILS ARE WET, MUDDY, FROZEN OR SNOW COVERED.

13. ALL DISTURBED AREA WITHIN LIMITS OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO ACCESS CORRIDORS, STAGING AREAS, STOCKPILING AREAS, ETC., SHALL BE RIPPED TO A DEPTH OF 12 INCHES AND PRIOR TO TOP–SOILING FOR CREATION OF THE SEED BED.

14. SOILS SHALL BE RAKED SMOOTH IN ALL AREAS TO BE BLANKETED. REMOVE ALL ROCKS, ROOTS, AND CLODS. SMOOTH LOW AND HIGH POINTS TO PREVENT BRIDGING OF BLANKETS ONCE STAKED. IN OTHER AREAS TO BE BROADCAST OR DRILL SEEDED REMOVE ROOTS, ROCKS, OR CLODS OVER 2–3 INCHES IN DIAMETER.

15. ALL SEEDED AREAS SHALL USE DESIGNATED ZONE SEED MIXTURE AS INDICATED ON THE PLANS. SEEDING MIXTURES SHOULD OVERLAP THE ADJACENT ZONE AT LEAST THREE FEET TO PREVENT WEEDY GAPS. LARGE AREAS CAN BE DRILL SEEDED WITH A NATIVE GRASS DRILL WITH AGITATORS. CROSS DRILL AREAS WITH 1/2 RATE IN TWO DIRECTIONS TO IMPROVE DENSITY OF SEEDING. SMALL AREAS, BLANKETED AREAS, SLOPES AND EDGES OF BLANKETED AREAS SHALL BE BROADCAST SEEDED AND HAND RAKED OR HARROWED TO COVER SEED 1/4 TO 1/2 INCH WITH SOIL.

16. IN ZONE 2, 3, AND 4, IMMEDIATELY BEFORE SEEDING AMEND THE AREA WITH 1800 #/ACRE BIOSOL FORTE, 900 #/ACRE MENEFEE HUMATE, PLUS 20 #/ACRE GRANULAR ENDOMYCORRHIZAL INOCULANT (MYCO APPLY OR EQUIVALENT). THE ENDOMYCORRHIZAL INOCULANT CAN ALSO BE MIXED WITH HYDROMULCH TO APPLY. SOILS SHALL NOT BE AMENDED PRIOR TO SEEDING IN ZONE 1.

17. SEEDED AREAS, WHICH ARE NOT TO BE BLANKETED, SHALL BE MULCHED WITH 2500 POUNDS PER ACRE MECHANICALLY DEFIBRATED VIRGIN WOOD FIBER HYDROMULCH PLUS 150 POUND/ACRE ORGANIC TACKIFIER (PSYLLIUM SEED OR APPROVED ALTERNATE). APPLY BLANKETS AS INDICATED ELSEWHERE IN PLANS.

18. TO ESTABLISH VEGETATION ON RIPRAP, THE CONTRACTOR WILL PLACE PLANTING MEDIUM OVER THE RIPRAP TO PROMOTE ESTABLISHMENT OF LIVE STAKES, POLES AND SEEDLINGS. LIVE STAKES AND/OR POLES WILL BE INSTALLED BETWEEN JOINTS OR OPEN SPACES OF RIPRAP (JOINT PLANTING). A STINGER (DEEP–REACHING HYDRAULIC PROBE OR MANUAL PROBE) AND/OR HAMMER–DRILL CAN ALSO BE USED IF JOINT PLANTING WILL NOT ALLOW STAKES AND/OR POLES TO REACH THE APPROPRIATE DEPTH. THE CONTRACTOR SHALL UTILIZE STAKES OF AN ADEQUATE LENGTH TO REACH SIX INCHES INTO THE LOW–SEASON WATER TABLE, WITH ENOUGH STEM REMAINING SUCH THAT NO FEWER THAN THREE TO FOUR LIVE BUDS REMAIN ABOVE THE GROUND SURFACE TO PROVIDE GOOD HYDRATION AND TO ASSIST WITH SURVIVAL.

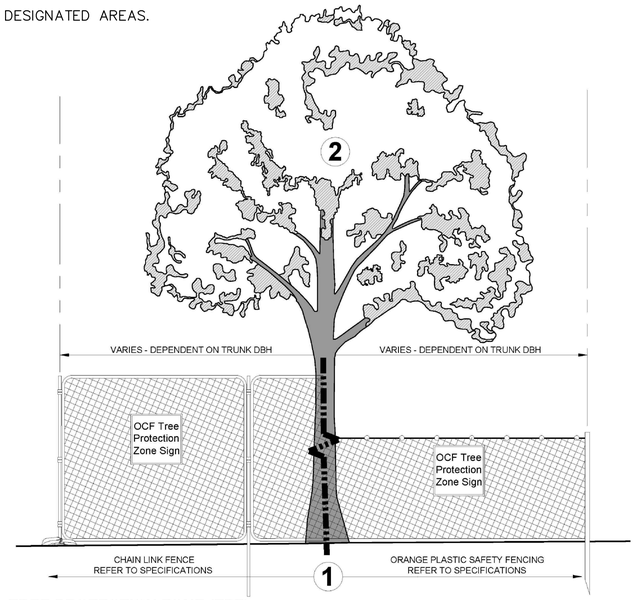
19. FOR ALL ZONES, THE FINISH GRADES WILL BE LEFT NATURAL AND ROUGH WITH NO SMOOTH SURFACES, RIGHT ANGLES, OR STRAIGHT EDGES.

20. ALL SEED SHALL BE "CERTIFIED" AND SHALL NOT INCLUDE THE PRESENCE OF NOXIOUS OR INVASIVE SPECIES PROHIBITED UNDER THE COLORADO SEED ACT (AS INDICATED ON THE TAG BY THE COLORADO SEED GROWERS ASSOCIATION APPROVED LABELING). ALL SEED SHALL BE INSPECTED BY THE RESTORATION ECOLOGIST AND/OR WATERSHED COORDINATOR PRIOR TO INSTALLATION AND ALL TAGS MUST BE MAINTAINED FOR DOCUMENTATION BY THE WATERSHED COORDINATOR, OR THEIR DESIGNEE. PRIOR TO DELIVERY, SEED SHALL BE PROCESSED BY THE SEED PROVIDER ON A "GRAVITY TABLE" TO REMOVE NON–TARGET SEED TYPES, SUCH AS YELLOW SWEET–CLOVER, ALFALFA, WOOD SORREL, AND OTHER POTENTIALLY INVASIVE SPECIES.

21. NO EQUIPMENT WILL BE ALLOWED IN THE RESTORATION AREA AFTER SEEDING OR PLANTING.

22. CHEMICAL AND/OR MECHANICAL WEED ABATEMENT SHALL BE FACILITATED BY THE WATERSHED COORDINATOR TO ASSIST IN ERADICATION OF INVASIVE AND NOXIOUS WEEDS. THE CONTROL OF NOXIOUS AND/OR INVASIVE SPECIES ESTABLISHMENT. AN ITERATIVE WEED MANAGEMENT PLAN SHALL BE IMPLEMENTED BASED UPON THE RESULTS OF MONITORING.

23. CONSTRUCTION EQUIPMENT, FUELS AND OTHER PETROLEUM PRODUCTS SHALL NOT BE STORED OR STOCKPILED WITHIN 50 FEET OF THE SOUTH PLATTE RIVER OR OTHER AQUATIC HABITATS. FUELING SHALL ONLY OCCUR WITHIN APPROVED DESIGNATED AREAS.



1 TREE PROTECTION ZONE (TPZ): SHALL BE EQUAL TO EIGHTEEN INCHES (18") RADIALLY FROM THE TREE FOR EVERY ONE INCH (1") OF TRUNK DIAMETER AT BREAST HEIGHT (DBH = FOUR FEET SIX INCHES (4'6") ABOVE SOIL LINE)

1. REFER TO THE TREE RETENTION AND PROTECTION SPECIFICATIONS FOR REQUIREMENTS OF THE TREE PROTECTION ZONES. THESE SPECIFICATIONS SHALL BE FOLLOWED THROUGHOUT THE DURATION OF THE PROJECT.
2. THE TREE PROTECTION FENCING AND SIGNS MUST BE IN PLACE AND APPROVED IN WRITING BY THE OFFICE OF THE CITY FORESTER (OCF) PRIOR TO COMMENCEMENT OF WORK. TRUNK PROTECTION MAY BE REQUIRED AND SHALL BE INSTALLED AT THE DIRECTION OF THE OCF.
3. CHAIN LINK FENCING IS REQUIRED AT STAGING AND HIGH-TRAFFIC AREAS AND MAY BE REQUIRED AT OTHER LOCATIONS AS INDICATED BY THE OCF.
4. ONCE APPROVED, THE TREE PROTECTION ZONE SHALL NOT BE RESIZED, ALTERED, OR REMOVED AT ANY TIME WITHOUT PRIOR APPROVAL FROM THE OCF. THE FENCING SHALL REMAIN IN PLACE UNTIL THE COMPLETION OF THE PROJECT AND THE CONTRACTOR IS APPROVED FOR REMOVAL BY THE OCF AND THE PROJECT MANAGER.
5. THE TREE PROTECTION FENCING AND SIGNS MUST BE MAINTAINED IN THE CONDITION AS APPROVED UNTIL THE COMPLETION OF THE PROJECT.
6. WATERING IS THE RESPONSIBILITY OF THE CONTRACTOR, REFER TO TREE RETENTION AND PROTECTION SPECIFICATIONS.
7. VIOLATION OF THE TREE PROTECTION ZONE AND DAMAGE TO TREES ARE SUBJECT TO PENALTY PER THE TREE RETENTION AND PROTECTION SPECIFICATIONS AND THE CITY ORDINANCE.

2 LOWER CANOPY PROTECTION:

1. CONTACT THE OCF IF POTENTIAL FOR DAMAGE EXISTS AND/OR IF PRUNING IS NEEDED FOR CLEARANCE ISSUES PRIOR TO WORK. PRUNING FOR THE PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR, REFER TO THE SPECIFICATIONS FOR REQUIREMENTS.

1 TREE PROTECTION FENCING

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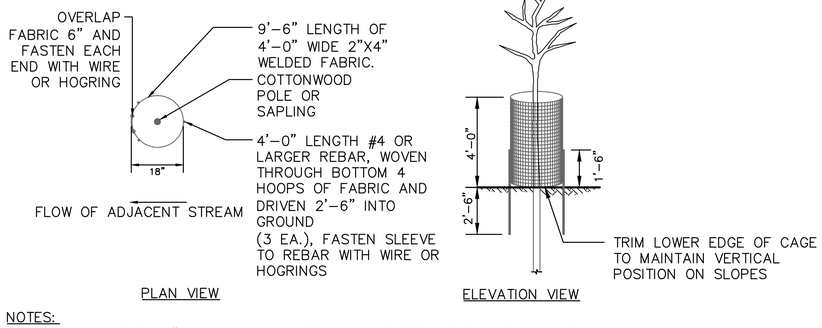

PLAN VIEW ELEVATION VIEW

NOTES:
1. CHECK FOR 12" MIN GROUNDWATER IN HOLE BEFORE PLANTING POLES.
2. CONTRACTOR'S OPTION : (3) #4 REBAR (SHOWN) OR (2) 5' T–POSTS
3. BEAVER PROTECTION TO BE PLACED AT ALL TREES, AND CLUSTERED AROUND SHRUBS.

2 BEAVER PROTECTION

NOT TO SCALE

No.	DATE	REVISIONS	APPR.

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PREPARED FOR: The City and County of Broomfield | MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: DHM DESIGN

PLAN
DRAWN TS/BP
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
GENERAL NOTES LS–3
ICON PROJECT No.

DATE APRIL 2024

SHEET OF

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LANDSCAPE SCHEDULE:

COMMON NAME	BOTANICAL NAME	SIZE	QUANTITY	COMMENTS
DECIDUOUS TREES				
Box Elder	Acer negundo	2 1/2" cal.	12	B&B, Specimen Quality
Peach Leaf Willow	Salix amygdaloides	2 1/2" cal.	8	B&B, Specimen Quality
Plains Cottonwood	Populus deltoides Monilifera	2 1/2" cal.	16	B&B, Specimen Quality
Plains Cottonwood	Populus deltoides Monilifera	5 GAL.	39	3ea @ 12' OC
Plains Cottonwood	Populus deltoides Monilifera	Stakes	80	5ea @ 5' OC
DECIDUOUS SHRUBS				
Chokecherry	Prunus virginianna	5 GAL.	16	Cont., 5 canes min., 18"–24" ht.
Golden Currant	Ribes aureum	5 GAL.	18	Cont., 5 canes min., 12"–18" ht.
Pawnee Buttes Sand Cherry	Prunus besseyi 'Pawnee Buttes'	5 GAL.	10	Cont., 5 canes min., 18"–24" ht.
Red Osier Dogwood	Cornus sericea	5 GAL.	10	Cont., 5 canes min., 12"–18" ht.
Wax Currant	Ribes cereum	5 GAL.	13	Cont., 5 canes min., 12"–18" ht.
Western Snowberry	Symphoricarpos occidentalis	5 GAL.	13	Cont., 5 canes min., 12"–18" ht.
Woods Rose	Rosa woodsii	5 GAL.	21	Cont., 5 canes min., 12"–18" ht.
Sandbar Willow	Salix exigua	Stakes	860	

SEED MIXES

ZONE 2 0.22 ACRES

Scientific Name	Common Name	Variety	Spacing	Size
Seed Mixture			PLS#/AC	
Carex nebrascensis	Nebraska sedge	native	1.5	
Carex pellita	Woolly sedge	native	1.5	
Distichlis stricta	Inland saltgrass	native	3	
Eleocharis palustris	Creeping spikerush	native	1	
Helianthus nutallii	Nuttall's sunflower	native	0.4	
Juncus balticus	Baltic rush (aka Arctic rush)	native	1	
Lolium perenne subsp multiflorum	Perennial ryegrass	Gulf	1.25	
Nassella viridula	Green needlegrass	Lodorn	4	
Pascopyrum smithii	Western wheatgrass	Ariba	6	
Panicum virgatum	Switchgrass	Blackwell	4	
Spartina pectinata	Prairie cordgrass	native	7	
Aesclepias incarnata	Swamp milkweed	native	3.84	
Verbena hastata	Blue vervain	native	0.1	
High Plains Wet Meadow Mix	Western Native Seed Co.	mixture	4	
SEEDING RATE PLS#/ACRE MECHANICAL/DRILL			**38.59**	
SEEDING RATE PLS#/ACRE HAND BROADCAST			**77.18**	

