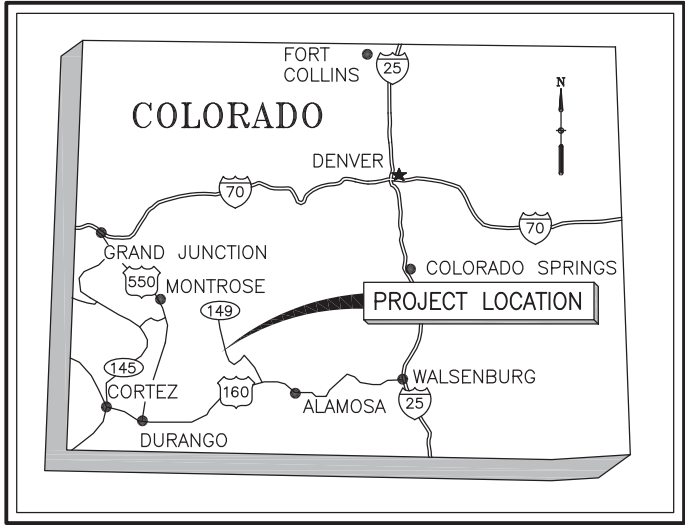
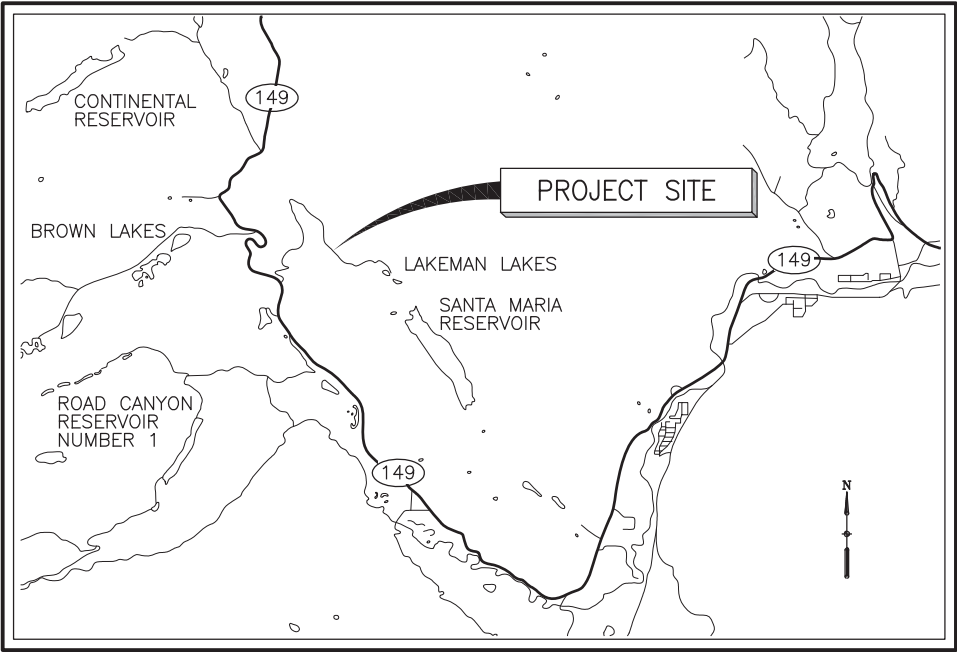


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DESIGN DRAWINGS
FOR
SANTA MARIA CANAL IMPROVEMENTS
PREPARED FOR
SANTA MARIA RESERVOIR COMPANY
MINERAL COUNTY, COLORADO



STATE MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

SHEET INDEX		
SHEET NO.	DRAWING NO.	DRAWING TITLE
GENERAL		
1	G-1	COVER SHEET, LOCATION MAPS AND SHEET INDEX
CIVIL		
2	C-1	SITE PLAN, SURVEY CONTROL AND LEGEND
3	C-2	GENERAL PLAN OF MODIFICATIONS AND DEMOLITION PLAN
4	C-3	NEW 42" BYPASS PIPE PLAN AND PROFILE STA 100+00 THRU 113+00
5	C-4	NEW 42" BYPASS PIPE PLAN AND PROFILE STA 113+00 THRU 124+04
6	C-5	NEW 42" BYPASS PIPE DETAILS
7	C-6	CANAL LINER PLAN & PROFILE STA 35+50 TO 46+50
8	C-7	CANAL LINER PLAN & PROFILE STA 46+50 TO 59+00
9	C-8	CANAL LINER DETAILS
10	C-9	CROSS SECTIONS STA 36+00 TO 47+50
11	C-10	CROSS SECTIONS STA 47+50 TO 58+00
12	C-11	CANAL CHECK STRUCTURES

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URS PROJECT NO: 22241248
DRAWN BY: BB
DESIGNED BY: JD
CHECKED BY: TM
DATE CREATED: 4/1/2012
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SCALE: AS SHOWN
ACAD VER: 2012

