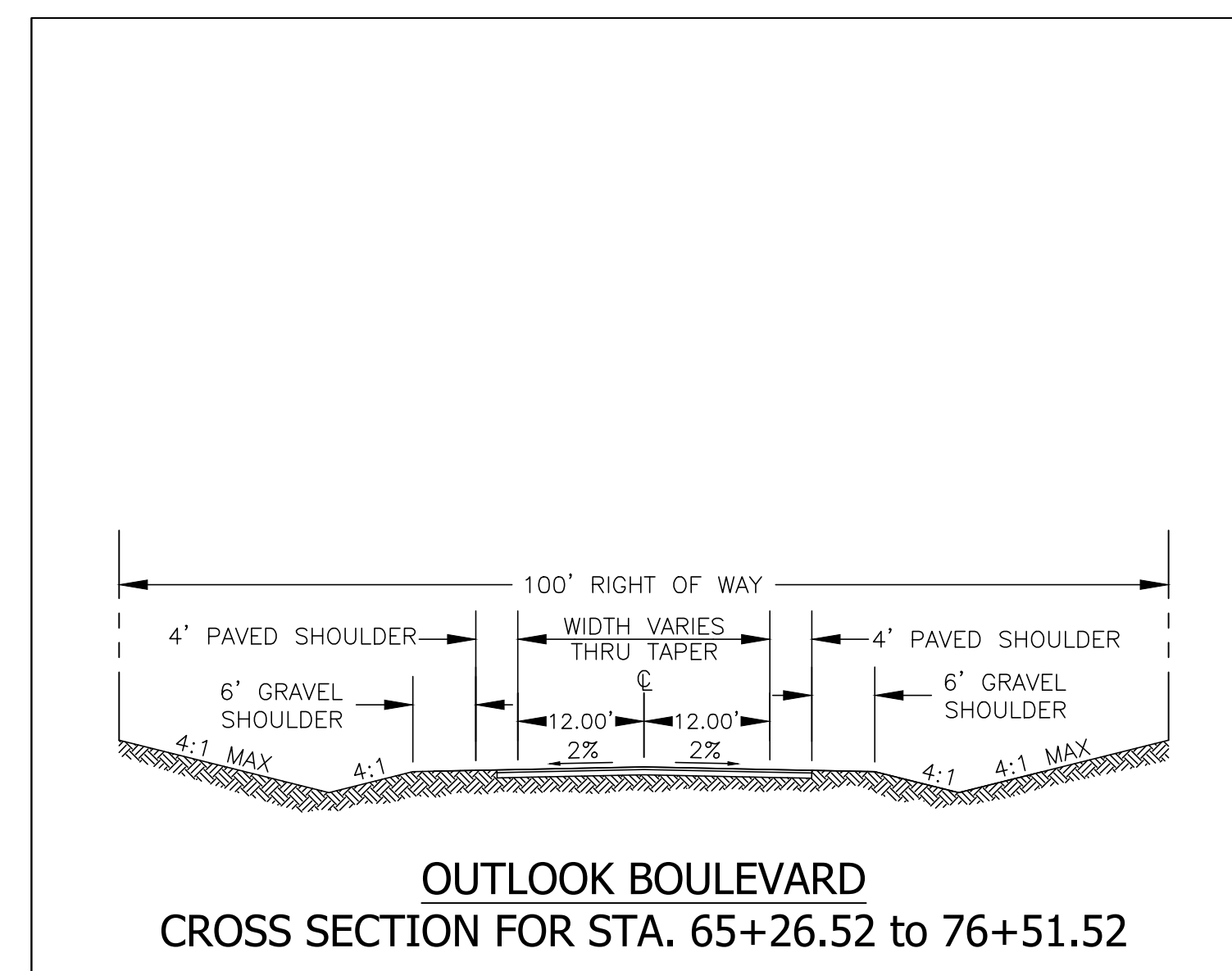
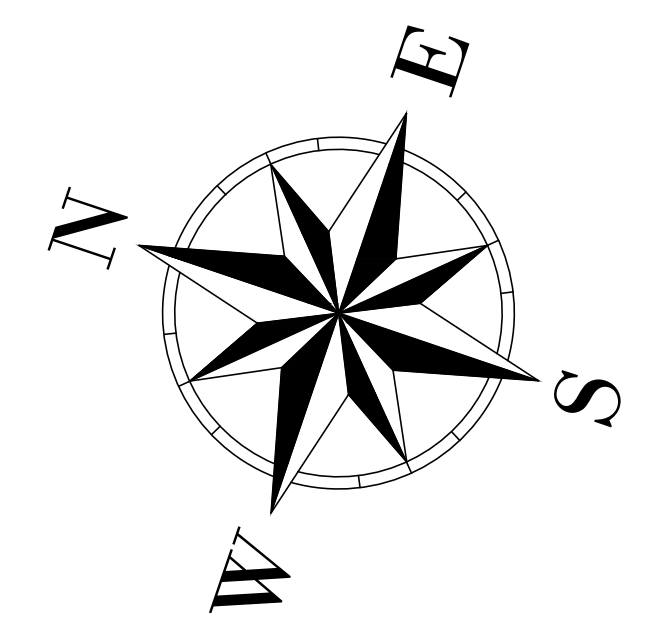
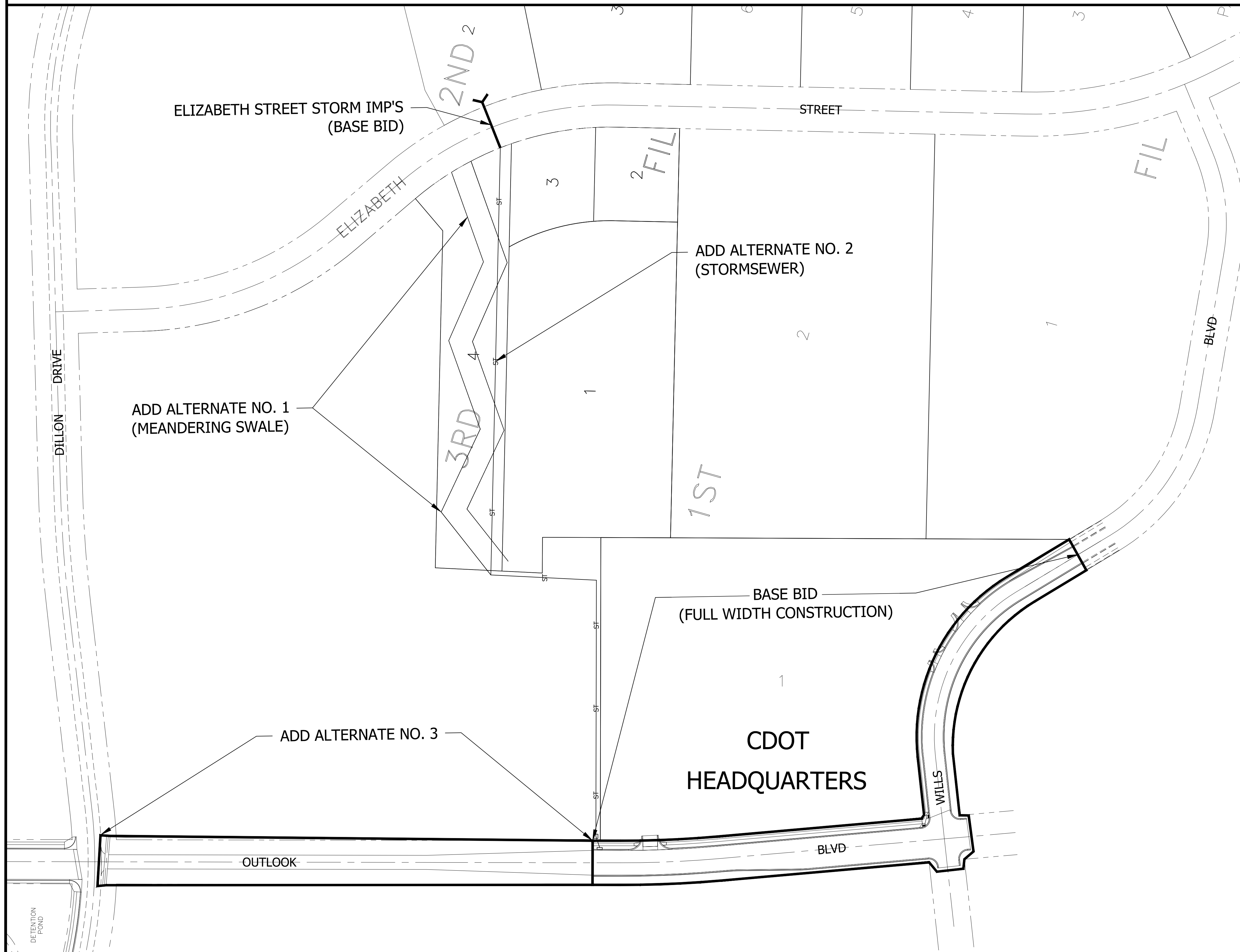
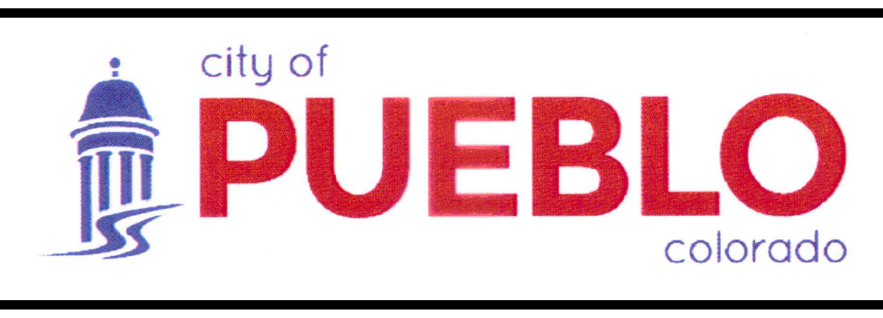
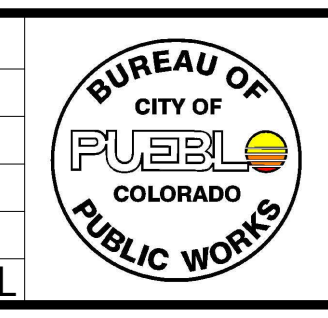


**PROJECT NO.: 17-005R (CI1703)**  
**OUTLOOK BLVD & WILLS BLVD STREET AND STORM SEWER CONSTRUCTION (RE-BID)**



- SHEET INDEX:**
1. COVER SHEET
  2. OUTLOOK BLVD STA. 57+26.52 TO 65+26.52
  3. OUTLOOK BLVD STA. 65+26.52 TO 76+51.52
  4. WILLS BLVD STA. 11+94.49 TO 19+84.02
  5. OUTLOOK BLVD STRIPING PLAN - SOUTH
  6. OUTLOOK BLVD STRIPING PLAN - NORTH
  7. WILLS BLVD STRIPING PLAN
  8. OUTLOOK BLVD STORM SEWER OUTFALL (STA. 1+00.00 TO STA. 9+18.85)
  9. OUTLOOK BLVD STORM SEWER OUTFALL (STA. 9+18.85 TO STA. 19+89)
  10. DETAIL SHEET
  11. EFFLUENT DRAINAGE DETAILS

NO.	REVISIONS	BY	DATE	APPROVAL



PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION  
 211 EAST "D" STREET PUEBLO, CO 81003  
 (719) 553-2295 PHONE  
 (719) 553-2294 FAX