ZONE 3 1.26 ACRES

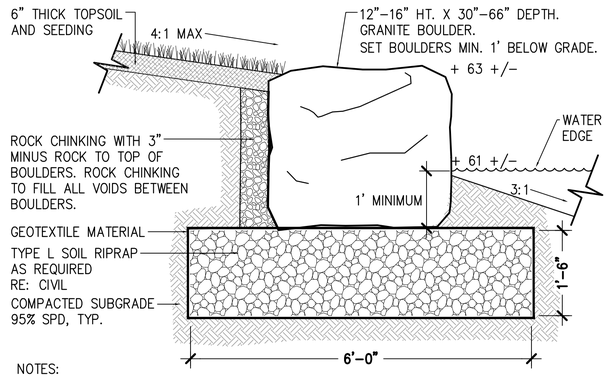
Scientific Name	Common Name	Variety	Spacing	Size
Seed Mixture			PLS#/AC	
Andropogon gerardii	Big bluestem	Champ	4	
Dalea purpurea	Purple prairie clover	native	0.2	
Distichlis stricta	Inland saltgrass	native	3	
Gaillardia aristata	Blanket flower	native	0.1	
Lolium perenne subsp multiflorum	Perennial ryegrass	Gulf	1.25	
Penstemon strictus	Rocky Mtn penstemon	Bandera	0.1	
Nassella viridula	Green needlegrass	Lodorn	6	
Pascopyrum smithii	Western wheatgrass	Ariba	6	
Panicum virgatum	Switchgrass	Blackwell	7	
Ratibida columnifera	Prairie coneflower	native	0.2	
Sorghastrum avenaceum (aka S.	Indiangrass	Holt /Cheyenne	3	
Spartina pectinata	Prairie cordgrass	native	3	
Sporobolus airoides	Alkali sacaton	Salado	1	
SEEDING RATE PLS#/ACRE MECHANICAL/DRILL			**34.85**	
SEEDING RATE PLS#/ACRE HAND BROADCAST			**69.70**	

ZONE 4 1.71 ACRES

Scientific Name	Common Name	Variety	Spacing	Size
Seed Mixture			PLS#/AC	
Buchloe dactyloides	Buffalograss	Cody/Bowie	5	
Bouteloua curtipendula	Sideoats grama	El Reno	5	
Chondrosum gracile	Blue grama	Hachita/Lovington	3	
Dalea purpurea	Purple prairie clover	native	0.2	
Distichlis stricta	Inland saltgrass	native	3	
Gaillardia aristata	Blanketflower	native	0.2	
Liatris punctata	Gay feather	native	0.2	
Lolium perenne subsp multiflorum	Perennial ryegrass	Gulf	1.25	
Machaeranthera tanacetifolia	tansy-aster	native	0.1	
Pascopyrum smithii	Western wheatgrass	Ariba	10	
Panicum virgatum	Switchgrass	Blackwell	2	
Penstemon strictus	Rocky Mtn Penstemon	Bandera	0.1	
Ratibida columnifera	Prairie coneflower	native	0.2	
Sporobolus airoides	Alkali sacaton	Salado	2	
Sporobolis cryptandrus	sand dropseed	native	2	
SEEDING RATE PLS#/ACRE MECHANICAL/DRILL			**34.25**	
SEEDING RATE PLS#/ACRE HAND BROADCAST			**68.50**	

ZONE 5 0.97 ACRES

Scientific Name	Common Name	Variety	Spacing	Size
Seed Mixture			PLS#/AC	
Buchloe dactyloides	Buffalograss	Cody/Bowie	7	
Bouteloua curtipendula	Sideoats grama	El Reno	5	
Chondrosum gracile	Blue grama	Hachita /Lovington	5	
Dalea purpurea	Purple prairie clover	native	0.2	
Distichlis stricta	Inland saltgrass	native	3	
Gaillardia aristata	Blanketflower	native	0.2	
Liatris punctata	Gay feather	native	0.2	
Lolium perenne subsp multiflorum	Perennial ryegrass	Gulf	1.25	
Machaeranthera tanacetifolia	tansy-aster	native	0.1	
Pascopyrum smithii	Western wheatgrass	Ariba	10	
Ratibida columnifera	Prairie coneflower	native	0.2	
Sporobolis cryptandrus	sand dropseed	native	2	
SEEDING RATE PLS#/ACRE MECHANICAL/DRILL			**34.15**	
SEEDING RATE PLS#/ACRE HAND BROADCAST			**68.30**	



NOTES:
1. MINIMUM 1/3 OF BOULDER DIAMETER SHALL BE EMBEDED.

1 BOULDER TOE EDGE

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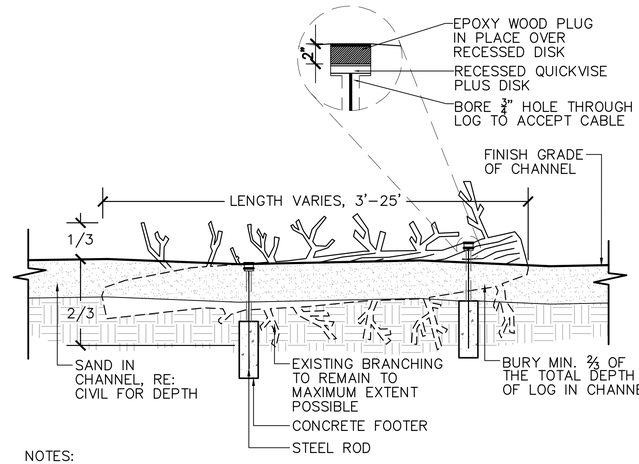

NOTES:
1. NATIVE LOG MATERIAL TO BE SOURCED FROM ON SITE RESOURCES FROM TREES REMOVED, OR ADDITIONAL MATERIAL FROM LOG DROP STRUCTURES.
2. LAYOUT OF LOGS TO BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
3. TOTAL LINEAR FEET OF LOGS TO BE DETERMINED BY MATERIAL AVAILABLE DURING CONSTRUCTION.
4. LOG SHALL BE SECURED BY (2) – 4" STEEL EARTH ANCHOR(S) WITH 3/16" STEEL CABLE TO PREVENT BUOYANCY DURING FLOOD EVENTS. INSTALL PER SPECIFICATION.

2 NATIVE LOG IN CHANNEL

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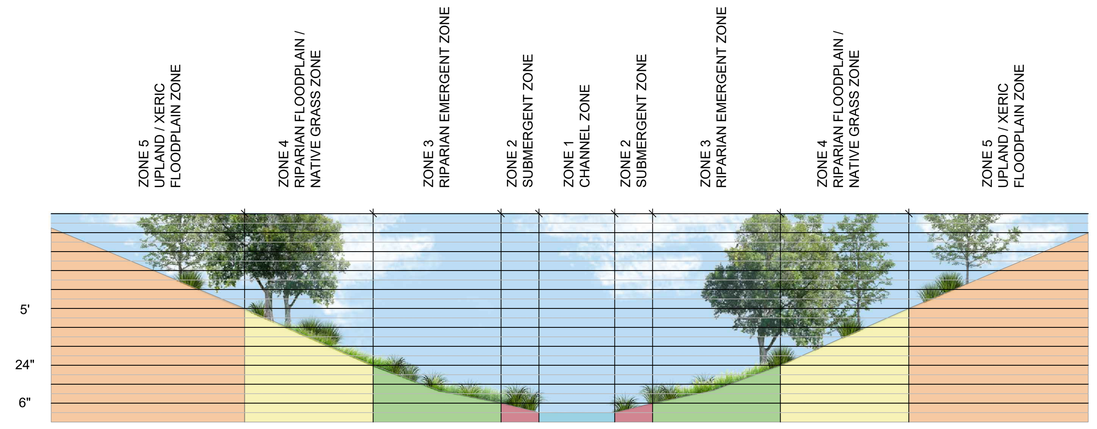

SECTION
ZONE 1: CHANNEL ZONE
ZONE 2: SUBMERGENT ZONE: -6"-6" ABOVE CHANNEL
ZONE 3: RIPARIAN EMERGENT ZONE: 6" - 24" ABOVE CHANNEL
ZONE 4: RIPARIAN FLOODPLAIN / NATIVE GRASS ZONE: 24" - 5' ABOVE CHANNEL
ZONE 5: UPLAND / XERIC FLOODPLAIN ZONE: 5'+ ABOVE CHANNEL

3 TYPICAL SECTION

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No.	DATE	REVISIONS	APPR.

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PREPARED FOR: The City and County of Broomfield | MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: DHM DESIGN

PLAN
DRAWN TS/BP
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
LANDSCAPE SCHEDULE, SEED CHARTS AND DETAILS LS–4

ICON PROJECT No.

DATE APRIL 2024

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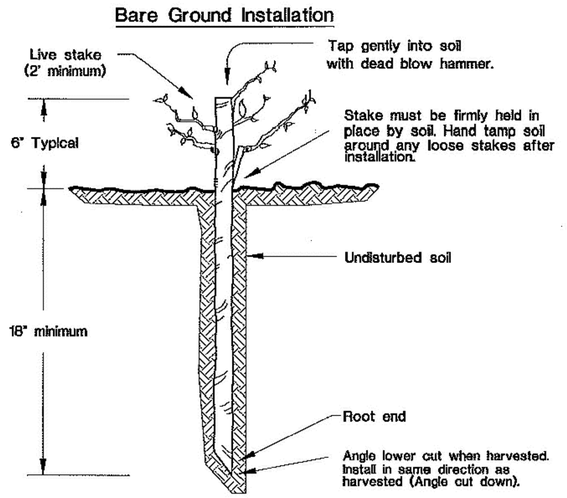
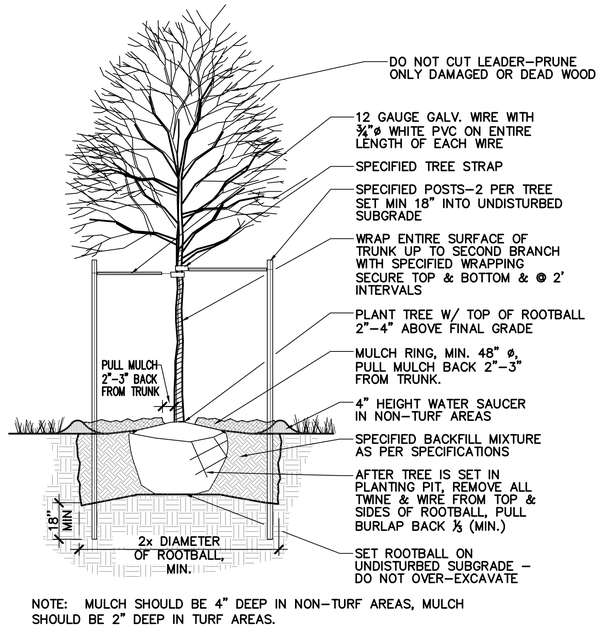
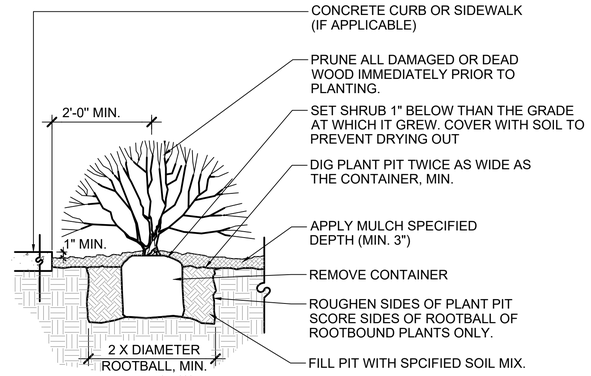
NOTE:
1. DETAIL OF LIVE STAKES REFERENCED FROM MILE HIGH FLOOD DISTRICTS SPECIFICATIONS "SOIL BIOENGINEERING OR SHORELINE STABILIZATION – 329343".
2. LIVE STAKES SHALL BE SINGLE STICKS. THEY SHALL BE TWENTY–FOUR (24) INCHES LONG, TAKEN FROM LOWER STEMS OF HEALTHY, ACTIVELY GROWING PLANTS, APPROXIMATELY ONE–HALF (½) TO ON (1) INCH IN DIAMETER.
3. ALL SIDE BRANCHES SHALL BE TRIMMED.
4. CUTTINGS SHALL BE PLANTED IN A STAGGERED PATTERN OR RANDOM PATTERN IN THE LOCATIONS SHOWN ON THE DRAWINGS AT THE DESIGNATED DENSITY.
5. CUTTING SHALL PROTRUDE FROM THE GROUND FOUR (4) TO SIX (6) INCHES. AT LEAST TWO–THIRDS (⅔) OF EACH CUTTING SHALL BE INSERTED INTO THE SOIL.
6. HOLES SHALL BE BACKFILLED WITH AN APPROVED SOIL, AS NECESSARY, SO THAT NO VOIDS REMAIN AROUND THE CUTTING.





NOTE: MULCH SHOULD BE 4" DEEP IN NON–TURF AREAS, MULCH SHOULD BE 2" DEEP IN TURF AREAS.

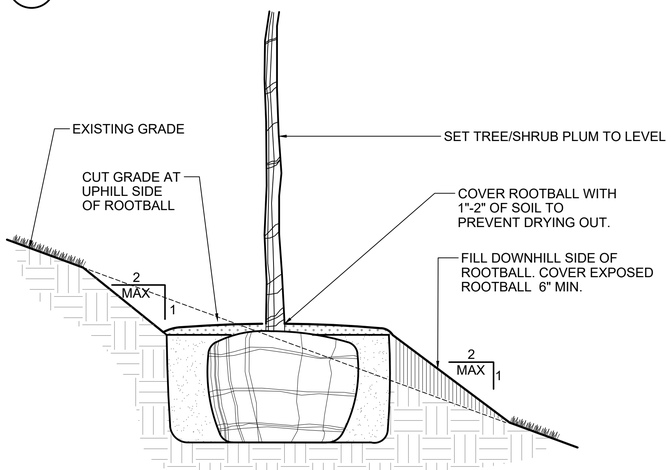


NOTES:
1. ANY BROKEN OR CRUMBLING ROOTBALLS WILL BE REJECTED.
2. REMOVING THE CONTAINERS WILL NOT BE AN EXCUSE FOR DAMAGED ROOTBALLS.
3. HOLD GRADE 1" BELOW EDGE OF WALK OR CURB
4. CREATE 2" WATER DISH AROUND PLANT. ON SLOPES CREATE 2" DEEP HALF-DISH NEAR STEM, OPEN TO UPSLOPE.

1 LIVE STAKE INSTALLATION
NOT TO SCALE

2 DECIDUOUS TREE PLANTING
NOT TO SCALE

3 CONTAINER PLANTING
NOT TO SCALE



NOTES:
1. REFER TO VARIOUS SPECIFIC TREE/SHRUB INSTALLATION DETAILS FOR STAKING, GUYING, MULCHING, ETC.
2. THIS INSTALLATION SHALL APPLY TO ALL TREE/SHRUB TYPES AND SIZES PLANTED ON SLOPES STEEPER THAN 2:1.

4 PLANTING ON A SLOPE
NOT TO SCALE

No.	DATE	REVISIONS	APPR.

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PREPARED BY: DHM DESIGN

PLAN
DRAWN TS/BP
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
LANDSCAPE DETAILS LS–5
ICON PROJECT No.

