STORM DRAIN PLANS FOR:

TRACT No. 29628

RIVERSIDE, CA.

CONSTRUCTION NOTES AND QUANTITY ESTIMATE

THE QUANTITIES SHOWN BELOW ARE FOR BONDING INFORMATION ONLY. THE CONTRACTOR IS TO CONSTRUCT PROJECT PER THESE PLANS AND SUBMIT CONSTRUCTION BID BASED ON THEIR OWN QUANTITY "TAKE-OFF".

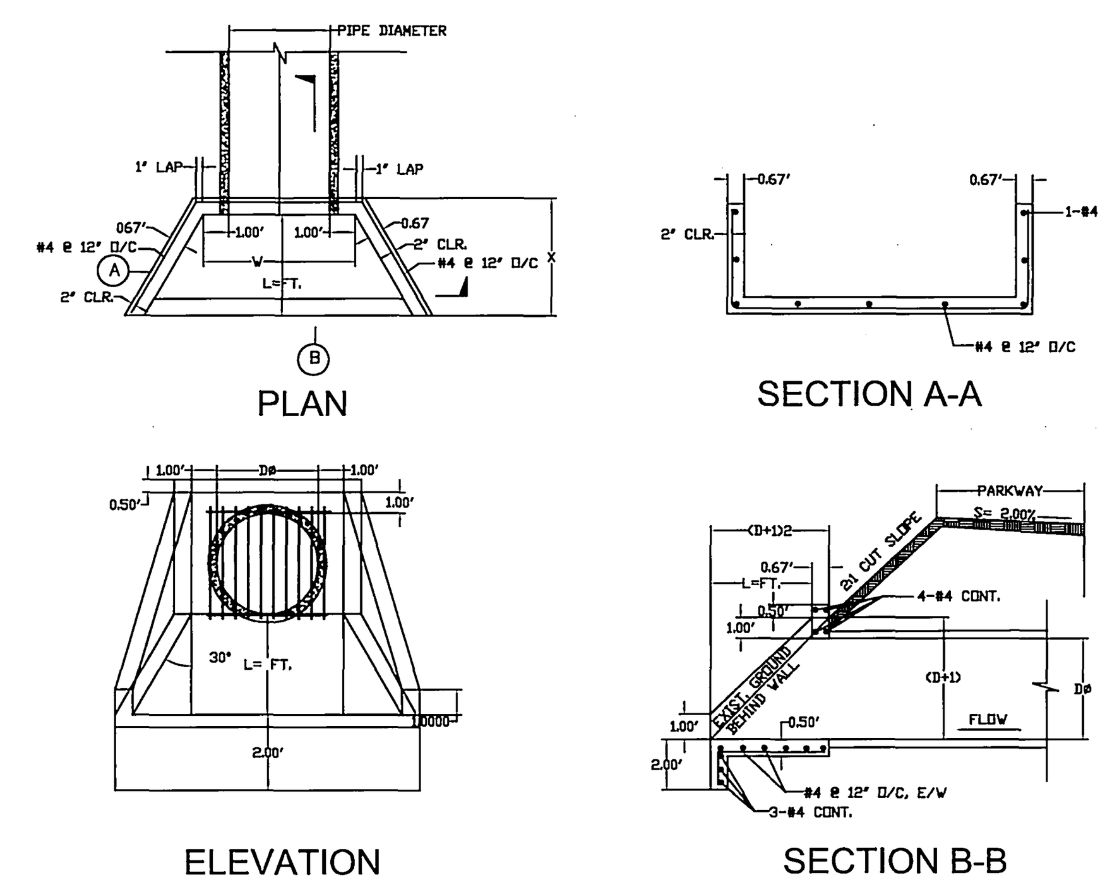
(1)	CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE PWD-ENGINEERING DIV. STD. DWG 407	4 EA
(2)	INSTALL 18" HDPE PER PLAN	856 LF
(3)	INSTALL 24" HDPE PER PLAN	325 LF
(4)	CONSTRUCT 8 X 4 HYDROARCH CULVERT PER DETAIL SHOWN ON SHEET 5	1 EA
(7)	CONSTRUCT 20 X 6 HYDROARCH CULVERT PER DETAIL SHOWN ON SHEET 5	1 EA
(8)	INSTALL TRASH RACK (INCLINED) AT INLET PER APWA STD DWG 361-0 SEE DETAIL ON SHEET 1	1 EA
(9)	INSTALL RIP-RAP PER DETAIL SHOWN ON SHT. 1	140 LF
(10)	INSTALL 2' X 2' GRATING CATCH BASIN PER APWA STD. DWG. 304-2	3 EA
(11)	CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE STD. DWG NO. 405	2 EA
(12)	INSTALL JUNCTION STRUCTURE "B" PER CITY OF RIVERSIDE STD. DWG NO. 421	2 EA
(13)	CONSTRUCT PIPE HEADWALL ENDWALL AND WINGWALLS PER DETAIL SHOWN ON SHEET 1 & 5	7 EA
(14)	CONSTRUCT CONCRETE COLLAR PER CITY OF RIVERSIDE STD. DWG. NO. 424	1 EA

WATER DEPARTMENT NOTE:

1. DEVELOPER TO GIVE THE CITY WATER DIVISION FIVE (5) WORKING DAYS WRITTEN NOTICE PRIOR TO START OF CONSTRUCTION AND TO ALLOW THE CITY TEN (10) WORKING DAYS FOR THE COMPLETION OF THE WORK.

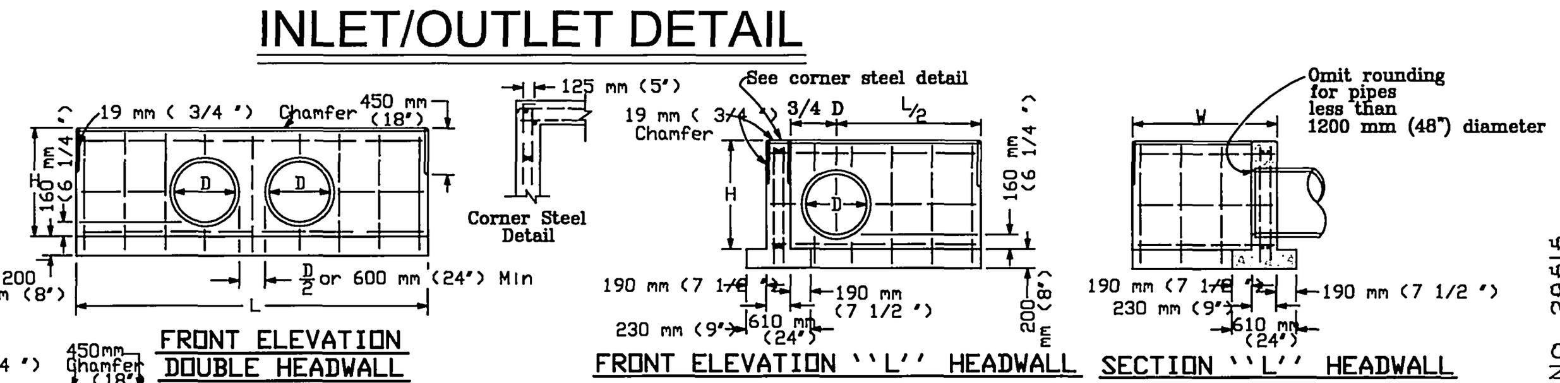
RIP RAP DATA
TABLE OF DIMENSIONS

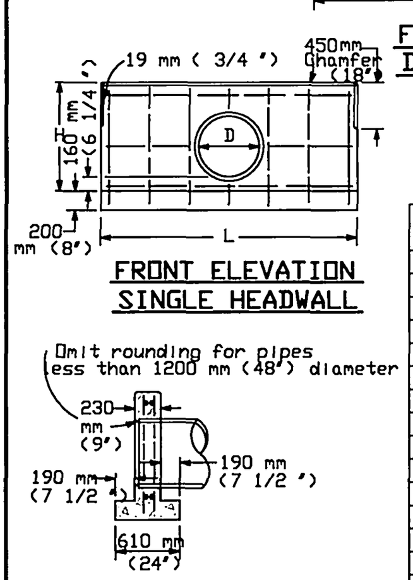
RIP RAP	T
¼-TON	2.70'
½-TON	3.40'
1-TON	4.30'
2-TON	5.40'



WING-TYPE HEADWALL
(N.T.S.)