SCALE (H): N.T.S.  
 SCALE (V): N/A  
 DRAWN BY: JM  
 DESIGNED BY: JM  
 CHECKED BY: SV  
 DATE: 04/04/17

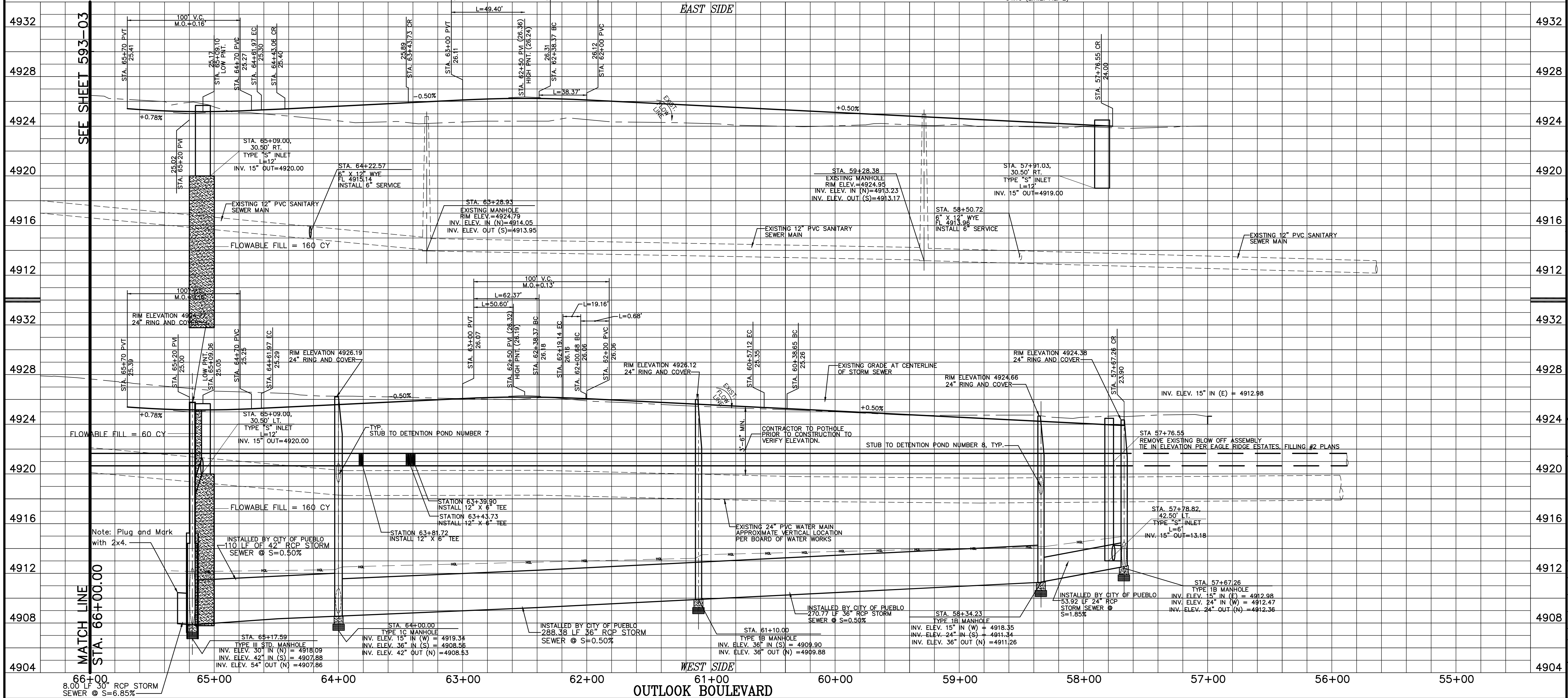
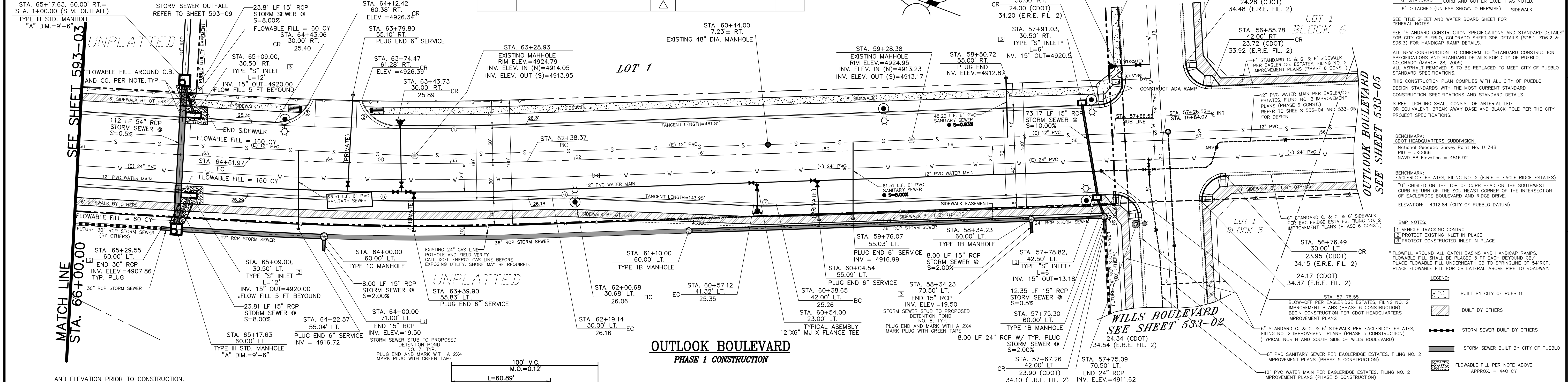
**PROJECT NUMBER 17-005R (CI1703)**  
**Outlook Blvd & Wills Blvd Street and Storm Sewer Construction (Re-Bid)**

DRAWING NO.  
 SHEET NO.  
**1 of 11**



R	2470.15'	30.00'	30.00'	2500.00'	2530.00'	250.00'	250.00'
D	02°24'52"	70°53'29"	70°40'17"	05°07'28"	05°07'28"	04°14'11"	04°14'11"
L	104.10'	48.99'	37.12'	223.60'	226.29'	18.48'	18.48'

REVISED BY	REVISION	DATE	MARK	REVIEWED BY	DATE
			△		
			△		



NOTE: STREET CROWN SLOPE @ 2.00%

THE DESIGN OF THIS SHEET IS INCOMPLETE UNLESS ACCOMPANIED BY THE TITLE SHEET.  
 PAYMENT DESIGN AS PER CITY ENGINEERS OFFICE REFER TO TITLE SHEET.  
 6" STANDARD CURB AND GUTTER EXCEPT AS NOTED.  
 6" DETACHED (UNLESS SHOWN OTHERWISE) SIDEWALK.  
 SEE TITLE SHEET AND WATER BOARD SHEET FOR GENERAL NOTES.  
 SEE "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO SHEET SDB-1, SDB-2 & SDB-3 FOR HANDICAP RAMP DETAILS.  
 ALL NEW CONSTRUCTION TO CONFORM TO "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO (MARCH 2005).  
 ALL ASPHALT REMOVED IS TO BE REPLACED TO MEET CITY OF PUEBLO STANDARD SPECIFICATIONS.  
 THIS CONSTRUCTION PLAN COMPLIES WITH ALL CITY OF PUEBLO DESIGN STANDARDS WITH THE MOST CURRENT STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.  
 STREET LIGHTING SHALL CONSIST OF ARTERIAL LED OR EQUIVALENT BREAK AWAY BASE AND BLACK POLE PER THE CITY PROJECT SPECIFICATIONS.

BENCHMARK: CDOT HEADQUARTERS SUBDIVISION  
 National Geodetic Survey Point No. U 348  
 PD = JK066  
 NAVD 88 Elevation = 4816.92

BENCHMARK: EAGLERIDGE ESTATES, PLING NO. 2 (E.R.E. - EAGLE RIDGE ESTATES)  
 1" CHISEL ON THE TOP OF CURB HEAD ON THE SOUTHWEST CORNER RETURN OF THE SOUTHEAST CORNER OF THE INTERSECTION OF EAGLERIDGE BOULEVARD AND RIDGE DRIVE.  
 ELEVATION: 4912.84 (CITY OF PUEBLO DATUM)

BMP NOTES:  
 1) VEHICLE TRACKING CONTROL  
 2) PROTECT EXISTING INLET IN PLACE  
 3) PROTECT CONSTRUCTED INLET IN PLACE

\* FLOWWALL AROUND ALL CATCH BASINS AND HANDICAP RAMPS.  
 FLOWWALL SHALL BE PLACED 3 FT EACH BEYOND 50' PLACE FLOWWALL UNDERNEATH CB TO SPRINGLINE OF 54" RCP. PLACE FLOWWALL UNDERNEATH CB TO SPRINGLINE OF 54" RCP. PLACE FLOWWALL UNDERNEATH CB TO SPRINGLINE OF 54" RCP.

LEGEND:  
 [Symbol] BUILT BY CITY OF PUEBLO  
 [Symbol] BUILT BY OTHERS  
 [Symbol] STORM SEWER BUILT BY OTHERS  
 [Symbol] STORM SEWER BUILT BY CITY OF PUEBLO  
 [Symbol] FLOWABLE FILL PER NOTE ABOVE APPROX. = 440 CY

REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS FOR WATER WORKS STANDARDS

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS

GENERAL: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SANITARY SEWER: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DRAINAGE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 TRANSPORTATION: \_\_\_\_\_ DATE: \_\_\_\_\_

PROJECT NAME: CDOT HEADQUARTERS SUBDIVISION

SHEET TITLE: OUTLOOK BOULEVARD (STA. 57+66.53 TO STA 66+00.00)

PREPARED UNDER THE DIRECT SUPERVISION OF KIM KLAYTON ROCK, P.E., COLORADO REGISTRATION NO. 19799

HOR. SCALE: 1"=40'  
 VERT. SCALE: 1"=4'

DATE: 11-03-16  
 DESIGN BY: JCS/MLC  
 DRAWN BY: DJA

CHECKED BY: KK  
 FILE: 593-02.DWG

JOB NO. 1502801

593 SHEET 2 OF 11



①	②	③	④
R	250.00'	22.33'	250.00'
D	04'14"11"	60'7"4"	04'14"11"
L	18.48'	23.43'	30.34'

- BMP NOTES:**
- 1 VEHICLE TRACKING CONTROL
  - 2 PROTECT EXISTING INLET IN PLACE
  - 3 PROTECT CONSTRUCTED INLET IN PLACE