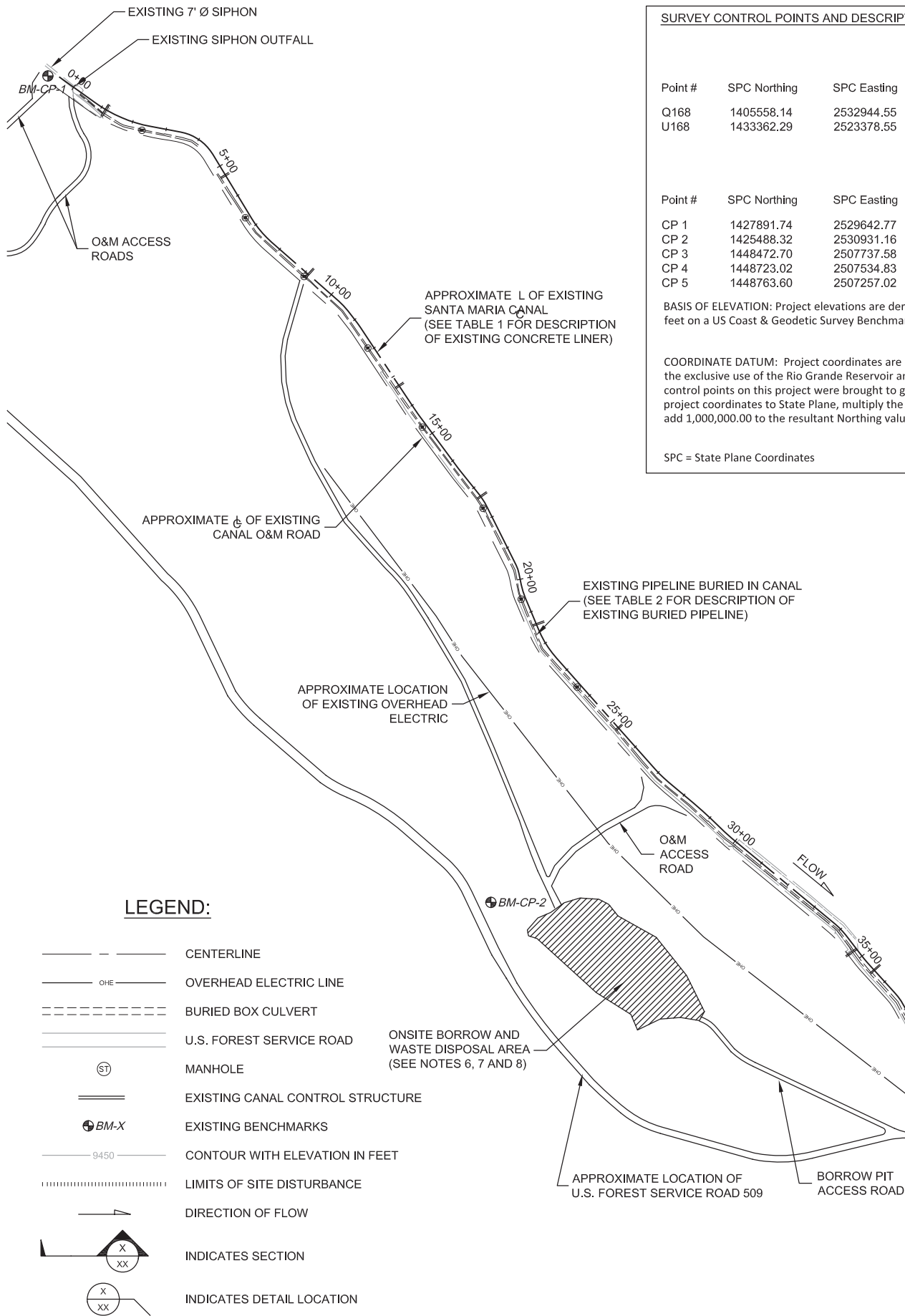
SHEET TITLE

COVER SHEET,
LOCATION MAPS
AND SHEET INDEX

G-1

SHEET 1 OF 12

URS DRAWING PATH: N:\Projects\22241248_Santa_Maria_Canal\Sub_00\9_D_Constr_Design\Santa_Maria_Canal\Plan_Sheets\Survey Control.dwg



SURVEY CONTROL POINTS AND DESCRIPTION

Point #	SPC Northing	SPC Easting	Project Coordinate Northing	Project Coordinate Easting	NAVD88 Elevation	Latitude	Longitude	Height	Description
Q168	1405558.14	2532944.55	405772.31	533225.98	9005.24	37°46'09.75942"N	107°06'57.31268"W	8954.70	Found USC&GS Brass Cap set in top of concrete monument
U168	1433362.29	2523378.55	433591.14	523654.93	9970.01	37°50'42.95235"N	107°09'02.55468"W	9919.72	Found USC&GS Brass Cap set in top of concrete monument

Point #	SPC Northing	SPC Easting	Project Coordinate Northing	Project Coordinate Easting	NAVD88 Elevation	Latitude	Longitude	Height	Description
CP 1	1427891.74	2529642.77	428117.69	529922.46	9717.98	37°49'49.96284"N	107°07'43.27871"W	9667.61	Set 18" #5 Rebar with a 1.5" Aluminum Cap stamped "CONTROL POINT CP-1"
CP 2	1425488.32	2530931.16	425713.01	531211.53	9664.85	37°49'26.42666"N	107°07'26.70053"W	9614.45	Set 18" #5 Rebar with a 1.5" Aluminum Cap stamped "CONTROL POINT CP-2"
CP 3	1448472.70	2507737.58	448709.53	508005.70	10308.60	37°53'09.53924"N	107°012'20.96506"W	10258.78	Set 18" #5 Rebar with a 1.5" Aluminum Cap stamped "CONTROL POINT CP-3"
CP 4	1448723.02	2507534.83	448959.98	507802.84	10291.05	37°53'11.97704"N	107°012'23.55080"W	10241.23	Set 18" #5 Rebar with a 1.5" Aluminum Cap stamped "CONTROL POINT CP-4"
CP 5	1448763.60	2507257.02	449000.58	507524.89	10346.88	37°53'12.32792"N	107°012'27.02498"W	10297.06	Set 18" #5 Rebar with a 1.5" Aluminum Cap stamped "CONTROL POINT CP-5"

BASIS OF ELEVATION: Project elevations are derived from GPS observations, using GEOID09, based on a NAVD88 elevation of 9970.01 feet on a US Coast & Geodetic Survey Benchmark disk U 168 (Brass Cap set in concrete). No differential levels were performed.

COORDINATE DATUM: Project coordinates are modified Colorado State Plane South Zone (0503) NAD 83(2007) coordinates, and are for the exclusive use of the Rio Grande Reservoir and Ditch Company, and are considered project coordinates only. Coordinates for the control points on this project were brought to ground using the inverse of the Combined Scale factor (1/0.999472205). To convert project coordinates to State Plane, multiply the Project Northing and Easting values by the Combined Scale Factor (0.999472205), then add 1,000,000.00 to the resultant Northing value, and 2,000,000.00 to the resultant Easting value.

SPC = State Plane Coordinates

TABLE 1 - EXISTING CANAL DESCRIPTION

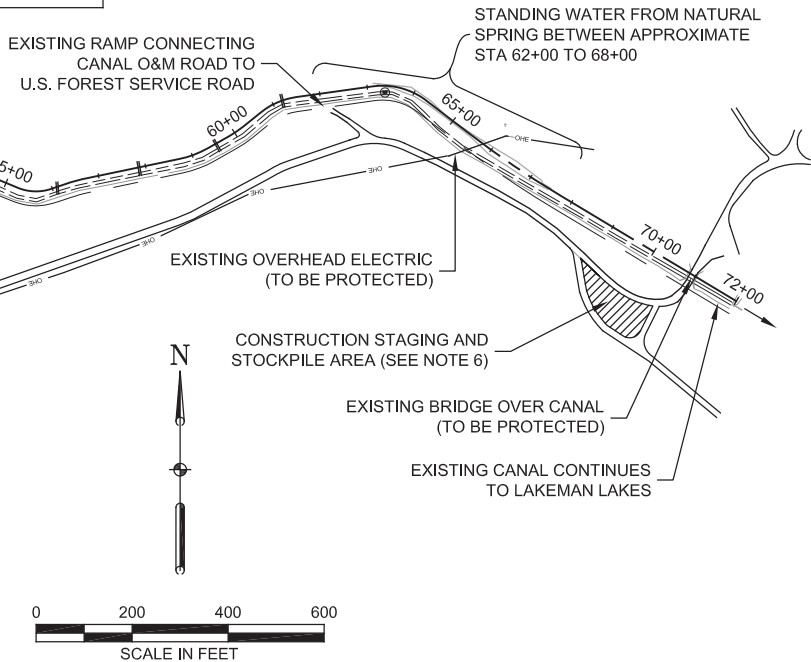
STA	DESCRIPTION OF CONCRETE LINER
0+00 TO 0+25	ENTIRE CANAL
0+25 TO 1+20	RIGHT BANK
1+20 TO 12+60	NO LINER
12+60 TO 16+80	RIGHT BANK
16+80 TO 20+50	NO LINER
20+50 TO 30+08	RIGHT BANK
30+08 TO 34+78	ENTIRE CANAL
34+78 TO 53+00	RIGHT BANK
53+00 TO 55+60	NO LINER
55+60 TO 72+00	RIGHT BANK

TABLE 2 - EXISTING BYPASS DESCRIPTION

STA	DESCRIPTION
0+00 TO 30+08	4' CMP ENCASED IN CONCRETE
30+08 TO 44+50	4' x 5' CONCRETE BOX CULVERT (INSIDE DIMENSIONS)
44+50 TO 47+90	4' CMP ENCASED IN CONCRETE
47+90 TO 72+00	4' x 5' CONCRETE BOX CULVERT (INSIDE DIMENSIONS)

NOTES:

- EXISTING FEATURES ARE BASED ON SURVEY CONDUCTED BY URS ON AUGUST 20, 2011 THROUGH AUGUST 15, 2011.
- CONTRACTOR TO VERIFY COORDINATES AND ELEVATIONS OF EXISTING MONUMENTS PRIOR TO USE.
- PERFORM UNDERGROUND UTILITY LOCATES PRIOR TO START OF CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE TO RESTORE THE U.S. FOREST SERVICE ROAD AND BRIDGE TO PRE-CONSTRUCTION CONDITIONS AT THE END OF CONSTRUCTION.
- UNLINED AREAS OF THE CANAL MAY BE USED FOR CONSTRUCTION ACCESS. NO EQUIPMENT SHALL BE ALLOWED TO OPERATE ON THE EXISTING BOX CULVERT, EXISTING LINED CANAL SECTIONS, OR NEW LINED CANAL SECTIONS.
- STRIPPING AND CLEARING OF THE CONSTRUCTION STAGING AND STOCKPILE AREAS AND DISTURBED PORTIONS OF THE ONSITE BORROW AND WASTE DISPOSAL AREAS IS REQUIRED.
- DISPOSAL OF EXCAVATED WASTE SHALL BE PLACED WITHIN A 0.5 ACRE FOOTPRINT WITHIN THE ONSITE WASTE DISPOSAL AREA AT DIRECTION OF THE OWNER.
- CONTRACTOR TO PROVIDE POSITIVE DRAINAGE IN FINAL GRADES.



