

DENVER WATER

DENVER, COLORADO

MOFFAT TUNNEL COLLECTION SYSTEM

VASQUEZ TUNNEL ACCESS ROAD CULVERTS

BOARD OF WATER COMMISSIONERS
DENVER, COLORADO

Paula Herzmark – President

James S. Lochhead – CEO/Manager

Robert J. Mahoney – Chief Engineering Officer



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denverwater.org

CONSULTANT

MOFFAT TUNNEL
COLLECTION
SYSTEM

VASQUEZ TUNNEL
ACCESS ROAD CULVERTS

REFERENCE:
CAPITAL PROJECTS CONSTRUCTION
STANDARDS 3rd Edition

THIS DRAWING IS BASED ON THE
DW_FRASER_GRID COORDINATE SYSTEM

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DRAWN BY: IVERY

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CHKD BY: M TURNEY/

APPD BY:

DATE: SEPTEMBER 2018

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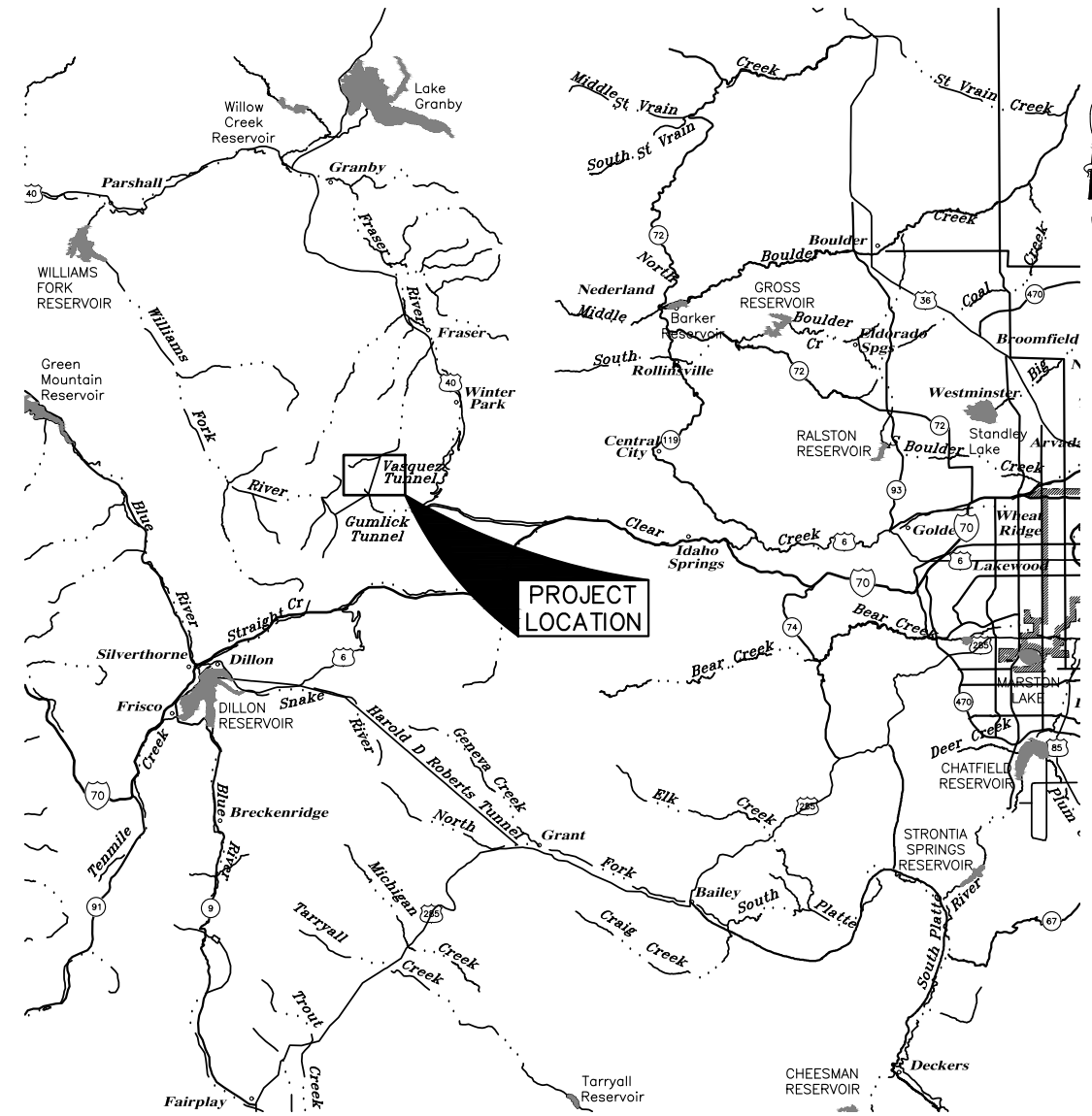
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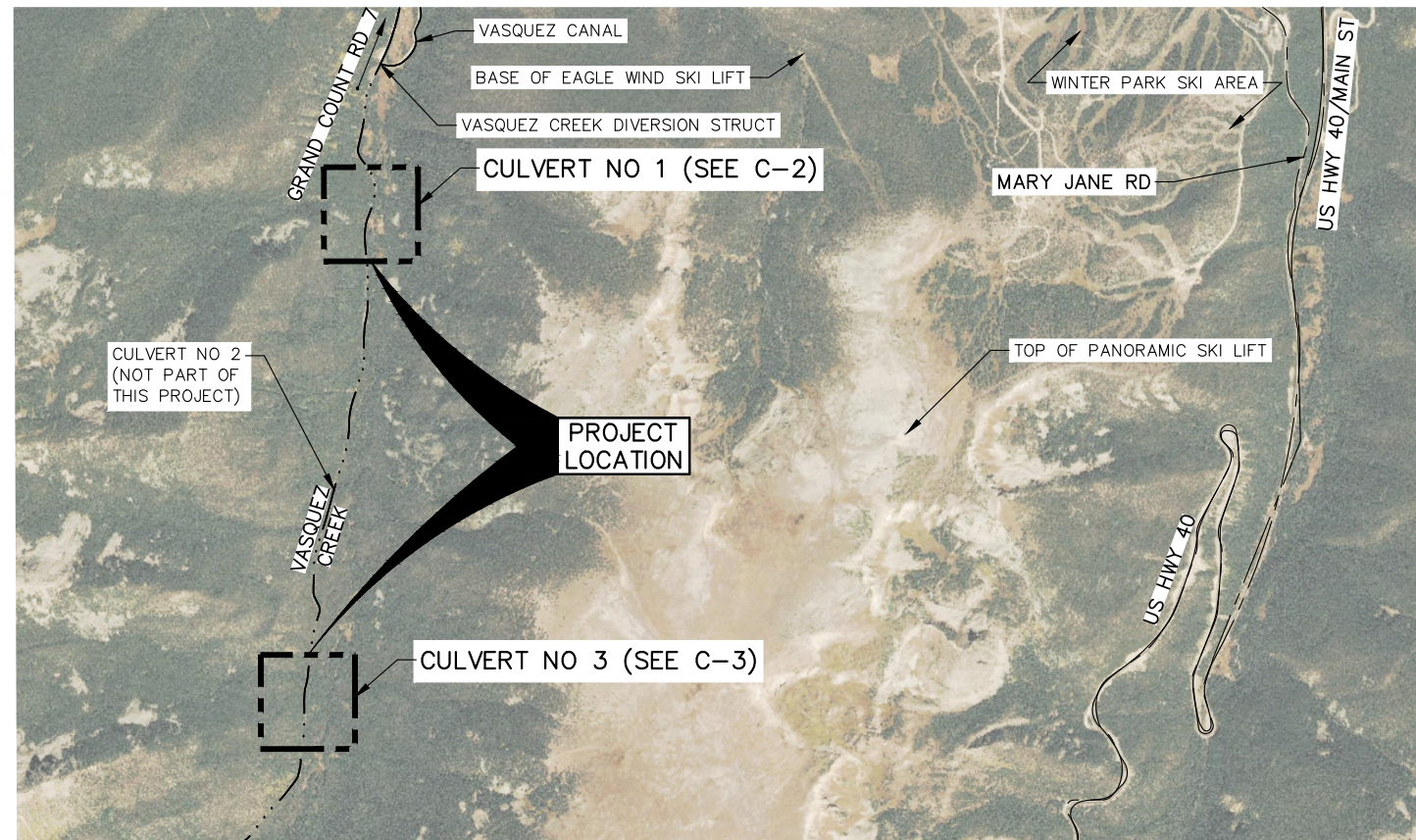
DRAWING TITLE