DATE APRIL 2024

SHEET OF

\\panzuraden\DHMPROJ\Denver\NISSEN RESERVOIR-172967 CD\CAD\Sheets\2-DHM Landscape Notes and Details.dwg Townson, Page Setup---- ICON, stb, 4/18/2024 11:06 AM

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER	MODEL NO.	DESCRIPTION	DETAIL NO.
	RAIN BIRD	RD-06-P30-F-S WITH MATCHED PRECIP. SERIES NOZZLE	POPUP SPRAY HEAD	1000-9
	RAIN BIRD	RD-12-P30-F-S WITH MATCHED PRECIP. SERIES NOZZLE	HI-POP SPRAY HEAD	1000-9
	RAIN BIRD	RD-6-P30-F-S WITH MATCHED PRECIP. SERIES NOZZLE -P10H	POP SPRAY HEAD (TREES IN NATIVE AREA)	1000-9
	RAIN BIRD	5006-SS-PC-SAM WITH #MPR MATCHED PRECPITATION NOZZLE (#25,#30,#35)	12" HI-POP GEAR DRIVEN ROTOR	1000-10
	RAIN BIRD	PESB	ELECTRIC CONTROL VALVE	1000-7
	RAIN BIRD	5-LC	QUICK COUPLING VALVE	1000-13
A	TORO DXI	DXI-SS2NT2XBM8CPSA130 - 72 STATION	ELECTRIC CONTROLLER - SS PEDESTAL	1000-23
N/S	OLDCASTLE / CARSON	REFER TO SPECIFICATIONS AND DETAILS	VALVE BOXES	JUMBO OR GREATER
	MEULLER	B-20283N	1" MANUAL DRAIN VALVE	1000-14
	MATCO	BRASS -THREADED	GATE VALVE W/ SQ. NUT OPERATOR	1000-16
	FEBCO	825YA WITH WATTS 223-HP PRV	RP BACKFLOW PREVENTER	1000-2
N/S	GUARDSHACK	GS-1	BACKFLOW PREVENTER ENCLOSURE	1000-2
	CAL-VAL	90-01 SERIES	PRESSURE REDUCING VALVE	
	BERMAD	410-KX (NORMALLY OPEN)	MASTER CONTROL VALVE	1000-15
FS	FLOWMEC	QS200 @ 45° ANGLE	FLOW SENSOR	1000-15
		CLASS 200 DR - 3" & SMALLER	PVC MAINLINE	1000-12
		DR-11	HDPE MAINLINE	1000-12
	HARCO	65-31430"2 1/2" WITH 65-90450"2 1/2" - DR11	TRANSITIONAL FITTING - HDPE TO PVC	N/A
		CLASS 200 DE	PVC LATERAL 1" MINIMUM	1000-12
		CLASS 160	PVC SLEEVING	1
		DR-11	HDPE SLEEVING	1

1 — CONTROLLER & STATION NO.
1" — CONTROL VALVE SIZE

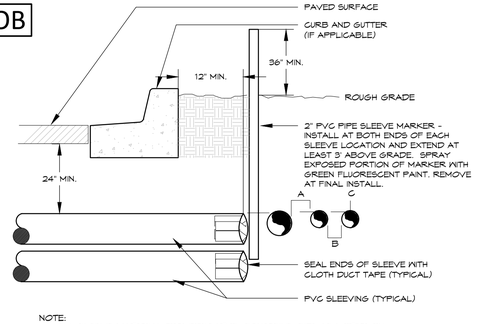
3c — A (controller) — NUMBER OF SPARE WIRES - 2 CONTROL AND 1 SPARE WIRES TO WHICH CONTROLLER - SEE CONSTRUCTION NOTES

IRRIGATION DETAILS PER CCOB 2022 STANDARDS & SPECIFICATIONS

- CONTRACTOR SHALL REFER TO CITY AND COUNTY OF BROOMFIELD 2022 STANDARDS AND SPECIFICATIONS UNLESS DIRECTED OTHER WISE BY CCOB IRRIGATION FOREMAN.

IRRIGATION EQUIPMENT NOTES PER CCOB

- ELECTRO-FUSE HDPE PIPE TO CL200 PVC PIPE SHALL REQUIRE FITTING #B212 AND MEGA-LUG FITTING.
- ROAD CROSSINGS AND SIZE PIPE WILL REQUIRE FITTINGS TO CONVERT BACK TO CL200 PVC (RING TITE) FOR 3" MAINLINE.
- 3" & SMALLER PVC MAINLINE USE SOLVENT WELD FITTING.



NOTE:
- ALL SLEEVE MATERIAL PER IRRIGATION SCHEDULE, SIZE AS NOTED ON PLAN.
- INSTALL SLEEVES IN SIDE-BY-SIDE CONFIGURATION WHERE MULTIPLE SLEEVES ARE TO BE INSTALLED. SPACE SLEEVES 4" TO 6" APART. DO NOT STACK SLEEVES VERTICALLY.
- CONTRACTOR TO COORDINATE WITH FLATWORK INSTALLER TO BRAND A "V" IN SIDEWALK OR CURB AT BOTH ENDS OF SLEEVE CROSSING.
- SLEEVING THROUGH OR UNDER RETAINING WALLS, PLANTER WALLS, POND LINING, OR WATER QUALITY AREAS SHALL BE COORDINATED WITH CIVIL WORK AT APPROXIMATE LOCATIONS SHOWN.

IRRIGATION SLEEVING — 1

IRRIGATION CONSTRUCTION NOTES

1. DRAWINGS AND BASE INFORMATION – ALL BASE AND PLANTING INFORMATION HAVE BEEN PROVIDED BY DHM DESIGN. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY HYDROSYSTEMS*KDI OF ANY DISCREPANCIES BETWEEN THE UTILITY OR PLANTING PLANS AND THE IRRIGATION PLAN. IF CONTRACTOR FAILS TO NOTIFY HYDROSYSTEMS*KDI AND MAKES CHANGES TO THE IRRIGATION SYSTEM DESIGN, HE ASSUMES ALL COSTS AND LIABILITIES ASSOCIATED WITH THOSE FIELD CHANGES. REFER TO SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. CONTACT IRRIGATION CONSULTANT FOR CURRENT SPECIFICATIONS IF NOT PROVIDED.

2. SYSTEM PRESSURE - HYDROSYSTEMS*KDI HAS CONTACTED THE LOCAL WATER DISTRICT THAT SERVES THIS SITE AND THEY HAVE BEEN TOLD THAT THE STATIC WATER PRESSURE IN THIS AREA SHOULD BE **104** PS I MIN. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY PRESSURE PRIOR TO COMMENCING ANY CONSTRUCTION AND NOTIFY HYDROSYSTEMS*KDI OF ANY VARIANCE FROM THE STATED PRESSURE IMMEDIATELY. WRITTEN DOCUMENTATION OF PRESSURE TEST AND RESULTS SHALL BE PROVIDED TO HYDROSYSTEMS*KDI AT CONSTRUCTION ONSET. IF CONTRACTOR FAILS TO FIELD VERIFY PRESSURE AND/OR NOTIFY HYDROSYSTEMS*KDI OF ANY VARIATIONS FROM THIS PRESSURE, THEN HE ASSUMES ALL CONSTRUCTION AND ENGINEERING COSTS ASSOCIATED WITH SYSTEM MODIFICATIONS REQUIRED TO ACCOMMODATE ACTUAL SITE PRESSURE. REFER TO POINT OF CONNECTION NOTES FOR SPECIFIC PRESSURE REQUIRED AT THAT LOCATION. THIS S (SET PRV).

3. IRRIGATION SYSTEM OPERATION INTENT - THIS IRRIGATION SYSTEM HAS BEEN DESIGNED TO IRRIGATE THE ESTABLISHED LANDSCAPE WITHIN A THREE NIGHT PER WEEK, THREE HOUR PER NIGHT WATERING WINDOW. ESTABLISHMENT WATERING WILL REQUIRE UP TO TWICE AS MUCH IRRIGATION FOR A FOUR TO SIX WEEK PERIOD. THE DESIGN IS BASED ON THE FOLLOWING PROJECTED WEEKLY APPLICATION RATES AFTER ESTABLISHMENT. THESE FIGURES ARE BASED ON A 30-YEAR AVERAGE WEATHER DATA AND WILL NEED TO BE ADJUSTED DUE TO SEASONAL CHANGES AND WEATHER CONDITIONS ABOVE AND BELOW THE AVERAGE VALUES UTILIZED.

TREES AND SHRUBS	0.89" PER WEEK PEAK SEASON
NATIVE SEED MIXES	0.78" PER WEEK PEAK SEASON (TWO SEASONS)

NOTE: IT IS THE INTENT OF THIS DESIGN THAT NATIVE AREAS WOULD ONLY BE IRRIGATED FOR ESTABLISHMENT. SYSTEM WILL REMAIN FOR USE DURING YEARS WITH LESS THAN NORMAL RAINFALL.

4. EQUIPMENT INSTALLATION - IT IS THE INTENT OF THIS DESIGN THAT ALL IRRIGATION EQUIPMENT BE INSTALLED WITHIN PROPERTY PROJECT LIMITS AND WITHIN LANDSCAPED AREAS. ANY EQUIPMENT OTHER THAN VALVE BOXES OR SLEEVING THAT CONTAINS PIPE OR WIRES SHOWN OUTSIDE OF THESE LIMITS IS SHOWN IN THAT LOCATION FOR GRAPHICAL CLARITY ONLY. ALL VALVE BOXES SHALL BE INSTALLED A MINIMUM OF 3'-0" FROM EDGE OF ANY PAVED SURFACES UNLESS SPECIFICALLY INDICATED ON PLANS. BOXES INSTALLED IN OPEN TURF AREAS SHALL BE KEPT TO EDGES AND STAKED FOR REVIEW IF ALONG HIGH TRAFFIC AREAS. ALL VALVE BOXES SHALL BE PLACED A MINIMUM OF 3'-0" FROM THE CENTERLINE OF ANY DRAINAGE SWALE. ALL VALVE BOXES WITHIN PAVEMENT SHALL BE TIER 15 RATED BOXES FOR HEAVY DUTY NON-DELIBERATE TRAFFIC. BOX LID COLOR SHALL MATCH ADJACENT MATERIALS, I.E. GREEN IN TURF, TAN IN WOOD MULCH, GRAY IN STONE MULCH, PURPLE FOR RECLAIMED WATER SYSTEMS (IF REQUIRED). REFER TO LANDSCAPE PLANS FOR MATERIAL COLORS AND TYPES. ALL BOXES SHALL BE INSTALLED TO BE FLUSH WITH GRADE AND IN AN ORDERLY MANNER.

5. PIPING INSTALLATION – IRRIGATION PIPING SHALL MAINTAIN A MINIMUM DISTANCE FROM BUILDING FOUNDATIONS OF 5 FEET OR AS DESCRIBED IN SOILS REPORT, WHICHEVER IS GREATER. NO SPRAY IRRIGATION SHALL OCCUR WITHIN 10 FEET OF THE FOUNDATION. NO DRIP IRRIGATION SHALL OCCUR WITHIN 5 FEET OF THE FOUNDATION UNLESS SOIL MOISTURE SENSORS ARE INSTALLED ON VALVES SERVICING THESE AREAS. ALL IRRIGATION PIPING AND EMISSION DEVICES LOCATED ON TOP OF OR WITHIN BUILDING STRUCTURE SHALL CONFORM TO WATERPROOFING CONSULTANT REQUIREMENTS. PIPE ROUTING MAY BE SHOWN WITHIN THESE DISTANCES FOR GRAPHICAL CLARITY ONLY.

6. MANUAL DRAIN VALVES - CONTRACTOR TO INSTALL MANUAL DRAIN VALVE ON PRESSURE SUPPLY IN VAULT AND DOWNSTREAM SIDE OF BACKFLOW ASSEMBLY (TOTAL OF 2).

7. POP-UP SPRAY NOZZLES - CONTRACTOR TO INSTALL PLASTIC NOZZLES ON ALL POP-UP SPRAY HEADS. INSTALL 15 SERIES NOZZLES ON ALL HEADS SPACED AT 12' TO 13'. INSTALL 12 SERIES NOZZLES ON ALL HEADS SPACED 10' TO 11'. INSTALL 10 SERIES NOZZLES ON ALL HEADS SPACED AT 8' TO 9'. INSTALL 8 SERIES NOZZLES ON ALL HEADS SPACED AT 6' TO 7'. INSTALL 5' NOZZLES ON ALL HEADS SPACED AT 5'. INSTALL SIDE STRIP NOZZLES ON ALL HEADS WITH AN "S" DESIGNATION AND RIGHT AND LEFT CORNER STRIP NOZZLES ON ALL HEADS WITH AN "L" OR "R" DESIGNATION. VARIABLE ARC NOZZLES SHOULD BE UTILIZED ADJACENT TO CURVILINEAR SHRUB BEDS OR FOR ANY ANGLES THAT ARE NOT A STANDARD NOZZLE ANGLE. WHERE INDICATED,

8. UNLABELED PIPING - ALL UNLABELED LATERAL PIPING SHALL BE 1" MINIMUM UNLESS OTHERWISE NOTED. NO 1 1/4" PIPE ALLOWED

9. SLEEVING - ALL SLEEVING UNDER PAVED SURFACES SHOWN ON PLANS IS BY CONTRACTOR UNLESS OTHERWISE NOTED. SLEEVING SHALL BE INSTALLED IN THE SIZES AND QUANTITIES SHOWN ON PLANS OR BASED ON THE SCHEDULE BELOW. WHERE SLEEVES ARE SHOWN, BUT NOT LABELED, FOLLOW THE SCHEDULE BELOW. ALL MAINLINE, CONTROL WIRES AND DRIP LINES UNDER PAVED SURFACES ARE TO BE INSTALLED IN SLEEVING. ALL MAINLINE SLEEVE LOCATIONS TO INCLUDE A SEPARATE WIRE SLEEVE.

SLEEVED PIPE SIZE/WIRE QUANTITY	REQUIRED SLEEVE SIZE & (QUANTITY)
¾" - 1¼" PIPING	2" PVC (1)
1½" - 2" PIPING	4" PVC (1)
2½" - 3" PIPING	6" PVC (1)
1 - 25 CONTROL WIRES	2" PVC (1)

10. ADJUSTMENT - CONTRACTOR SHALL FINE TUNE/ADJUST THE IRRIGATION SYSTEM TO REDUCE/AVOID OVERSPRAY ONTO HARD SURFACES BY ADJUSTING NOZZLE DIRECTION AND NOZZLE RADIUS.

11. PLANS AND SPECIFICATIONS - CONTRACTOR RESPONSIBLE TO ENSURE WORK CONFORMS TO PLANS AND SPECIFICATIONS. AT ONSET OF CONSTRUCTION, VERIFY PLANS ARE CURRENT. WHERE REQUIRED BY CCOB, CONTRACTOR SHALL CONSTRUCT ONLY OFF CITY OR TOWN STAMPED PLANS. REVISIONS TO CITY OR TOWN STAMPED PLANS SHALL CONFORM TO CITY FIELD CHANGE PROCEDURES AND DOCUMENTATION.