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DESIGNED BY:	
CHECKED BY:	
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SCALE:	AS SHOWN
ACAD VER:	2012

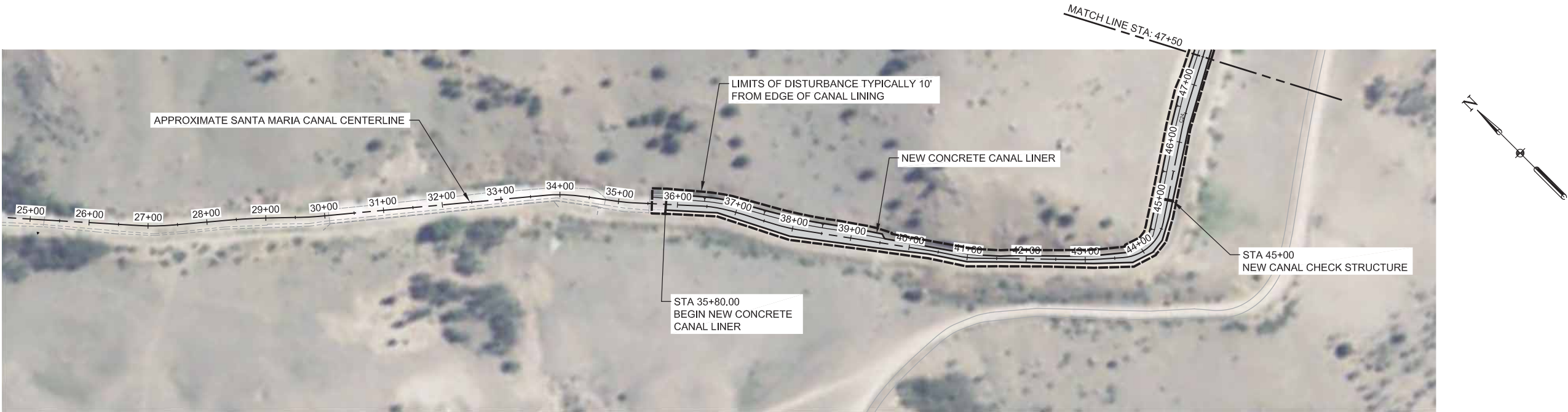
SHEET TITLE

SITE PLAN,
SURVEY CONTROL
AND LEGEND

C-1

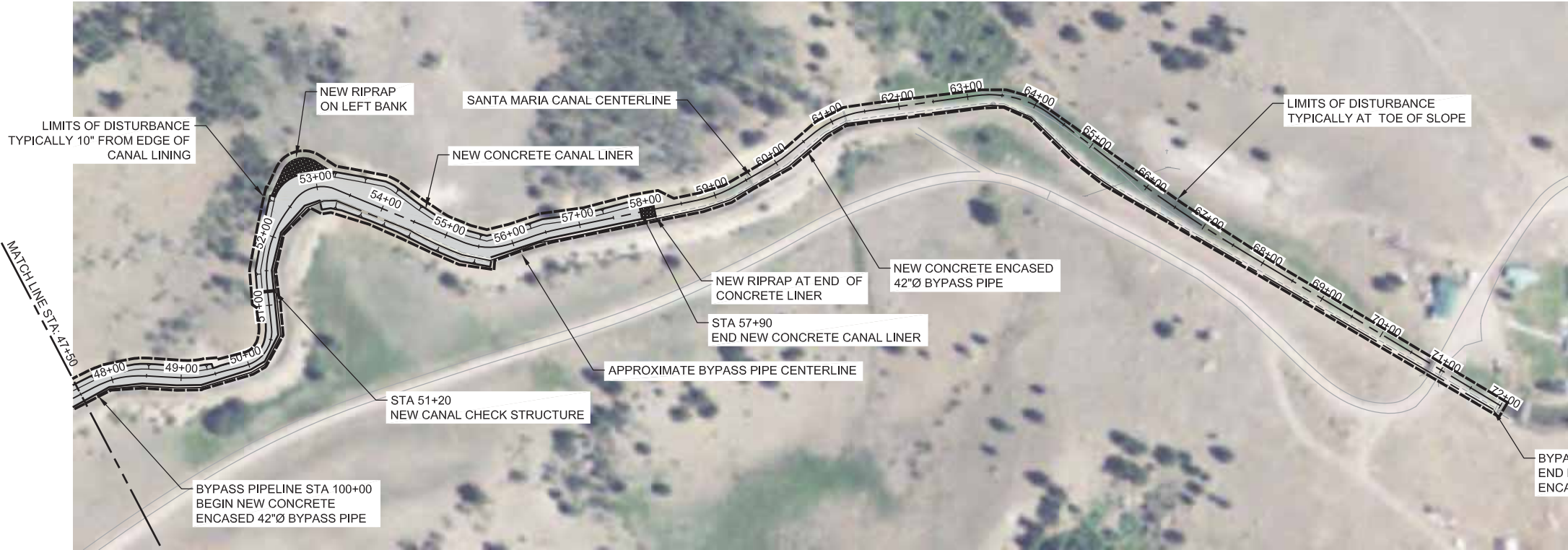
SHEET 2 OF 12

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GENERAL PLAN OF MODIFICATIONS

DEMOLITION PLAN	
STATION	DESCRIPTION
BYPASS PIPE STA 100+00 TO 124+04	DEMOLISH AND REMOVE TOP SLAB OF EXISTING BOX CULVERT (SEE DETAIL 1/C-5) (SEE NOTE 2)
46+85	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
49+28	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
50+24	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
51+05	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
52+10	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
56+12	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)
57+85	DEMOLISH AND REMOVE CANAL CONTROL STRUCTURE (SEE NOTES 1 AND 2)



GENERAL PLAN OF MODIFICATIONS

NOTES

- EXISTING CANAL CONTROL STRUCTURES SHALL BE DEMOLISHED AND REMOVED TO 3-INCHES (MIN.) BELOW GRADE OF NEW CONCRETE LINER.
- ALL DEMOLISHED MATERIALS FROM EXISTING CONCRETE STRUCTURES SHALL BE HAULED AND DISPOSED OF OFFSITE.