COVER SHEET

G-1



LOCATION MAP
SCALE: 1" = 6 Miles



VICINITY MAP
SCALE: 1" = 2000'

DRAWING INDEX

DWG NO	DWG TITLE
G-1	COVER SHEET
G-2	SURVEY CONTROL DIAGRAM
C-1	CULVERT NOS 1 & 3 DEMOLITION & TEMPORARY FLOW MANAGEMENT
C-2	CULVERT NO 1 PLAN
C-3	CULVERT NO 1 PROFILES
C-4	CULVERT NO 3 PLAN
C-5	CULVERT NO 3 PROFILES
C-6	SECTION & DETAIL

PROJECT DIRECTORY

OWNER:
DENVER WATER
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DENVER, CO 80204
303-628-6000

CONTACT:
DESIGN PROJECT MANAGER
JON FISCHER, PE
303-628-6678
jon.fischer@denverwater.org

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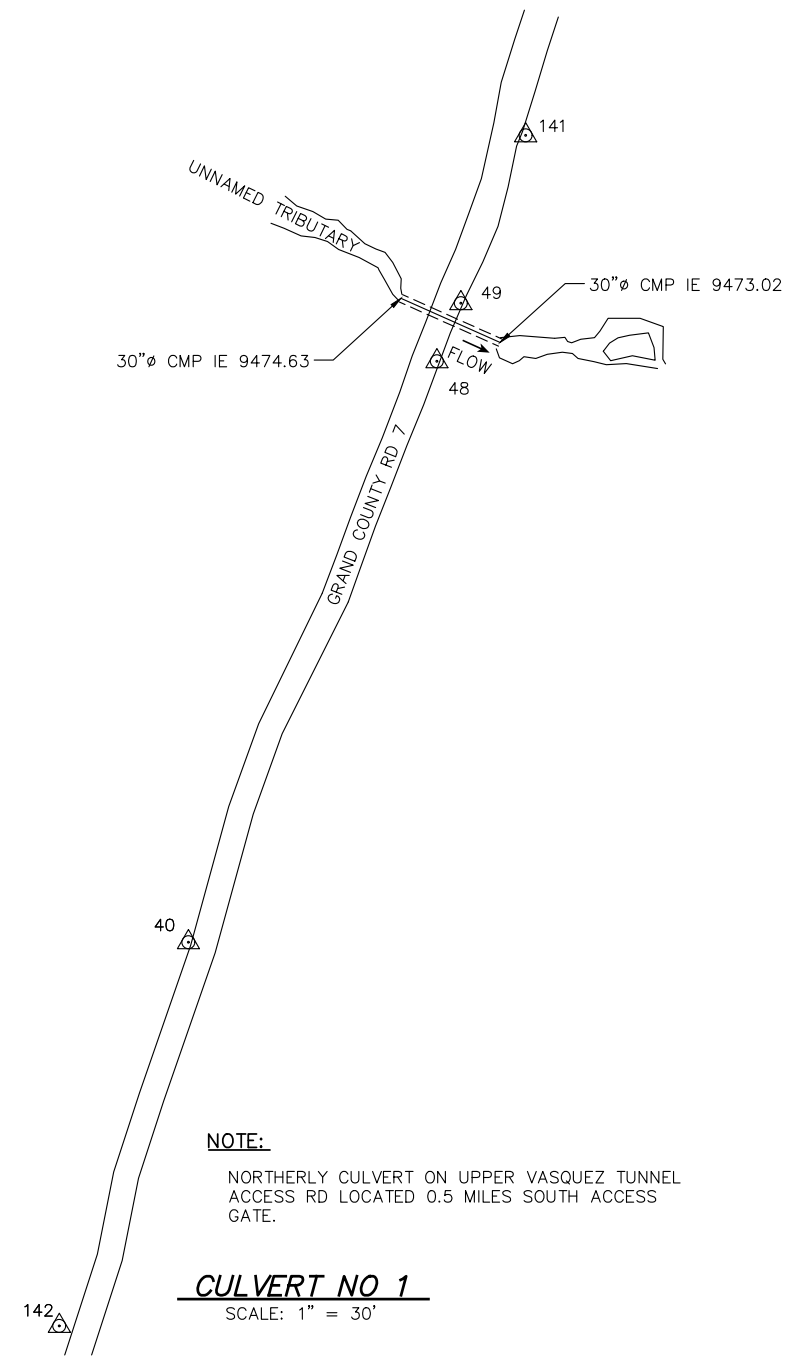
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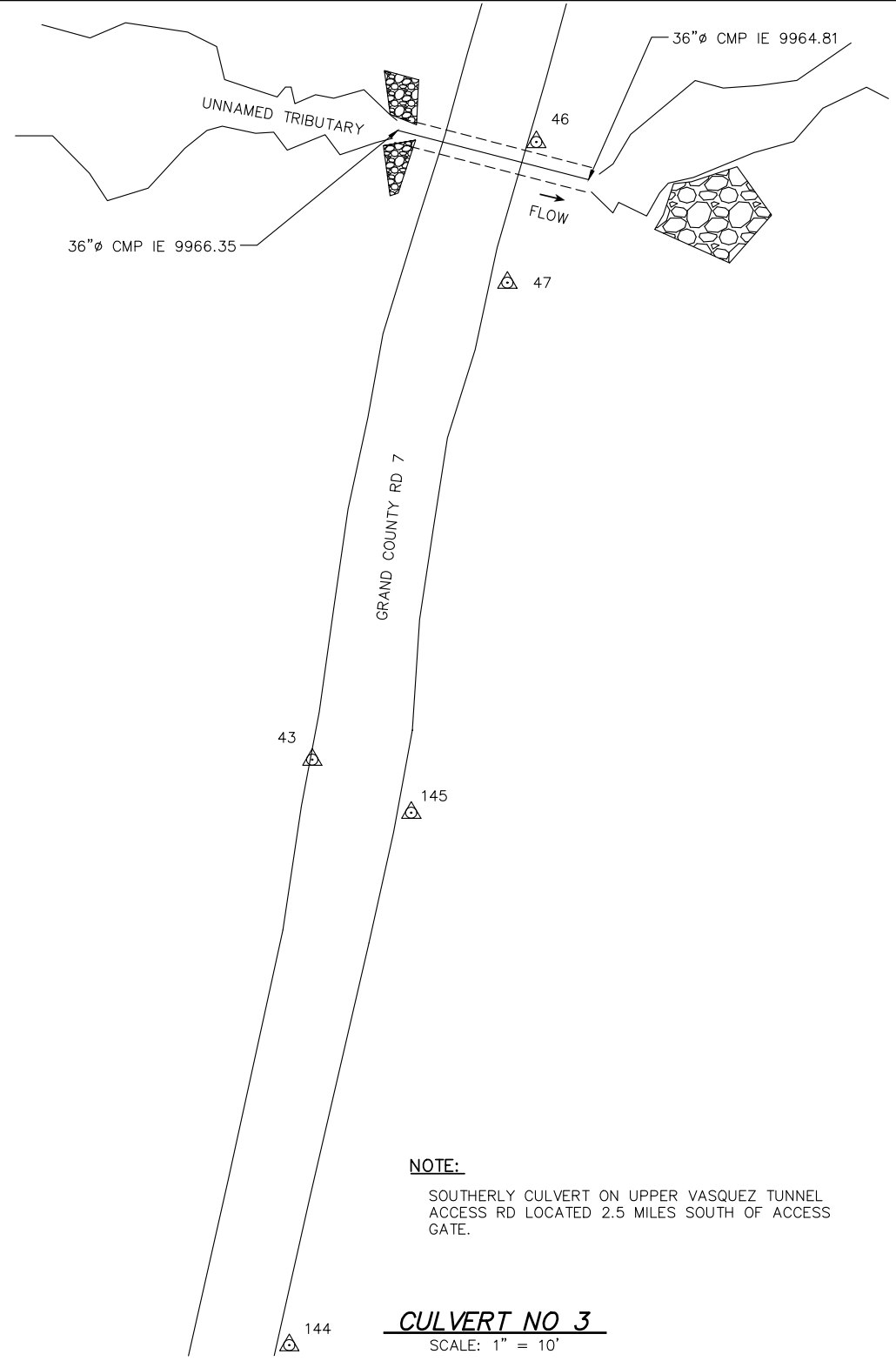
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**SURVEY CONTROL
 DIAGRAM**



NOTE:
 NORTHERLY CULVERT ON UPPER VASQUEZ TUNNEL
 ACCESS RD LOCATED 0.5 MILES SOUTH ACCESS
 GATE.

CULVERT NO 1
 SCALE: 1" = 30'



NOTE:
 SOUTHERLY CULVERT ON UPPER VASQUEZ TUNNEL
 ACCESS RD LOCATED 2.5 MILES SOUTH OF ACCESS
 GATE.

CULVERT NO 3
 SCALE: 1" = 10'

NOTE:
 THIS PROJECT IS ON A MODIFIED COLORADO STATE PLANE CENTRAL ZONE COORDINATE SYSTEM, NAD 83
 HORIZONTAL DATUM OF FRASER GRID:
 GRID NAME: DW_FRASER_GRID
 TRUNCATION NORTH: 1180024
 TRUNCATION EAST: 2000260
 COMBINED FACTOR: 1.00046
 UNITS: US SURVEY FEET