12. SIMULTANEOUS ZONE OPERATION - THIS IRRIGATION SYSTEM HAS BEEN DESIGNED TO OPERATE MULTIPLE ZONES SIMULTANEOUSLY BASED ON INDIVIDUAL ZONE FLOW. THE DESIGN IS INTENDED TO OPERATE MULTIPLE VALVES, UP TO THE MAXIMUM FLOW IN THE POINT OF CONNECTION NOTE. REFER TO CONTROLLER SPECIFICATION FOR MAXIMUM SIMULTANEOUS VALVE COUNT.

13. CITY DETAILS - HYDROSYSTEMS-KDI WILL BE RESPONSIBLE FOR THE IRRIGATION DESIGN ITSELF. STANDARD DETAILS DESIGNED AND SPECIFIED BY THE APPLICABLE GOVERNING AUTHORITY, CITY AND COUNTY OF BROOMFIELD. HYDROSYSTEMS*KDI DID NOT DESIGN AND SPECIFY THESE DETAILS. HYDROSYSTEMS*KDI IS NOT RESPONSIBLE, AND ACCEPTS NO RESPONSIBILITY, FOR THE SELECTION AND SPECIFICATION OF THESE DETAILS, AND HYDROSYSTEMS*KDI MAKES NO REPRESENTATIONS WITH REGARD TO THESE DETAILS.

14. WATER BUDGETS AND PROJECTIONS - HYDROSYSTEMS-KDI HAS BASED THE IRRIGATION DESIGN AND THE ASSOCIATED PROJECTED WATER USE UPON SUCH FACTORS AS CITY OR WATER DISTRICT IMPOSED REQUIREMENTS, PUBLISHED PLANT SPECIES WATER NEEDS, SELECTED IRRIGATION METHOD EFFICIENCIES AS REPORTED BY INDEPENDENT TESTING FACILITIES, HISTORICAL WEATHER DATA FOR THE PROJECT LOCATION, AND PROPER MAINTENANCE PROCEDURES. HYDROSYSTEMS*KDI IS NOT RESPONSIBLE, AND ACCEPTS NO RESPONSIBILITY, FOR THE ACTUAL WATER USAGE VARIATION THAT IS A RESULT OF FIELD MODIFICATIONS TO THE SYSTEM NOT MATCHING CONSTRUCTION DOCUMENTS, IMPROPER MAINTENANCE, WASTE DUE TO SYSTEM DAMAGE OR VANDALISM, OR WEATHER CONDITIONS THAT DEVIATE FROM PUBLISHED 30 YEAR HISTORICAL AVERAGES.

15. REFER TO PLANTING PLAN FOR EXACT TREE LOCATIONS AND QUANTITIES, TREES SHOWN ON IRRIGATION PLAN ARE APPROXIMATE.

16. CONTRACTOR TO MARK ON HARDSCAPES (CONCRETE) ON EACH SIDE OF SLEEVE LOCATIONS WITH A "V" 2" LONG X 1/8th" DEEP, ETCHING, POINTING TO SLEEVE ENDS.

17. MATCH PRECIPITATION RATES FOR ALL ROTOR NOZZLES.

18. CONTROL VALVES 1" -UP TO 2", NEED TO BE INSTALLED IN JUMBO VALVE BOX.

19. 3/4" & 1 1/4" LATERAL PIPING WILL NOT ACCEPTABLE AND SHOULD NOT BE USED.

20. GENERAL NOTE:
- NO CLUSTERING OF ELECTRIC CONTROL VALVES. (MINIMUM OF 4' SPACING BETWEEN)
- PURPLE TRACER #14UF WIRE TO EXTEND FROM CONTROLLER TO ALL ENDS OF MAINLINE.
- CONNECT WIRE TO 2" GROUND ROD W/ CLAMP IN QC BOX.

"All work shall be constructed to City and County of Broomfield STANDARDS and SPECIFICATIONS.
This drawing has been reviewed and found to be in general compliance with these STANDARDS and SPECIFICATIONS and other Broomfield requirements. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON . "

_____ _____ _____
City Engineer (or Designee) Date

"All work shall be constructed to City and County of Broomfield STANDARDS and SPECIFICATIONS.
This drawing has been reviewed and found to be in general compliance with these STANDARDS and SPECIFICATIONS and other Broomfield requirements. THE DESIGN AND CONCEPT REMAINS THE
RESPONSIBILITY OF THE PROFESSIONAL LANDSCAPE AND IRRIGATION SYSTEM DESIGNER WHOSE SIGNATURE APPEARS HEREON."

_____ _____ _____
Parks Maintenance Superintendent (or Designee) Date

DIRECTORY

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Irrigation Consulting & Water Management
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o: 303.980.5327 www.hydrosystemskdi.com

No.	DATE	REVISIONS	APPR.

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PREPARED BY: DHM DESIGN

PLAN
DRAWN TS
DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
IRRIGATION NOTES & SCHEDULE IR-1
ICON PROJECT No.

DATE 07-16-2024
SHEET OF

I:\7900-7999 Jobs\7903-Nissen Channel\DHM-Ecological Phase1 - Standard\Irrigation - Revised Ecological-rev3.dwg Kend Page Setup:22x34 PDF 8pen38screen-15-HSKDI.ctb 7/23/2024 1:53 PM

CONTROLLER LOCATION "A"

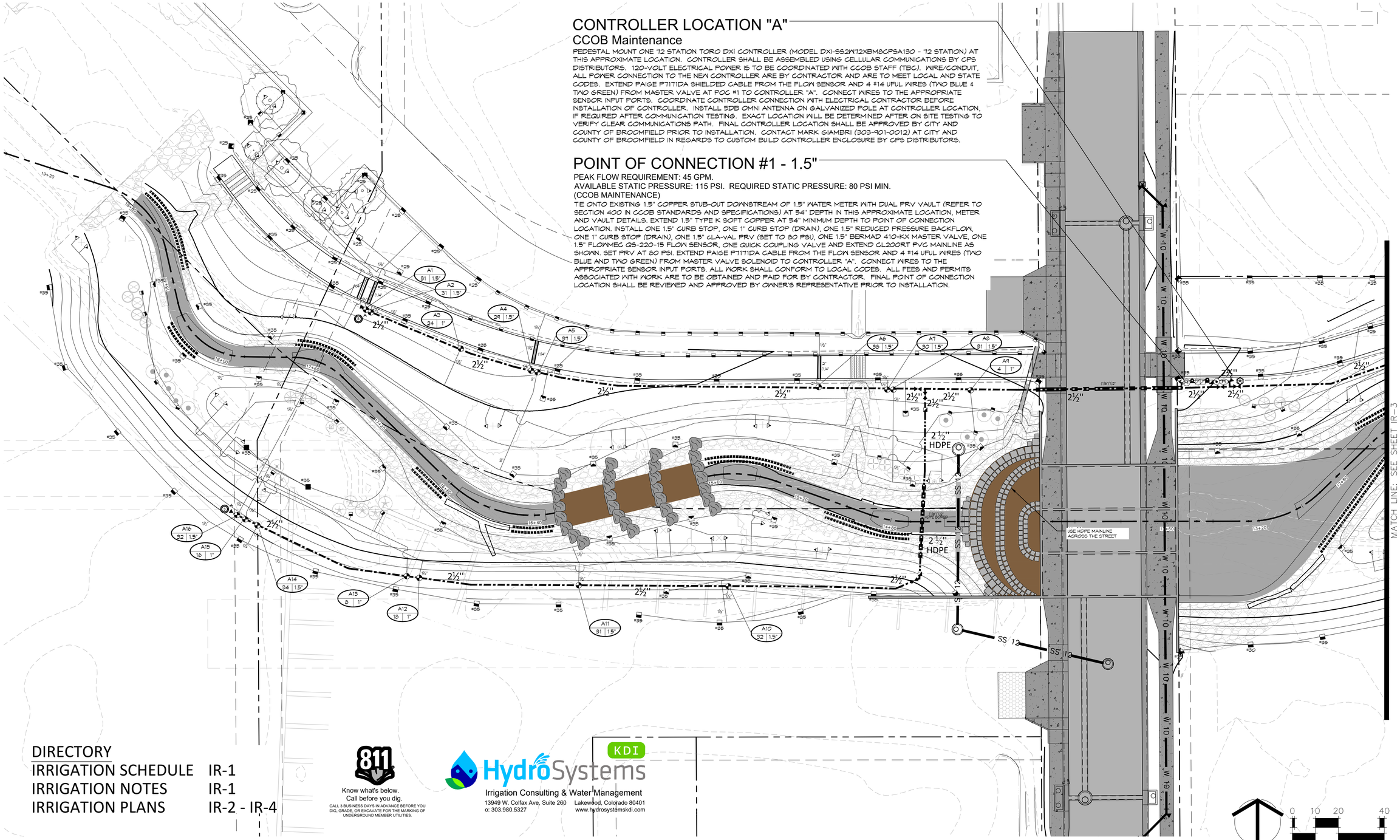
CCOB Maintenance

PEDESTAL MOUNT ONE 72 STATION TORO DXi CONTROLLER (MODEL DXI-SS2M72XBM8CPSA130 - 72 STATION) AT THIS APPROXIMATE LOCATION. CONTROLLER SHALL BE ASSEMBLED USING CELLULAR COMMUNICATIONS BY CPS DISTRIBUTORS. 120-VOLT ELECTRICAL POWER IS TO BE COORDINATED WITH CCOB STAFF (TBC). WIRE/CONDUIT, ALL POWER CONNECTION TO THE NEW CONTROLLER ARE BY CONTRACTOR AND ARE TO MEET LOCAL AND STATE CODES. EXTEND PAIGE PT1171DA SHIELDED CABLE FROM THE FLOW SENSOR AND 4 #14 UFUL WIRES (TWO BLUE & TWO GREEN) FROM MASTER VALVE AT POC #1 TO CONTROLLER "A". CONNECT WIRES TO THE APPROPRIATE SENSOR INPUT PORTS. COORDINATE CONTROLLER CONNECTION WITH ELECTRICAL CONTRACTOR BEFORE INSTALLATION OF CONTROLLER. INSTALL 5DB OMNI ANTENNA ON GALVANIZED POLE AT CONTROLLER LOCATION, IF REQUIRED AFTER COMMUNICATION TESTING. EXACT LOCATION WILL BE DETERMINED AFTER ON SITE TESTING TO VERIFY CLEAR COMMUNICATIONS PATH. FINAL CONTROLLER LOCATION SHALL BE APPROVED BY CITY AND COUNTY OF BROOMFIELD PRIOR TO INSTALLATION. CONTACT MARK GIAMBRI (303-901-0012) AT CITY AND COUNTY OF BROOMFIELD IN REGARDS TO CUSTOM BUILD CONTROLLER ENCLOSURE BY CPS DISTRIBUTORS.

POINT OF CONNECTION #1 - 1.5"

PEAK FLOW REQUIREMENT: 45 GPM.
AVAILABLE STATIC PRESSURE: 115 PSI. REQUIRED STATIC PRESSURE: 80 PSI MIN.
(CCOB MAINTENANCE)

TIE ONTO EXISTING 1.5" COPPER STUB-OUT DOWNSTREAM OF 1.5" WATER METER WITH DUAL PRV VAULT (REFER TO SECTION 400 IN CCOB STANDARDS AND SPECIFICATIONS) AT 54" DEPTH IN THIS APPROXIMATE LOCATION, METER AND VAULT DETAILS. EXTEND 1.5" TYPE K SOFT COPPER AT 54" MINIMUM DEPTH TO POINT OF CONNECTION LOCATION. INSTALL ONE 1.5" CURB STOP, ONE 1" CURB STOP (DRAIN), ONE 1.5" REDUCED PRESSURE BACKFLOW, ONE 1" CURB STOP (DRAIN), ONE 1.5" CLA-VAL PRV (SET TO 80 PSI), ONE 1.5" BERMAD 410-KX MASTER VALVE, ONE 1.5" FLOWMEC QS-220-15 FLOW SENSOR, ONE QUICK COUPLING VALVE AND EXTEND CL200RT PVC MAINLINE AS SHOWN. SET PRV AT 80 PSI. EXTEND PAIGE PT1171DA CABLE FROM THE FLOW SENSOR AND 4 #14 UFUL WIRES (TWO BLUE AND TWO GREEN) FROM MASTER VALVE SOLENOID TO CONTROLLER "A". CONNECT WIRES TO THE APPROPRIATE SENSOR INPUT PORTS. ALL WORK SHALL CONFORM TO LOCAL CODES. ALL FEES AND PERMITS ASSOCIATED WITH WORK ARE TO BE OBTAINED AND PAID FOR BY CONTRACTOR. FINAL POINT OF CONNECTION LOCATION SHALL BE REVIEWED AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.



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DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I

100% DESIGN

IRRIGATION PLANS IR-2

ICON PROJECT No.

DATE 07-16-2024

SHEET OF

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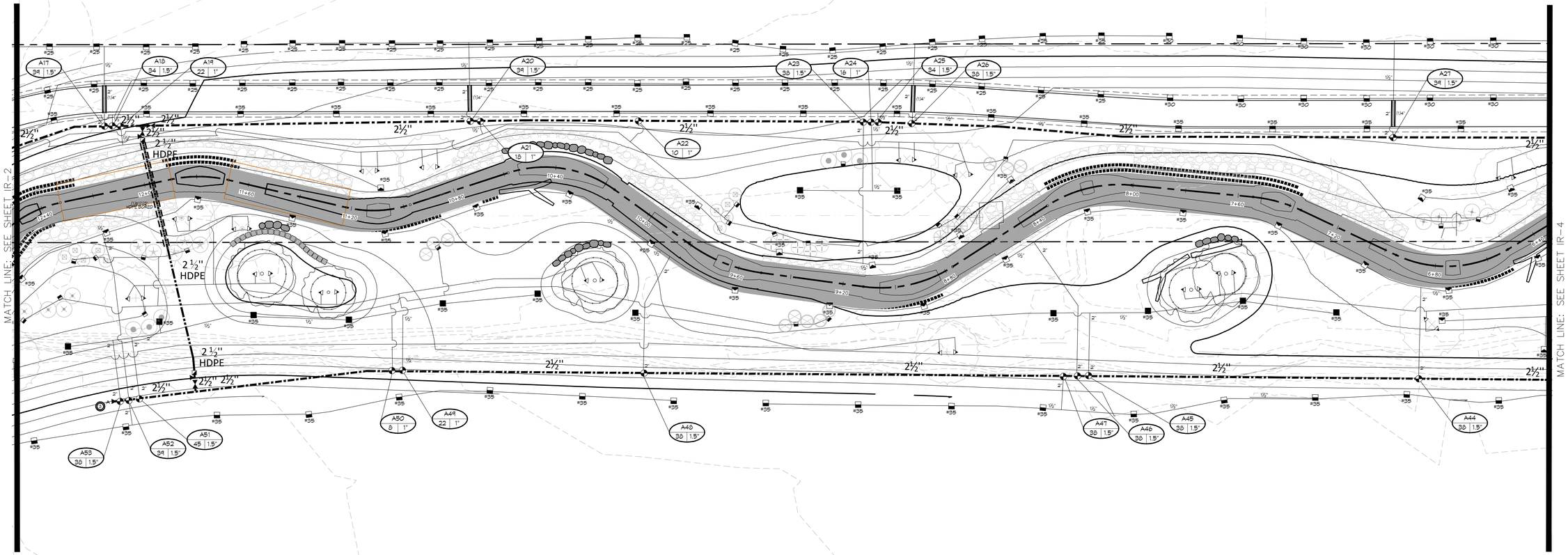

DIRECTORY

IRRIGATION SCHEDULE	IR-1
IRRIGATION NOTES	IR-1
IRRIGATION PLANS	IR-2 - IR-4

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PREPARED BY: DHM DESIGN

PLAN
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DESIGNED EG
CHECKED MW

NISSEN RESERVOIR DRAINAGEWAY - PHASE I
100% DESIGN
IRRIGATION PLANS
IR-3
ICON PROJECT No.