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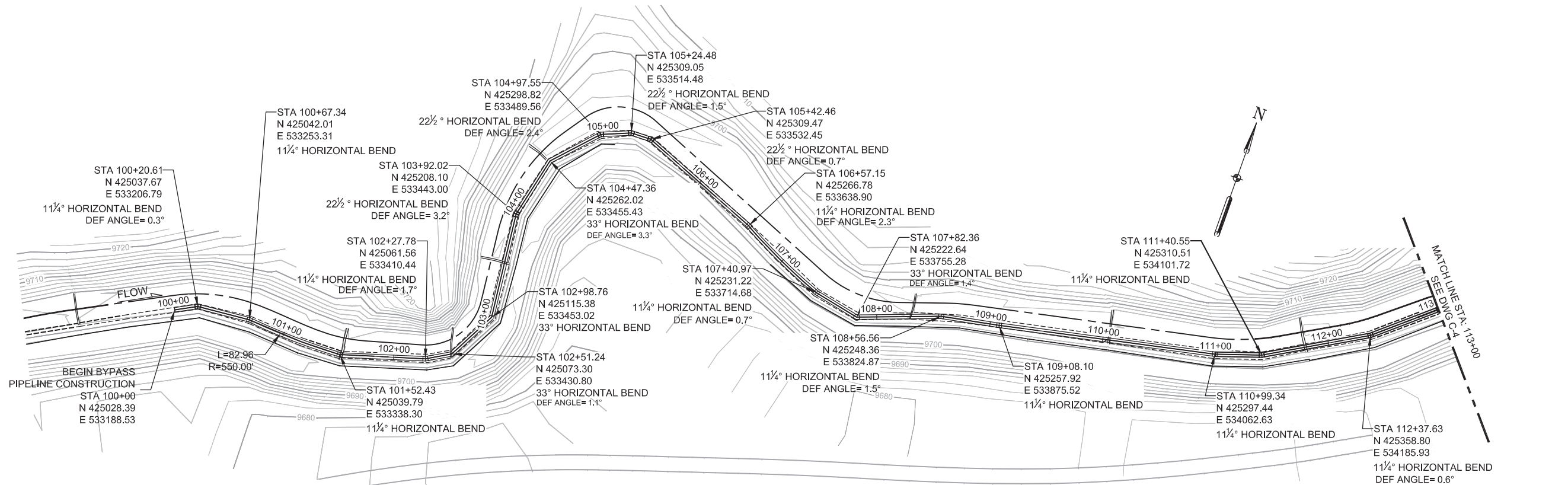
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GENERAL PLAN OF
MODIFICATIONS AND
DEMOLITION PLAN

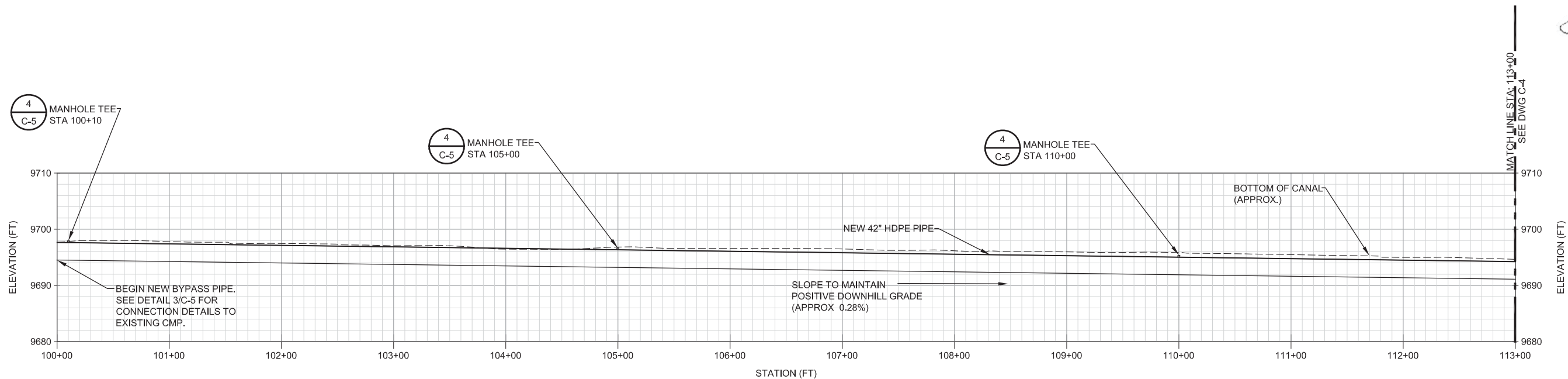
C-2

SHEET 3 OF 12

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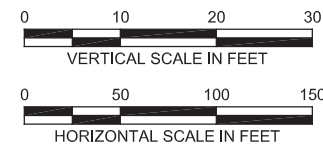
BYPASS PIPE PLAN



BYPASS PIPE PROFILE

NOTES

1. NEW BYPASS PIPE TO BE INSTALLED INSIDE EXISTING BOX CULVERT. SEE SHEET C-5 FOR INSTALLATION DETAILS.
2. NEW BYPASS PIPE SHALL FOLLOW ALIGNMENT AND GRADE OF EXISTING BOX CULVERT. FITTINGS AND PIPE LENGTHS SHOWN HERE ARE TO BE CONFIRMED IN THE FIELD.
3. CONCRETE CANAL LINER NOT SHOWN FOR CLARITY.



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CHECKED BY:
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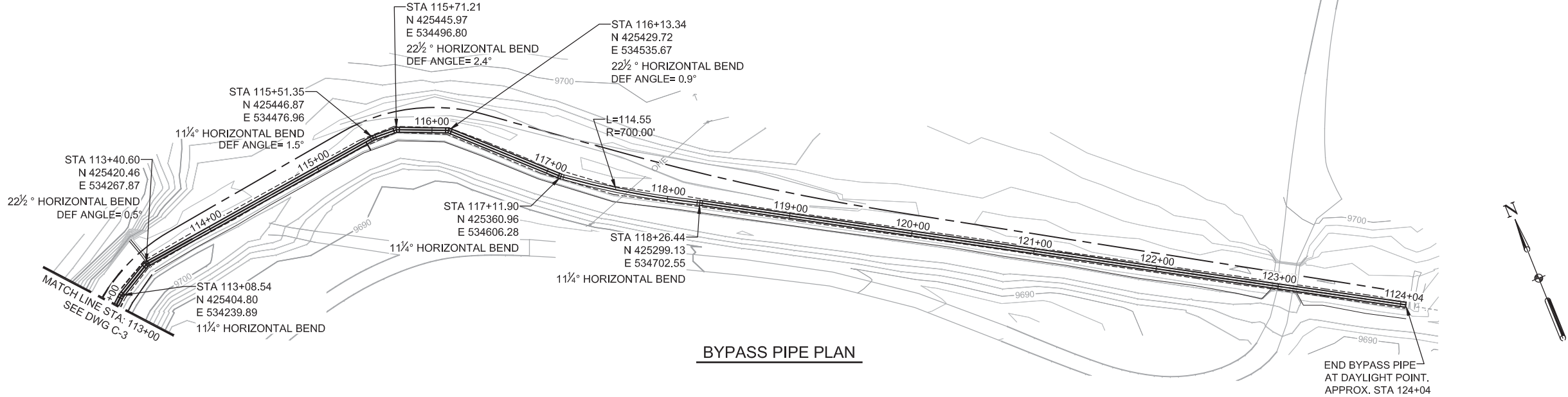
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**NEW 42" BYPASS PIPE
PLAN AND PROFILE
STA 100+00 TO 113+00**