INLET/OUTLET DETAIL





PROPOSED TRACT NO. 29515

D	H	SINGLE L	SINGLE STEEL	SINGLE CONC	DOUBLE L	DOUBLE STEEL	DOUBLE CONC
300 mm (12")	810 mm (32")	1500 mm (5.0')	16 kg (35 lb)	0.45 m³ (0.60 CY)	2500 mm (8.0')	24 kg (50 lb)	0.74 m³ (0.94 CY)
375 mm (15")	885 mm (35")	1800 mm (6.0')	18 kg (40 lb)	0.56 m³ (0.75 CY)	2950 mm (9.5')	28 kg (60 lb)	0.91 m³ (1.17 CY)
450 mm (18")	960 mm (38")	2100 mm (7.0')	22 kg (50 lb)	0.68 m³ (0.91 CY)	3250 mm (10.5')	34 kg (75 lb)	1.04 m³ (1.35 CY)
525 mm (21")	1035 mm (41")	2250 mm (7.5')	26 kg (60 lb)	0.76 m³ (1.02 CY)	3550 mm (11.5')	40 kg (90 lb)	1.18 m³ (1.52 CY)
600 mm (24")	1110 mm (44")	2550 mm (8.5')	34 kg (75 lb)	0.90 m³ (1.20 CY)	3850 mm (12.5')	46 kg (100 lb)	1.32 m³ (1.72 CY)
675 mm (27")	1185 mm (47")	2850 mm (9.5')	38 kg (85 lb)	1.04 m³ (1.39 CY)	4300 mm (14.0')	52 kg (115 lb)	1.53 m³ (2.00 CY)
750 mm (30")	1260 mm (50")	3000 mm (10.0')	40 kg (85 lb)	1.13 m³ (1.52 CY)	4600 mm (15.0')	54 kg (126 lb)	1.69 m³ (2.21 CY)
825 mm (33")	1335 mm (53")	3300 mm (11.0')	44 kg (100 lb)	1.29 m³ (1.73 CY)	4900 mm (16.0')	58 kg (130 lb)	1.86 m³ (2.42 CY)
900 mm (36")	1410 mm (56")	3600 mm (12.0')	46 kg (105 lb)	1.46 m³ (1.95 CY)	5200 mm (17.0')	66 kg (145 lb)	2.03 m³ (2.65 CY)
975 mm (39")	1485 mm (59")	3750 mm (12.5')	58 kg (130 lb)	1.57 m³ (2.09 CY)	5500 mm (18.0')	78 kg (170 lb)	2.21 m³ (2.88 CY)
1050 mm (42")	1560 mm (62")	4050 mm (13.5')	62 kg (140 lb)	1.75 m³ (2.34 CY)	5800 mm (19.0')	84 kg (185 lb)	2.39 m³ (3.13 CY)
1125 mm (45")	1635 mm (65")	4350 mm (14.5')	66 kg (150 lb)	1.94 m³ (2.60 CY)	6100 mm (20.0')	88 kg (195 lb)	2.58 m³ (3.38 CY)
1200 mm (48")	1710 mm (68")	4500 mm (15.0')	70 kg (160 lb)	2.06 m³ (2.75 CY)	6400 mm (21.0')	90 kg (200 lb)	2.78 m³ (3.64 CY)
1275 mm (51")	1785 mm (71")	4800 mm (16.0')	80 kg (180 lb)	2.26 m³ (3.03 CY)	6850 mm (22.5')	102 kg (225 lb)	3.06 m³ (4.02 CY)
1350 mm (54")	1860 mm (74")	5100 mm (17.0')	84 kg (190 lb)	2.47 m³ (3.31 CY)	7150 mm (23.5')	108 kg (240 lb)	3.27 m³ (4.30 CY)

STRAIGHT HEADWALLS

D	H	L/2	LENGTH OF W: 1000 mm (40") STEEL	1000 mm (40") CONC	1450 mm (58") STEEL	1450 mm (58") CONC	1900 mm (76") STEEL	1900 mm (76") CONC	2350 mm (94") STEEL	2350 mm (94") CONC	2800 mm (112") STEEL	2800 mm (112") CONC
300 mm (12")	810 mm (32")	750 mm (30")	22 kg (50 lb)	0.59 m³ (0.79 CY)	26 kg (60 lb)	0.73 m³ (0.98 CY)	---	---	---	---	---	---
375 mm (15")	885 mm (35")	900 mm (36")	24 kg (55 lb)	0.68 m³ (0.91 CY)	28 kg (65 lb)	0.83 m³ (1.11 CY)	---	---	---	---	---	---
450 mm (18")	960 mm (38")	1050 mm (42")	28 kg (65 lb)	0.78 m³ (1.04 CY)	32 kg (75 lb)	0.94 m³ (1.25 CY)	---	---	---	---	---	---
525 mm (21")	1035 mm (41")	1125 mm (45")	32 kg (75 lb)	0.86 m³ (1.15 CY)	40 kg (90 lb)	1.02 m³ (1.36 CY)	---	---	---	---	---	---
600 mm (24")	1110 mm (44")	1275 mm (51")	38 kg (85 lb)	0.96 m³ (1.29 CY)	44 kg (100 lb)	1.13 m³ (1.51 CY)	48 kg (110lb)	1.30 m³ (1.74 CY)	---	---	---	---
675 mm (27")	1185 mm (47")	1425 mm (57")	40 kg (90 lb)	1.07 m³ (1.44 CY)	46 kg (105 lb)	1.25 m³ (1.67 CY)	50 kg (115 lb)	1.43 m³ (1.91 CY)	---	---	---	---
750 mm (30")	1260 mm (50")	1500 mm (60")	42 kg (95 lb)	1.16 m³ (1.55 CY)	48 kg (110 lb)	1.34 m³ (1.80 CY)	52 kg (120 lb)	1.53 m³ (2.05 CY)	60 kg (135 lb)	1.72 m³ (2.29 CY)	---	---
825 mm (33")	1335 mm (53")	1650 mm (66")	46 kg (105 lb)	1.28 m³ (1.71 CY)	52 kg (120 lb)	1.47 m³ (1.97 CY)	60 kg (135 lb)	1.67 m³ (2.23 CY)	66 kg (150 lb)	1.86 m³ (2.48 CY)	---	---
900 mm (36")	1410 mm (56")	1800 mm (72")	48 kg (110 lb)	1.40 m³ (1.88 CY)	54 kg (125 lb)	1.61 m³ (2.15 CY)	62 kg (140 lb)	1.81 m³ (2.41 CY)	68 kg (155 lb)	2.01 m³ (2.68 CY)	74 kg (170 lb)	2.21 m³ (2.95 CY)
975 mm (39")	1485 mm (59")	1875 mm (75")	---	---	66 kg (150 lb)	1.71 m³ (2.28 CY)	74 kg (170 lb)	1.92 m³ (2.56 CY)	80 kg (185 lb)	2.13 m³ (2.84 CY)	88 kg (200 lb)	2.33 m³ (3.12 CY)
1050 mm (42")	1560 mm (62")	2025 mm (81")	---	---	68 kg (155 lb)	1.85 m³ (2.42 CY)	76 kg (175 lb)	2.07 m³ (2.76 CY)	84 kg (190 lb)	2.28 m³ (3.05 CY)	92 kg (210 lb)	2.50 m³ (3.34 CY)
1125 mm (45")	1635 mm (65")	2175 mm (87")	---	---	---	---	78 kg (180 lb)	2.22 m³ (2.97 CY)	88 kg (200 lb)	2.45 m³ (3.27 CY)	94 kg (215 lb)	2.67 m³ (3.57 CY)
1200 mm (48")	1710 mm (68")	2250 mm (90")	---	---	---	---	84 kg (190 lb)	2.34 m³ (3.13 CY)	94 kg (216 lb)	2.57 m³ (3.44 CY)	100 kg (230 lb)	2.81 m³ (3.75 CY)
1275 mm (51")	1785 mm (71")	2400 mm (96")	---	---	---	---	---	---	96 kg (220 lb)	2.75 m³ (3.67 CY)	102 kg (235 lb)	2.98 m³ (3.99 CY)
1350 mm (54")	1860 mm (74")	2550 mm (102")	---	---	---	---	---	---	102 kg (235 lb)	2.92 m³ (3.91 CY)	110 kg (250 lb)	3.17 m³ (4.24 CY)

''L'' HEADWALLS

CIRCULAR PIPE CULVERT HEADWALLS

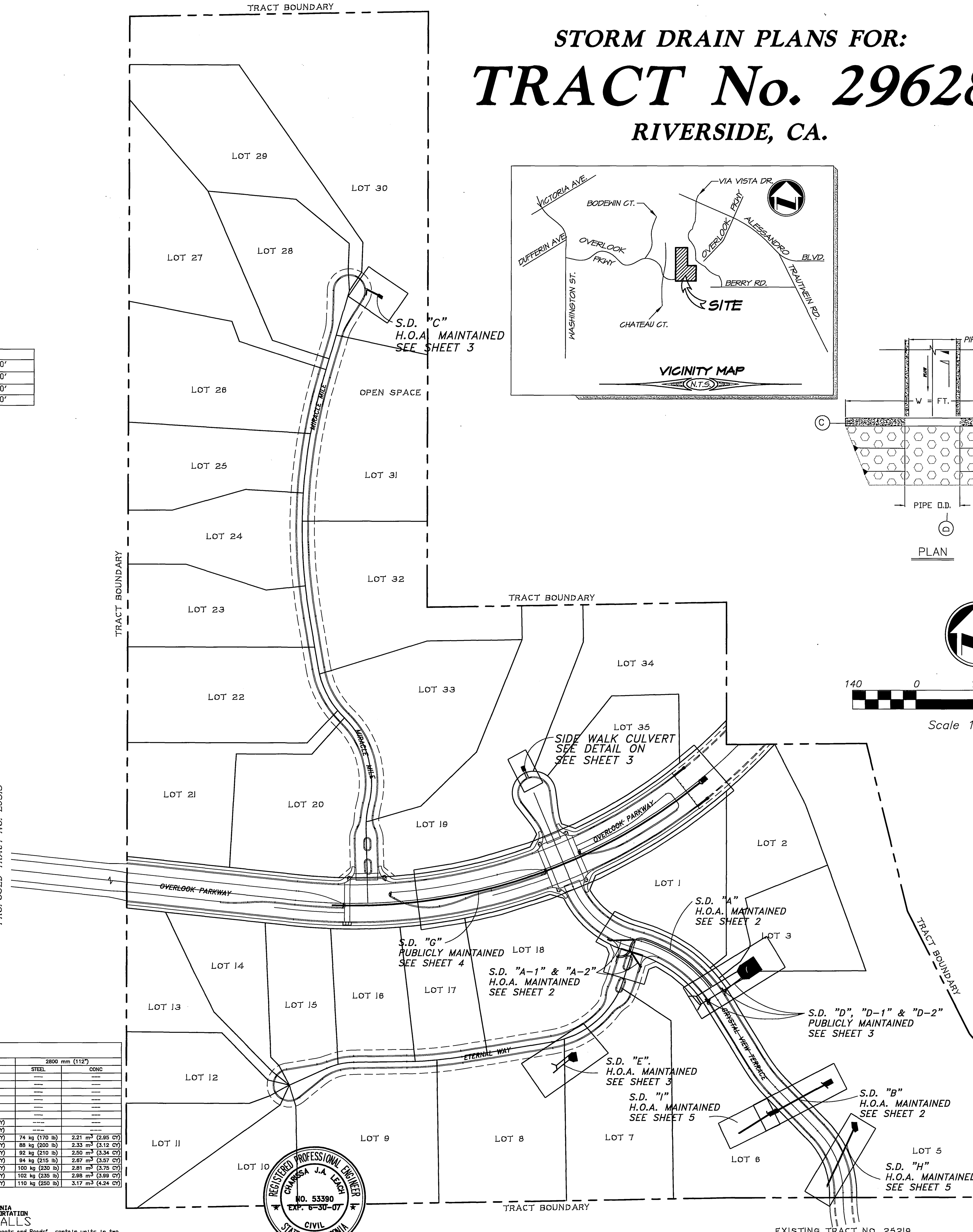
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
PIPE HEADWALLS

These 'Standard Plans for Construction of Local Streets and Roads' contain units in two systems of measurement: International System of Units (SI or "metric") and United States Standard Measures shown in the parentheses ( ). The measurements expressed in the two systems are not necessarily equal or interchangeable. See the 'Foreword' at the beginning of this publication.