DATE 07-16-2024
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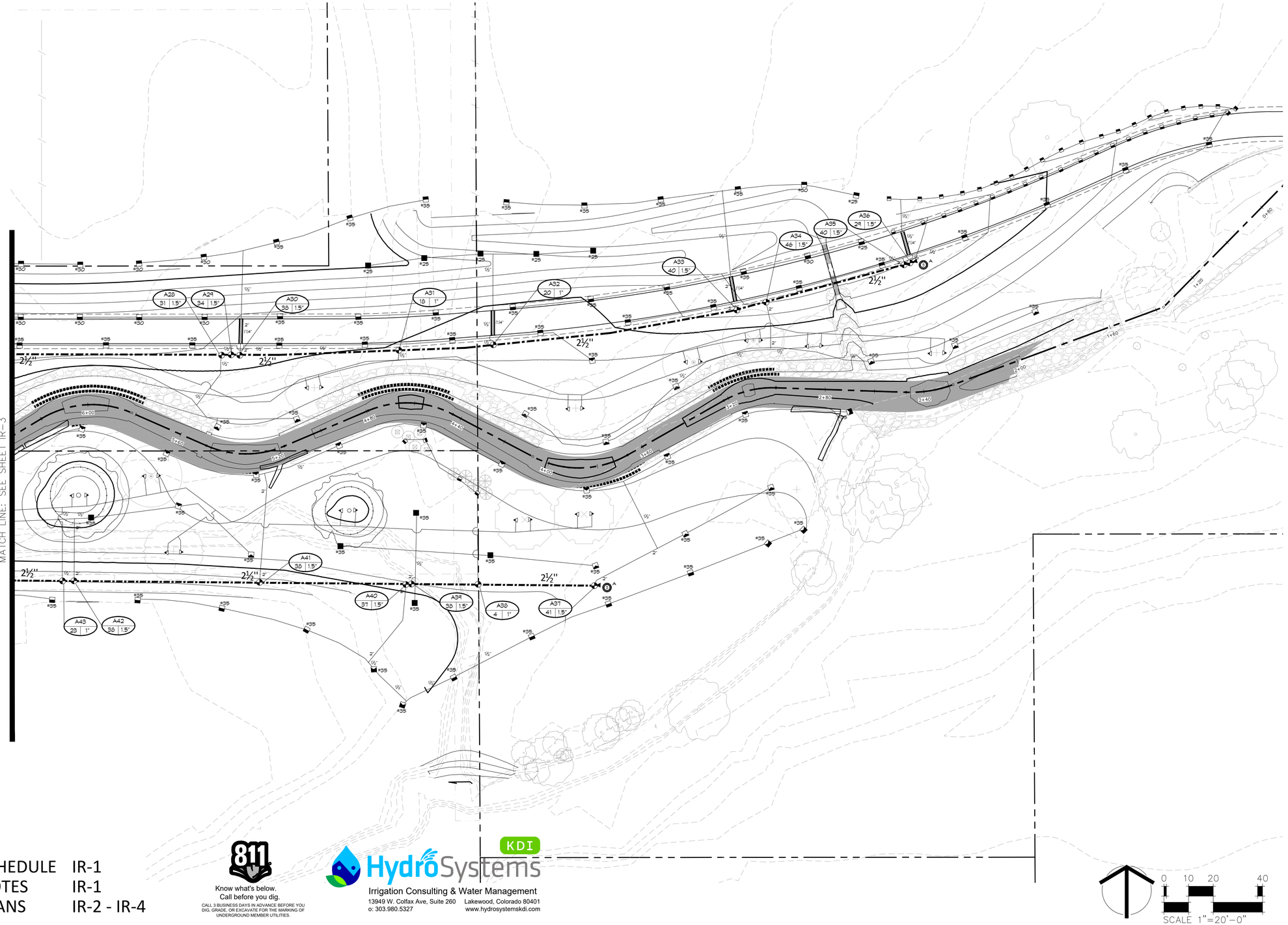

DIRECTORY

IRRIGATION SCHEDULE	IR-1
IRRIGATION NOTES	IR-1
IRRIGATION PLANS	IR-2 - IR-4

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0 10 20 40
SCALE 1"=20'-0"

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PLAN
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NISSEN RESERVOIR DRAINAGEWAY - PHASE I

100% DESIGN

IRRIGATION PLANS IR-4

ICON PROJECT No.

DATE 07-16-2024

SHEET

I:\7900-7999 Jobs\7903-Nissen Channel\DHM-Ecological Phase1 - Standard\Irrigation - Revised Ecological-rev3.dwg Kend Page Setup-22x34 PDF - 8pen39screen-15-HSKDI.ctb 7/23/2024 1:54 PM

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH (IN ORDER OF PRECEDENCE): CITY AND COUNTY OF BROOMFIELD SPECIFICATIONS, MILE HIGH FLOOD DISTRICT PROJECT-SPECIFIC SPECIFICATIONS, AND THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

ALL CAST-IN-PLACE CONCRETE SHALL BE CDOT CLASS D UNLESS NOTED OTHERWISE.

ALL REINFORCING SHALL BE TIED AND CAST-IN UNLESS NOTED OTHERWISE OR APPROVED BY ENGINEER. DRILLED AND EPOXIED REINFORCING BARS, WHEN APPROVED, SHALL BE EMBEDDED A MINIMUM OF 6 INCHES OR AS SPECIFIED BY THE EPOXY MANUFACTURER.

ALL LONGITUDINAL AND TRANSVERSE DIMENSIONS ARE MEASURED HORIZONTALLY AND INCLUDE NO CORRECTION FOR GRADE.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS.

SPLICE LENGTH FOR CLASS D CONCRETE								
EPOXY BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
Ld (HORIZONTAL)	2'-4"	2'-11"	4'-4"	5'-1"	5'-9"	7'-2"	8'-10"	10'-8"
Ld (VERTICAL)	1'-10"	2'-3"	3'-4"	3'-11"	4'-5"	5'-6"	6'-10"	8'-2"

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURES DURING CONSTRUCTION.

E.F.	=	EACH FACE	O.F.	=	OUTSIDE FACE
E.W.	=	EACH WAY	T.&B.	=	TOP AND BOTTOM
NS	=	NEAR SIDE	T.F.	=	TOP FACE
FS	=	FAR SIDE	B.F.	=	BOTTOM FACE
BF	=	BACK FACE	ELEV	=	ELEVATION
FF	=	FRONT FACE	I.F.	=	INSIDE FACE

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH CDOT STANDARD M-206-2.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.

ALL EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW THE GROUND LINE

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

STRUCTURE DRAWING INDEX

STRUCTURE DESCRIPTION

THREE-CELL CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT CARRYING PERRY STREET.

18'-0" INTERIOR WIDTH FOR EACH CELL
5'-3" INTERIOR HEIGHT FOR TWO EXTERIOR CELLS
5'-9" INTERIOR HEIGHT FOR ONE INTERIOR CELL

60'-0" STRUCTURE LENGTH

CARRYING PERRY STREET OVER NISSEN CHANNEL

DESIGN DATA

AASHTO LRFD, 9th EDITION 2020

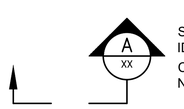
DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN.

REINFORCED CONCRETE:
- CLASS D CONCRETE: f'c = 4,500 psi
- REINFORCING STEEL: f'y = 60,000 psi

LOADING:
- LIVE LOAD: HL-93 DESIGN VEHICLE; HL-93 LANE LOAD; NRL; CDOT MOD. TANDEM; CDOT PERMIT VEHICLE
- LIVE LOAD SURCHARGE: PER AASHTO
- PEDESTRIAN RAIL: 50 P.L.F. PLUS 200 LBS (CONCURRENT)
- TOP SLAB FILL RANGE: 0'-6" MIN, 2'-0" MAX

SOILS PROPERTIES:
- STRUCTURE BACKFILL (CLASS 1):
  - UNIT WEIGHT: 125 PCF
  - AT-REST EQUIVALENT FLUID PRESSURE: 35 PCF
  - ACTIVE EQUIVALENT FLUID PRESSURE: 55 PCF
- NATIVE/ONSITE:
  - UNIT WEIGHT: 125 PCF
  - AT-REST EQUIVALENT FLUID PRESSURE: 52 PCF
  - ACTIVE EQUIVALENT FLUID PRESSURE: 74 PCF
  - PASSIVE SOIL RESISTANCE: 250 PCF
  - SLIDING FRICTION FACTOR: 0.3
- ALLOWABLE BEARING PRESSURE: 2,000 PSF (WITH MODIFIED SUBGRADE)

REFER TO GEOTECHNICAL REPORT NO 17-3679 BY GROUND ENGINEERING DATED FEBRUARY 8, 2018 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.



SECTION OR DETAIL IDENTIFICATION
CROSS-REFERENCE SHEET NUMBER (-- = SAME SHEET)

No.	DATE	REVISIONS	APPR.

811 Know what's below. Call before you dig.

PREPARED FOR: The City and County of Broomfield; MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: San Engineering LLC, Civil and Structural Engineering

PLAN
DRAWN MDP
DESIGNED BRD
CHECKED JJM

NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
STRUCTURAL GENERAL NOTES & DRAWING INDEX

ICON PROJECT No. 17-029-NRD

DATE JULY 2024

SHEET S01 OF 08

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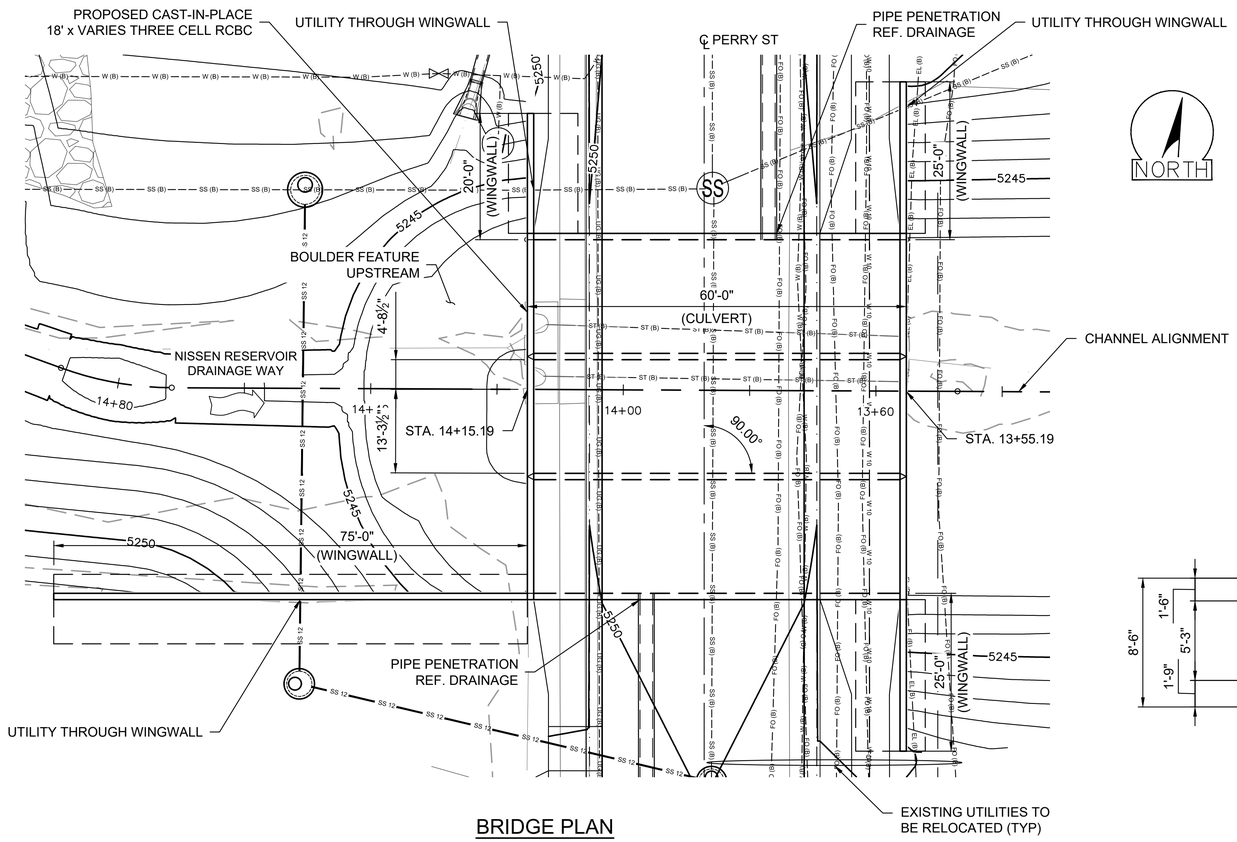
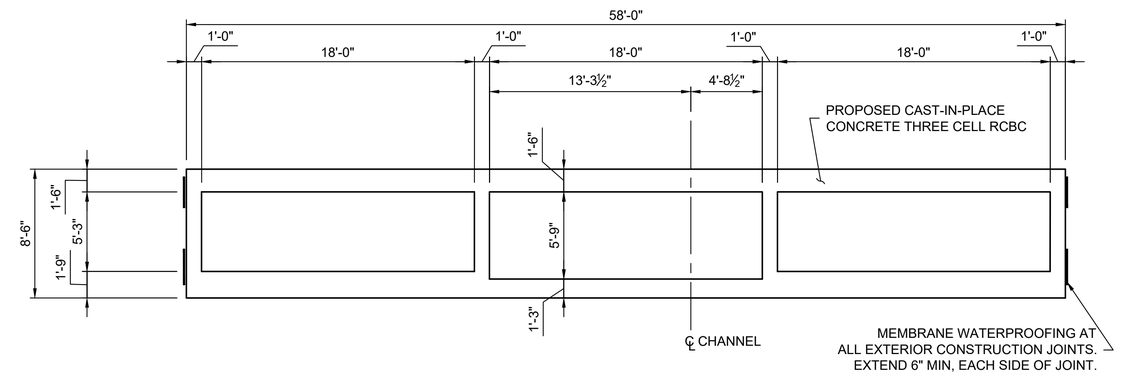
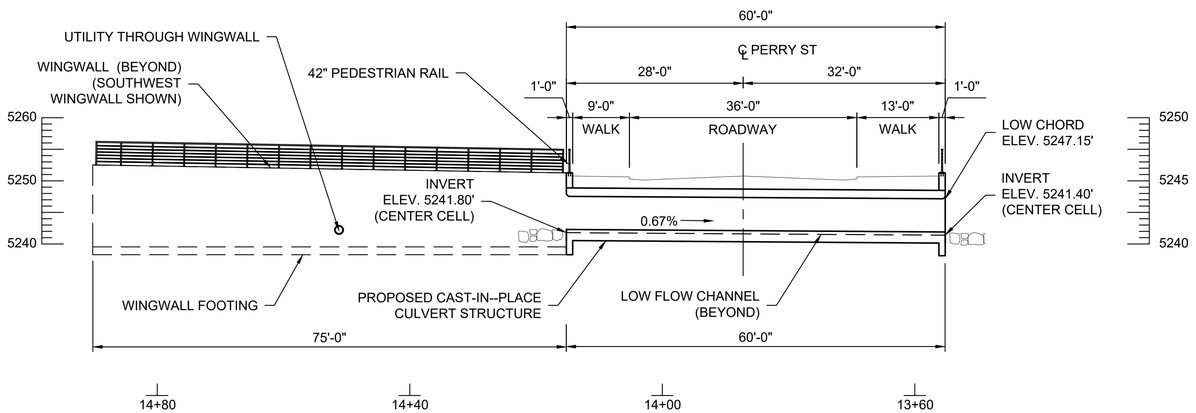