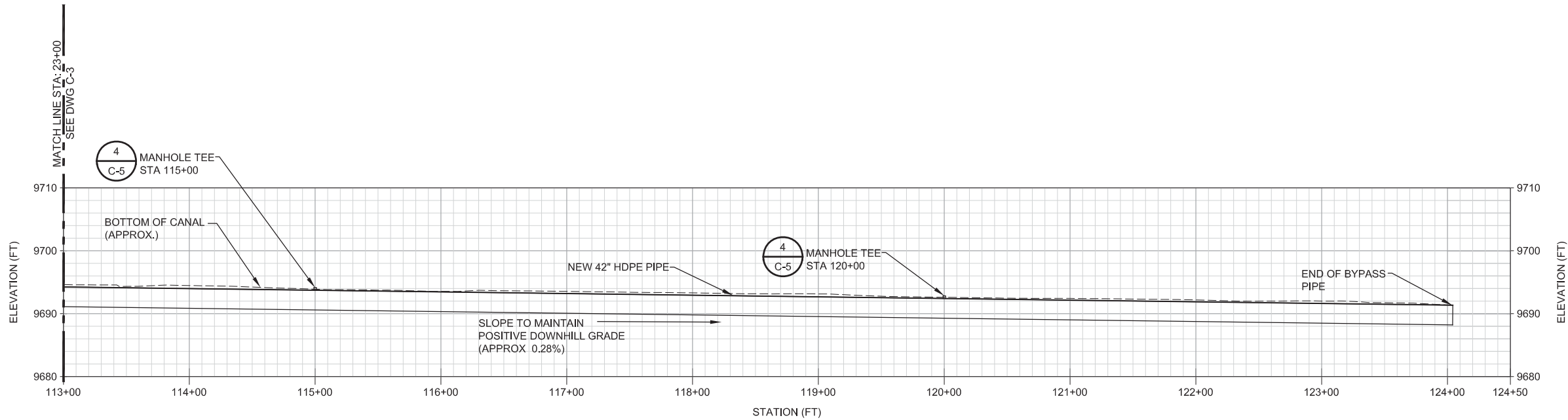
C-3

SHEET 4 OF 12

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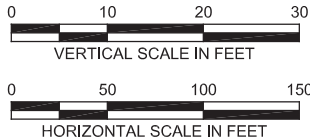
BYPASS PIPE PLAN



BYPASS PIPE PROFILE

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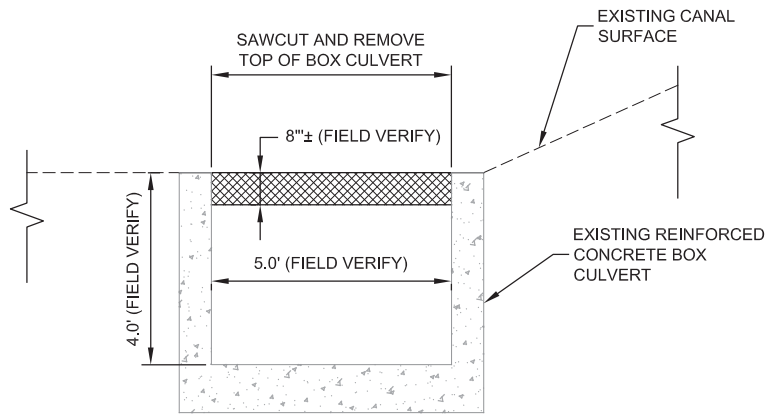
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NEW 42" BYPASS PIPE
PLAN AND PROFILE
STA 113+00 TO 124+04

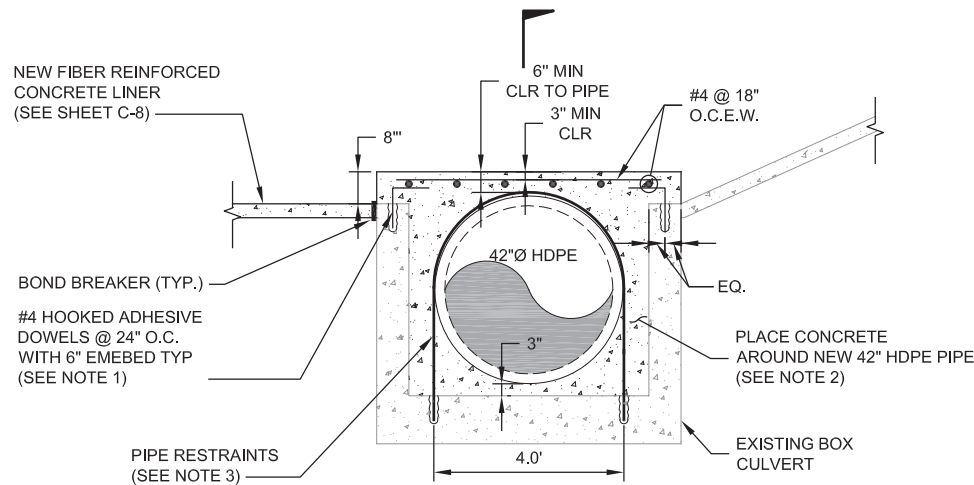
C-4

SHEET 5 OF 12

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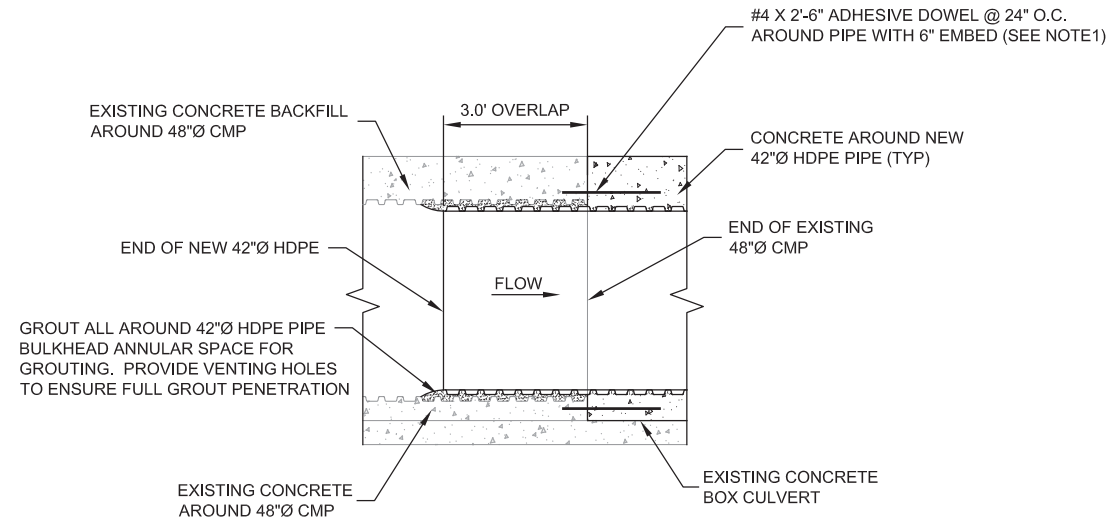
1
C-3/C-4
1" = 2'



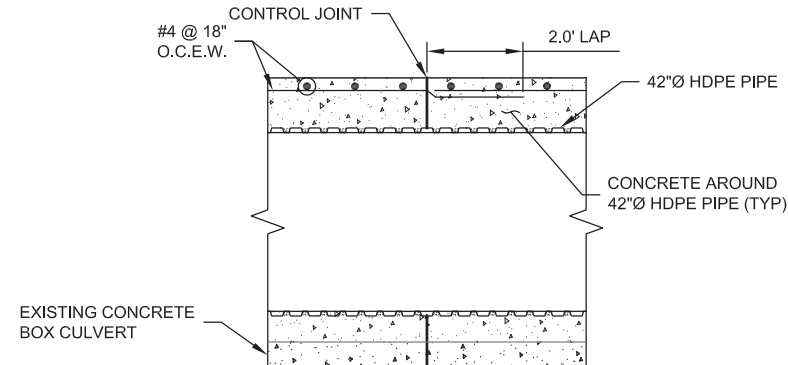
2
C-3/C-4
1" = 2'