TO CONVERT FROM STATE PLANE COORDINATES TO DW_FRASER_GRID COORDINATES:
 GRID NORTH = (STATE PLANE NORTH -1180024) x 1.00046
 GRID EAST = (STATE PLANE EAST -2000260) x 1.00046
 VERTICAL DATUM: THE ELEVATIONS SHOWN HEREON ARE ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) GEOID 12B
 -CULVERT No 1 ELEVATIONS ARE BASED ON NAVD88 GEIOD 12B, CONTROL POINT 40 EL: 9482.70'
 -CULVERT No 3 ELEVATIONS ARE BASED ON NAVD88 GEIOD 12B, CONTROL POINT 43 EL: 9976.98'

SURVEY CONTROL				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
40	10865.60	909603.48	9482.70	1 1/2" ALUMINUM CAP, LOCATED 195' SW OF CULVERT No 1 AND 5.4' W OF CL OF GVL ACS RD
43	907.42	908300.13	9976.98	1 1/2" ALUMINUM CAP, LOCATED 75' S OF CULVERT No 3
46	981.35	908326.95		No 5 REBAR, LOCATED 1' N OF CULVERT No 3
47	964.52	908323.49		No 5 REBAR, LOCATED 15' S OF CULVERT No 3
48	11047.51	909681.31		No 5 REBAR, LOCATED 13' S OF CULVERT No 1
49	11065.71	909688.80		No 5 REBAR, LOCATED 5' N OF CULVERT No 1
141	11118.31	909709.10	9474.56	1 1/2" ALUMINUM CAP, LOCATED 57' N OF CULVERT No 1 AND 5.8' E OF CL OF GVL ACS RD
142	10745.42	909563.07	9481.91	1 1/2" ALUMINUM CAP, LOCATED 335' SW OF CULVERT No 1 AND 4.6' W OF CL OF GVL ACS RD
144	837.34	908297.38	9980.53	1 1/2" ALUMINUM CAP, LOCATED 142' S OF CULVERT No 3
145	901.08	908311.98	9977.10	1 1/2" ALUMINUM CAP, LOCATED 80' S OF CULVERT No 3