NO SCALE

NOTES

1. No deduction made in quantities for thickness of pipe walls.
2. All reinforcing steel #13M (#4) bars. All vertical and horizontal tie bars 450 mm (18") maximum spacing.
3. Length of wall ''W'' may be varied to suit conditions encountered in the field, and straight line interpolation may be used to calculate quantities.
4. Quantities are for design purposes only.
5. Cable railing to be installed on top of headwall when shown on Project Plans. See Standard Plan B11-47 for cable railing details.



STORM DRAIN CONSTRUCTION GENERAL NOTES

1. NO PERSON SHALL PERFORM ANY CONSTRUCTION ACTIVITY OR INSTALL ANY OBJECTS WITHIN THE PUBLIC RIGHT-OF-WAY OR EASEMENTS OF THE CITY OF RIVERSIDE WITHOUT A VALID CONSTRUCTION PERMIT OR, A STREET OPENING PERMIT OR AN ENCROACHMENT PERMIT ISSUED BY THE CITY'S PUBLIC WORKS DEPARTMENT.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CLEAR THE RIGHT OF WAY IN ACCORDANCE WITH THE PROVISIONS OF LAW AS IT AFFECTS EACH UTILITY INCLUDING IRRIGATION LINES AND APPURTENANCES AND AT NO COST TO THE CITY.
3. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF RIVERSIDE DEPARTMENT OF PUBLIC WORKS, STANDARD DRAWINGS, ITS SUPPLEMENTAL NOTES AND THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, CURRENT EDITION.
4. THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE WORK HEREON. IN THE EVENT OF DISCREPANCIES ARISING DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.
5. QUANTITIES SHOWN ARE FOR INFORMATION ONLY AND THE CITY OF RIVERSIDE IS NOT RESPONSIBLE FOR THEIR ACCURACY.
6. THE DEVELOPER SHALL BE RESPONSIBLE FOR PRESERVING OR REESTABLISHING AND REFERENCING SURVEY MONUMENTS DESTROYED, DISTURBED OR BURIED AS A RESULT OF CONSTRUCTION SHOWN HEREON.
7. THE CONTRACTOR SHALL COORDINATE TRENCHING FOR CABLE TELEVISION WITH OTHER TRENCHING WITHIN THE PROJECT.
8. ALL FLAGGED ELEVATIONS SHALL BE STAKED IN THE FIELD BY THE PRIVATE ENGINEER.
9. THE CONTRACTOR SHALL CALL IN A LOCATION REQUEST TO UNDERGROUND SERVICE ALERT (USA), PHONE # 1-800-227-2600, TWO WORKING DAYS BEFORE DIGGING. NO CONSTRUCTION PERMIT WILL BE ISSUED BY THE PUBLIC WORKS DEPARTMENT INVOLVING EXCAVATION FOR UNDERGROUND FACILITIES UNLESS THE APPLICANT HAS BEEN PROVIDED AN INQUIRY IDENTIFICATION NUMBER BY U.S.A.
10. BEFORE THE RIP- RAP AT THE OUTLET OF ANY DRAINAGE STRUCTURE IS ACCEPTED BY THE CITY, IT SHALL BE TESTED UNDER FLOW AS CLOSE AS POSSIBLE TO DESIGN CONDITIONS WITH WATER OBTAINED FROM FIRE HYDRANT IN THE IMMEDIATE AREA.

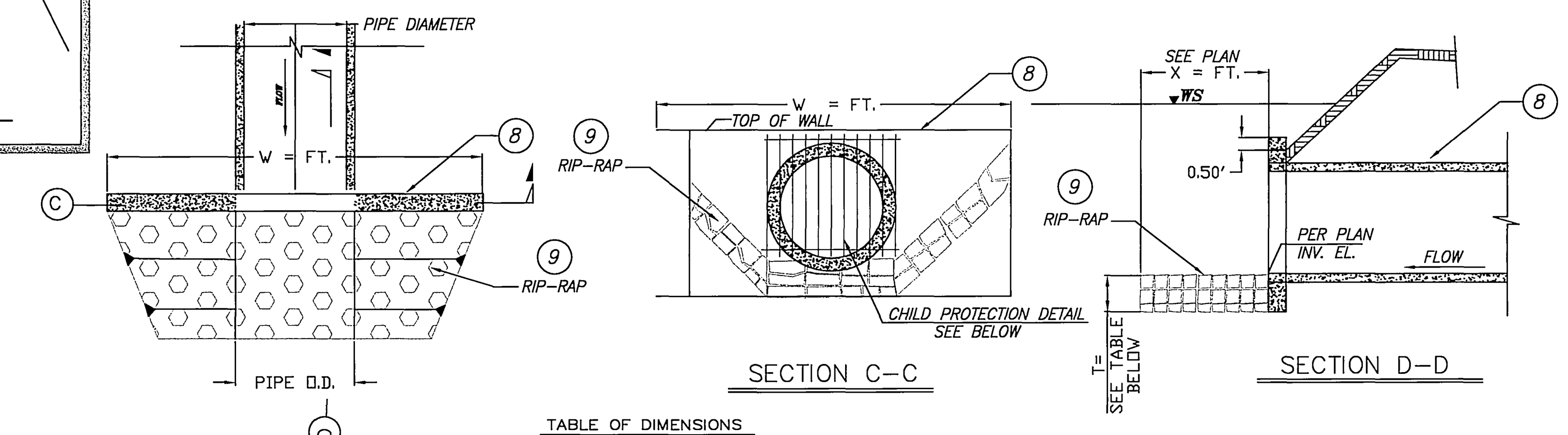


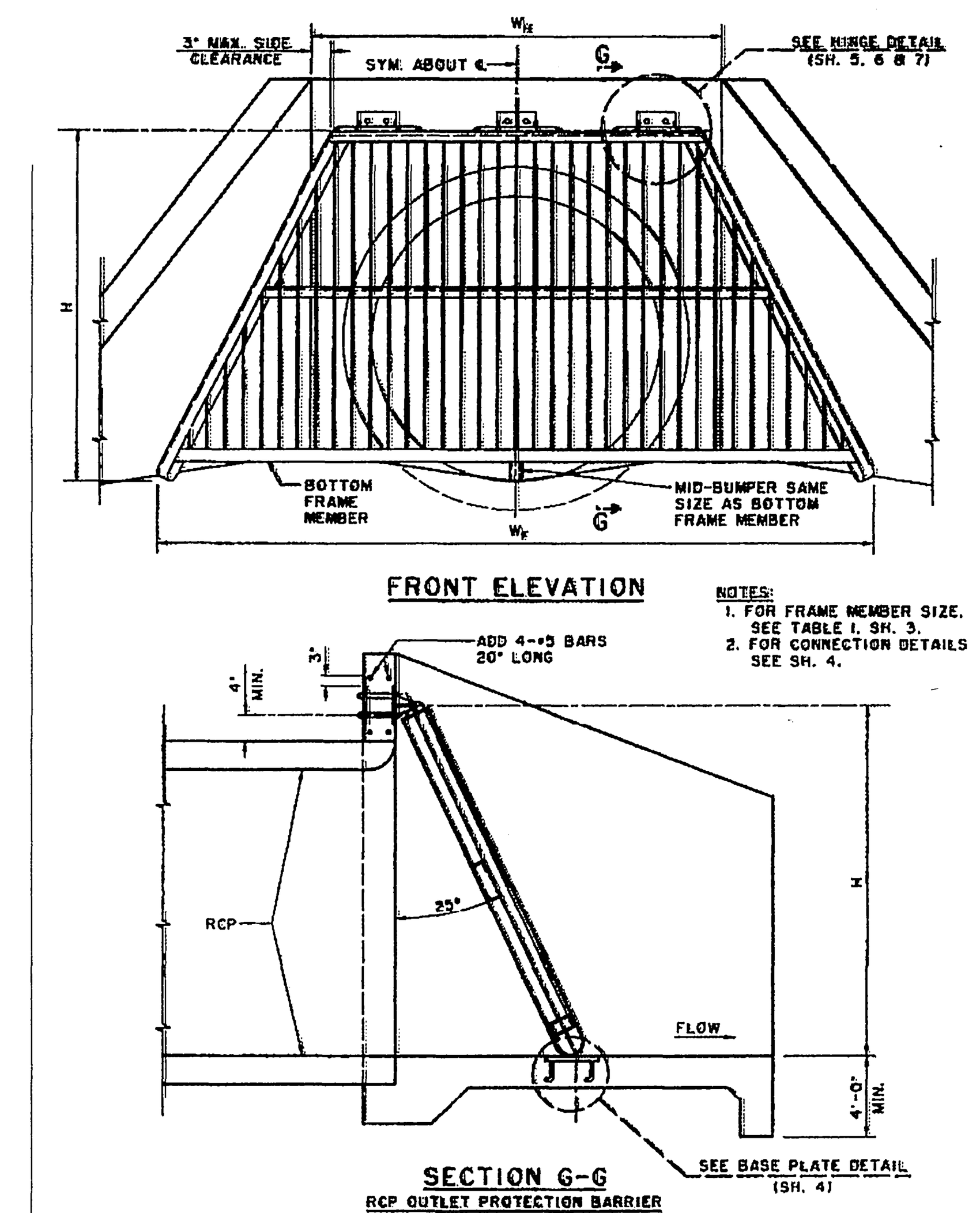
TABLE OF DIMENSIONS

LINE	STATION	D	W
LINE A	29+54.68	36"	12.00'
LINE B	43+54.66	48"	15.00'
LINE F	10+50.00	18"	7.00'

TRASH RACK (INCLINED) INLET
(N.T.S.)