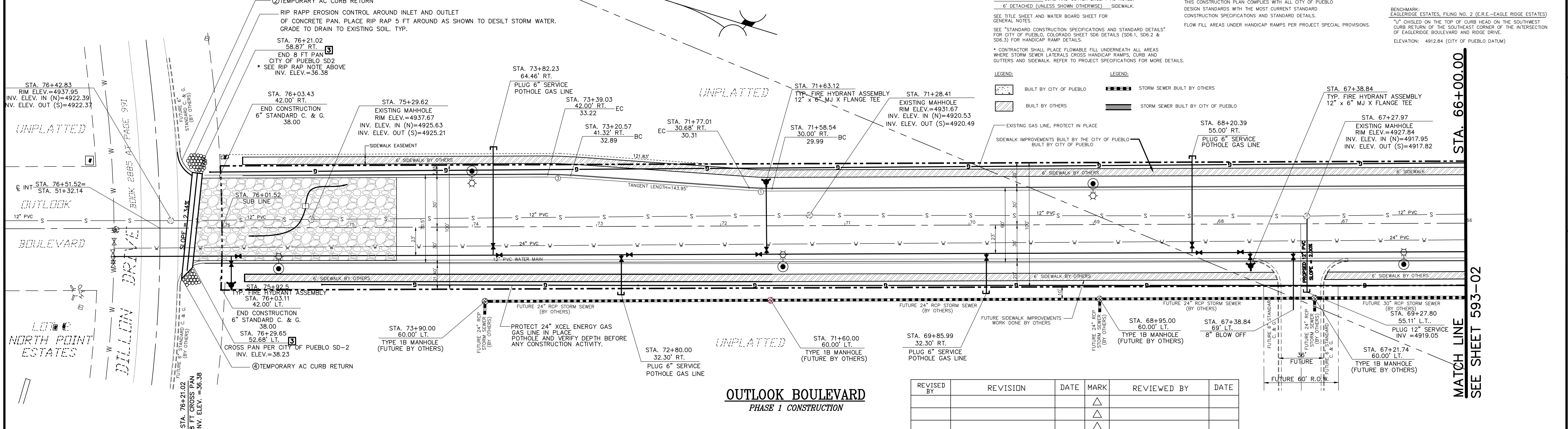
**NOTE: STREET CROWN SLOPE @ 2.00%**

NOTE: THE DESIGN OF THIS SHEET IS INCOMPLETE UNLESS ACCOMPANIED BY THE "TITLE SHEET".  
PAVEMENT DESIGN AS PER CITY ENGINEERS OFFICE REFER TO TITLE SHEET.  
6" STANDARD CURB AND GUTTER EXCEPT AS NOTED.  
6" DETACHED (UNLESS SHOWN OTHERWISE) SIDEWALK.  
SEE TITLE SHEET AND WATER BOARD SHEET FOR GENERAL NOTES.  
SEE "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO SHEET 306 DETAILS (SD6.1, SD6.2 & SD6.3) FOR HANDICAP RAMP DETAILS.  
CONTRACTOR SHALL PLACE FLOWABLE FILL UNDERNEATH ALL AREAS WHERE STORM SEWER LATERALS CROSS HANDICAP RAMPS, CURB AND GUTTERS AND SIDEWALK. REFER TO PROJECT SPECIFICATIONS FOR MORE DETAILS.

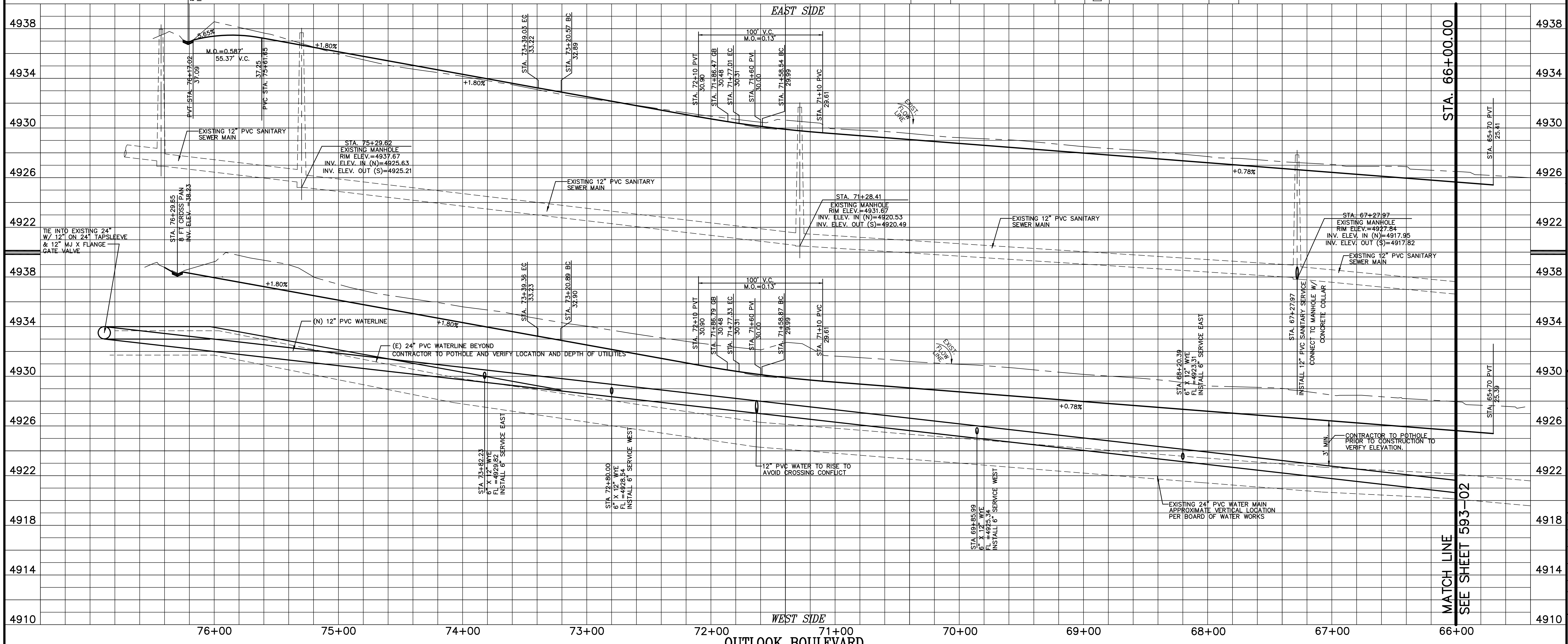
ALL NEW CONSTRUCTION TO CONFORM TO "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO (MARCH 28, 2005).  
ALL ASPHALT REMOVED IS TO BE REPLACED TO MEET CITY OF PUEBLO STANDARD SPECIFICATIONS.  
THIS CONSTRUCTION PLAN COMPLIES WITH ALL CITY OF PUEBLO DESIGN STANDARDS WITH THE MOST CURRENT STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.  
FLOW FILL AREAS UNDER HANDICAP RAMPS PER PROJECT SPECIAL PROVISIONS.

**BENCHMARK:**  
CDOT HEADQUARTERS SUBDIVISION  
National Geodetic Survey Point No. U 348  
PID - 40066  
NAVD 88 Elevation = 4816.92

**BENCHMARK:**  
EAGLE RIDGE ESTATES, FILING NO. 2 (E.R.E.-EAGLE RIDGE ESTATES)  
"U" CHECKED ON THE TOP OF CURB HEAD ON THE SOUTHWEST CORNER RETURN OF THE SOUTHEAST CORNER OF THE INTERSECTION OF EAGLE RIDGE BOULEVARD AND RISE DRIVE.  
ELEVATION: 4912.84 (CITY OF PUEBLO DATUM)



REVISED BY	REVISION	DATE	MARK	REVIEWED BY	DATE
			△		
			△		
			△		



REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS FOR WATER WORKS STANDARDS

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

GENERAL: \_\_\_\_\_ DATE: \_\_\_\_\_

SANITARY SEWER: \_\_\_\_\_ DATE: \_\_\_\_\_

DRAINAGE: \_\_\_\_\_ DATE: \_\_\_\_\_

TRANSPORTATION: \_\_\_\_\_ DATE: \_\_\_\_\_

PROJECT NAME: CDOT HEADQUARTERS SUBDIVISION

SHEET TITLE: OUTLOOK BOULEVARD (STA. 66+00.00 TO STA 76+01.52)

PREPARED UNDER THE DIRECT SUPERVISION OF KIM JOYCE ROCK, P.E., COLORADO REGISTRATION NO. 19799.

HOR. SCALE: 1"=40'  
VERT. SCALE: 1"=4'

DATE: 11-03-16  
DESIGN BY: JCS/MLC  
DRAWN BY: DJA

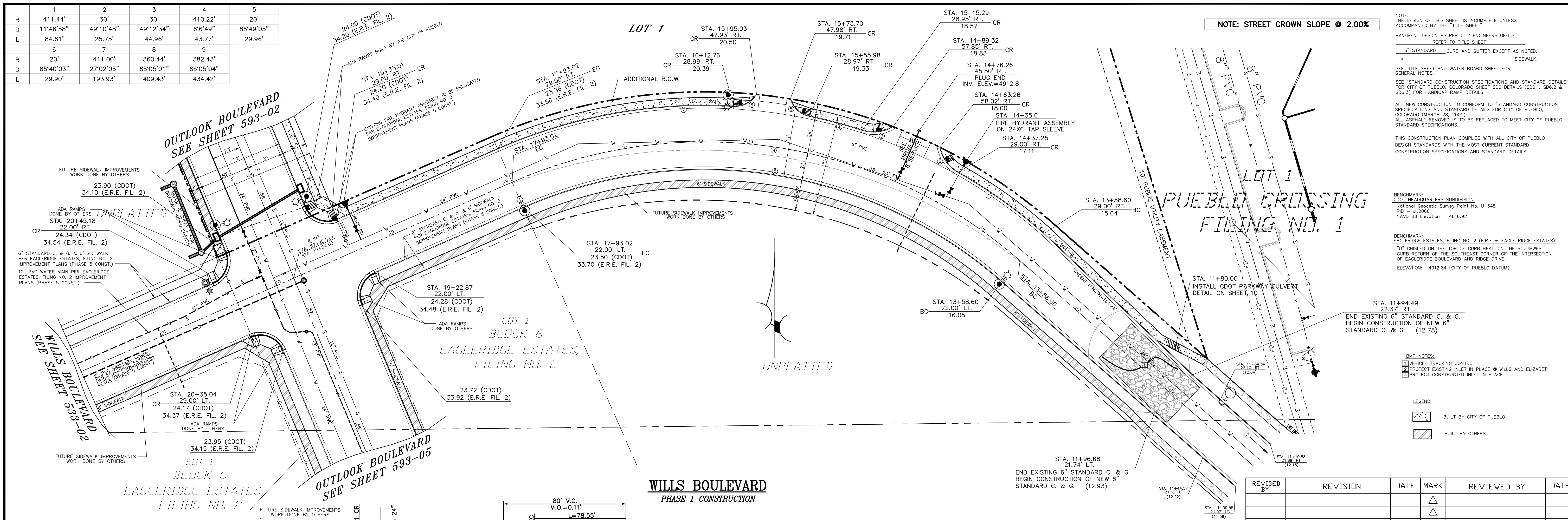
CHECKED BY: KK  
FILE: 593-03.DWG

JOB NO. 1502801

**593**  
SHEET 3 OF 11



R	411.44"	30'	30'	410.22"	20'
D	11'46.58"	49'10.48"	49'12.34"	6'6.49"	85'49.05"
L	84.61'	25.75'	44.96'	43.77'	29.96'
R	20'	7'	8'	9'	
D	85'40.03"	27'02.05"	65'05.01"	65'05.04"	
L	29.90'	193.93'	409.43'	434.42'	