NOTES

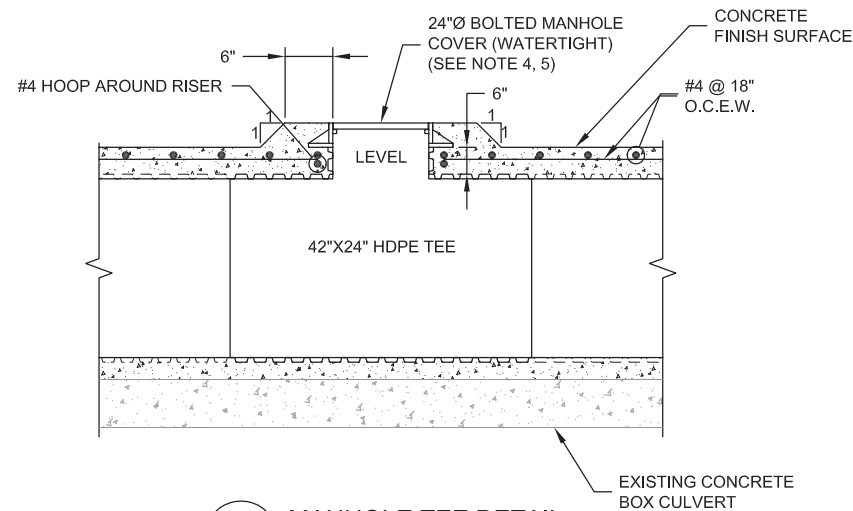
- USE HILTI HY 150 EPOXY, OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S RECOMMENDATION.
- CONCRETE ENCASEMENT CONTROL JOINTS TO BE SPACED AT 20' O.C. MAXIMUM, AND AT EXISTING JOINTS IN BOX CULVERT.
- PIPE RESTRAINT SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING AND IMPLEMENTING THE PIPE RESTRAINTS. PIPE RESTRAINTS TO BE SPACED A MAXIMUM OF 10' O.C.
- TRIM 24" RISER 6" (LEVEL) FROM O.D. OF 42" SECTION OF TEE TO ACCOMMODATE MANHOLE COVER.
- USE NEENAH R-1916 WATERTIGHT MANHOLE FRAME AND BOLTED LID, OR APPROVED EQUAL.



A
C-3
1" = 2'



B
C-3/C-4
1" = 2'



4
C-3/C-4
1" = 2'

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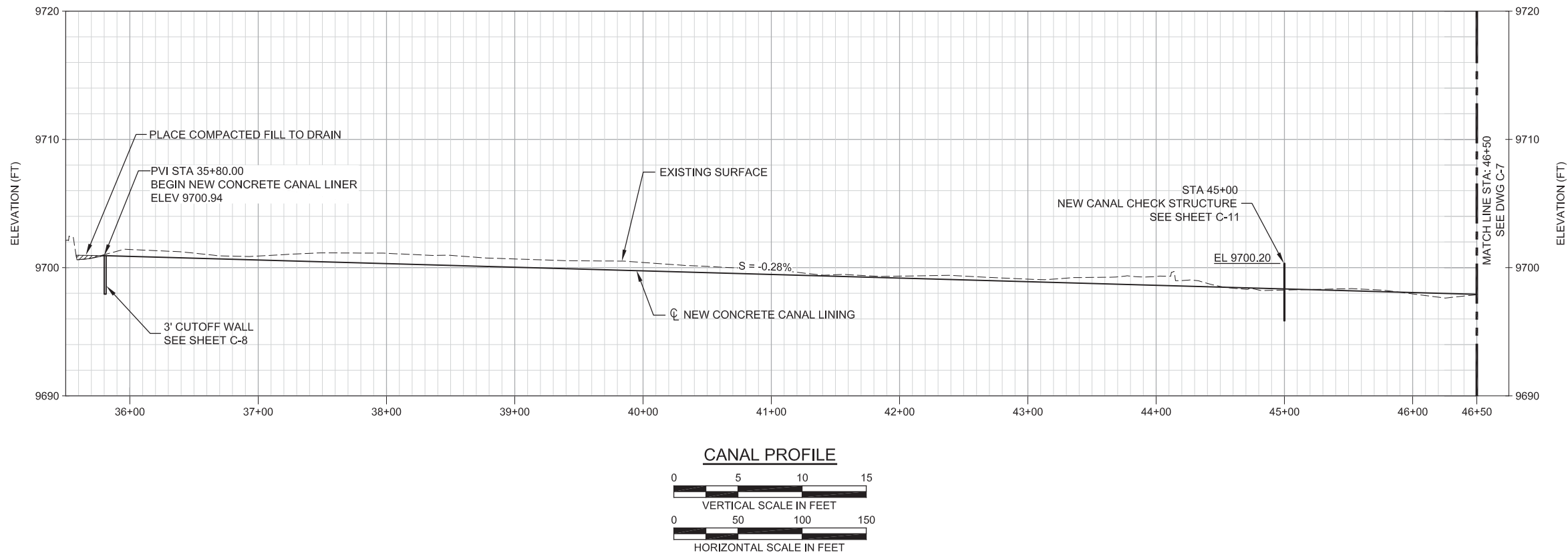
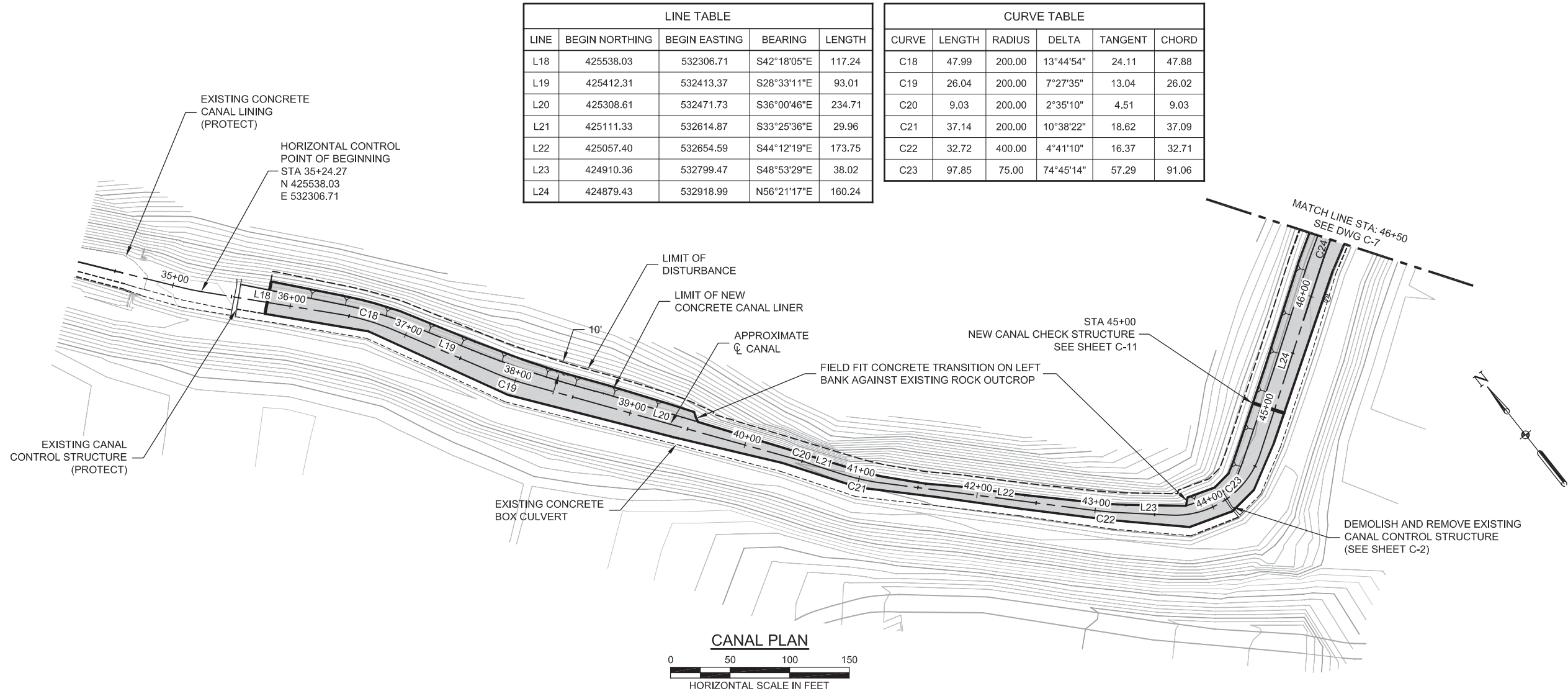
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NEW 42" BYPASS PIPE
DETAILS