D= DIAMETER OF OUTLET PIPE
W= WIDTH OF HEADWALL

140 0 140 280 420
Scale 1" = 140'



AMERICAN PUBLIC WORKS ASSOCIATION - SOUTHERN CALIFORNIA CHAPTER	STANDARD PLAN 360 - 0 SHEET 2 OF 8
SLOPED PROTECTION BARRIER	

CHILD PROTECTION DETAIL

INDEX

REGISTERED PROFESSIONAL ENGINEER
CHARISSA J.A. LEACH
NO. 53390
EXP. 6-30-07
CIVIL
STATE OF CALIFORNIA

CITY OF RIVERSIDE WATER DEPT.
MW McNeil 10/11/06
REVIEWED FOR CONFLICTS BY DATE

CITY OF RIVERSIDE ELECTRICAL DEPT.
OVERHEAD & UNDERGROUND
10/13/06
REVIEWED FOR CONFLICTS BY DATE

Underground Service Alert
Call: TOLL FREE
1-800 227-2600
TWO WORKING DAYS BEFORE YOU DIG

CITY OF RIVERSIDE BUSINESS TAX ACCT.#058833 EXP. 1/1/07

PLANS PREPARED BY:
adkan ENGINEERS
CIVIL ENGINEERING•SURVEYING•PLANNING
6820 AIRPORT DRIVE, RIVERSIDE, CA 92504
TEL: (951) 688-0241 • FAX: (951) 688-0599
DATE: 10/13/06
UNDER THE SUPERVISION OF: R.C.E. 53390 6/30/07

B E N C H M A R K : F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-C2 BY CITY SURVEY CREW 6/10/2002.
E L E V A T I O N : 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

APPROVED BY	DATE	BY
PRINCIPAL ENGINEER	10/27/06	PH

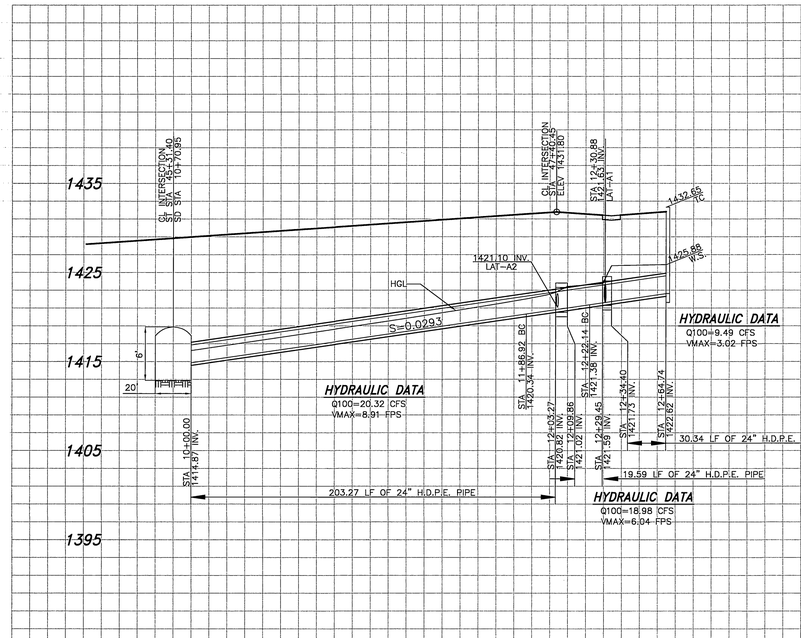
APPROVED BY
CITY ENGINEER
DATE 10/27/06

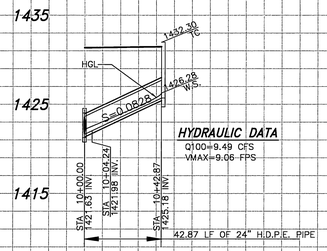
STORM DRAIN PLAN
TRACT 29628
COVER SHEET
A.P.N. 243-380-012, 268-320-015
HORIZ. SCALE: AS NOTED VERT. SCALE: N/A

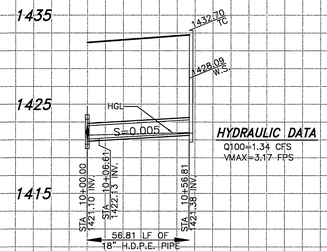
PW03-0415
ACCOUNT NO.
D-738
SHEET 1 OF 8
J.N. 6124

Plot Date: 10/12/06
File name: U:\DRAWING\BODEWIN\6124\6124sd01

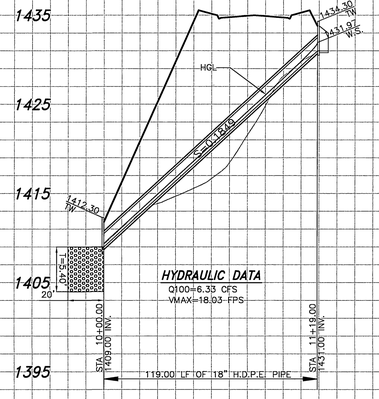
RVZ
INDEXED 11-08-06 (H)



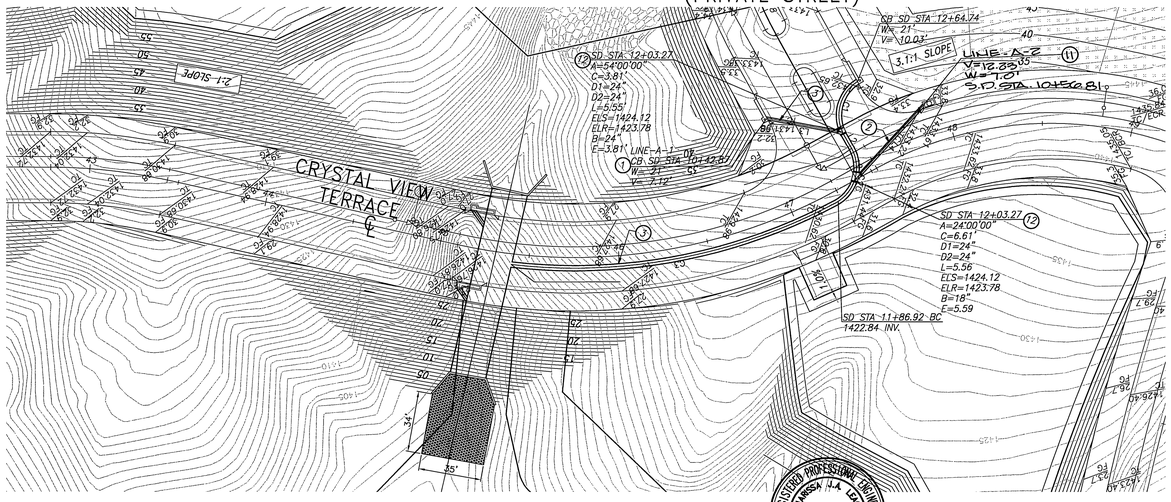


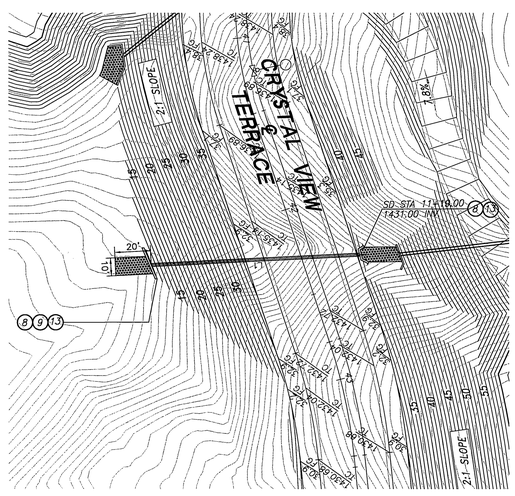


PROFILE SCALES
HORIZ. 1"= 40'
VERT. 1"=8'



ETERNAL WAY
(PRIVATE STREET)





CONSTRUCTION NOTES:

1. CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE PWD-ENGINEERING DIV. STD. DWG 407
2. INSTALL 18" H.D.P.E. PER PLAN
3. INSTALL 24" H.D.P.E. PER PLAN
8. INSTALL TRASH RACK (INCLINED) AT INLET PER APWA STD DWG 361-0 SEE DETAIL ON SHEET 1
9. INSTALL RIP-RAP PER DETAIL SHOWN ON SHT. 1
11. CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE STD. DWG NO. 405
12. INSTALL JUNCTION STRUCTURE "B" PER CITY OF RIVERSIDE STD. DWG NO. 421
13. CONSTRUCT PIPE HEADWALL ENDWALL AND WINGWALLS PER DETAIL SHOWN ON SHEET 1 & 5

S.D. CURVE DATA

NUMBER	DELTA	TAN	RAD	LENGTH
C1	85°51'46"	21.02	22.60	33.86
C2	89°53'42"	22.46	22.50	35.30
C3	34°58'45"	96.48	306.18	186.92

S.D. LINE DATA

NUMBER	DIRECTION	DISTANCE
L1	S 61°29'23" W	119.36'
L2	N 16°59'40" E	8.66'
L3	S 33°24'56" E	42.87'
L4	S 88°21'08" W	56.82'

40 0 40 80 120

Scale 1" = 40'

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CITY OF RIVERSIDE BUSINESS TAX ACCT.#058833 EXP. 1/1/07

PLANS PREPARED BY:
adkan ENGINEERS
CIVIL ENGINEERING • SURVEYING • PLANNING
6820 AIRPORT DRIVE, RIVERSIDE, CA 92504
TEL. (951) 688-0241 • FAX. (951) 688-7699
DATE 10/13/06
UNDER THE SUPERVISION OF:
R.C.E. 53390 6/30/07

BENCHMARK: F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-G2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