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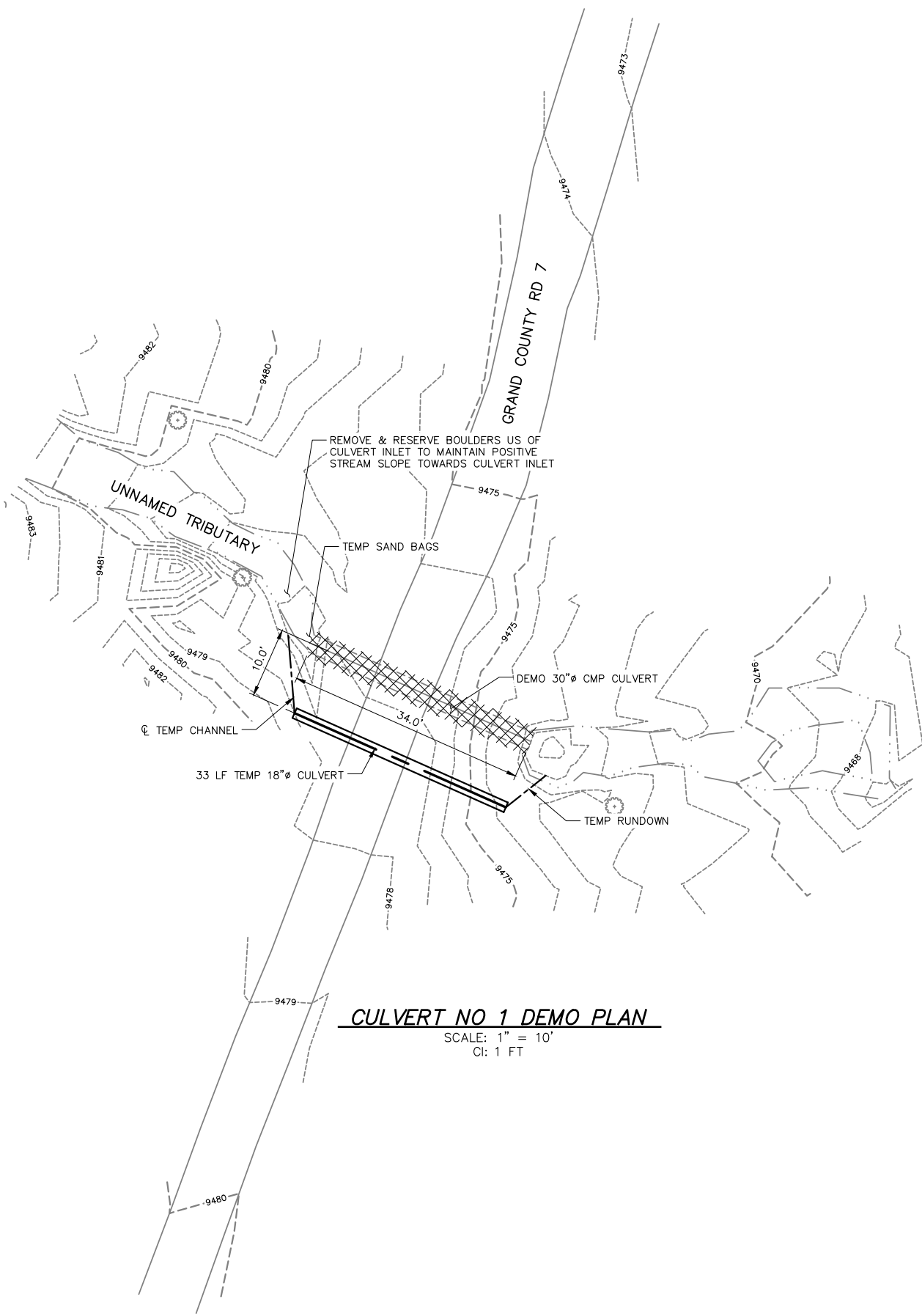
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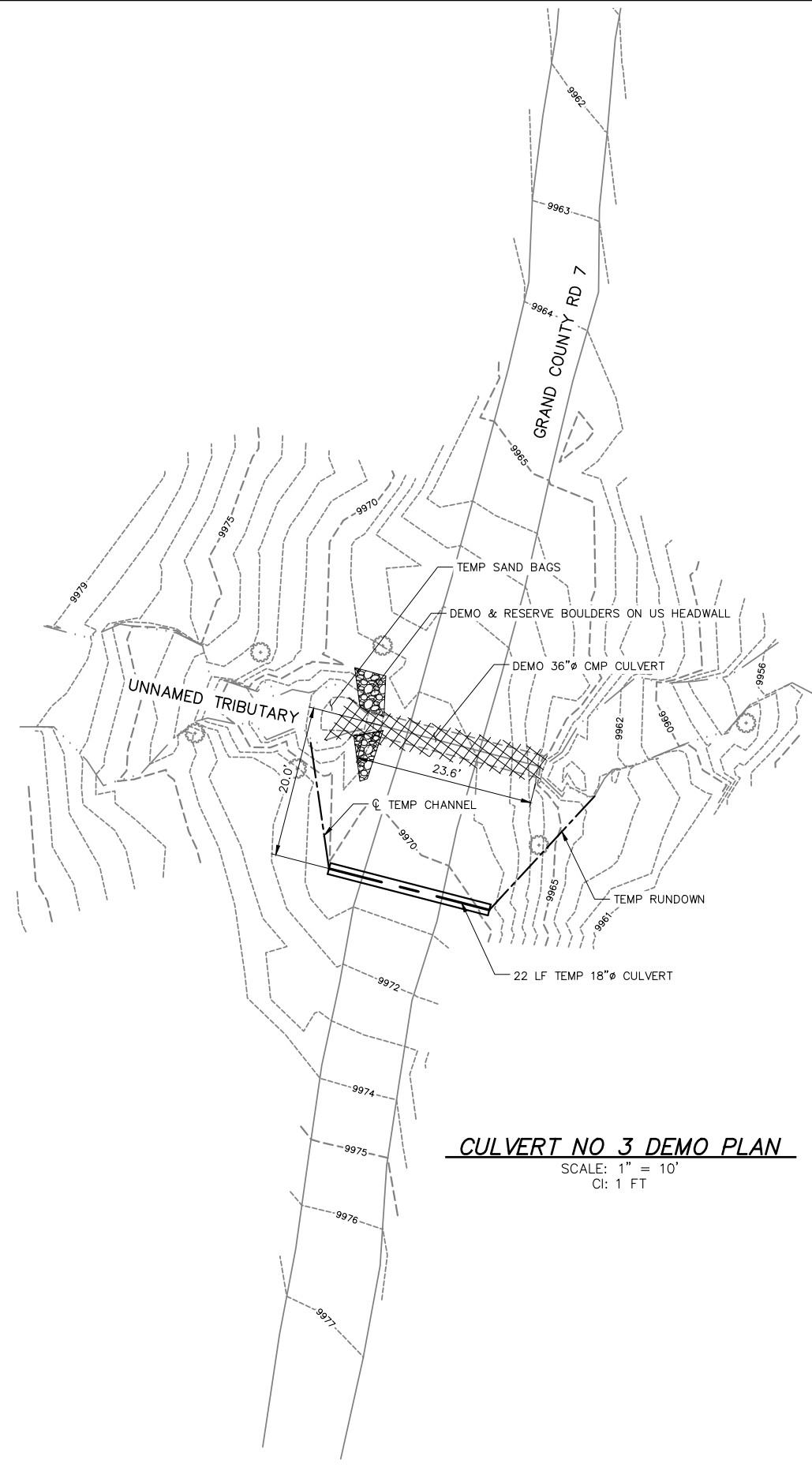
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**CULVERT NOS 1 & 3
 DEMOLITION &
 TEMPORARY FLOW
 MANAGEMENT**