BRIDGE PLAN



BRIDGE TYPICAL SECTION



BRIDGE LONGITUDINAL SECTION

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NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
STRUCTURE GENERAL LAYOUT

ICON PROJECT No. 17-029-NRD

DATE JULY 2024

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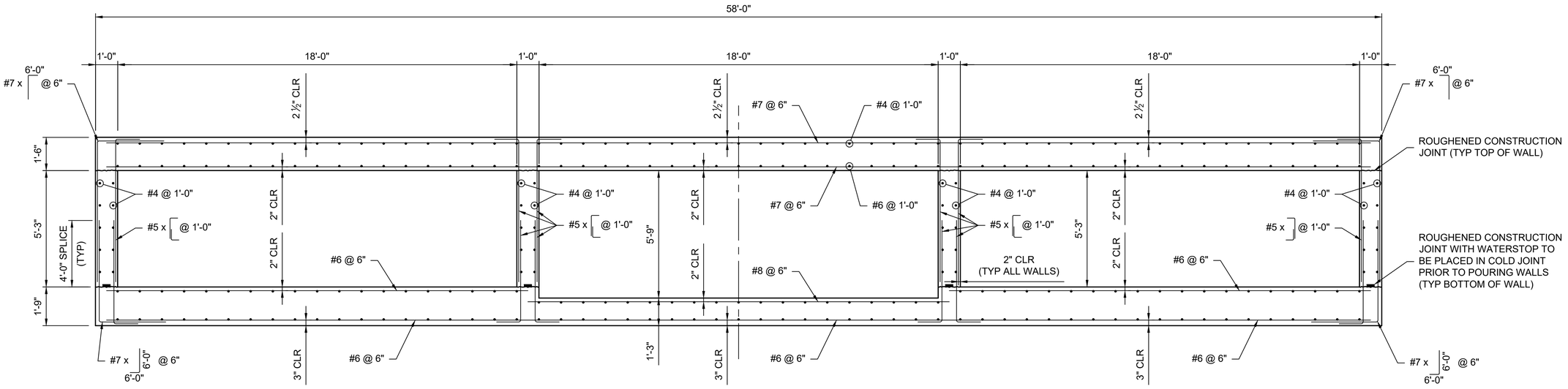

TYPICAL REINFORCING SECTION

07/23/2024

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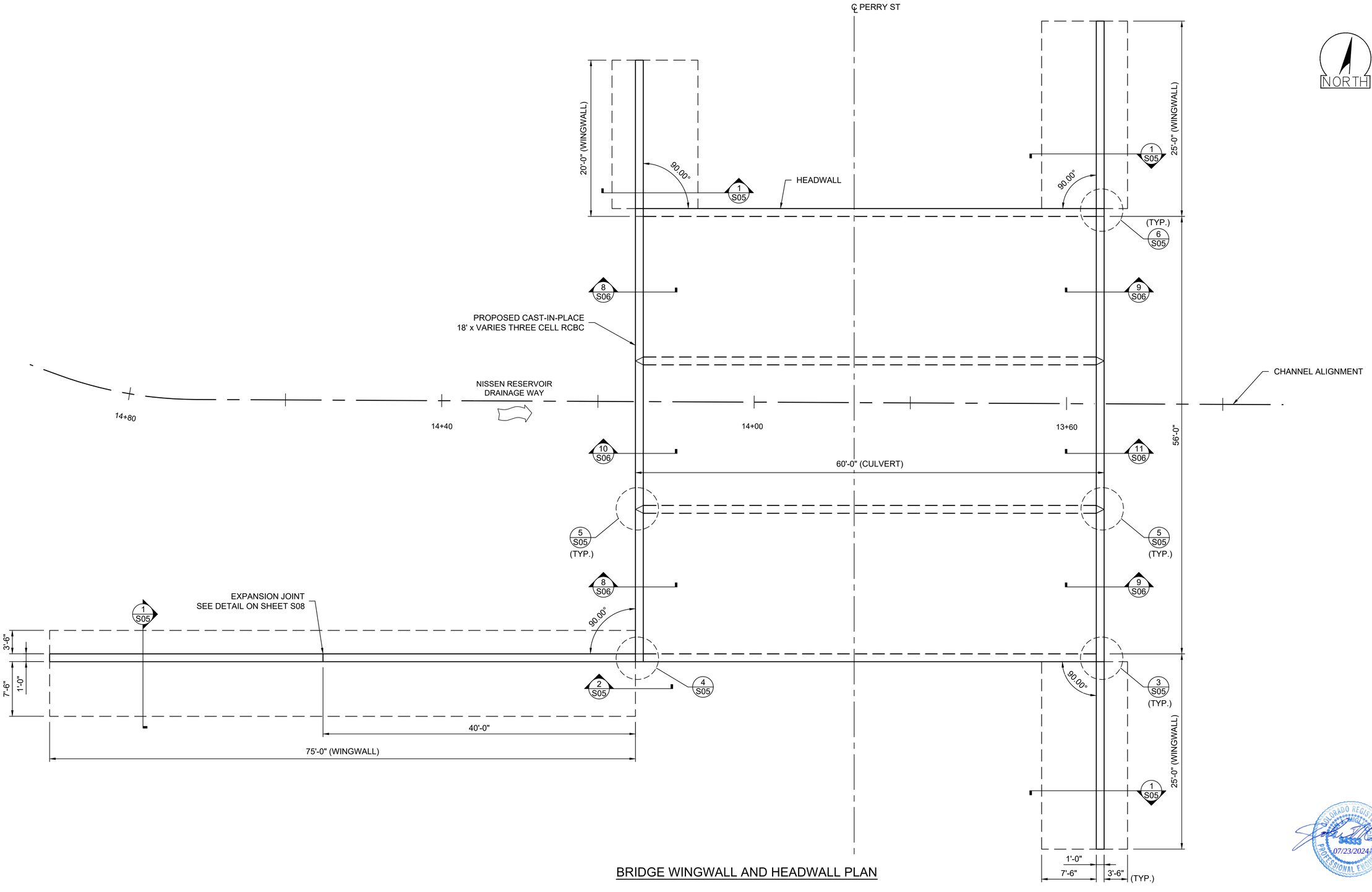
NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
CULVERT REINFORCING SECTION
ICON PROJECT No. 17-029-NRD

DATE JULY 2024

SHEET S03 OF 08



BRIDGE WINGWALL AND HEADWALL PLAN

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07/23/2024

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NISSEN RESERVOIR DRAINAGEWAY

PERRY STREET CULVERT

HEADWALL AND WINGWALL PLAN

ICON PROJECT No. 17-029-NRD

DATE JULY 2024

SHEET S04 OF 08

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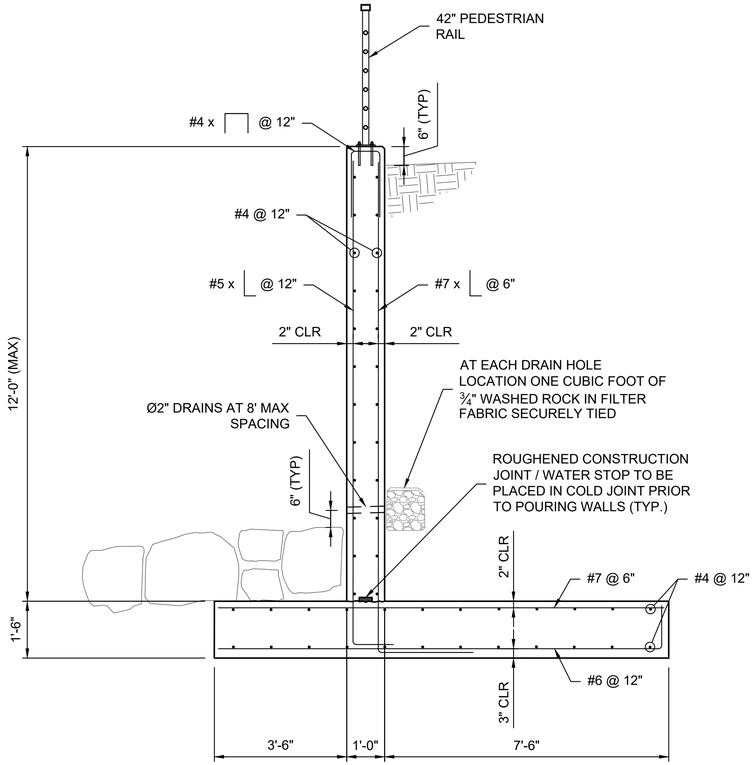
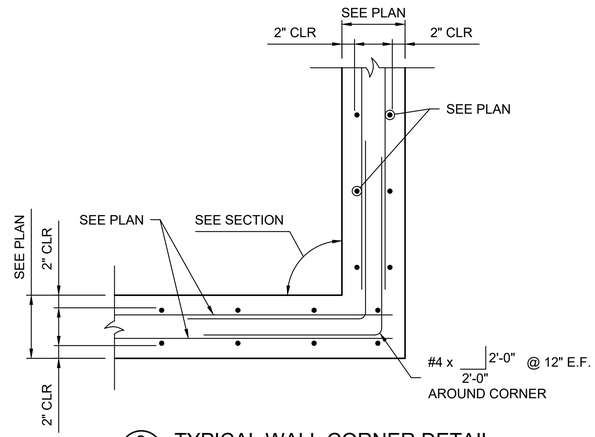
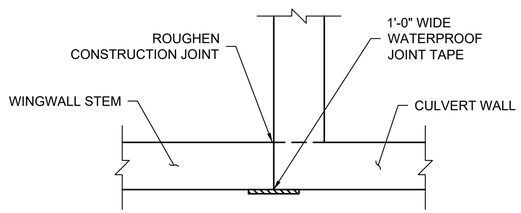


1 S04 TYPICAL WINGWALL SECTION
SCALE: 1" = 4'-0"

2 S04 NOT USED
SCALE: N/A

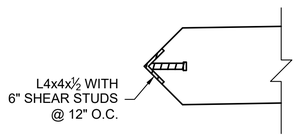


3 S04 TYPICAL WALL CORNER DETAIL



4 S04 WALL CONSTRUCTION JOINT

NOTE:
ALL PROPOSED CONSTRUCTION JOINTS NOT DETAILED IN THESE PLANS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.



5 S04 INTERIOR WALL NOSE ARMOR
SCALE: 1" = 4'-0"

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07/23/2024

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NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
WINGWALL DETAILS AND SECTION

ICON PROJECT No. 17-029-NRD

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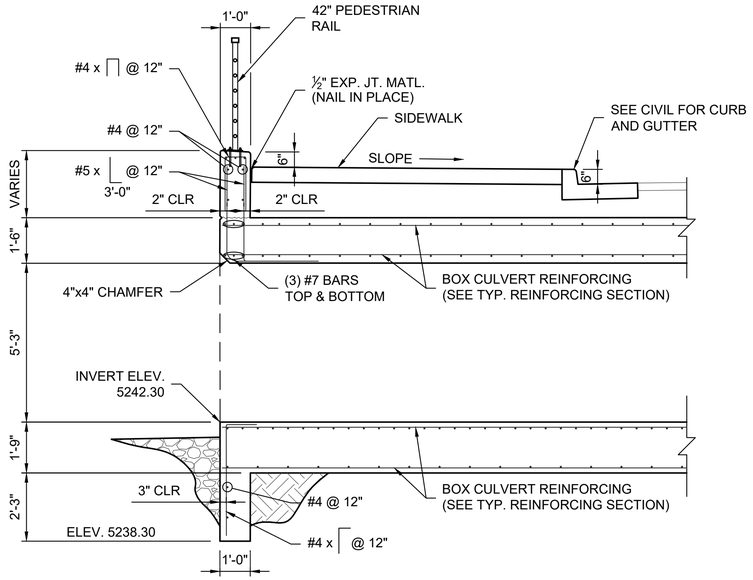
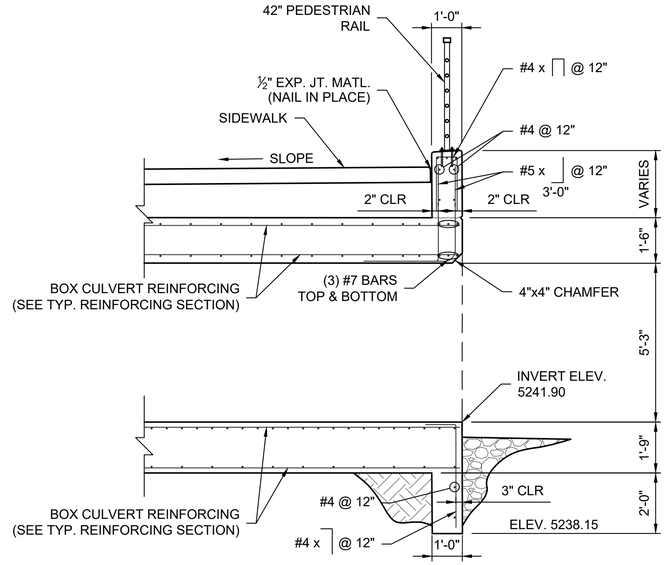
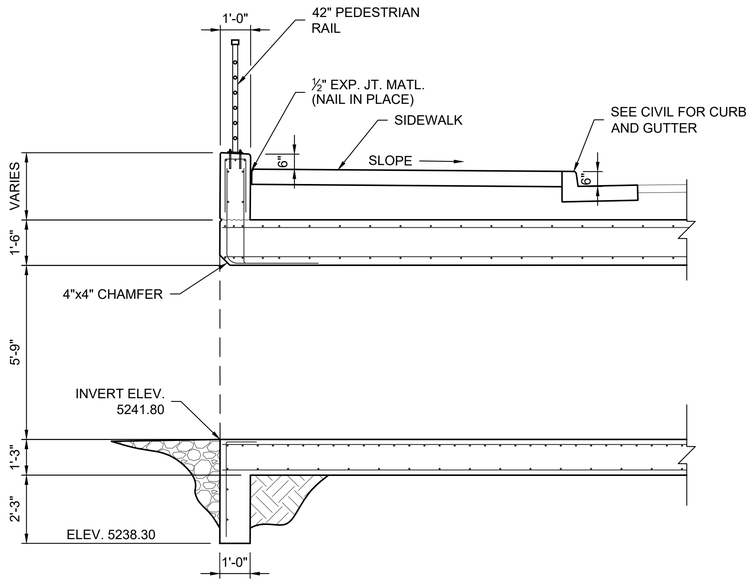