C-5

SHEET 6 OF 12

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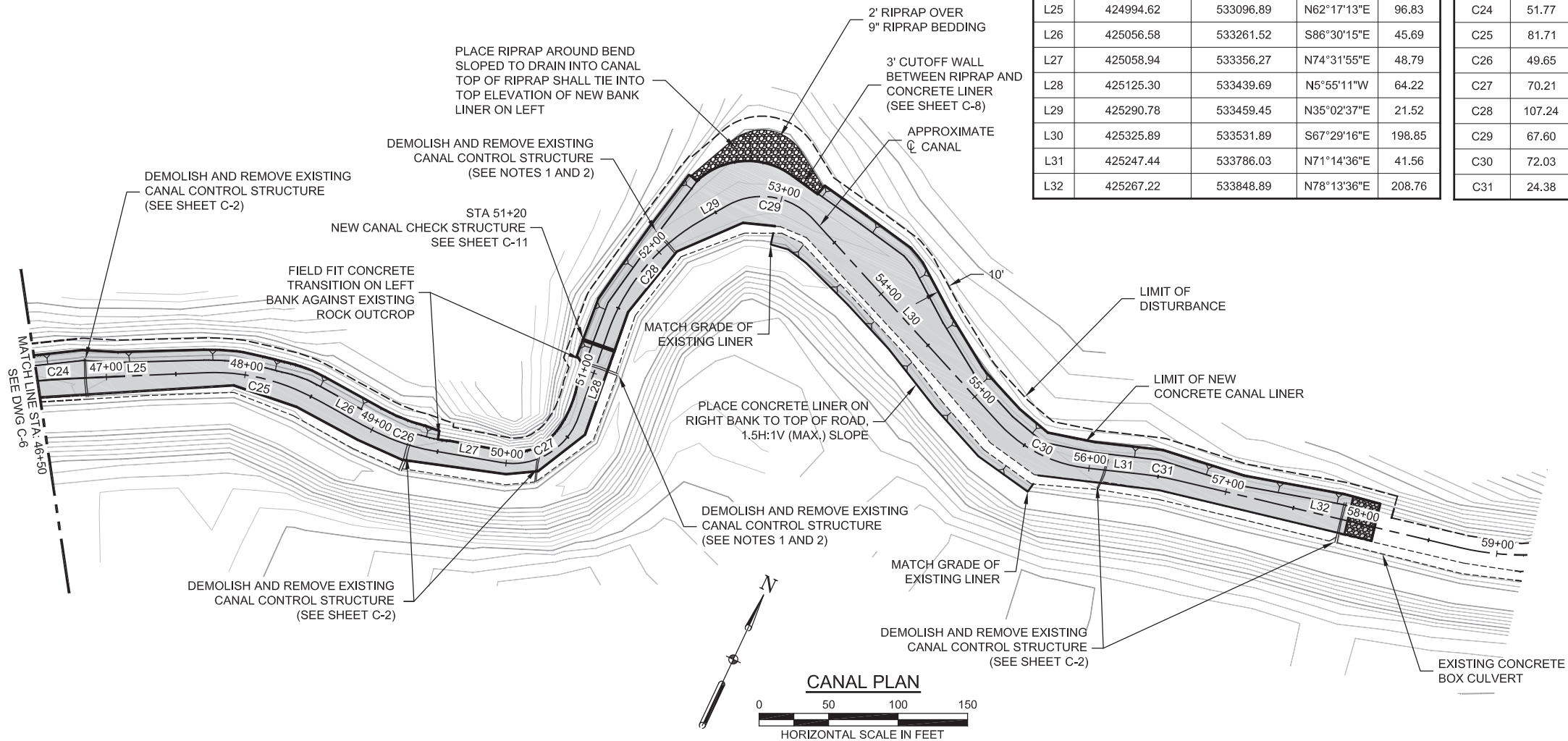
CANAL LINER
PLAN & PROFILE
STA 35+50 TO 46+50

C-6

SHEET 7 OF 12

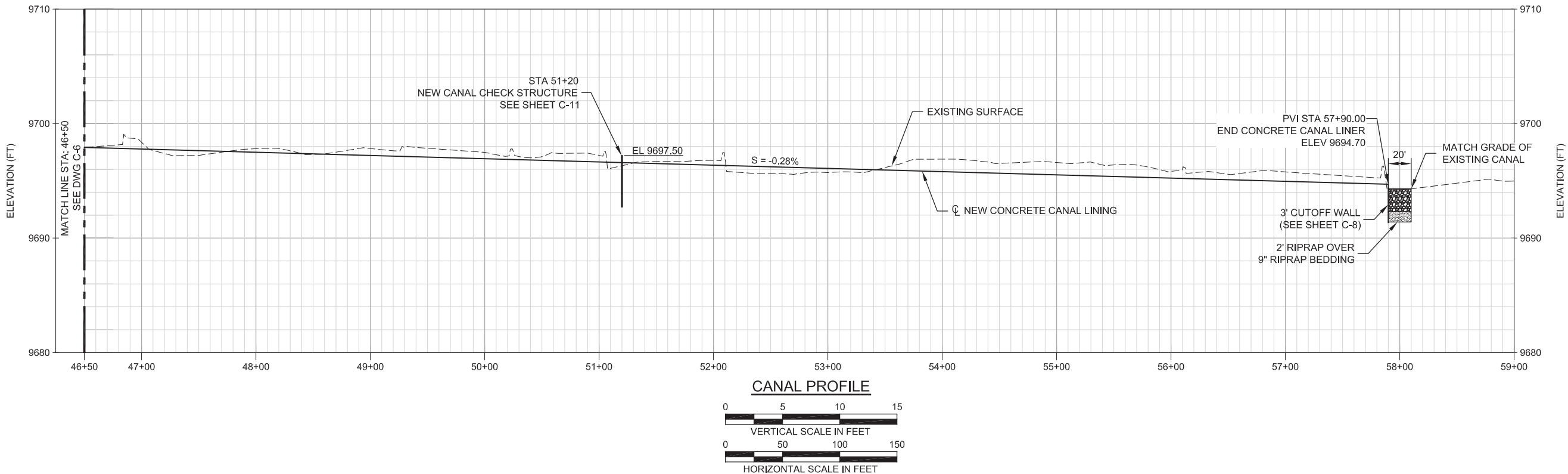
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URS