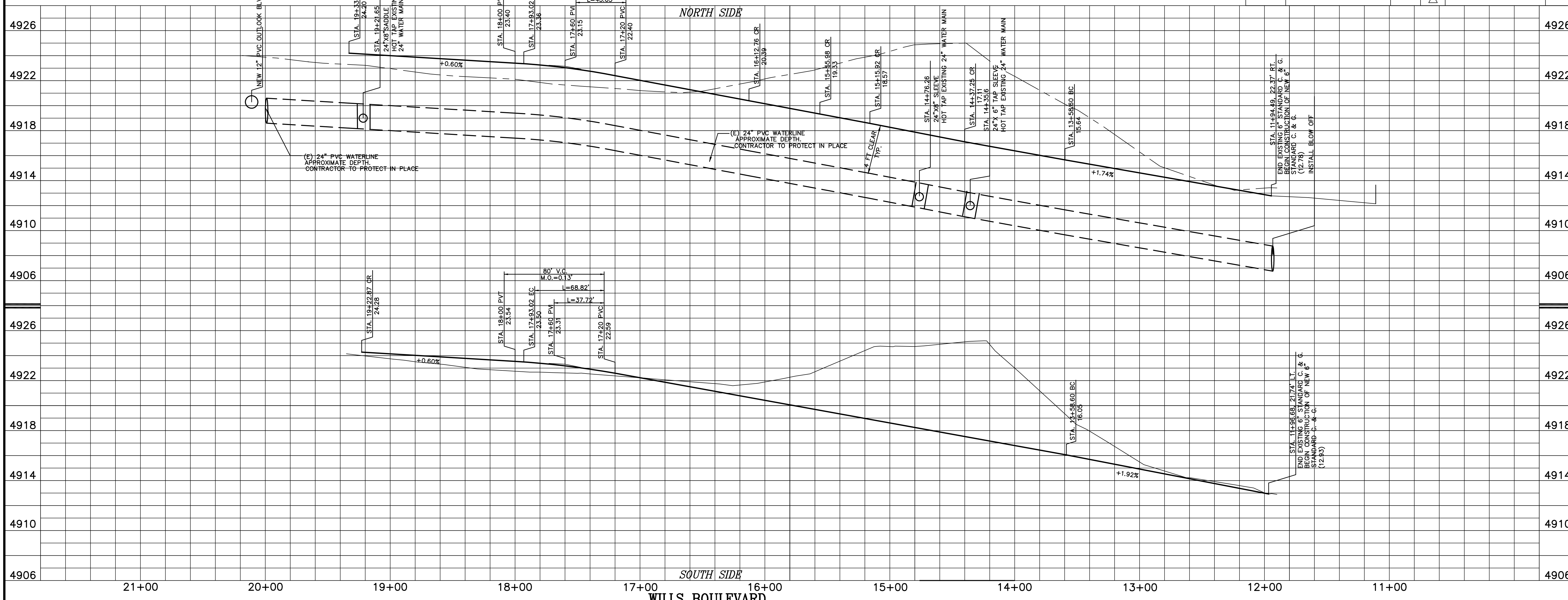
NOTE: STREET CROWN SLOPE @ 2.00%

NOTE: THE DESIGN OF THIS SHEET IS INCOMPLETE UNLESS ACCOMPANIED BY THE "TITLE SHEET".  
 PAVEMENT DESIGN AS PER CITY ENGINEERS OFFICE REFER TO TITLE SHEET.  
 6" STANDARD CURB AND GUTTER EXCEPT AS NOTED.  
 6" SIDEWALK.  
 SEE TITLE SHEET AND WATER BOARD SHEET FOR GENERAL NOTES.  
 SEE "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO SHEET SD6 DETAILS (SD6.1, SD6.2 & SD6.3) FOR HANDICAP RAMP DETAILS.  
 ALL NEW CONSTRUCTION TO CONFORM TO "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO (MARCH 28, 2005).  
 ALL ASPHALT REMOVED IS TO BE REPLACED TO MEET CITY OF PUEBLO STANDARD SPECIFICATIONS.  
 THIS CONSTRUCTION PLAN COMPLIES WITH ALL CITY OF PUEBLO DESIGN STANDARDS WITH THE MOST CURRENT STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.  
 BENCHMARK: CDOT HEADQUARTERS SUBDIVISION National Geodetic Survey Point No. U 348 PD - 40006 NAVD 88 Elevation = 4816.92  
 BENCHMARK: EAGLERIDGE ESTATES, FILE NO. 2 (E.R.E. = EAGLE RIDGE ESTATES) "Y" CHISEL ON THE TOP OF CURB HEAD ON THE SOUTHWEST CURB RETURN OF THE SOUTHEAST CORNER OF THE INTERSECTION OF EAGLERIDGE BOULEVARD AND RIDGE DRIVE. ELEVATION: 4912.84 (CITY OF PUEBLO DATUM)

BMP NOTES:  
 1. VEHICLE TRACKING CONTROL  
 2. PROTECT EXISTING INLET IN PLACE @ WILLS AND ELIZABETH  
 3. PROTECT CONSTRUCTED INLET IN PLACE

LEGEND:  
 [Symbol] BUILT BY CITY OF PUEBLO  
 [Symbol] BUILT BY OTHERS

REVISED BY	REVISION	DATE	MARK	REVIEWED BY	DATE
			△		
			△		
			△		

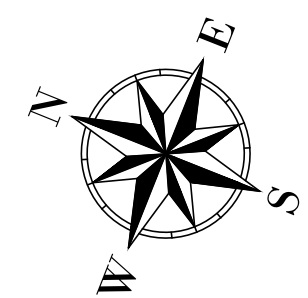


REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS FOR WATER WORKS STANDARDS  
 BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 GENERAL DATE: \_\_\_\_\_ SANITARY SEWER DATE: \_\_\_\_\_  
 DRAINAGE DATE: \_\_\_\_\_ TRANSPORTATION DATE: \_\_\_\_\_

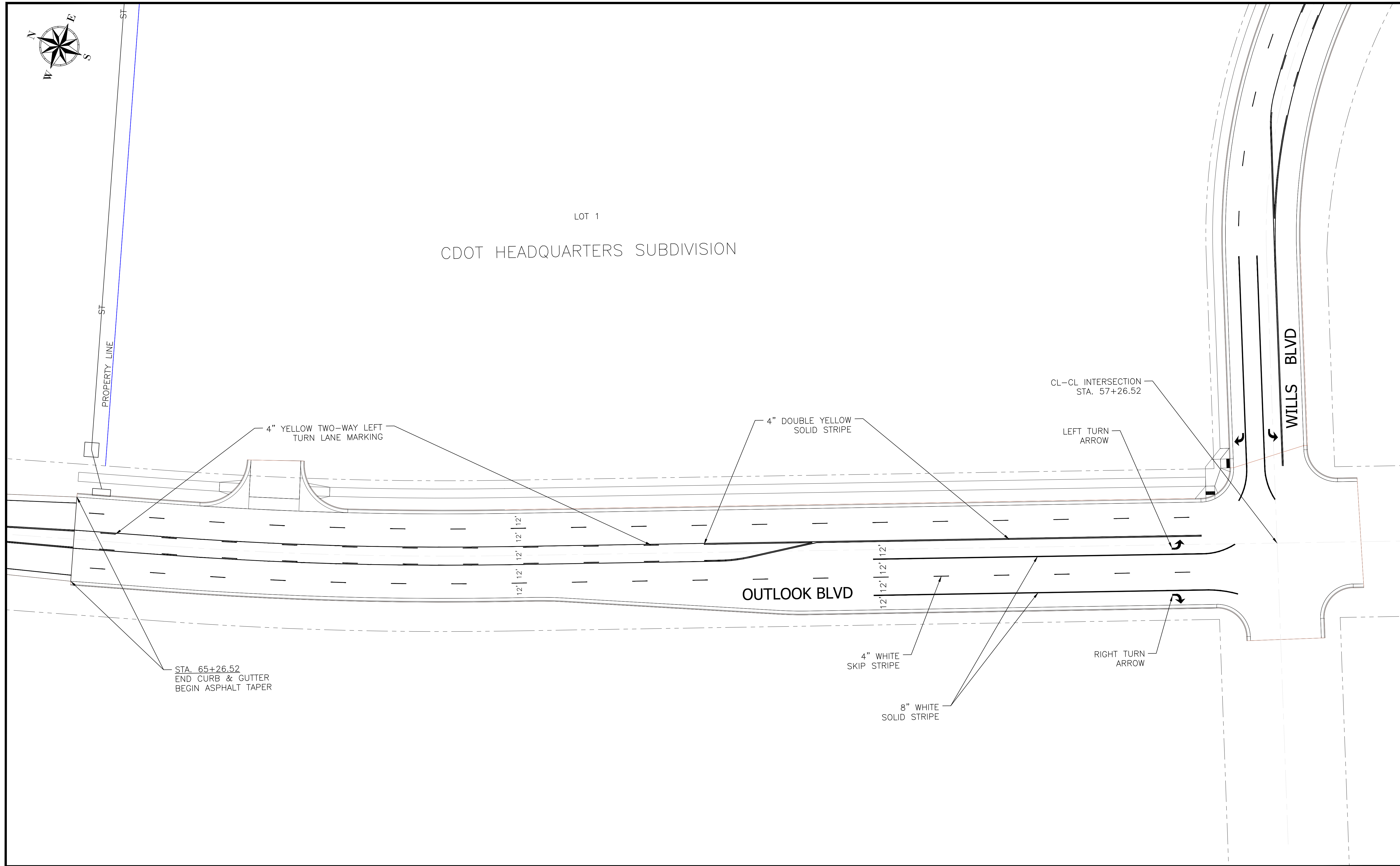
CDOT HEADQUARTERS SUBDIVISION  
 PROJECT NAME: WILLS BOULEVARD  
 SHEET TITLE: (STA. 11+94.00 TO STA 19+84.02)

**NORTHSTAR**  
 ENGINEERING AND SURVEYING, INC.  
 1111 E. 8TH ST., PUEBLO, CO 81002  
 TELEPHONE: 719.244.8888  
 FAX: 719.244.8888

PREPARED UNDER THE DIRECT SUPERVISION OF KIM KLAYTON ROCK, P.E., COLORADO REGISTRATION NO. 19799.  
 HOR. SCALE: 1"=40'  
 VERT. SCALE: 1"=4'  
 DATE: 11-3-16  
 DESIGN BY: JCS/MLC  
 DRAWN BY: DJA  
 CHECKED BY: KK  
 FILE: 593-04.DWG  
 JOB NO. 1502801  
**593**  
 SHEET 4 OF 11



LOT 1  
 CDOT HEADQUARTERS SUBDIVISION



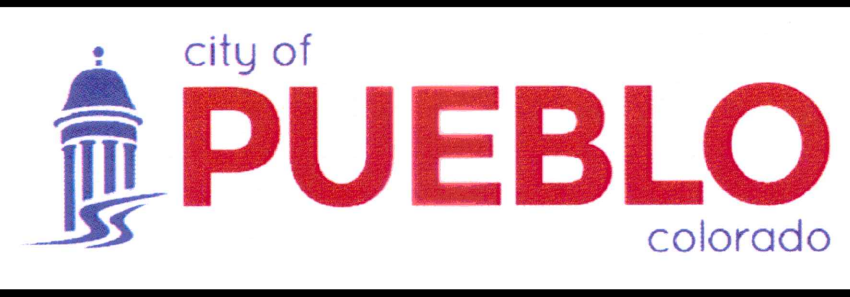
STA. 65+26.52  
 END CURB & GUTTER  
 BEGIN ASPHALT TAPER