CULVERT NO 1 DEMO PLAN
 SCALE: 1" = 10'
 CI: 1 FT



CULVERT NO 3 DEMO PLAN
 SCALE: 1" = 10'
 CI: 1 FT

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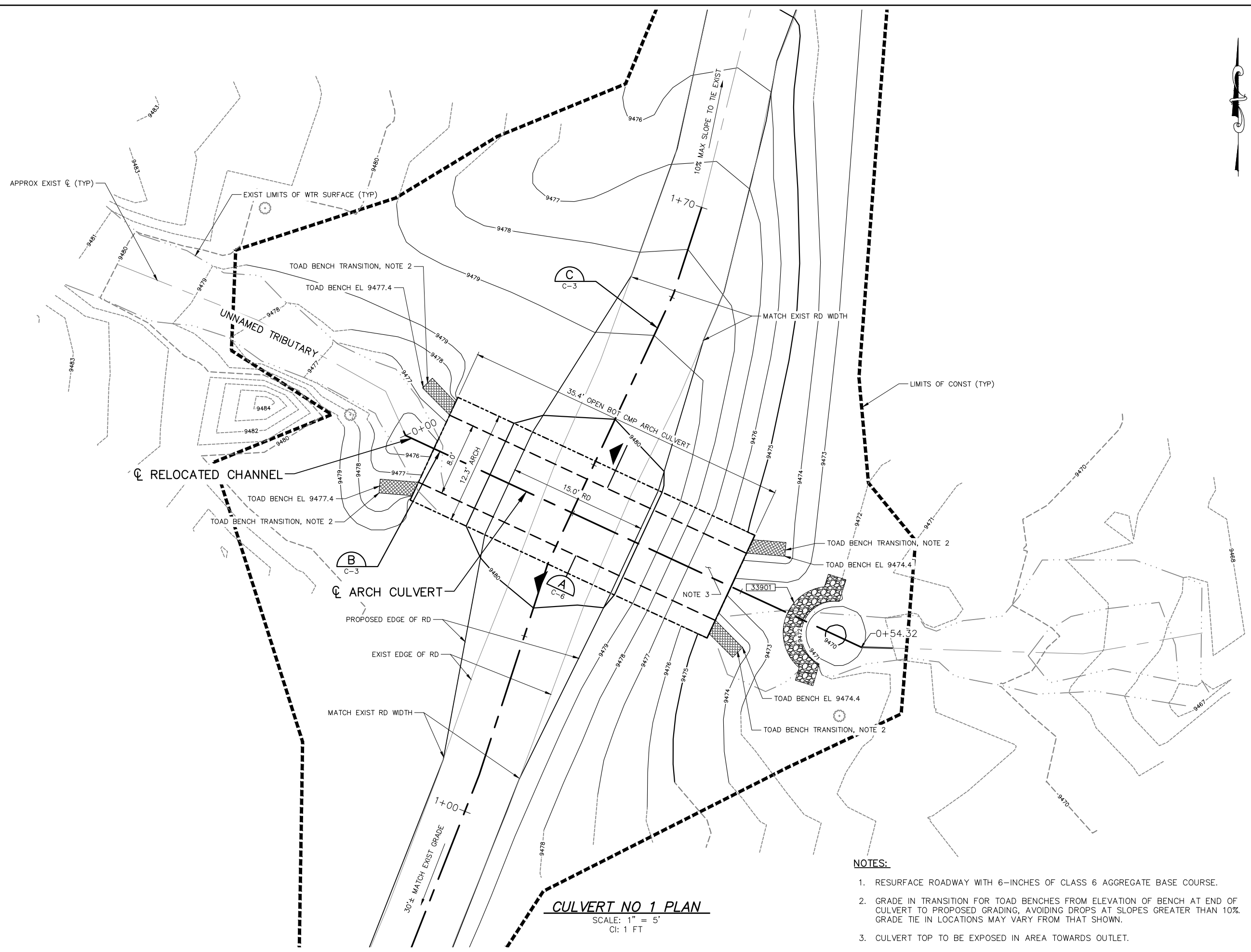
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CULVERT NO 1 PLAN