APPROVED BY	DATE	BY
PRINCIPAL ENGINEER	10/27/06	DH

APPROVED BY: _____
CITY ENGINEER
DATE 10/27/06

BJZ

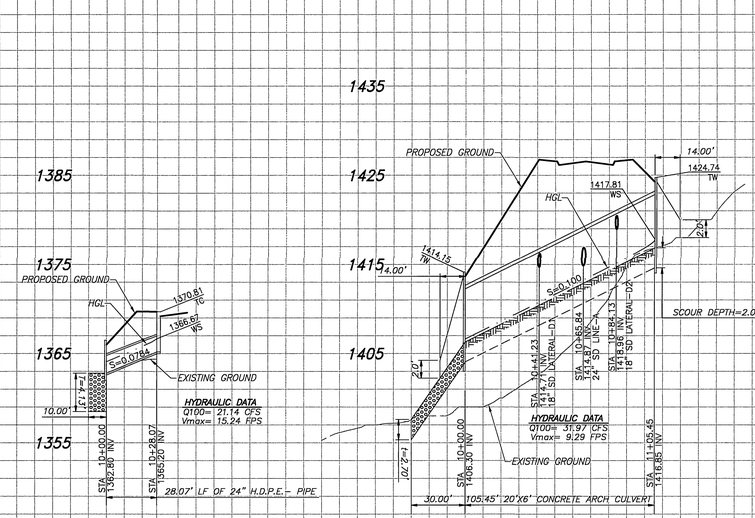
STORM DRAIN PLAN
TRACT 29628
STORM DRAIN
A.P.N. 243-380-012, 268-320-015
HORIZ. SCALE: VERT. SCALE:

PW03-0415
ACCOUNT NO.
D-738
SHEET 2 OF 8
J.N. 6124

Plot Date: 10/12/06

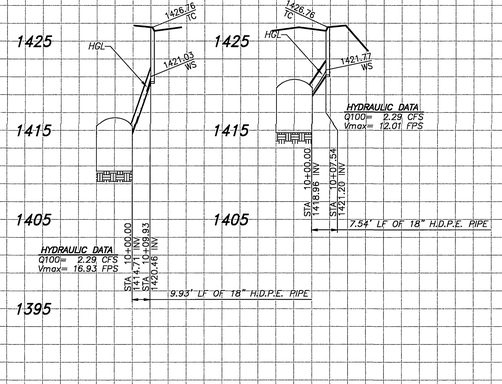
File name: U:\DRAWING\BODEWIN\6124\6124SD02

Indexed 11-08-06 GH



S.D. C

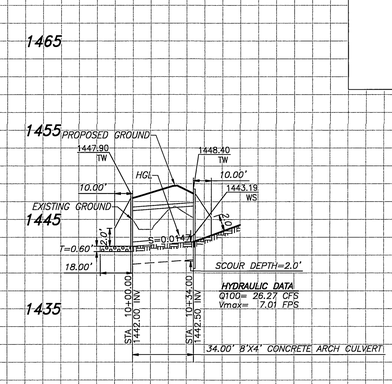
S.D. D



S.D. D1

S.D. D2

PROFILE SCALES
HORIZ. 1"= 40'
VERT. 1"=8'



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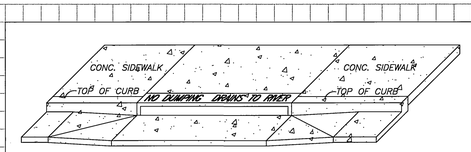
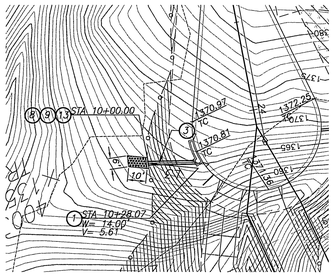
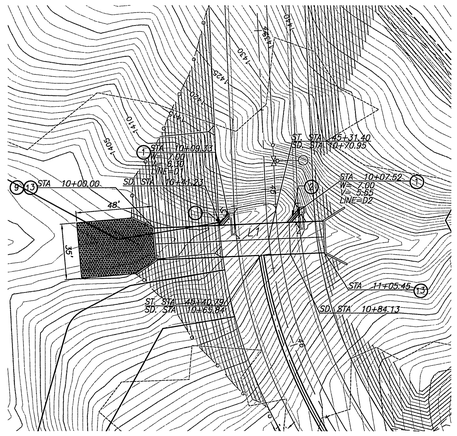


CATCH BASIN STENCILING DETAIL

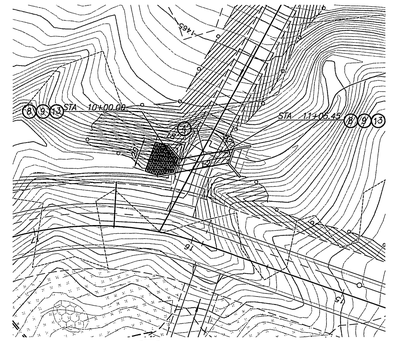
- (A) — STENCILS TO HAVE 2" LETTERS AS FOLLOWS NO DUMPING DRAINS TO RIVER
- (B) — PLACE BOTH STENCILS CENTERED WITHIN THE CATCH BASIN OPENING AND WITHIN THE TOP OF THE CURB.
- (C) — SPRAY BOTH STENCILS WITH WHITE PAINT.
- (D) — REMOVE STENCILS WHEN THE PAINT IS DRY.



S.D. C



S.D. D, D1 & D2



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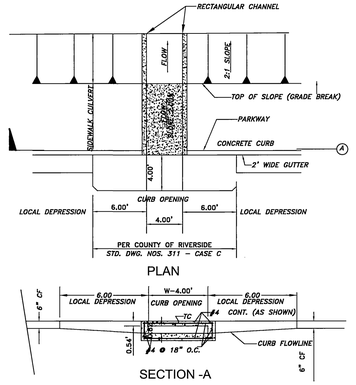

SIDEWALK CULVERT
(MODIFIED-CURB INLET- NO CATCH BASIN)
NTS

CONSTRUCTION NOTES:

1. CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE PWD-ENGINEERING DIV. STD. DWG 407
2. INSTALL 18" HDPE PER PLAN
3. INSTALL 24" HDPE PER PLAN
4. CONSTRUCT 8 X 4 HYDROARCH CULVERT PER DETAIL SHOWN ON SHEET 5
7. CONSTRUCT 20 X 6 HYDROARCH CULVERT PER DETAIL SHOWN ON SHEET 5
8. INSTALL TRASH RACK (INCLINED) AT INLET PER APWA STD DWG 361-0 SEE DETAIL ON SHEET 1
9. INSTALL RIP-RAP PER DETAIL SHOWN ON SHT. 1
11. CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE STD. DWG NO. 405
13. CONSTRUCT PIPE HEADWALL ENDWALL AND WINGWALLS PER DETAIL SHOWN ON SHEET 1 & 5

REGISTERED PROFESSIONAL ENGINEER
CHARISSA J.A. LEACH
NO. 53390
EXP. 6-30-07
CIVIL
STATE OF CALIFORNIA

40 0 40 80 120
Scale 1" = 40'

S.D. LINE DATA

NUMBER	DIRECTION	DISTANCE
L1	S 58°40'58" W	105.45'
L2	S 50°47'04" W	33.97'
L3	N 57°08'11" W	28.07'
L4	S 11°17'00" W	9.93'
L5	S 11°17'00" W	7.52'

CITY OF RIVERSIDE BUSINESS TAX ACCT.#058833 EXP. 1/1/07

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6820 AIRPORT DRIVE, RIVERSIDE, CA. 92504
TEL: (951) 688-0241 • FAX: (951) 688-0599
DATE: 10/19/06
UNDER THE SUPERVISION OF: R.C.E. 53390 6/30/07

BENCHMARK: F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-C2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

	APPROVED BY	DATE	BY
APPROVED BY	PRINCIPAL ENGINEER	10/27/06	DH

CITY ENGINEER
DATE 10/24/06

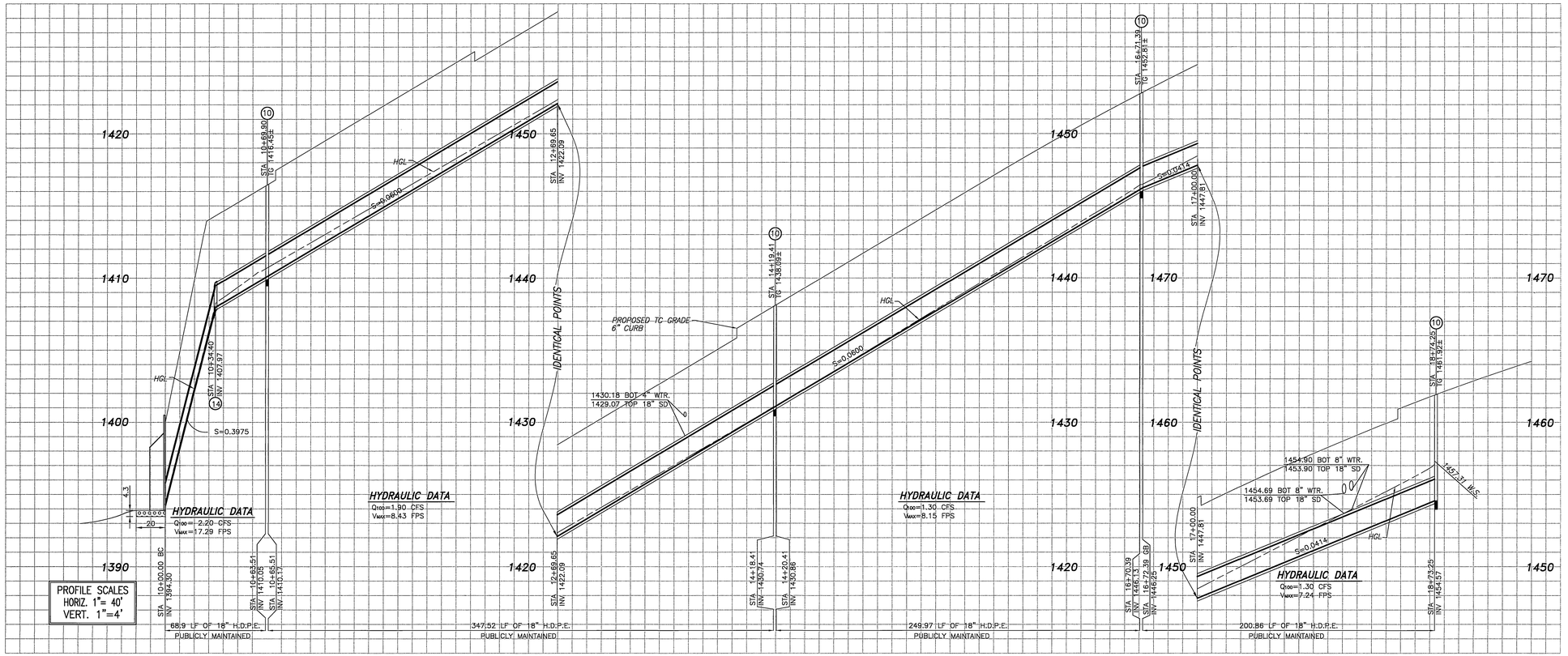
RIZ

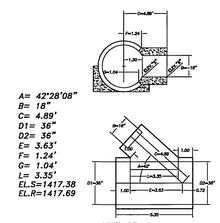
STORM DRAIN PLAN
TRACT 29628
STORM DRAIN
A.P.N. 243-380-012, 268-320-015
HORIZ. SCALE: VERT. SCALE:

PW03-0415
ACCOUNT NO.
D-738
SHEET 3 OF 8
J.N. 6124

Plot Date: 10/12/2006
File name: U:\DRAWING\BODEWIN\6124\6124SD03

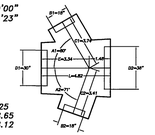
INDEXED 11-08-06 GH





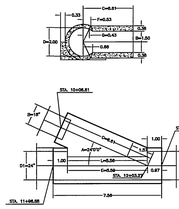
A= 42°28'08"
B= 18"
C= 4.89'
D1= 36"
D2= 36"
E= 3.63'
F= 1.24'
G= 1.04'
L= 5.35'
EL.S=1417.38
EL.R=1417.69

LINE C3
JUNCTION NOS. B– 36"x18"@42°28'08"
STATION: 14+30.09



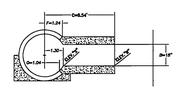
A1= 60°00'00"
A2= 70°31'23"
B1= 18"
B2= 18"
C1= 3.74'
C2= 3.41'
D1= 36"
D2= 36"
E= 3.34'
L= 4.82'
ELS=1417.25
ELR1=1418.65
ELR2=1418.12

LINE–C1 & C2
MANHOLE NOS. JM– 30"x36"x18"x18"
STATION: 14+52.72



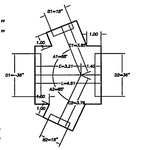
A= 24°00'00"
B= 18"
C= 6.61'
D1= 24"
D2= 24"
E= 5.56'
L= 5.56'
EL.S=1424.12
EL.R=1423.78

LINE A2
JUNCTION NOS. B– 24"x 18"@24'
STATION: 10+00.00



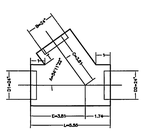
A= 30°00'00"
B= 18"
C= 6.54'
D1= 36"
D2= 36"
E= 6.36'
F= 1.24'
G= 1.04'
L= 4.54'
EL.S=1390.26
EL.R=1390.29

LINE–F
JUNCTION NOS. B– 36"x 18"@30°00'00"
STATION: 11+30.44



A1= 68°05'56"
A2= 64°44'43"
B1= 18"
B2= 18"
C1= 3.65'
C2= 3.79'
D1= 30"
D2= 36"
E= 3.21'
L= 4.61'
ELS=1413.18
ELR1=1414.06
ELR2=1413.38

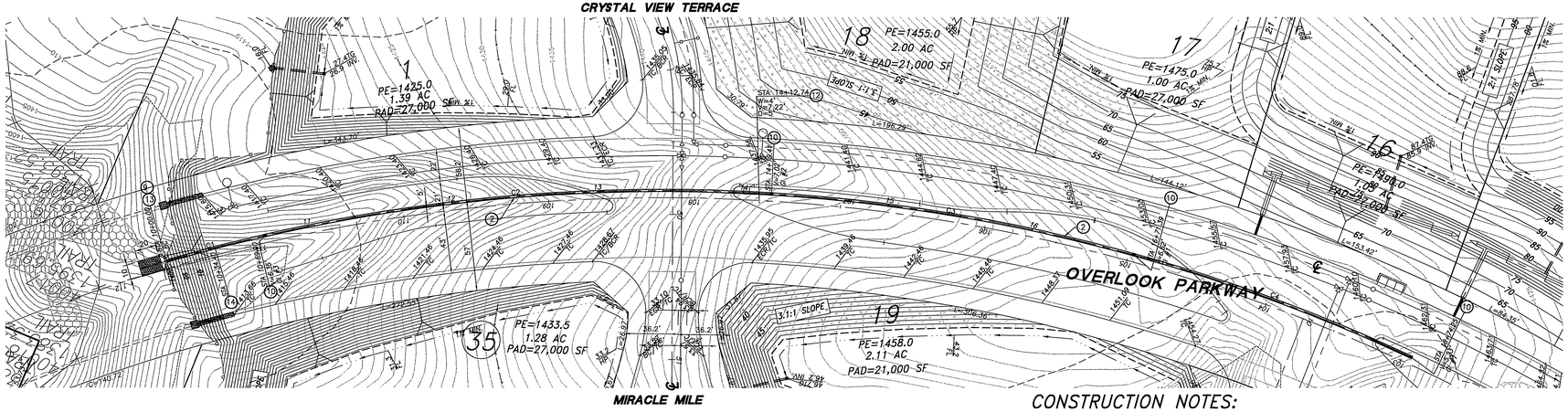
LINE–A1&A2
MANHOLE NOS. JM– 36"x36x18"x18"
STATION: 12+13.58



A= 54°11'22"
B= 24"
C= 3.81'
D1= 24"
D2= 24"
E= 3.81'
L= 5.55'
EL.S=
EL.R=

LINE–A1
JUNCTION STRUCT. C– 24"x 24"x24"@54°11'22"
STATION: 11+30.44

CRYSTAL VIEW TERRACE



CURVE TABLE				
CURVE	DELTA	RADIUS	LENGTH	TAN.
C1	3°19'25"	1205.00	69.90	34.96
C2	16°37'06"	1205.00	349.51	175.99
C3	11°58'53"	1205.00	251.98	126.45
C4	9°38'44"	1205.00	202.86	101.67

REGISTERED PROFESSIONAL ENGINEER
GRANISSA J.A. LUCAS
NO. 53390
EXP. 6-30-07
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES:

1. CONSTRUCT CATCH BASIN PER CITY OF RIVERSIDE PWD–ENGINEERING DIV. STD. DWG 407
2. INSTALL 18" HDPE PER PLAN
8. INSTALL TRASH RACK (INCLINED) AT INLET PER APWA STD DWG 361–0 SEE DETAIL ON SHEET 1
9. INSTALL RIP–RAP PER DETAIL SHOWN ON SHT. 1
10. INSTALL 2' X 2' GRATING CATCH BASIN PER APWA STD. DWG. 304–2
13. CONSTRUCT PIPE HEADWALL ENDWALL AND WINGWALLS PER DETAIL SHOWN ON SHEET 1 & 5
14. CONSTRUCT CONCRETE COLLAR PER CITY OF RIVERSIDE STD. DWG. NO. 424

S.D. G

40 0 40 80 120

Scale 1" = 40'

CITY OF RIVERSIDE BUSINESS TAX ACCT.#058833 EXP. 1/1/07

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CIVIL ENGINEERING • SURVEYING • PLANNING
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TEL: (951)688-0241 FAX: (951) 688-0599
DATE 10/13/06
UNDER THE SUPERVISION OF: R.C.E. 53390 6/30/07

BENCHMARK: F7 – K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7–C2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C–

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

	APPROVED BY	DATE	BY
PRINCIPAL ENGINEER		10/27/06	DR

APPROVED BY: [signature]
CITY ENGINEER
DATE 10/27/06

ZVR

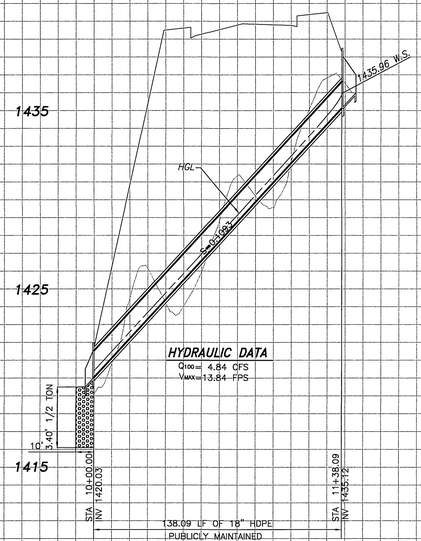
STORM DRAIN PLAN
TRACT 29628
LINE G
A.P.N. 243–380–012, 268–320–015
HORIZ. SCALE: VERT. SCALE:

PW03–0415
ACCOUNT NO.
D–738
SHEET 4 OF 8
J.N. 6124

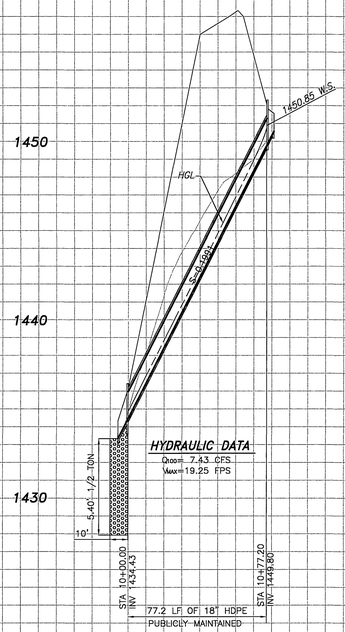
File name: U:\DRAWING\BODEWIN\6124\6124SD04