LINE TABLE				
LINE	BEGIN NORTHING	BEGIN EASTING	BEARING	LENGTH
L25	424994.62	533096.89	N62°17'13"E	96.83
L26	425056.58	533261.52	S86°30'15"E	45.69
L27	425058.94	533356.27	N74°31'55"E	48.79
L28	425125.30	533439.69	N5°55'11"W	64.22
L29	425290.78	533459.45	N35°02'37"E	21.52
L30	425325.89	533531.89	S67°29'16"E	198.85
L31	425247.44	533786.03	N71°14'36"E	41.56
L32	425267.22	533848.89	N78°13'36"E	208.76

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD
C24	51.77	500.00	5°55'56"	25.91	51.75
C25	81.71	150.00	31°12'33"	41.89	80.70
C26	49.65	150.00	18°57'51"	25.05	49.42
C27	70.21	50.00	80°27'06"	42.29	64.58
C28	107.24	150.00	40°57'48"	56.03	104.97
C29	67.60	50.00	77°28'07"	40.11	62.57
C30	72.03	100.00	41°16'08"	37.66	70.48
C31	24.38	200.00	6°59'01"	12.20	24.36



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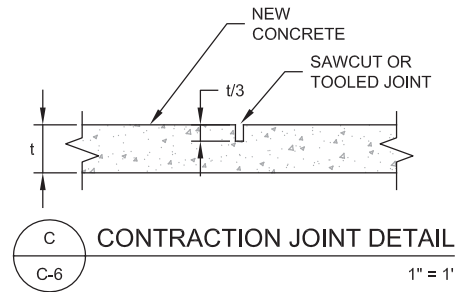
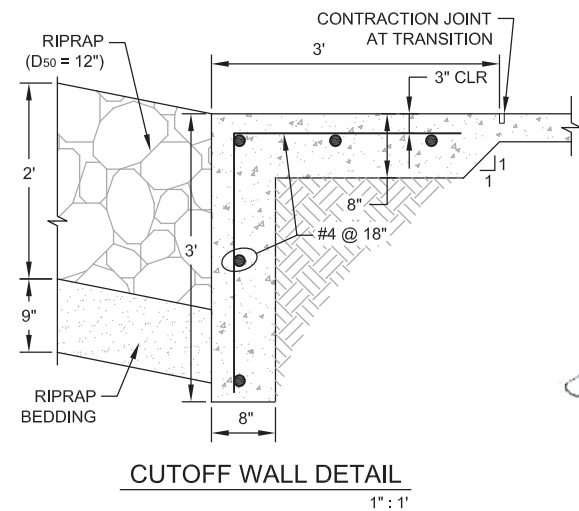
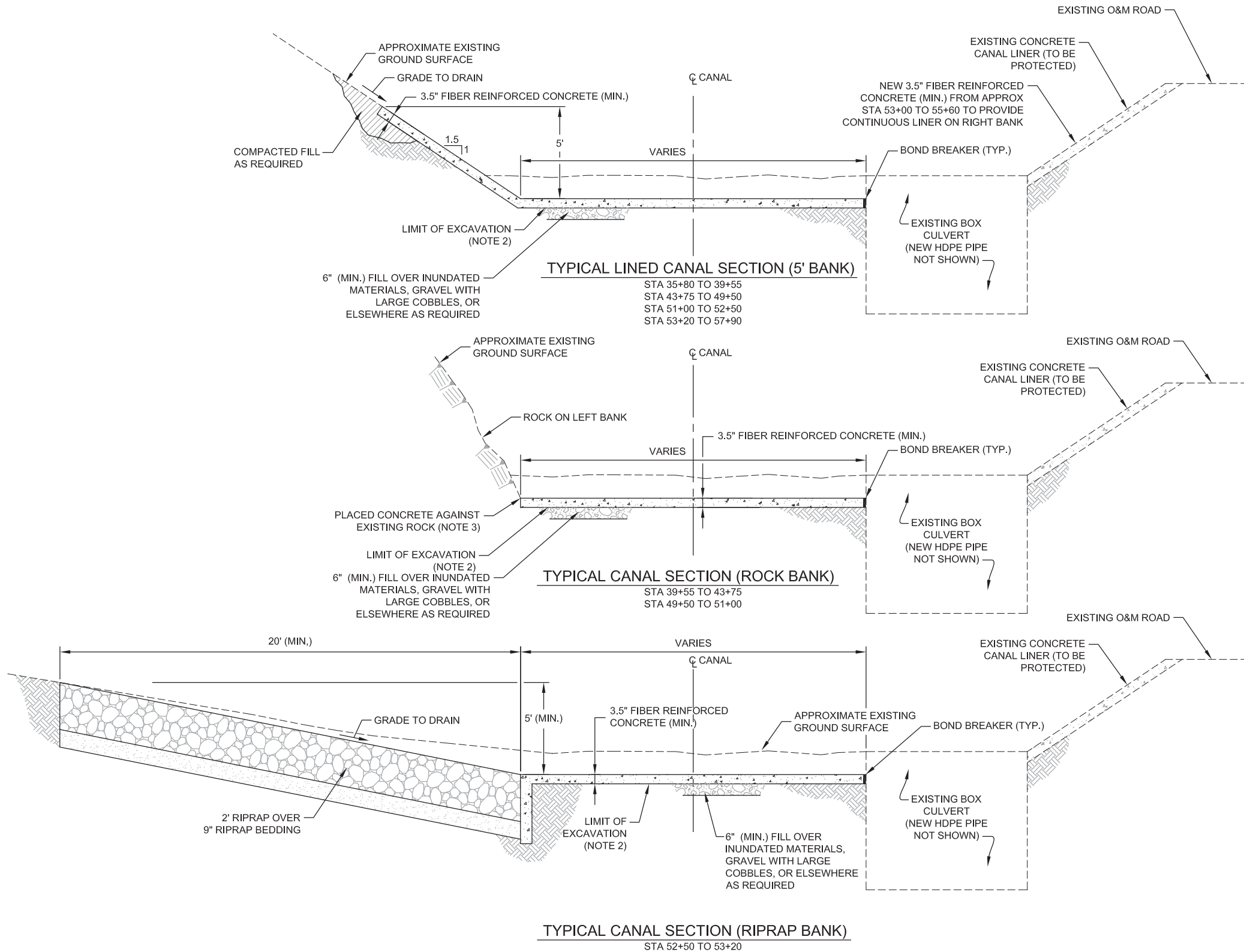
SHEET TITLE

CANAL LINER
PLAN & PROFILE
STA 46+50 TO 59+00

C-7

SHEET 8 OF 12

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- NOTES
- CONCRETE CANAL LINER CONTRACTION JOINTS TO BE CONSTRUCTED AT A MINIMUM LONGITUDINAL SPACING OF 10'.
 - CONCRETE CANAL LINER SUBGRADE SHALL NOT CONTAIN VEGETATION, ROOTS, AND OTHER DELETERIOUS MATERIAL.
 - REMOVE ROCK PROTRUSIONS AND ANY LOOSE MATERIAL AT THE DIRECTION OF THE ENGINEER.

URS
URS Center
8181 East Tufts Avenue
Denver, Co. 80237-2637
303 694-2770 (phone)
303-694-3946 (fax)

**SANTA MARIA
RESERVOIR
COMPANY**

SANTA MARIA CANAL
IMPROVEMENTS

FINAL DESIGN



ISSUED FOR BIDDING 5/18/12 JPD

ISSUED FOR CONSTRUCTION DATE BY

REVISIONS		
NO.	DESCRIPTION	DATE
△	ISSUED FOR BID	5/18/12
△		
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URS PROJECT NO: 22241248
DRAWN BY: PRH
DESIGNED BY:
CHECKED BY:
DATE CREATED: 4/27/2012
PLOT DATE:
SCALE: AS SHOWN
ACAD VER: 2012

SHEET TITLE

CANAL LINING DETAILS

C-8

SHEET 9 OF 12