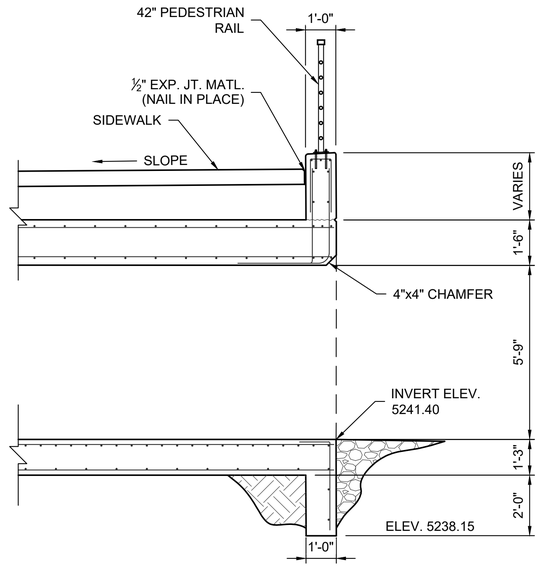
8/S04 UPSTREAM HEADWALL/TOEWALL SECTION
SCALE: 1" = 5'-0"



9/S04 DOWNSTREAM HEADWALL/TOEWALL SECTION
SCALE: 1" = 5'-0"



10/S04 UPSTREAM HEADWALL/TOEWALL SECTION
SCALE: 1" = 5'-0"



11/S04 DOWNSTREAM HEADWALL/TOEWALL SECTION
SCALE: 1" = 5'-0"

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NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
STRUCTURE HEADWALL/TOEWALL SECTIONS

ICON PROJECT No. 17-029-NRD

DATE JULY 2024

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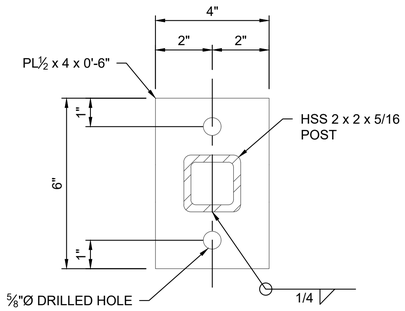
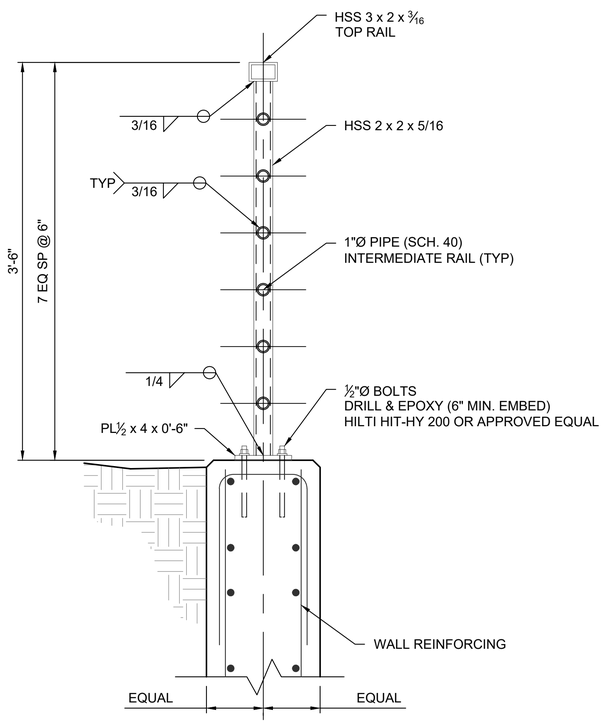


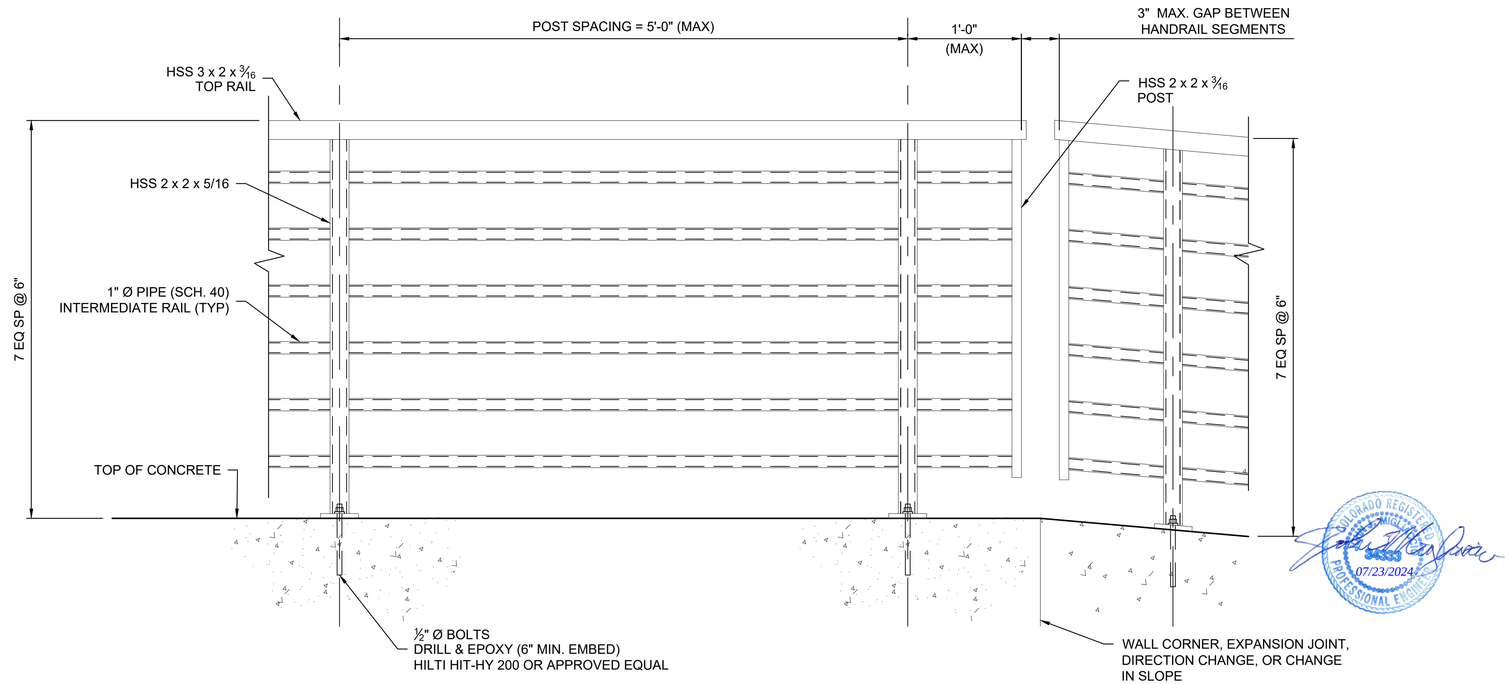
BASE PLATE DETAIL

HANDRAIL NOTES

1. ALL TUBES AND HSS SHALL BE ASTM A-500 GRADE B.
2. ALL POSTS AND BASE PLATES SHALL BE ASTM A-572 GRADE 50.
3. ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.
4. THE ABOVE MATERIAL AND ALL MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIPPED GALVANIZED AND DUPLEX-COATED BLACK WITH AN EXTERIOR COATING SYSTEM COMPATIBLE WITH GALVANIZED MATERIAL. A SAMPLE SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO FABRICATION.
5. CAST-IN ANCHOR BOLTS, IF UTILIZED, SHALL BE HOT-DIPPED GALVANIZED.
6. POST-INSTALLED ANCHORS, SHALL BE AN APPROVED PRODUCT, INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. POST-INSTALLED ANCHORS SHALL BE STAINLESS STEEL.
7. TUBES AND OTHER HORIZONTAL MEMBERS SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL AND VERTICAL CURVES.
8. VERTICAL SLOPES AND GRADES OF WALLS AND GROUND NOT SHOWN FOR SIMPLICITY. GUARDRAIL SHALL BE FABRICATED TO ACCOMODATE THE HORIZONTAL AND VERTICAL SLOPE OF THE WALL. POSTS SHALL BE VERTICALLY PLUMB.
9. HANDRAILS INSTALLED IN SEGMENTS SHALL BE PROVIDED WITH SPLICE JOINTS GROUND SMOOTH, OR ARRANGED SUCH THAT THE GAPS BETWEEN HANDRAIL SEGMENTS ARE A MAXIMUM OF 3 INCHES. JOINT AND GAP DETAILS SHALL BE CLEARLY SHOWN ON SHOP DRAWINGS.
10. ALL WELDS SHALL BE GROUND SMOOTH.
11. PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. SHOP DRAWINGS SHALL INCLUDE LAYOUT AND GEOMETRY OF THE RAILS AND AND GATES, AND SHALL INDICATE ALL MEMBER SIZES, CONNECTIONS, AND MATERIALS.



HANDRAIL SECTION



HANDRAIL ELEVATION

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07/23/2024

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NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
HANDRAIL DETAILS

ICON PROJECT No. 17-029-NRD

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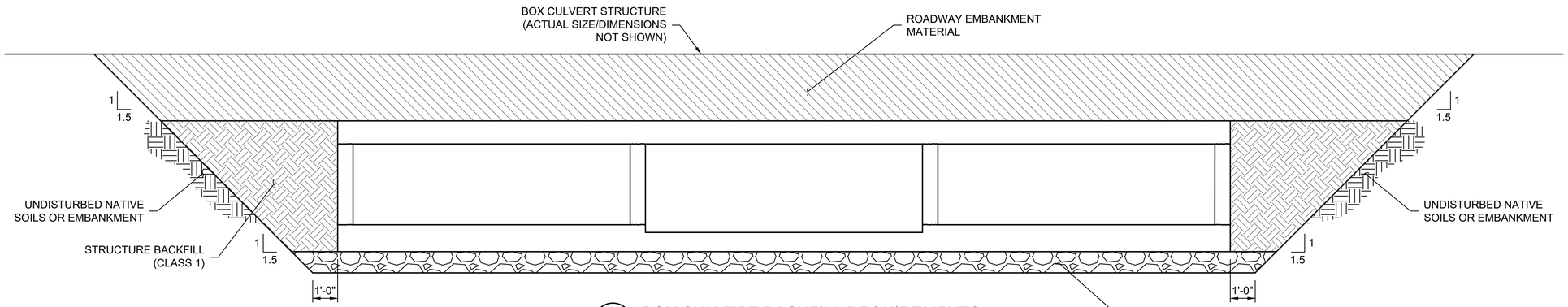
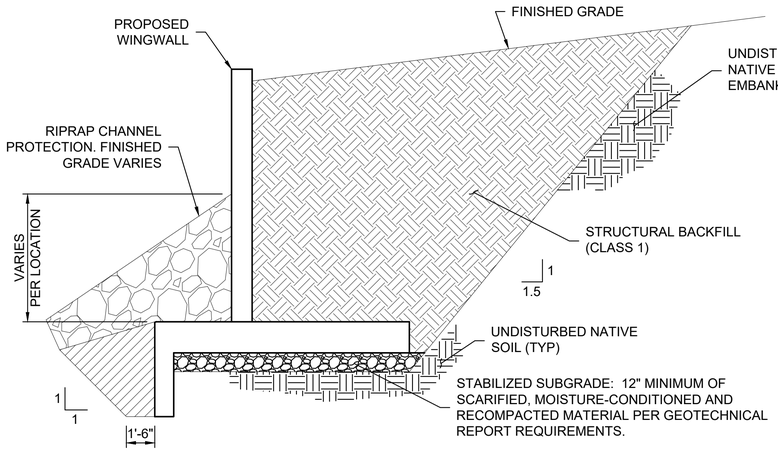
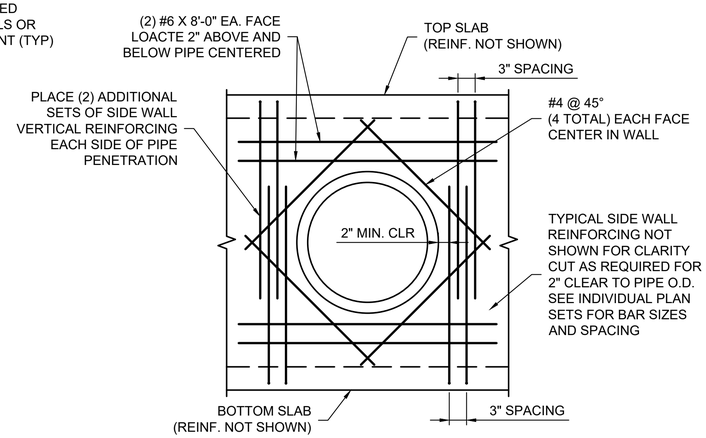


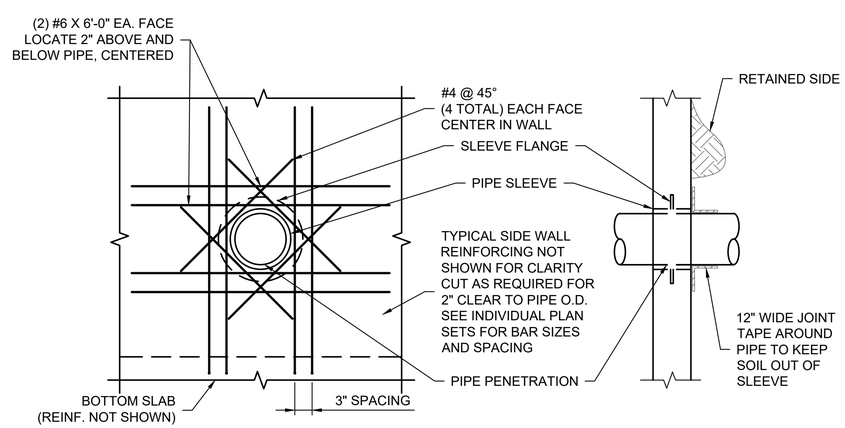
12 - BOX CULVERT BACKFILL REQUIREMENTS



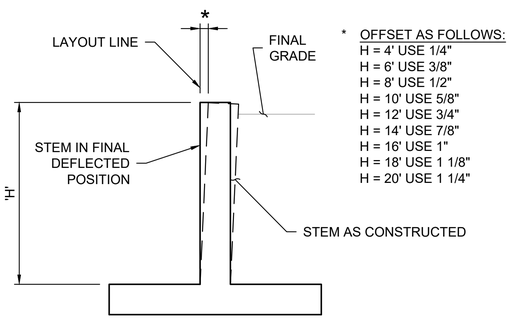
13 - WINGWALL BACKFILL REQUIREMENTS



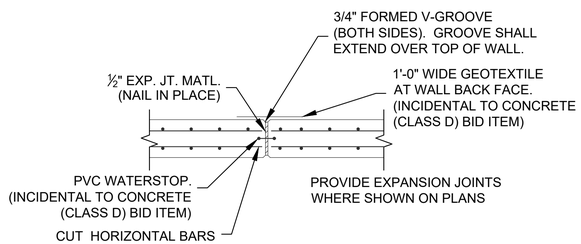
14 - PIPE PENETRATION IN CULVERT



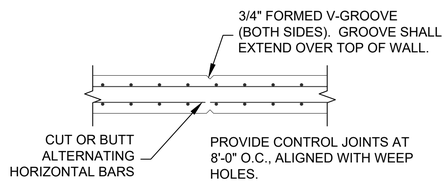
15 - PIPE PENETRATION W/ SLEEVE IN WINGWALL



16 - WALL BATTER DETAIL



EXPANSION JOINT DETAIL



CONTROL JOINT DETAIL

NOTE:
PROVIDE CONTROL JOINTS IN ALL
HEADWALLS AND WINGWALLS.