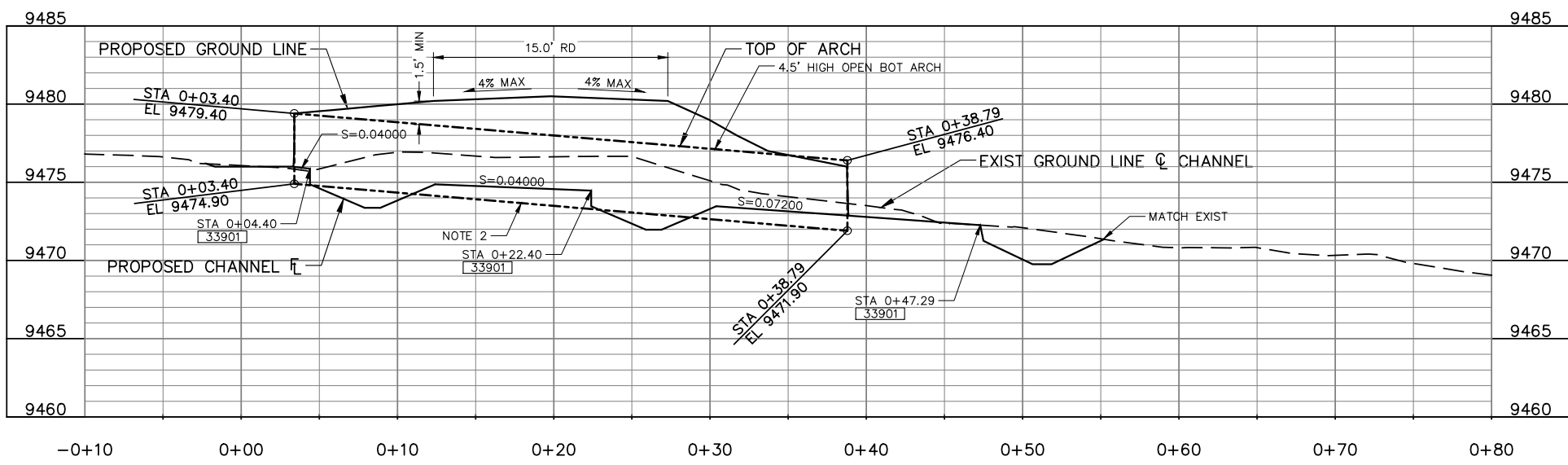


CULVERT NO 1 PLAN
 SCALE: 1" = 5'
 CI: 1 FT

NOTES:

- RESURFACE ROADWAY WITH 6-INCHES OF CLASS 6 AGGREGATE BASE COURSE.
- GRADE IN TRANSITION FOR TOAD BENCHES FROM ELEVATION OF BENCH AT END OF CULVERT TO PROPOSED GRADING, AVOIDING DROPS AT SLOPES GREATER THAN 10%. GRADE TIE IN LOCATIONS MAY VARY FROM THAT SHOWN.
- CULVERT TOP TO BE EXPOSED IN AREA TOWARDS OUTLET.

C:\bms\denverwater-pw\mcmillan\dms07896\19861_DSGN_C-2.dwg ## C-2 5/22/2019 6:46 AM

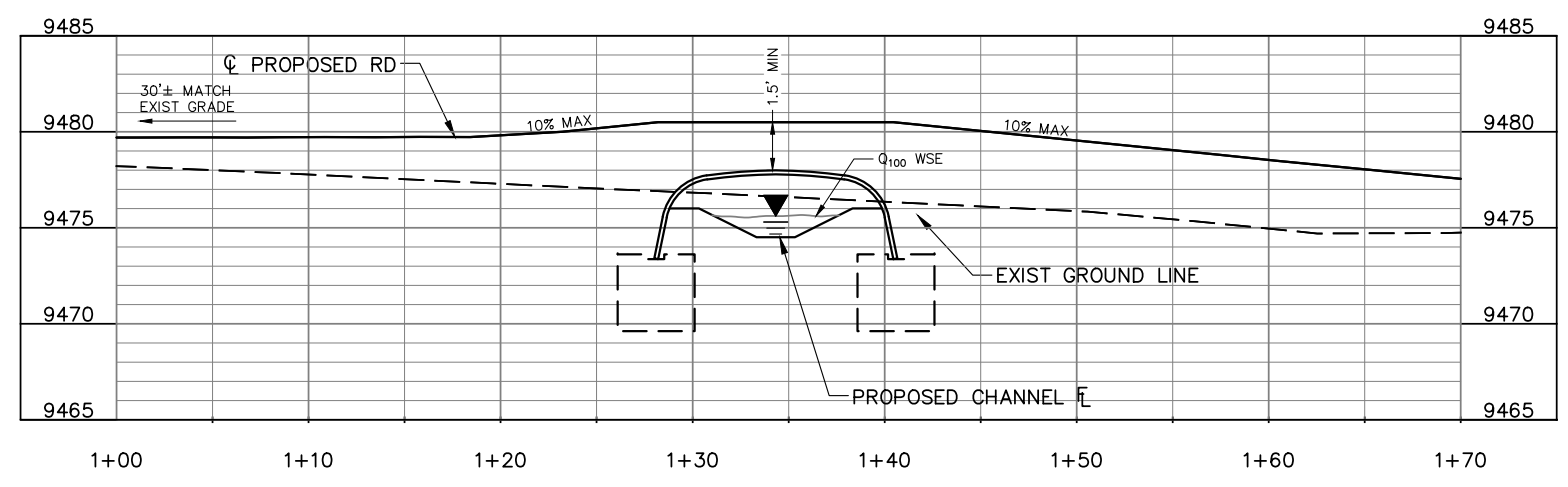


NOTES:

1. BOTTOM OF FOOTER NOT SHOWN FOR CLARITY, SEE $\frac{A}{C-6}$.
2. BOTTOM OF ARCH, TOP OF CONCRETE FOOTER. PROPOSED CHANNEL WILL BE BELOW THIS ELEVATION IN SOME LOCATIONS.
3. SCOUR POOL DEPTH FROM CREST SHALL NOT EXCEED 1.5--FEET.
4. RIFFLE CRESTS WILL BE STAKED IN THE FIELD PRE SUITABLE SPACING AND ELEVATION TO MEET THE SPECIFIED RECONSTRUCTED CHANNEL SLOPE. RIFFLE/WEIR CREST ELEVATIONS WILL MATCH ELEVATIONS SHOWN IN PLANS OR AS DETERMINED APPROPRIATE IN THE FIELD.
5. USE NATIVE ALLUVIAL MATERIALS FOUND ON SITE, IF SUFFICIENTLY COARSE BASED ON SITE CONDITIONS OF STREAM. IF NOT, IMPORT MATERIAL TO MATCH STREAM BED SIMULATIONS GRADATIONS IDENTIFIED ON C-6.