CL-CL INTERSECTION  
 STA. 57+26.52

OUTLOOK BLVD

WILLS BLVD

NO.	REVISIONS	BY	DATE	APPROVAL



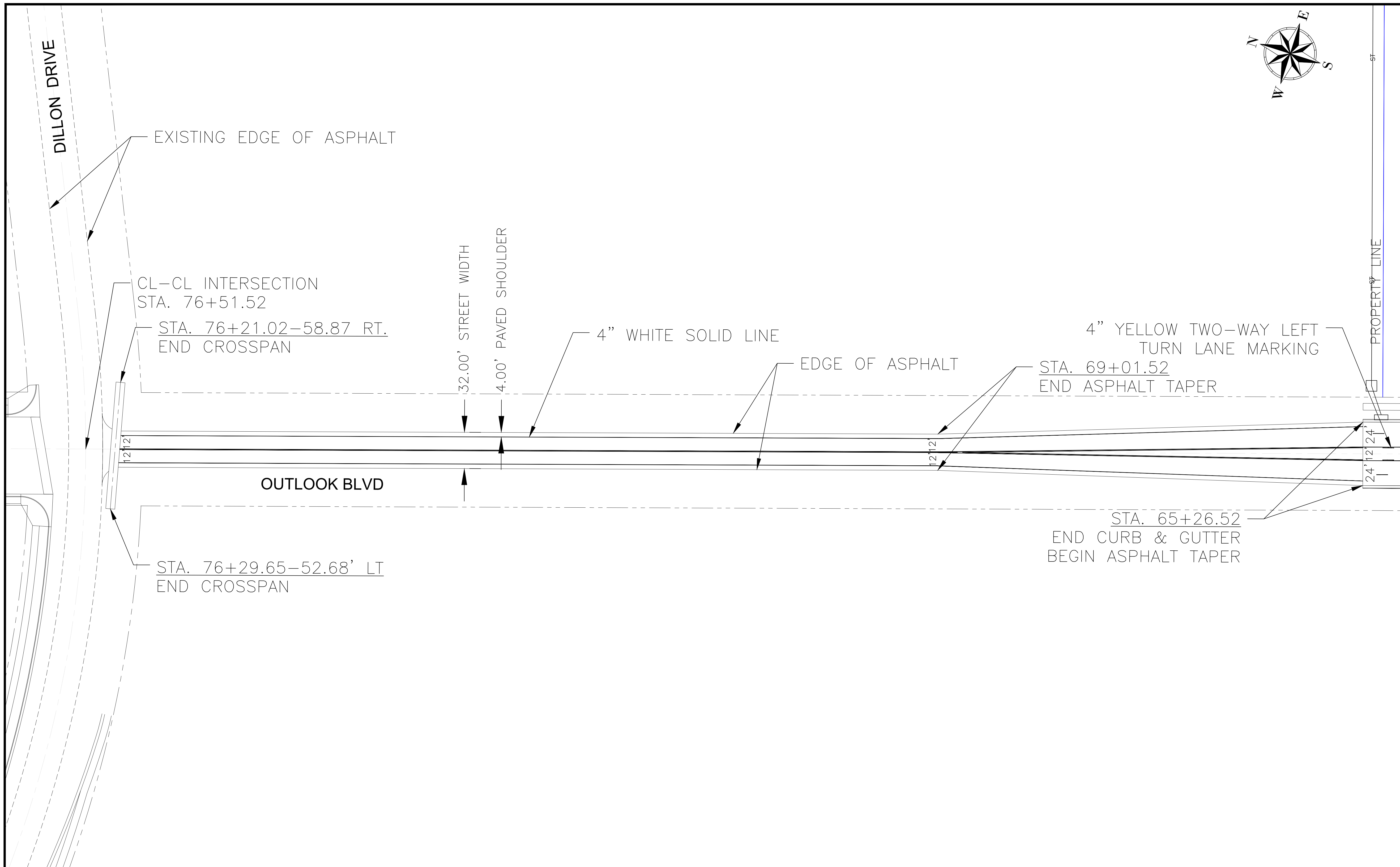
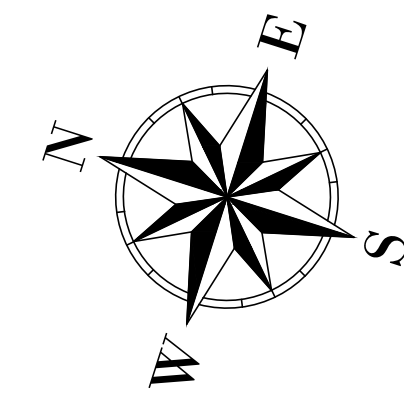
PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION  
 211 EAST "D" STREET PUEBLO, CO 81003  
 (719) 553-2295 PHONE  
 (719) 553-2294 FAX

SCALE (H): 1"=30'  
 SCALE (V): N/A  
 DRAWN BY: JM  
 DESIGNED BY: JM  
 CHECKED BY: SV  
 DATE: 04/04/17

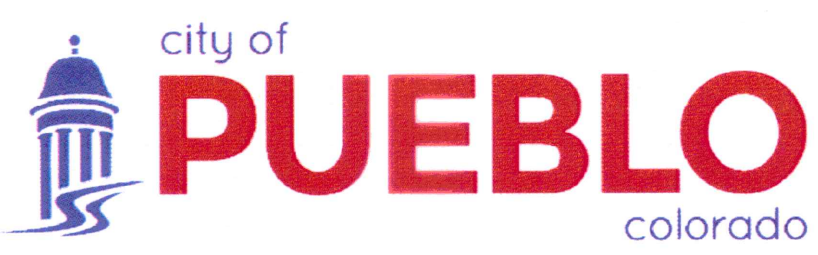
PROJECT NUMBER 17-005R (CI1703)  
 Outlook Blvd & Wills Blvd Street and Storm  
 Sewer Construction (Re-Bid)

DRAWING NO.  
 SHEET NO.  
 5 of 11





NO.	REVISIONS	BY	DATE	APPROVAL

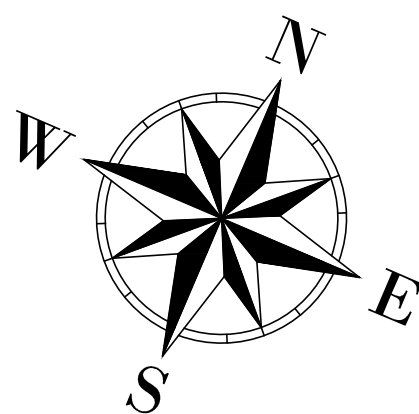
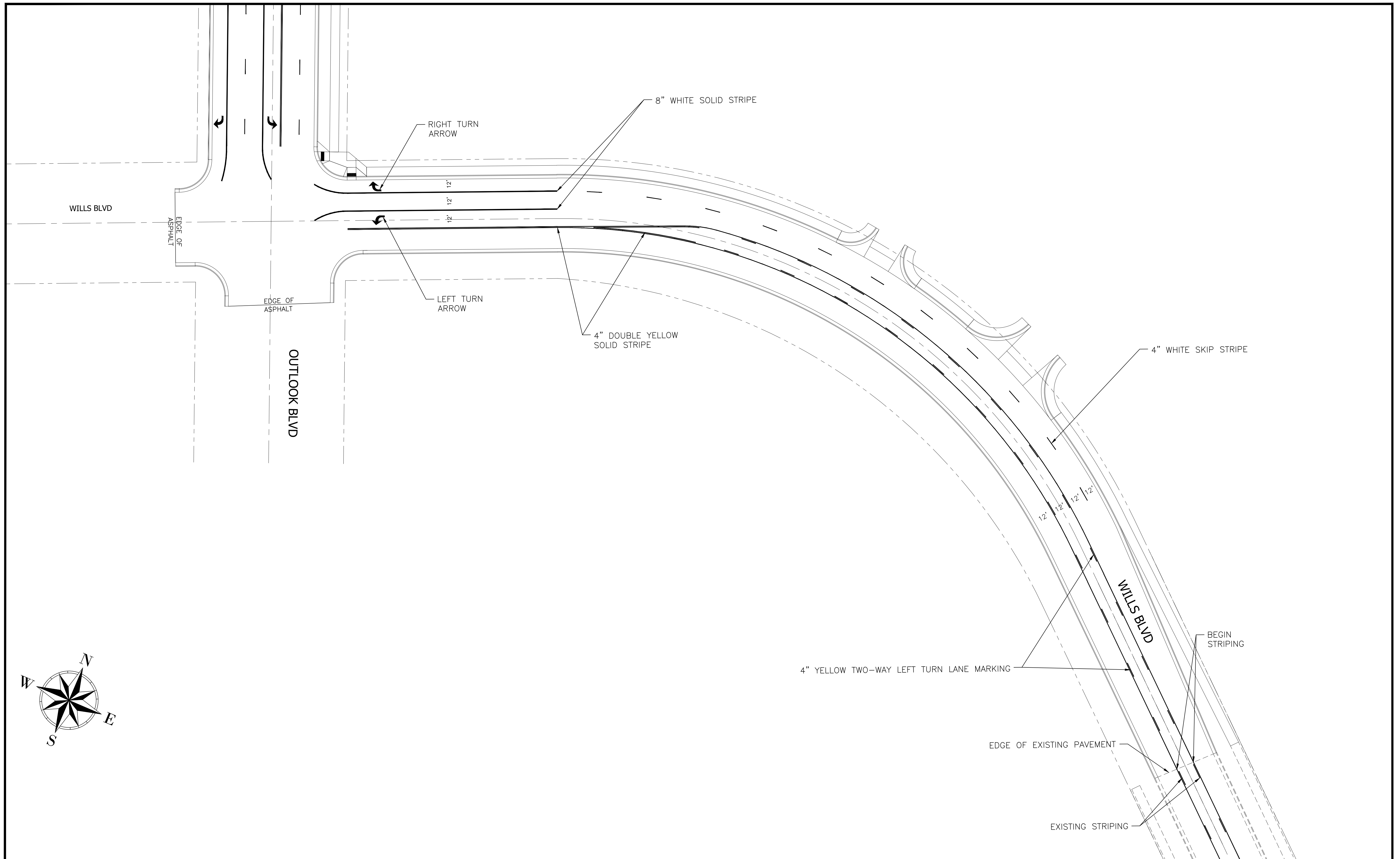


PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION  
 211 EAST "D" STREET PUEBLO, CO 81003  
 (719) 553-2295 PHONE  
 (719) 553-2294 FAX

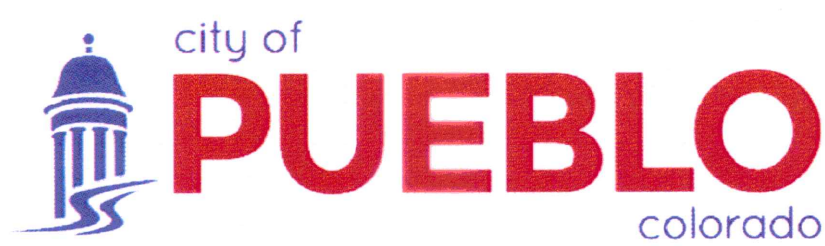
SCALE (H): 1"=40'  
 SCALE (V): N/A  
 DRAWN BY: JM  
 DESIGNED BY: JM  
 CHECKED BY: SV  
 DATE: 04/03/17

PROJECT NUMBER 17-005R (CI1703)  
 Outlook Blvd & Wills Blvd Street and Storm  
 Sewer Construction (Re-Bid)