INDEXED 11-08-06 FH

Plot Date: 4/21/2005



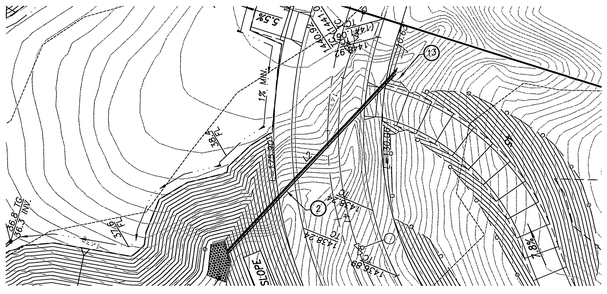
S.D. H



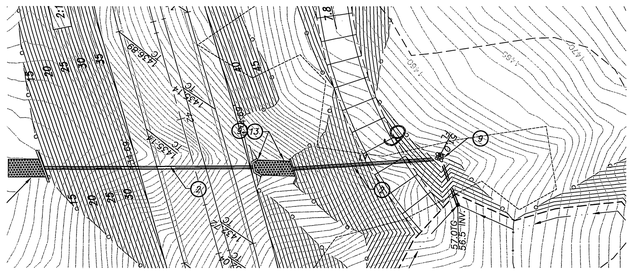
S.D. I

PROFILE SCALES
HORIZ. 1"= 40'
VERT. 1"=4'

10 11 12 10 11



S.D. H



S.D. I

S.D. LINE DATA

NUMBER	DIRECTION	DISTANCE
L1	N 57°46'1" E	77.20'
L2	N 25°09'04" E	138.07'

REGISTERED PROFESSIONAL ENGINEER
CLARISSA J.A. LEACH
NO. 53390
EXP. 6-30-07
CIVIL
STATE OF CALIFORNIA

CONSTRUCTION NOTES:

(2) INSTALL 18" HDPE PER PLAN
(9) INSTALL RIP-RAP PER DETAIL SHOWN ON SHT. 1
(13) CONSTRUCT PIPE HEADWALL ENDWALL AND WINGWALLS PER DETAIL SHOWN ON SHEET 1 & 5

40 0 40 80 120
Scale 1" = 40'

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TEL (951) 688-0241 • FAX (951) 688-0599
DATE 10/20/06 UNDER THE SUPERVISION OF:
R.C.E. 53390 6/30/07

BENCHMARK: F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-C2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

	APPROVED BY	DATE	BY
PRINCIPAL ENGINEER		10/27/06	DH

APPROVED BY
CITY ENGINEER
DATE 10/27/06

BZ

STORM DRAIN PLAN
TRACT 29628
STORM DRAIN
A.P.N. 243-380-012, 268-320-015
HORIZ. SCALE: VERT. SCALE:

PW03-0415
ACCOUNT NO.
D-738
SHEET 5 OF 8
J.N. 6124

File name: U:\DRAWING\BODEWIN\6124\6124SD04

INDEXED 11-08-06 LH

Plot Date: 4/21/2005

GENERAL STRUCTURAL NOTES

GENERAL REQUIREMENTS

1. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE STRUCTURAL ENGINEERS IN THIS OR SIMILAR LOCALITIES. THEY NECESSARILY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND /OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, IT IS UNDERSTOOD THAT THE CONTRACTOR WILL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR ALL MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

2. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING, FORM-WORK, ETC... AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. CONSTRUCTION MATERIALS SHALL BE UNIFORMLY SPREAD OUT SUCH THAT DESIGN LIVE LOAD PER SQUARE FOOT AS STATED HEREIN IS NOT EXCEEDED. VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH THE LOCAL BUILDING DEPARTMENT. ALL WORK OR CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATIONS AND SAFETY REQUIREMENTS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, CONDITIONS AND ELEVATIONS WITH CIVIL DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEER AND/OR STRUCTURAL ENGINEER IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED BEFORE START OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. WHERE DISCREPANCIES OCCUR IN THESE DRAWINGS, NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS.

5. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.

6. OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF ANY OPTION IS USED, THE CONTRACTOR SHALL USE THE LATEST EDITION AND/OR ADDENDA.

7. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR CIVIL AND ELECTRICAL REQUIREMENTS WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

8. OWNER SHALL BE RESPONSIBLE FOR THE COSTS OF ALL INSPECTIONS WHETHER PERFORMED BY AN AGENCY, INDEPENDENT CONSULTANT OR STRUCTURAL ENGINEER ALL INSPECTIONS REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS OR BY THESE PLANS SHALL BE PROVIDED BY AN INDEPENDENT INSPECTION COMPANY OR THE BUILDING DEPARTMENT. SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN INSPECTION, UNLESS SPECIFICALLY CONTRACTED FOR.

9. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS. SHOP DRAWINGS ARE REVIEWED ONLY FOR GENERAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. REVIEW DOES NOT INDICATE THAT THE SHOP DRAWINGS ARE CORRECT OR COMPLETE. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DRAWINGS SHALL BE CLOUDED. ANY OF THE AFOREMENTIONED SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEERS REVIEW UNLESS SPECIFICALLY NOTED ACCORDINGLY. THE SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE ORIGINAL CONTRACT DRAWINGS. ANY ENGINEERING PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF AN APPROPRIATELY REGISTERED ENGINEER. ES2 SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF ENGINEERING DESIGNS PERFORMED BY THE OTHERS. ALLOW 5 WORKING DAYS FOR THE ENGINEER OF RECORD'S REVIEW. ONE COPY OF EACH SUBMITTAL WILL BE RETAINED BY THE ENGINEER OF RECORD.

10. ONLY HYDRO-ARCH, ENGINEERING STRUCTURAL SOLUTIONS'S APPROVED INSTALLER MAY PROVIDE THE STRUCTURE SHOWN ON THESE PLANS. THE USE OF ANOTHER INSTALLER OR SYSTEM WITH THE DESIGN ASSUMPTIONS USED FOR THE HYDRO-ARCH STRUCTURE MAY LEAD TO SERIOUS CONSTRUCTION ERRORS. USE OF ANY OTHER INSTALLER OR SYSTEM WITH THIS DESIGN VOIDS ANY CERTIFICATION OR WARRANTY MADE BY ES2. ES2 ASSUMES NO LIABILITY FOR THE DESIGN OF ANY ALTERNATE OF SIMILAR TYPE STRUCTURES

DESIGN BASIS

1. BODEWIN – (1) 20'-0" x 6'-0" AND (1) 8'-0" x 4'-0" ARCHED CULVERTS

2. CODE.....AASHTO 1996 ed. STANDARD SPECIFICATIONS

3. DEAD LOAD:
   STRUCTURE SELF WEIGHT CONCRETE.....150 pcf
   VARYING COVER WITH A SOIL BACKFILL DENSITY.....120 pcf

4. LIVE LOAD.....HS20-44 LOADING

FOUNDATION

1. THE FOUNDATIONS FOR THE ABOVE REFERENCED PROJECT ARE DESIGNED WITH RECOMMENDATIONS FROM:

   FIRM: EARTH TECHINCS REPORT NO.: 99286-01 DATE: NOVEMBER 2, 1999

   ALL RECOMMENDATIONS LISTED WITH IN THIS REPORT REGARDING SITE PREPARATION, GRADING, COMPACTION TESTS, INSPECTIONS ETC. SHALL BE FOLLOWED WITH STRICT ADHERENCE AND SHALL BE COMPLETED PRIOR TO CONSTRUCTION.

CONCRETE

1. MIN. 28 DAY COMPRESSIVE STRENGTH, f'c, SHALL BE 4500 PSI.

2. CEMENT SHALL BE TYPE V AND MAX W/C RATIO SHALL BE 0.45

3. CONCRETE SHALL BE TESTED IN ACCORDANCE WITH ASTM C 42 SPECIFICATION.

4. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY AND APPROVED BY ES2.

5. ALL CONCRETE SHALL BE REGULAR WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARDROCK AGGREGATES CONFORMING TO TO ASTM C33. WATER SHALL BE CLEAN AND POTABLE.

6. CONCRETE FOR SLABS ON GRADE SHALL BE CONSOLIDATED USING SURFACE VIBRATION METHODS. ALL OTHER CONCRETE SHALL BE CONSOLIDATED USING INTERNAL VIBRATION METHODS. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.

7. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., SHALL BE SECURELY POSITIONED PRIOR TO CONCRETE PLACEMENT.

8. SHOTCRETE PROPORTIONS SHALL BE SELECTED THAT ALLOW SUITABLE PLACEMENT PROCEDURES USING THE DELIVERY EQUIPMENT SELECTED AND SHALL RESULT IN FINISHED IN-PLACE HARDENED SHOTCRETE MEETING THE STRENGTH REQUIREMENTS STATED HERE-IN. COARSE AGGREGATE, IF USED, SHALL NOT EXCEED 3/8 INCH. ANY REBOUND OR ACCUMULATED LOOSE AGGREGATE SHALL BE REMOVED FROM THE SURFACES TO BE COVERED PRIOR TO PLACING THE INITIAL OR ANY SUCCEEDING LAYERS OF SHOTCRETE. REBOUND SHALL NOT BE REUSED AS AGGREGATE.

9. SHOTCRETE PLACEMENT SHALL BE PLACED ACCORDING TO ACI 506R-90. PRE-CONSTRUCTION TESTING OF SHOTCRETE IS NOT REQUIRED PROVIDED THE CONTRACTOR DEMONSTRATES TO THE BUILDING OFFICIAL, BY MEANS APPROVED BY THE BUILDING OFFICIAL, ACCEPTED SHOTCRETE WORK USING SIMILAR EQUIPMENT UNDER SIMILAR CIRCUMSTANCES WITH THE SAME PERSONNEL.

10. FINISHING:
    ACCORDING TO THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY, ONLY SURFACES EXPOSED TO VIEW AFTER BACKFILL IS PLACED REQUIRE FINISHING (EITHER ORDINARY OR FINE). HOWEVER, IT IS REQUIRED THAT THE EXTERIOR SHOTCRETE SURFACE IS MADE SMOOTH WITH A STEEL TROWEL OR FRESNO TO FACILITATE THE APPLICATION OF WATERPROOFING. THIS FINISH SHALL HAVE NO REQUIREMENTS FOR FLATNESS. HOWEVER, THE SURFACE SHALL BE FREE FROM STONE POCKETS, DEPRESSIONS OR PROJECTIONS IN EXCESS OF 1/4 INCH BEYOND THE SURFACE. INVERT EXPOSED SURFACE SHALL BE ORDINARY BROOM FINISH.