CULVERT NO 1 PROFILE $\frac{B}{C-2}$

SCALE: 1" = 5' HORIZ
 1" = 5' VERT



CULVERT NO 1 ROAD PROFILE $\frac{C}{C-2}$

SCALE: 1" = 5' HORIZ
 1" = 5' VERT

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DRAWING TITLE

CULVERT NO 1 PROFILES

CONSULTANT


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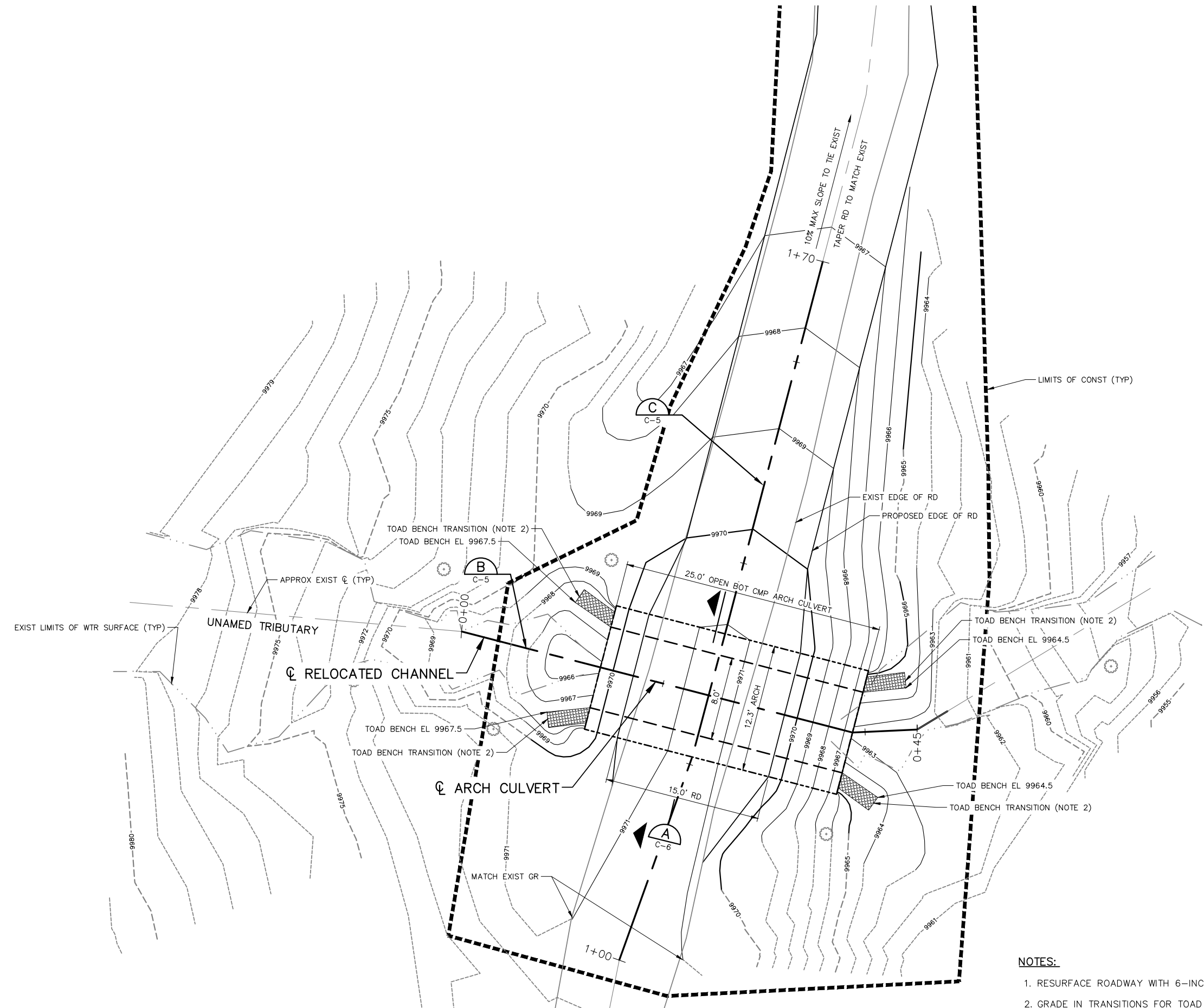
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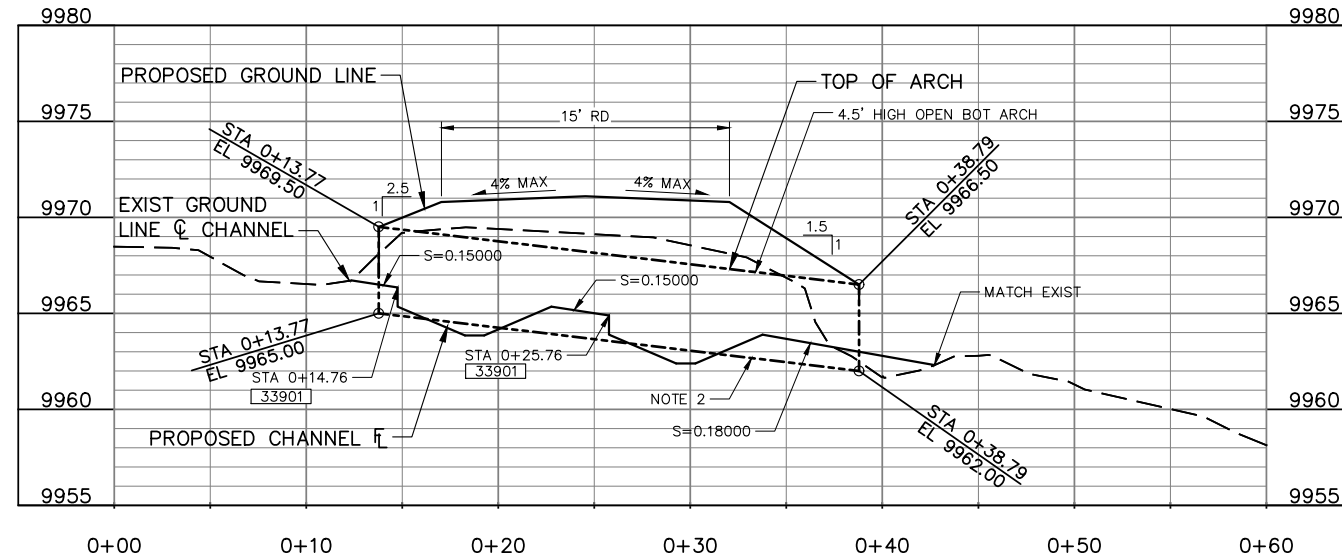
CULVERT NO 3 PLAN



CULVERT NO 3 PLAN
 SCALE: 1" = 5'
 CI: 1 FT

- NOTES:**
- RESURFACE ROADWAY WITH 6-INCHES OF CLASS 6 AGGREGATE BASE COURSE.
 - GRADE IN TRANSITIONS FOR TOAD BENCHES FROM ELEVATION OF BEND CAT END OF CULVERT TO PROPOSED GRADING AVOIDING DROPS OR SLOPES GREATER THAN 10%. GRADE TIE IN LOCATIONS MAY VARY FROM THAT SHOWN.
 - CULVERT TOP TO BE EXPOSED IN AREAS TOWARDS INLET AND OUTLET.