DRAWING NO.  
 SHEET NO.  
 6 of 11



NO.	REVISIONS	BY	DATE	APPROVAL



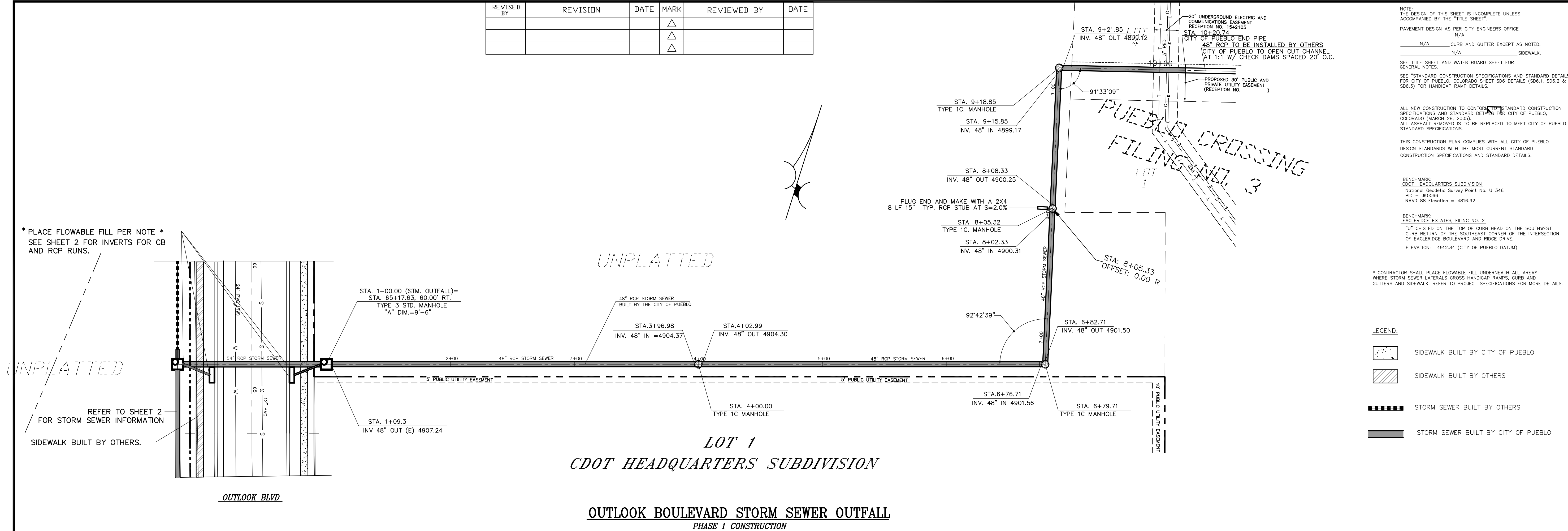
PUBLIC WORKS DEPARTMENT  
 ENGINEERING DIVISION  
 211 EAST "D" STREET PUEBLO, CO 81003  
 (719) 553-2295 PHONE  
 (719) 553-2294 FAX

SCALE (H): 1"=30'  
 SCALE (V): N/A  
 DRAWN BY: JM  
 DESIGNED BY: JM  
 CHECKED BY: SV  
 DATE: 04/04/17

PROJECT NUMBER 17-005R (CI1703)  
 Outlook Blvd & Wills Blvd Street and Storm  
 Sewer Construction (Re-Bid)

DRAWING NO.  
 SHEET NO.  
 7 of 11

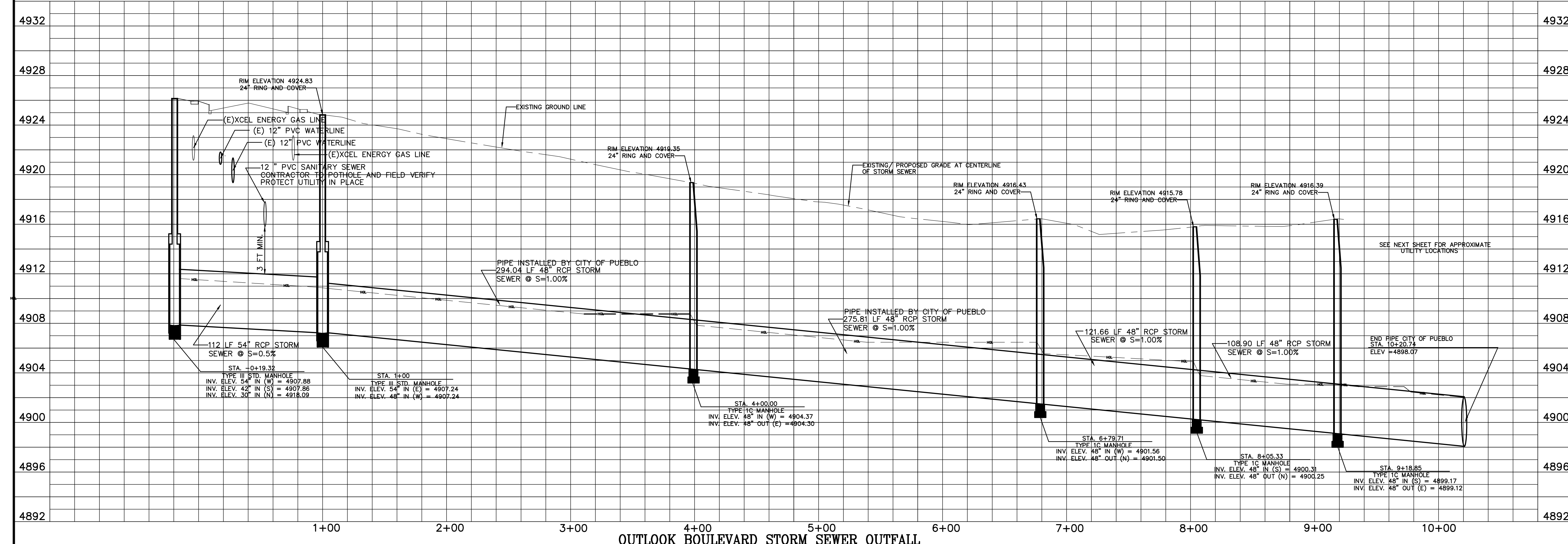
REVISED BY	REVISION	DATE	MARK	REVIEWED BY	DATE
			△		
			△		
			△		



NOTE: THE DESIGN OF THIS SHEET IS INCOMPLETE UNLESS ACCOMPANIED BY THE "TITLE SHEET".  
 PAVEMENT DESIGN AS PER CITY ENGINEERS OFFICE  
 N/A  
 N/A CURB AND GUTTER EXCEPT AS NOTED.  
 N/A SIDEWALK.  
 SEE TITLE SHEET AND WATER BOARD SHEET FOR GENERAL NOTES.  
 SEE "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO SHEET SD6 (SD6.1, SD6.2 & SD6.3) FOR HANDICAP RAMP DETAILS.  
 ALL NEW CONSTRUCTION TO CONFORM TO STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS FOR CITY OF PUEBLO, COLORADO (MARCH 28, 2005).  
 ALL ASPHALT REMOVED IS TO BE REPLACED TO MEET CITY OF PUEBLO STANDARD SPECIFICATIONS.  
 THIS CONSTRUCTION PLAN COMPLIES WITH ALL CITY OF PUEBLO DESIGN STANDARDS WITH THE MOST CURRENT STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.  
 BENCHMARK: CDOT HEADQUARTERS SUBDIVISION  
 National Geodetic Survey Point No. U 348  
 PID = JK0066  
 NAVD 88 Elevation = 4816.92  
 BENCHMARK: EAGLERIDGE ESTATES, FILING NO. 2  
 "F" CHISEL ON THE TOP OF CURB HEAD ON THE SOUTHWEST CURB RETURN OF THE SOUTHEAST CORNER OF THE INTERSECTION OF EAGLERIDGE BOULEVARD AND RIDGE DRIVE.  
 ELEVATION: 4912.84 (CITY OF PUEBLO DATUM)  
 \* CONTRACTOR SHALL PLACE FLOWABLE FILL UNDERNEATH ALL AREAS WHERE STORM SEWER LATERALS CROSS HANDICAP RAMPS, CURB AND GUTTERS AND SIDEWALK. REFER TO PROJECT SPECIFICATIONS FOR MORE DETAILS.

REVIEWED FOR GENERAL COMPLIANCE WITH BOARD OF WATER WORKS STANDARDS	BY: _____	DATE: _____
REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS	GENERAL: _____	DATE: _____
	SANITARY SEWER: _____	DATE: _____
	DRAINAGE: _____	DATE: _____
	TRANSPORTATION: _____	DATE: _____
	DME: _____	DATE: _____

NOTE TO CONTRACTOR:  
 CONTRACTOR TO POTHOLE AND FIELD VERIFY ALL UTILITIES.  
 PROTECT UTILITY IN PLACE. ALL DEPTH SHOWN ARE APPROXIMATE PER UTILITY COMPANY STANDARDS.



PROJECT NAME	CDOT HEADQUARTERS SUBDIVISION
SHEET TITLE	OUTLOOK BOULEVARD STORM SEWER OUTFALL (STA. 1+00.00 TO STA. 9+18.85)
 NORTH STAR ENGINEERING AND SURVEYING, INC. 111 E. 8TH ST., DENVER, CO. 80202 TELEPHONE (773) 944-8888 FAX (773) 944-8888	
PREPARED UNDER THE DIRECT SUPERVISION OF KIM KLAYTON KOCK, P.E., COLORADO REGISTRATION NO. 19793.	
HOR. SCALE:	1" = 40'
VERT. SCALE:	1" = 4'
DATE:	11-03-16
DESIGN BY:	SMC
DRAWN BY:	SMC
CHECKED BY:	KK
FILE:	593-08.DWG
JOB NO.:	1502801
<b>593</b> SHEET 8 OF 11	



- LEGEND:**
- STORM SEWER BUILT BY OTHERS
  - STORM SEWER BUILT BY CITY OF PUEBLO
  - STORM SEWER (BID ALTERNATE)

REVISED BY	REVISION	DATE	MARK	REVIEWED BY	DATE
			△		
			△		

NOTE: THE DESIGN OF THIS SHEET IS INCOMPLETE UNLESS ACCOMPANIED BY THE "TITLE SHEET".  
 PAVEMENT DESIGN AS PER CITY ENGINEERS OFFICE N/A  
 CURB AND GUTTER EXCEPT AS NOTED. N/A  
 SIDEWALK. N/A

SEE TITLE SHEET AND WATER BOARD SHEET FOR GENERAL NOTES.

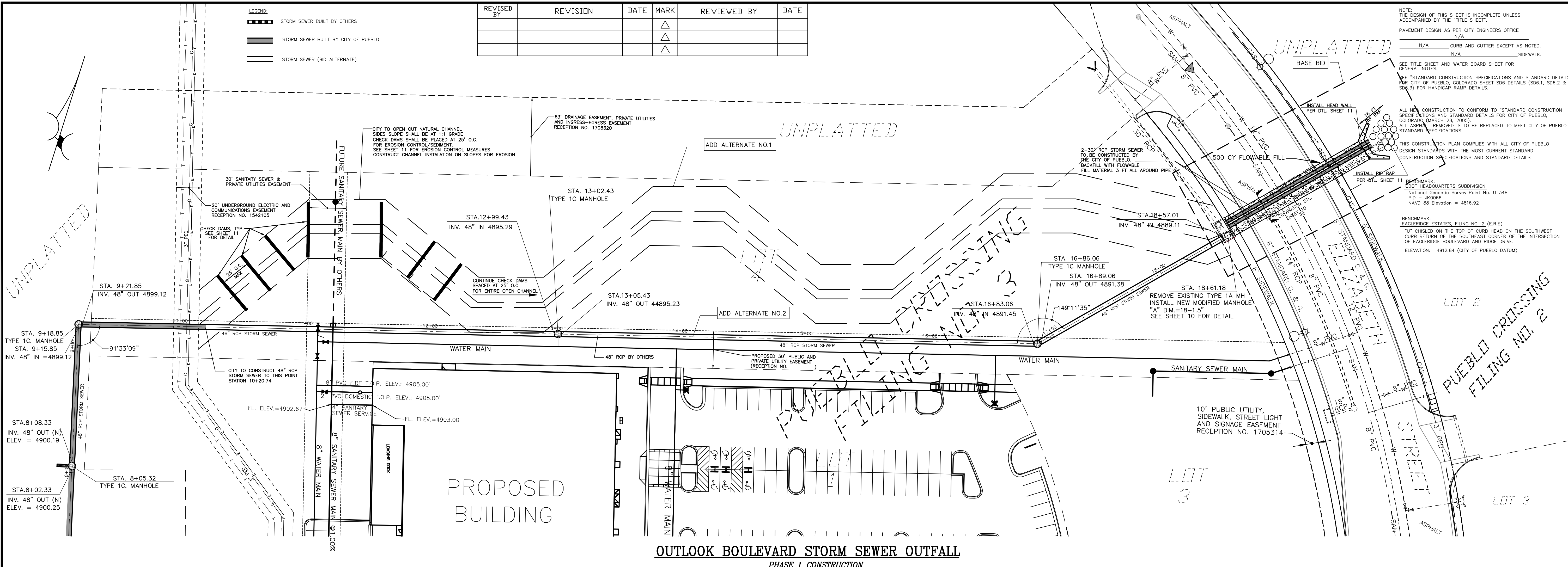
SEE "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO SHEET SD6 DETAILS (SD6.1, SD6.2 & SD6.3) FOR HANDICAP RAMP DETAILS.