COLORADO REGISTERED PROFESSIONAL ENGINEER
07/23/2024

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PREPARED BY: San Engineering LLC Civil and Structural Engineering

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NISSEN RESERVOIR DRAINAGEWAY
PERRY STREET CULVERT
MISCELLANIES DETAILS

ICON PROJECT No. 17-029-NRD

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NISSEN RESERVIOR DRAINAGEWAY PHASE 1
EXISTING UTILITY PLAN
W 120TH AVE AND LOWELL BLVD

VICINITY MAP

SCALE: N.T.S.

N

SHEET INDEX	
1	COVER PAGE
2	LEGEND
3 - 5	UTILITY PLAN
6	EXISTING UTILITY QUALITY LEVEL DEFINITIONS

NOTE:
CAUTION: LOCATION OF EXISTING UTILITIES IS SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AS SUPPLIED BY THE UTILITY PROVIDERS INCLUDING TYPE, SIZE, LOCATION, AND NUMBER OF UTILITIES. PRIOR TO DATE OF CONSTRUCTION CONTRACTOR SHALL VERIFY EXISTING UTILITIES WITH 811 AND/OR UTILITY COMPANIES. FOR ADDITIONAL INFORMATION CONTACT: UNCC 1-800-922-1987. THE CONTRACTOR SHALL VERIFY EXISTENCE, SIZE, AND LOCATION OF EXISTING UTILITIES AND FACILITIES PRIOR TO CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

- UTILITY INVESTIGATIONS WERE CONDUCTED IN A MANNER THAT CONFORM TO COLORADO SB 18-167 AND THE ASCE 38.02 STANDARD.
- NOTE THAT ALL LINE WORK SHOWN IS QL B WITH SANITARY SEWER AND STORM SHOWN AS QL C UNLESS OTHERWISE DESIGNATED.

CITY & COUNTY OF BROOMFIELD APPROVALS

ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

ACCEPTED BY: [signature] 6/26/2024
CITY ENGINEER (OR DESIGNEE) DATE

LANDMARK
CIVIL, STRUCTURAL, PLANNING, SURVEYING, GEOTECHNICAL, AND SUE SERVICES
5803 LOCKHEED AVENUE,
LOVELAND COLORADO 80538
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Client: ICON ENGINEERING

ISSUE / DATE

Project Information:
NISSEN RESERVOIR DRAINAGEWAY PHASE 1
EXISTING UTILITY PLAN
W 120TH AVE AND LOWELL BLVD
BROOMFIELD, CO

Date: 2/16/2023
Job No.:
Drawn By:

SHEET TITLE: COVER SHEET

SHEET #: 1

LEGEND:

- BORE — BORE — PROPOSED BORE PATH
- TRENCH — TRENCH — PROPOSED TRENCH
- ROW — ROW — RIGHT OF WAY
- G — G — NATURAL GAS LINE, (QUALITY LEVEL B)
- G — G — NATURAL GAS LINE, (QUALITY LEVEL C OR D)
- P — P — PETROLEUM PIPELINE (QUALITY LEVEL B)
- P — P — PETROLEUM PIPELINE (QUALITY LEVEL C OR D)
- UE — UE — UNDERGROUND ELECTRIC LINE (QUALITY LEVEL B)
- UE — UE — UNDERGROUND ELECTRIC LINE (QUALITY LEVEL C OR D)
- OE — OE — OVERHEAD ELECTRIC LINE (QUALITY LEVEL B)
- T — T — TELEPHONE LINE (QUALITY LEVEL B)
- T — T — TELEPHONE LINE (QUALITY LEVEL C OR D)
- TF — TF — TELEPHONE FIBER LINE (QUALITY LEVEL B)
- TF — TF — TELEPHONE FIBER LINE (QUALITY LEVEL C OR D)
- TD — TD — TELEPHONE DUCT (QUALITY LEVEL B)
- TD — TD — TELEPHONE DUCT (QUALITY LEVEL C OR D)
- CF — CF — CABLE TV FIBER LINE (QUALITY LEVEL B)
- CF — CF — CABLE TV FIBER LINE (QUALITY LEVEL C OR D)
- TV — TV — CABLE TV LINE (QUALITY LEVEL B)
- TV — TV — CABLE TV LINE (QUALITY LEVEL C OR D)
- FO — FO — FIBER OPTIC LINE (QUALITY LEVEL B)
- FO — FO — FIBER OPTIC LINE (QUALITY LEVEL C OR D)
- TR — TR — TRAFFIC ELECTRIC LINE (QUALITY LEVEL B)
- TR — TR — TRAFFIC ELECTRIC LINE (QUALITY LEVEL C OR D)
- W — W — WATER LINE (QUALITY LEVEL B)
- W — W — WATER LINE (QUALITY LEVEL C OR D)
- SS — SS — SANITARY SEWER LINE (QUALITY LEVEL B)
- SS — SS — SANITARY SEWER LINE (QUALITY LEVEL C OR D)
- ST — ST — STORM SEWER LINE (QUALITY LEVEL B)
- ST — ST — STORM SEWER LINE (QUALITY LEVEL C OR D)
- IR — IR — IRRIGATION LINE (QUALITY LEVEL B)
- IR — IR — IRRIGATION LINE (QUALITY LEVEL C OR D)
- MC — MC — MISCELLANEOUS CONDUIT (QUALITY LEVEL B)
- X — X — X — X — FENCE LINE (QUALITY LEVEL B)

- E — ELECTRIC MANHOLE
- V — ELECTRIC VAULT
- E — ELECTRIC PEDESTAL
- E — ELECTRIC HANDHOLE
- T — ELECTRIC TRANSFORMER
- SC — ELECTRIC SWITCH CABINET
- GAS VALVE
- R — RISER POLE
- STREET LIGHT
- UTILITY POLE
- T — TELEPHONE MANHOLE
- T — TELEPHONE HANDHOLE
- T — TELEPHONE PEDESTAL
- X — TELEPHONE CROSS-BOX
- C — CATV HANDHOLE
- C — CATV PEDESTAL

- F — FIBER OPTIC MANHOLE
- F — FIBER OPTIC HANDHOLE
- TR — TRAFFIC HANDHOLE
- TR — TRAFFIC PEDESTAL
- T — TRAFFIC LIGHT
- FIRE HYDRANT
- WATER VALVE
- WM — WATER METER
- WATER VENT
- W — WATER MANHOLE
- S — SANITARY SEWER MANHOLE
- ST — STORM SEWER MANHOLE
- STORM SEWER INLET
- BORE PIT
- END OF MAIN

ABBREVIATIONS:

EOP	EDGE OF PAVEMENT
F/L	FLOW LINE
BOC	BACK OF CURB
BOW	BACK OF WALK
S/L	STREET LIGHT
F/O	FIBER OPTIC
MW	MILL WRAP
AL	ALUMINUM
CU	COPPER
CLN	CENTURYLINK LOCAL NETWORK
H2O	WATER
MH	MANHOLE
SS	SANITARY SEWER
STM	STORM SEWER
TELE	TELEPHONE
EOM	END OF MAIN
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
RE:	REFER TO

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ALL WORK SHALL BE CONSTRUCTED TO CITY AND COUNTY OF BROOMFIELD STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS AND OTHER CITY AND COUNTY REQUIREMENTS. THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEARON

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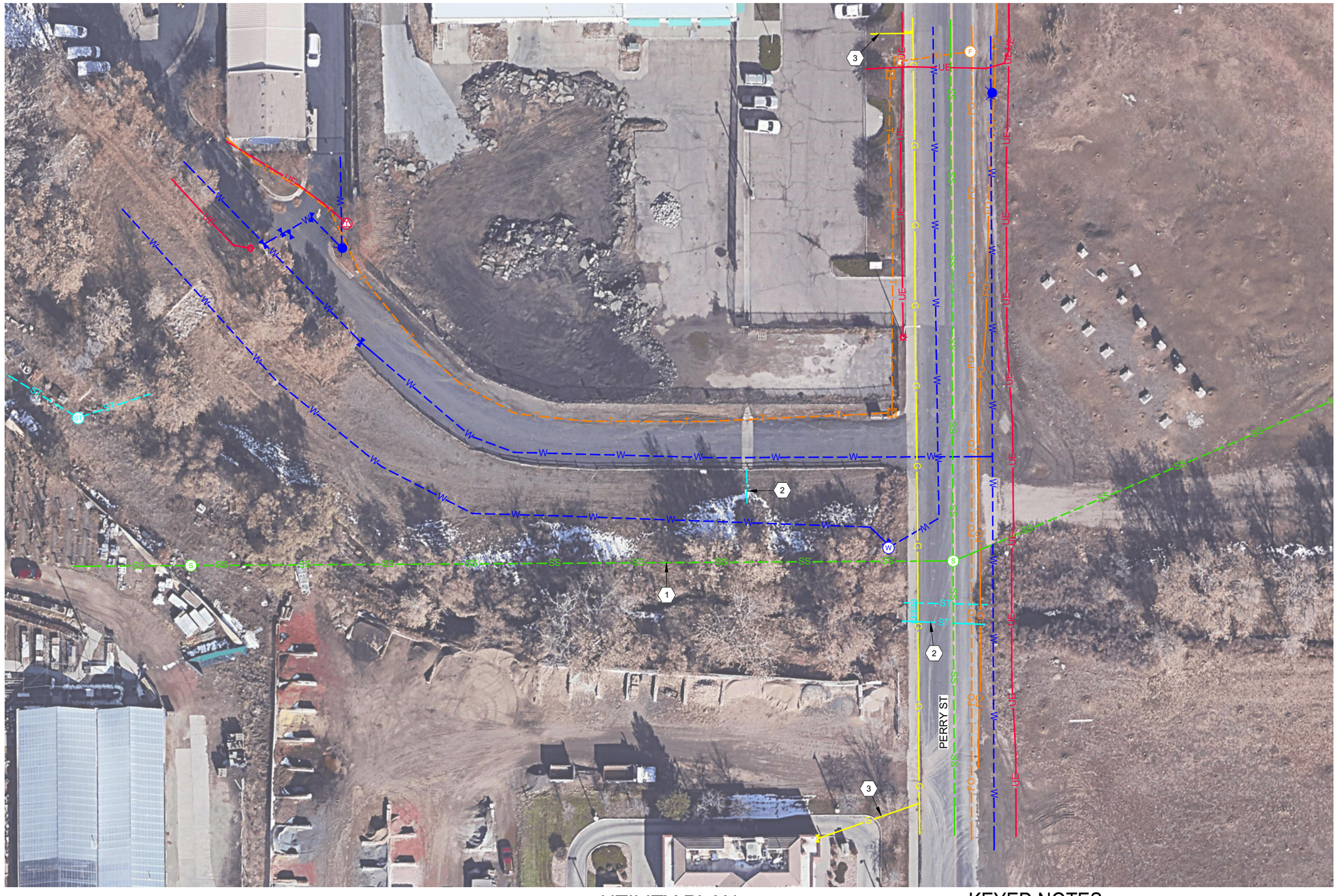
SHEET TITLE: LEGEND

SHEET #: 2



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UTILITY PLAN

50 0 50 100

SCALE: 1"= 50'

N

KEYED NOTES

1. 24" SANITARY SEWER
2. 24" STORM SEWER
3. 1" GAS SERVICE

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SHEET # 3

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UTILITY PLAN

50 0 50 100

SCALE: 1"= 50'

N

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SHEET #
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UTILITY PLAN

50 0 50 100

SCALE: 1"= 50'

KEYED NOTES

1. ZAYO / COMCAST FIBER OPTIC
2. ZAYO FIBER OPTIC

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ASCE-38 EXISTING UTILITY QUALITY LEVEL DEFINITIONS

Quality Level D ("QL D") information comes solely from existing utility records. It may provide an overall "feel" for the congestion of utilities, but it is often highly limited in terms of comprehensiveness and accuracy. Its usefulness may be limited to early design stage (project planning and route selection) activities or to projects with minimal planned excavations.

Quality Level C ("QL C") involves surveying visible above-ground utility facilities, such as manholes, valve boxes, posts, etc., and correlating this information with existing utility records (i.e., QL D data). When using this information, it is not unusual to find underground utilities that have been either omitted or erroneously plotted. QL C information may not, however, eliminate all inaccuracies; nor will it reveal an unrecorded line that has no surface features. Therefore, its usefulness may be limited to preliminary design reviews or to projects with minimal anticipated conflicts.

Quality Level B ("QL B") involves the use of surface geophysical techniques to determine the existence and horizontal position of underground utilities. This activity is called "designating". It further correlates utility records and surface topographical information, and may also help reveal unrecorded lines. Two-dimensional mapping information is obtained. This information may be sufficient to accomplish preliminary engineering goals, by helping the designer to determine where to place storm drainage systems, footers, foundations, and other design features in order to avoid conflicts with existing utilities. Slight adjustments in the design may produce substantial cost savings by eliminating utility relocations.

Quality Level A ("QL A ") involves the use of nondestructive digging equipment at discrete, critical points to determine the precise horizontal and vertical position of underground utilities, as well as the type, size, condition, material, and other characteristics. This activity is called "locating." It is the highest quality level presently available. This information, when combined with other surveyed and mapped information, allows the designer to infer plan and profile information, for use in making final design decisions. By knowing exactly where a utility is positioned in three dimensions, the designer can accurately determine the extent of a utility conflict, or can often make small adjustments in elevations or horizontal locations and avoid the need to relocate utilities. Additional information such as utility material, condition, size, soil contamination, and paving thickness also assists the designer and utility owner in their decisions. QL A information (in the form of test hole logs), when included in the project bid documents, may yield more favorable bids due to reduced contractor uncertainty about subsurface conditions.

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SHEET #
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