C:\bms\denverwater-pw\mcmillan\dms07896\19861_DSGN_C-3.dwg ##C-4 5/22/2019 6:46 AM

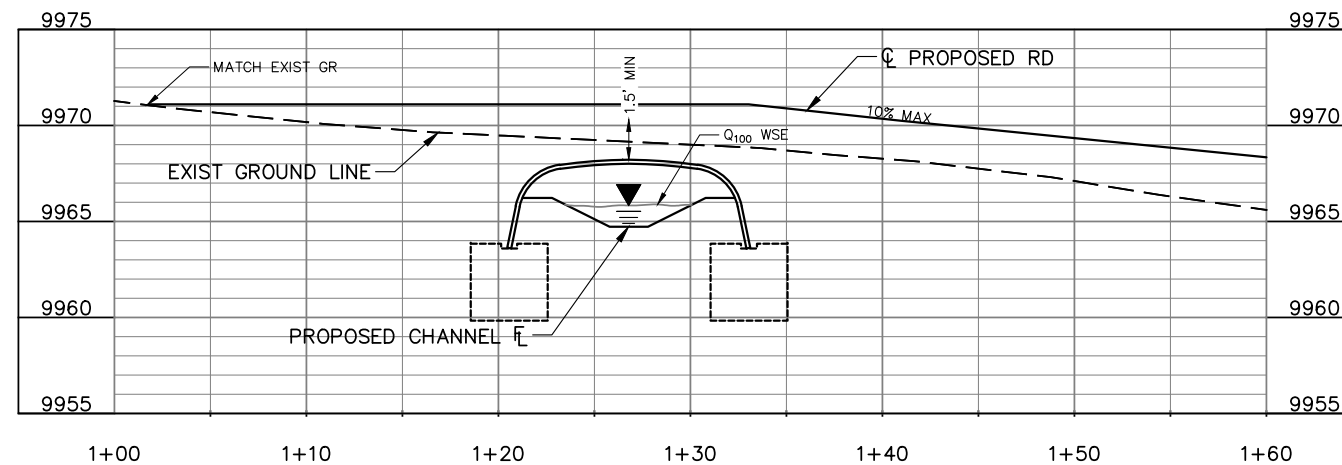


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5. USE NATIVE ALLUVIAL MATERIALS FOUND ON SITE IF SUFFICIENTLY COARSE BASED ON SITE CONDITIONS OF STREAM. IF NOT, IMPORT MATERIAL TO MATCH STREAM BED SIMULATIONS GRADATIONS IDENTIFIED ON C-6.

CULVERT NO 3 PROFILE $\frac{B}{C-4}$

SCALE: 1" = 5' HORIZ
 1" = 5' VERT



CULVERT NO 3 ROAD PROFILE $\frac{C}{C-4}$

SCALE: 1" = 5' HORIZ
 1" = 5' VERT

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CULVERT NO 3 PROFILES

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APPD BY: *Stephen C. P...*

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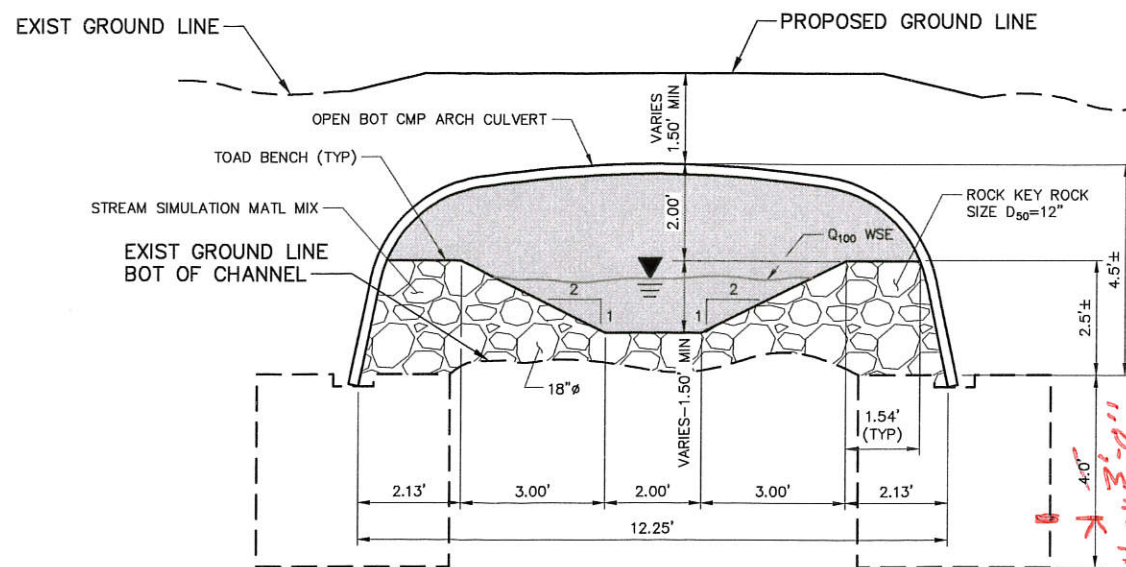
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SECTION & DETAIL

C-6



NOTES:

1. CONCRETE FOOTER TO BE INSTALLED AT SLOPE TO MATCH CULVERT SLOPE.
2. CONCRETE FOOTER TO BE DESIGNED BY CULVERT SUPPLIER.
3. PREPARE FOOTER SUBSURFACE TO PROVIDE A MINIMUM 1500 LB/SF BEARING CAPACITY.

TYPICAL CROSS SECTION @ VORTEX ROCK WEIR

SCALE: 1" = 2'

A
 C-2, C-3,
 C-4 & C-5

STREAM SIMULATION SAND/GRAVEL ROCK MIX	
PROPORTION	SIZE
1 UNIT	0"-3/4"
2 UNITS	3/4"-2"
2 UNITS	2"-7"
1 UNIT	7"-10"

NOTES:

1. STREAMBED SIMULATION SHALL BE MIXED ACCORDING TO TABLE ABOVE.
2. ROCK WEIR SHALL USE 18-INCH MEDIAN AXIS FOR FOOTER ROCKS.
 9-INCH MEDIAN AXIS FOR HEADER ROCKS.
 D₅₀= 12-INCH IN ROCK KEY