ALL NEW CONSTRUCTION TO CONFORM TO "STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS" FOR CITY OF PUEBLO, COLORADO (MARCH 28, 2005).  
 ALL ASPHALT REMOVED IS TO BE REPLACED TO MEET CITY OF PUEBLO STANDARD SPECIFICATIONS.

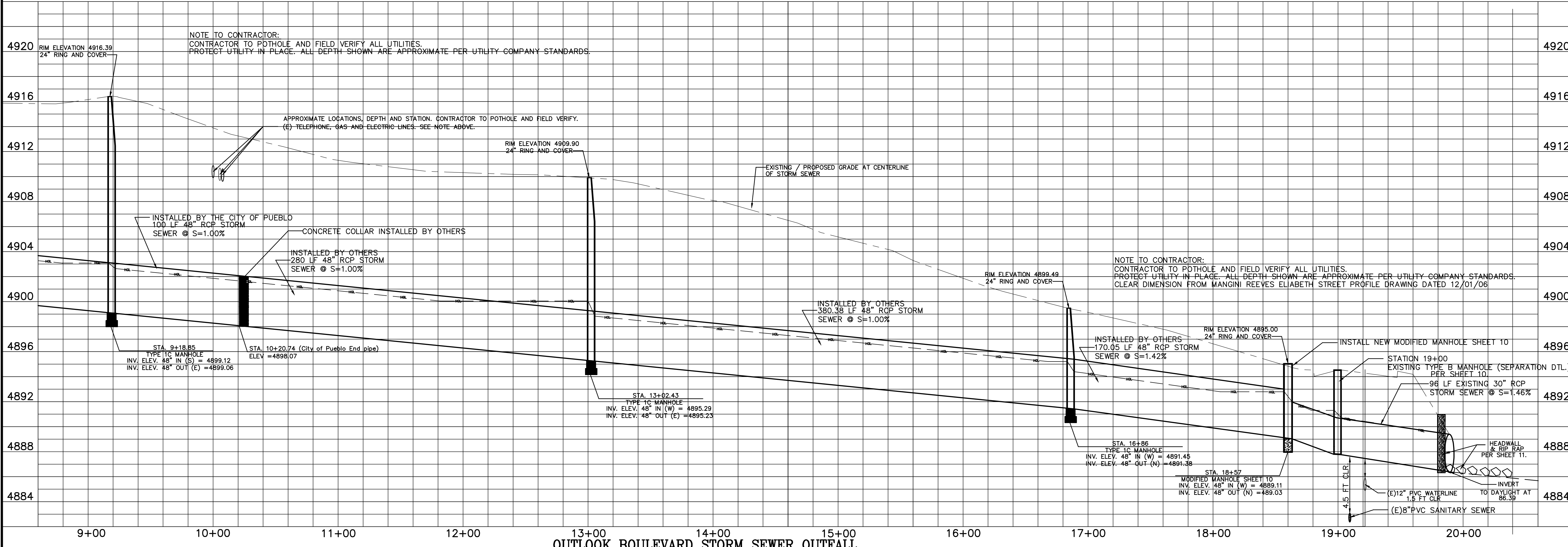
THIS CONSTRUCTION PLAN COMPLIES WITH ALL CITY OF PUEBLO DESIGN STANDARDS WITH THE MOST CURRENT STANDARD CONSTRUCTION SPECIFICATIONS AND STANDARD DETAILS.

ROOT HEADQUARTERS SUBDIVISION  
 National Geospatial Survey Point No. U 348  
 P.O. = 40556  
 NAVD 88 Elevation = 4816.92

BENCHMARK:  
 EAGLERIDGE ESTATES, FILING NO. 2 (E.R.E)  
 "U" CHISEL ON THE TOP OF CURB HEAD ON THE SOUTHWEST CURB RETURN OF THE SOUTHEAST CORNER OF THE INTERSECTION OF EAGLERIDGE BOULEVARD AND RIDGE DRIVE.  
 ELEVATION: 4912.84 (CITY OF PUEBLO DATUM)



**OUTLOOK BOULEVARD STORM SEWER OUTFALL**  
 PHASE 1 CONSTRUCTION



**OUTLOOK BOULEVARD STORM SEWER OUTFALL**

COMPLIANCE WITH BOARD OF WATER WORKS STANDARDS

REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS

REVIEWED FOR GENERAL COMPLIANCE WITH CITY OF PUEBLO STANDARDS

CDOT HEADQUARTERS SUBDIVISION

OUTLOOK BOULEVARD STORM SEWER OUTFALL (STA. 9+18.85 TO STA. 19+89)

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

GENERAL DATE: \_\_\_\_\_

DRAINAGE DATE: \_\_\_\_\_

SANITARY SEWER DATE: \_\_\_\_\_

TRANSPORTATION DATE: \_\_\_\_\_

PROJECT NAME SHEET TITLE

**NORTHSTAR**  
 ENGINEERING AND SURVEYING, INC.  
 1111 S. BROADWAY, SUITE 1000, PUEBLO, CO 81002  
 PHONE: (719) 544-8888

PREPARED UNDER THE DIRECT SUPERVISION OF KIM KLAYTON KOCK, P.E., COLORADO REGISTRATION NO. 19799.

HOR. SCALE: 1"=40'  
 VERT. SCALE: 1"=4'

DATE: 11-3-16  
 DESIGN BY: SMC  
 DRAWN BY: SMC

CHECKED BY: KK  
 FILE: 593-9.DWG

JOB NO. 1502801

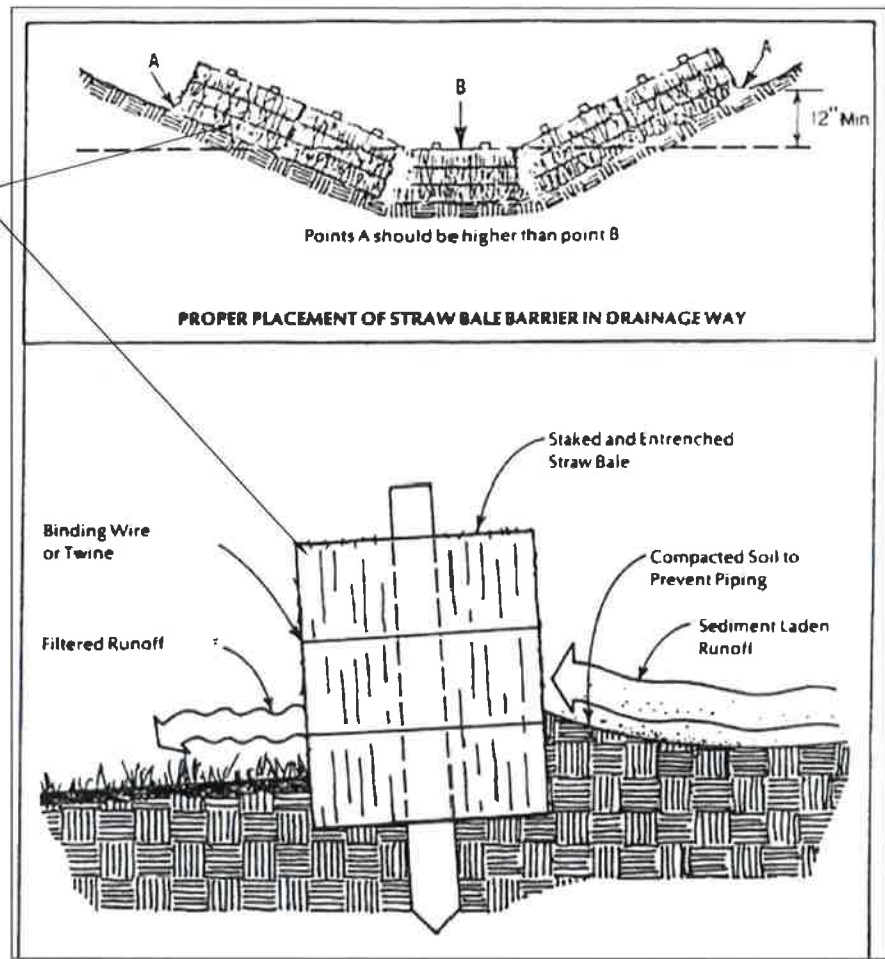
**593**  
 SHEET 9 OF 11



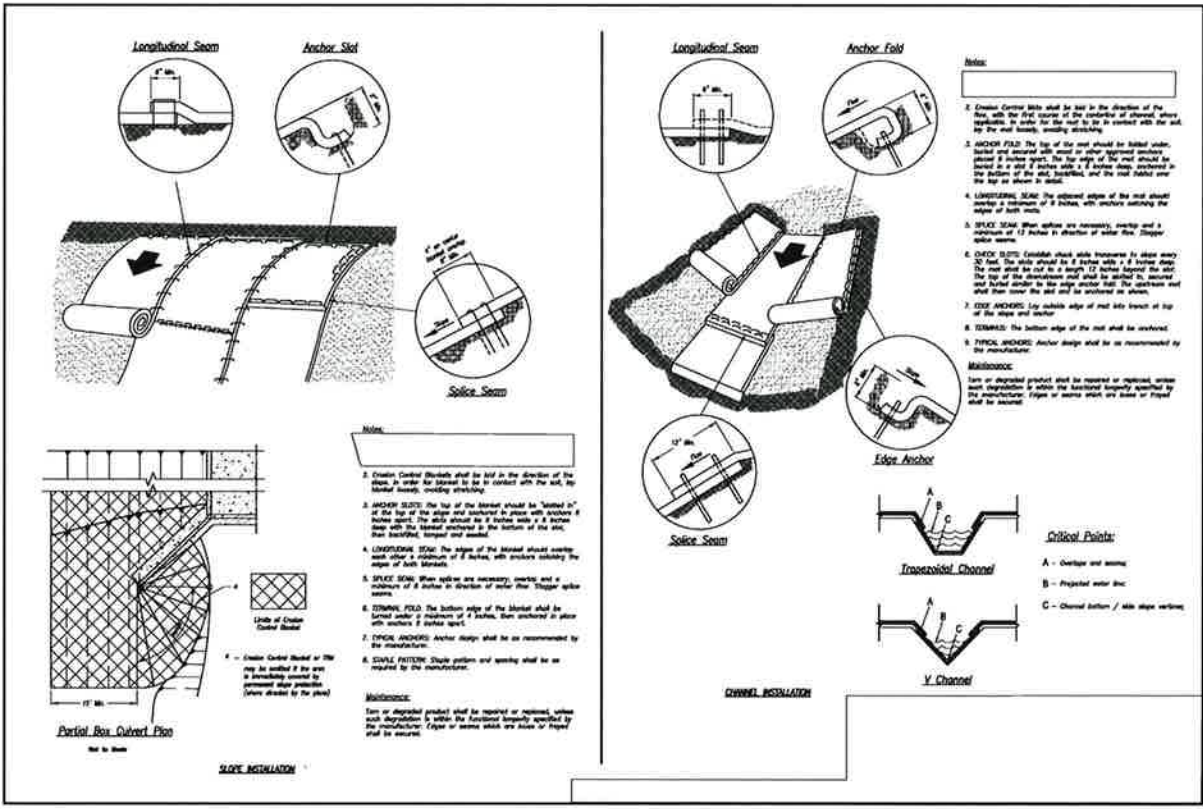




CHECK DAM SPACING PER PLAN AT CONTRACTOR OPTION FIBER ROLLS MAY BE SUBSTITUTED



CHECK DAM DETAIL



SLOPE PROTECTION DETAIL

### CONCRETE HEADWALL INSTALLATIONS

SEE STANDARD PLAN M-601-10 FOR REINFORCING DETAILS

**SINGLE PIPE**

**DOUBLE PIPE**

**GENERAL NOTES**

- PIPE SIZE AND LOCATION OF PIPES SEE THE PLANS.
- ALL CONCRETE SHALL BE CLASS B.
- FOOTINGS IN ROCK SHALL BE PERFORATED TO ROCK AND NOT FORMED IN ACCORDANCE WITH SUBSECTION E51.09(10).
- EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 1/4" IN.
- HEADWALL SHALL HAVE REINFORCING STEEL INSTALLED IN A PATTERN SIMILAR TO STANDARD PLAN M-601-10.
- THE COST OF PRECASTING STEEL SHALL BE INCLUDED IN THE WORK ORDER. THE STEEL QUANTITIES ARE LISTED ON THE PLANS AND ARE PAID FOR SEPARATELY.

PIPE	PIPE DIAMETER (AND EQUIVALENT DIAMETER) (IN.)							
	18	24	30	36	42	48	54	60
TYPE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE	SINGLE	DOUBLE
MATERIAL	10	13	15	2.0	2.7	2.8	3.6	4.6
CIRCULAR	FLEXIBLE	18	24	30	36	42	48	54
ELLIPSE	RIGID	23 x 38	30 x 47	36 x 54	45 x 63	51 x 74	60 x 86	66 x 96
ARCH	METAL	0.9	1.2	1.3	1.6	1.7	2.3	2.9
		22 x 13	29 x 18	36 x 22	43 x 27	50 x 31	58 x 35	66 x 39
		0.9	1.3	1.4	1.9	1.8	2.4	3.4
		1.4	1.9	1.8	2.4	3.4	3.7	4.4
		3.4	4.4	3.4	4.4	3.4	4.4	5.0

**CONCRETE QUANTITIES FOR ONE CONCRETE HEADWALL (CUBIC YARDS)**

THICKNESS	MATERIAL	PIPE DIAMETER ONLY							
		18	24	30	36	42	48	54	60
4"	CONCRETE	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2
6"	CONCRETE	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8
8"	PPRAP	2.0	3.5	5.4	7.8	10.7	13.5	16.4	19.3

**PIPE OUTLET PAVING (CUBIC YARDS)**

NOTE: VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED.

**CIRCULAR**

D = PIPE DIAMETER (INSIDE)  
H = D + 30"  
W = 3D + 18"  
T = 0.4 H (NEAREST IN.)  
B = 1.5 D (10" MINIMUM)  
L = W - B

**ARCH OR ELLIPTICAL**

D = EQUIVALENT CIRCULAR DIAMETER (INSIDE)  
H = RISE + 30"  
W = 3D + 30"  
T = 0.4 H (NEAREST IN.)  
B = 1.5 D (10" MINIMUM)  
L = W - B

**PIPE OUTLET PAVING**  
MAY BE USED WITH MULTIPLE PIPES

**CIRCULAR**

**ARCH OR ELLIPTICAL**

**TYPE OF PIPE HEADWALL DIMENSIONS**

**TYPE OF PIPE HEADWALL DIMENSIONS**

**Computer File Information**

Creation Date: 07/04/12    InChg: DD

Last Modification: 07/04/12    InChg: LTA

Full Path: c:\cor\pds\dot\info\business\designsupport

Drawing File Name: 60102010.dwg

ISO: Non-Modifiable    Scale: Not to Scale    Units: English

**Sheet Revisions**

Date	Comments

Colorado Department of Transportation

4701 East Broadway Avenue  
Denver, Colorado 80222  
Phone: (303) 757-9083  
Fax: (303) 757-9820

Project Development Branch    DD/LTA

**HEADWALLS AND PIPE OUTLET PAVING**

Issued By: Project Development Branch July 4, 2012

**STANDARD PLAN NO.**

M-601-12

Sheet No. 1 of 1

### HEADWALL FOR PIPES

STANDARD PLAN NO. M-601-10

Sheet No. 1 of 1

Issued By: Project Development Branch July 4, 2012

Colorado Department of Transportation  
4701 East Broadway Avenue  
Denver, Colorado 80222  
Phone: (303) 757-9083  
Fax: (303) 757-9570

Project Development Branch    DD/LTA

**GENERAL NOTES**

- CONCRETE SHALL BE CLASS B.
- HEADWALL SHALL BE PERPENDICULAR TO THE PIPE UNLESS OTHERWISE SHOWN ON THE PLANS. FABRICATED CONCRETE AND QUANTITIES MUST BE ADJUSTED FOR SKEWED INSTALLATIONS.
- FOR MINOR DETAILS, SEE STANDARD PLAN M-601-30.
- VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED FROM STEEL AND CONCRETE QUANTITIES.
- EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 1/4" IN.
- ALL REINFORCING BARS SHALL HAVE A 2 IN. MINIMUM CLEARENCE.
- WHEN 180 OR MORE PIPES ARE Laid SIDE BY SIDE, THEY SHALL BE PLACED SO THAT THE MINIMUM PIPES ARE 1/2" INSIDE DIAMETER APART, OR 1/4" INSIDE SPAN APART, OR 3 FT APART (INCLUDING WALL THICKNESS), WHICHEVER IS LESS.
- 400 G.S.P. #5 OR #4 BARS WHEN APRON IS REQUIRED.

**TYPICAL BAR LAYOUT FOR CONCRETE HEADWALLS**

**HEADWALL FOR RIGID ROUND PIPE**

**HEADWALL FOR FLEXIBLE PIPE ARCH**

**FRONT VIEW**

**BAR BENDING**

**HEADWALL FOR FLEXIBLE ROUND PIPE**

**TOP VIEW**

**INLET OUTLET ENDS OF FLEXIBLE PIPE**

**INLET OUTLET ENDS OF RIGID PIPE**

**WHEN APRON IS REQUIRED**

**SKEW FACTOR TABLE**

**Computer File Information**

Creation Date: 07/04/12    InChg: DD

Last Modification: 07/04/12    InChg: LTA

Full Path: c:\cor\pds\dot\info\business\designsupport

Drawing File Name: 60102010.dwg

ISO: Non-Modifiable    Scale: Not to Scale    Units: English

**Sheet Revisions**

Date	Comments

Colorado Department of Transportation

4701 East Broadway Avenue  
Denver, Colorado 80222  
Phone: (303) 757-9083  
Fax: (303) 757-9570

Project Development Branch    DD/LTA

**HEADWALL FOR PIPES**

Issued By: Project Development Branch July 4, 2012

**STANDARD PLAN NO.**

M-601-10

Sheet No. 1 of 1



## HP STORM TRENCH INSTALLATION DETAIL

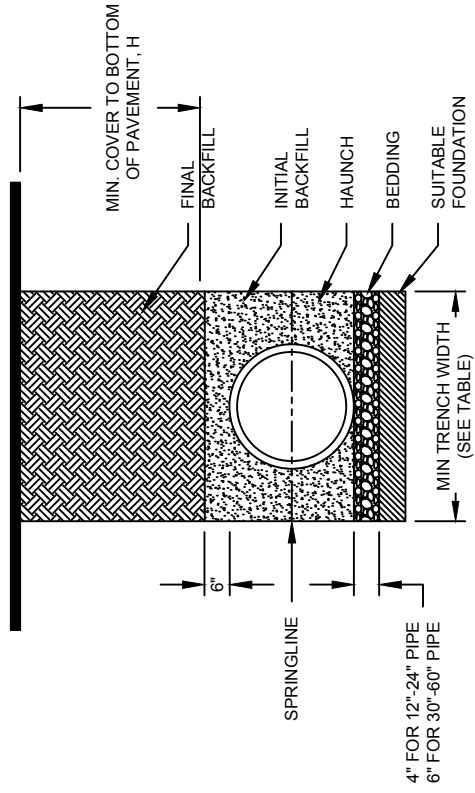


TABLE 1. RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN TRENCH WIDTH
12" (300mm)	30" (750mm)
15" (375mm)	34" (860mm)
18" (450mm)	39" (990mm)
24" (600mm)	48" (1200mm)
30" (750mm)	56" (1420mm)
36" (900mm)	64" (1620mm)
42" (1050mm)	72" (1830mm)
48" (1200mm)	80" (2030mm)
60" (1500mm)	96" (2440mm)

TABLE 3. MAXIMUM COVER FOR HP STORM PIPE, ft

PIPE DIA (300mm)	CLASS I			CLASS II		
	COMPACTED	95%	85%	COMPACTED	95%	85%
12"	41 (12.5m)	28 (8.5m)	21 (6.4m)	41 (12.5m)	28 (8.5m)	21 (6.4m)
15"	42 (12.8m)	29 (8.8m)	21 (6.4m)	42 (12.8m)	29 (8.8m)	21 (6.4m)
18"	44 (13.4m)	30 (9.1m)	21 (6.4m)	44 (13.4m)	30 (9.1m)	21 (6.4m)
24"	37 (11.3m)	26 (7.9m)	18 (5.5m)	37 (11.3m)	26 (7.9m)	18 (5.5m)
30"	39 (11.9m)	27 (8.2m)	19 (5.8m)	39 (11.9m)	27 (8.2m)	19 (5.8m)
36"	28 (8.5m)	20 (6.1m)	14 (4.3m)	28 (8.5m)	20 (6.1m)	14 (4.3m)
42"	30 (9.1m)	21 (6.4m)	14 (4.3m)	30 (9.1m)	21 (6.4m)	14 (4.3m)
48"	29 (8.8m)	20 (6.1m)	9 (2.7m)	29 (8.8m)	20 (6.1m)	9 (2.7m)
60"	29 (8.8m)	20 (6.1m)	9 (2.7m)	29 (8.8m)	20 (6.1m)	9 (2.7m)

FILL HEIGHT TABLE GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:  
NO HYDROSTATIC PRESSURE  
UNIT WEIGHT OF SOIL ( $\gamma_s$ ) = 120 PCF

**NOTES:**

- ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
- FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
- BEDDING: SUITABLE MATERIAL SHALL BE CLASS I OR II. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. THE PIPE TRENCH SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TRENCH EXCAVATION SECTION OF THIS SPECIFICATION. FILL SHALL BE PLACED IN SIX (6) INCH LIFTS WITH A MINIMUM COMPACTION OF 95% PER THE CITY STANDARDS FOR BOTH COHESIVE AND COHESION LESS SOILS. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"-24" (300mm-600mm) DIAMETER PIPE; 6" (150mm) FOR 30"-60" (750mm-1500mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED.
- INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I OR II PER THE CITY OF PUEBLO STANDARDS IN THE PIPE ZONE EXTENDING TO 6" ABOVE THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION, FOR TRAFFIC APPLICATIONS; CLASS I OR II MATERIAL SHALL BE COMPACTED TO A DENSITY OF NOT LESS THAN 95% PER THE CITY STANDARDS FOR BOTH COHESIVE AND COHESION LESS SOILS.