    ADMIXTURES:
    ONLY ADMIXTURES PERMITTED BY THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS OF RIVERSIDE COUNTY COUNTY SHALL BE ALLOWED.

    CURING:
    CURING ON THE OUTSIDE SURFACE AND INSIDE SURFACE AFTER FORM REMOVAL SHALL BE BY MEANS OF LIQUID MEMBRANE-FORMING COMPOUND MEETING THE REQUIREMENTS OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS RIVERSIDE COUNTY. A BULKHEAD SHALL BE PLACED AT THE END OF THE CULVERT TO STOP WIND MOVEMENT THROUGH THE CULVERT IMMEDIATELY AFTER CONCRETE PLACEMENT.

CONCRETE CONT

11. COMPLETED SHOTCRETE WORK SHALL BE CHECKED VISUALLY DURING CONSTRUCTION AND PRIOR TO FINAL APPROVAL OF SHOTCRETE FOR REINFORCING BAR EMBEDMENT, VOIDS, ROCK POCKETS, SAND STREAKS AND SIMILAR DEFICIENCIES. THE SPECIAL INSPECTOR SHALL EXAMINE.

12. SURFACES OF STEEL FORMS SHALL BE COATED W/ AN ICC APPROVED FORM RELEASE OIL.

13. SHOTCRETE NOZZLEMAN SHALL BE CERTIFIED PER ACI 506.3R-91.

14. SHOTCRETE MAY BE USED IN LIEU OF POURED IN PLACE CONCRETE ON ALL ARCHES, WALLS, MANHOLE BASES (ATTACHED DIRECTLY TO ARCH).

15. SLABS SHALL BE POURED IN PLACE.

16. AT CONTRACTORS OPTION CUT OFF WALLS MAY UTILIZE A 3/8" MINUS AGGREGATE IN MIX DESIGN.

17. CONCRETE USED IN BASE INVERTS AND SLABS SHALL BE AN ABRASION RESISTANT MIX USING 1 1/2" MINUS AGGREGATE.

REINFORCING STEEL

1. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615. REINFORCING SHALL BE GRADE 60 (FY = 60 KSI) DEFORMED BARS FOR ALL BARS #4 AND LARGER AND ALL BARS USED FOR CONCRETE WALLS. REINFORCING MAY BE GRADE 40 (FY = 40 KSI) DEFORMED BARS FOR ALL BARS #3 AND SMALLER UNLESS NOTED OTHERWISE ON PLANS OR DETAILS. ALL REINFORCING TO BE WELDED SHALL BE ASTM A706, GRADE 60 ALLOY WELDABLE STEEL.

2. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR" ARE TO CENTER OF STEEL. MINIMUM COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE ON PLANS OR DETAILS:

EXPOSURE CONDITION	COVER	TOLERANCES: (+/-)
FOOTINGS & SLABS ON GRADE:	3"	3/8"
WALLS & SLABS EXPOSED TO EARTH OR WEATHER:	1 1/2"	1/2"
#6 BAR OR LARGER:	2"	1/2"
INTERIOR SLABS:	1 1/2"	1/2"

3. LAP SPLICES OF REINFORCING STEEL IN CONCRETE BEAMS, SLABS AND FOOTINGS SHALL BE ACCORDING TO ACI 318-99 CPT 12 OR LAP SCHEDULE WHERE PRESENT, UNLESS NOTED OTHERWISE. SPLICES MAY BE CONTACT OR NON-CONTACT SPLICES. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. SPLICE BARS TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC..., UNLESS NOTED OTHERWISE.

REBAR LAP SCHEDULE				
BAR	#3	#4	#5	#6
LAP	31"	31"	39"	48"

4. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UNBENT AND RE-BENT EXCEPT AS NOTED ON PLAN. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED EXCEPT AS NOTED ON PLAN. BENDS AND HOOKS SHALL CONFORM TO ACI STANDARD 315-80.

5. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL CONFORM WITH ACI 318 CHAPTER 12, AND SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS.

6. REINFORCING BAR SPACING SHOWN ON PLANS ARE MAXIMUM ON CENTERS. ALL BARS SHALL BE DETAILED AND PLACED PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

INSPECTIONS

1. THE OWNER SHALL EMPLOY ONE OR MORE INSPECTORS WHO SHALL PROVIDE INSPECTIONS DURING PLACEMENT OF BACKFILL, REINFORCEMENT, SHOTCRETING, CONCRETE AND EPOXY DOWELING. THE INSPECTOR SHALL SUBMIT A STATEMENT TO THE OWNER, HYDRO ARCH, AND ES2 INDICATING COMPLIANCE WITH THE PLANS AND SPECIFICATIONS.

2. SPECIAL INSPECTION OF THE FILL AROUND THE CULVERT SHALL BE PROVIDED AT A FREQUENCY AS NECESSARY TO ENSURE THAT PROPER FILL AND COMPACTION IS ACHIEVED. COMPACTION TESTS FOR EACH LIFT SHALL BE TAKEN PER EVERY 2500 SQUARE FEET PLACED AS A MINIMUM. THE SPECIAL INSPECTOR SHALL SUBMIT A COMPLIANCE REPORT TO THE OWNER, HYDRO ARCH, AND ES2 DOCUMENTING FILL TYPE AND PROCEDURES OF PLACEMENT.

3. INSPECTORS SHALL BE ON THE APPROVED LIST OF RIVERSIDE COUNTY. INSPECTORS SHALL BE SPECIFICALLY CERTIFIED BY ACI FOR EACH TYPE OF WORK LISTED. SHOTCRETE INSPECTORS SHALL HAVE A MIN OF 40 HOURS OF WORK ON A SIMILAR TYPE PROJECT. EVIDENCE OF THIS WORK SHALL BE PROVIDED TO ES2 AND RIVERSIDE COUNTY FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.

DEFERRED SUBMITTALS

1. ALL ITEMS CONSIDERED IN THESE DESIGN DOCUMENTS AS BY OTHERS ARE NOTED AS DEFERRED SUBMITTALS. THE FOLLOWING WILL INCLUDE BUT NOT BE LIMITED TO:

   CONCRETE MIX DESIGN

   REINFORCING SHOP DRAWING

2. PRIOR TO SUBMITTAL OF DEFERRED ITEMS TO PLAN REVIEW, THEY SHALL BE SUBMITTED TO OUR OFFICE FOR REVIEW.

WATER PROOFING

1. THE EXTERIOR SURFACE OF THE CONCRETE ARCH SHALL BE WATERPROOFED W/ AN EPRO ECOBASED II PRODUCT OR EQUAL. INSTALLATION SHALL BE IN ACCORDANCE W/ MANUFACTURE RECOMMENDATIONS FOR SPECIFICATIONS SEE EPRO WEB SITE EPROSERV.COM/PSI_SET.HTM

EPOXY ANCHORAGE

1. EPOXY GROUTED DOWELS SHALL BE INSTALLED USING:

   A. HILTI HIT HY-150 ADHESIVE ANCHOR SYSTEM

   B. SIMPSON STRONG-TIE SET ADHESIVE ANCHOR SYSTEM

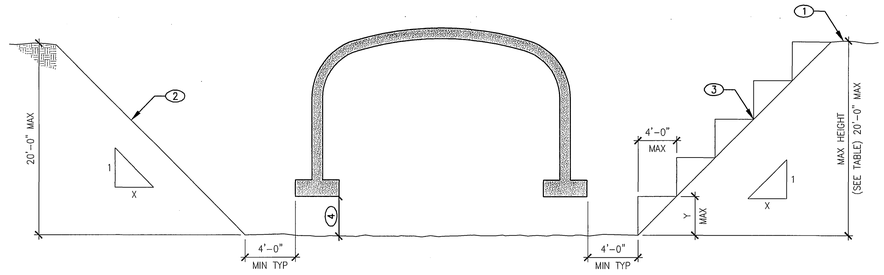
      INSTALL THE ABOVE SYSTEMS PER THE ICC REPORT AND MFR'S RECOMMENDATIONS.

      ALTERNATE EPOXY GROUT SYSTEMS WITH CURRENT ICC APPROVAL MAY BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL.

STANDARD ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE	FLR	FLOOR	PSI	POUNDS PER SQUARE INCH
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	FTG	FOOTING	REQ'D	REQUIRED
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	GSN	GENERAL STRUCTURAL NOTES	SIM	SIMILAR
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIAL	KSI	KIPS PER SQUARE INCH	T&B	TOP AND BOTTOM
℄	CENTER LINE	MFR	MANUFACTURER	TOF	TOP OF FOOTING
CLR	CLEAR	MAX	MAXIMUM	TOPC	TOP OF PILECAP
CONC	CONCRETE	MECH	MECHANICAL	TOW	TOP OF WALL
CONT	CONTINUOUS	MIN	MINIMUM	UBC	UNIFORM BUILDING CODE
DIA OR ø	DIAMETER	MISC	MISCELLANEOUS	UNO	UNLESS NOTED OTHERWISE
DWG	DRAWING	NTS	NOT TO SCALE	VERT	VERTICAL
EF	EACH FACE	OC	ON CENTER	W/	WITH
ELEV	ELEVATION	OPP	OPPOSITE	W/O	WITHOUT
EQ	EQUAL	PSF	POUNDS PER SQUARE FOOT	WT	WEIGHT

SHEET INDEX

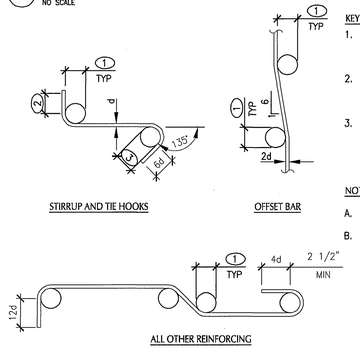


KEYNOTES:
1. FINISHED GRADE
2. SIMPLE SLOPE EXCAVATION
3. MULTIPLE BENCH EXCAVATION
4. OVER EXCAVATE AS REQUIRED FOR FILL PLACEMENT
5. COORDINATE EXCAVATION SOIL WITH OSHA 29 CFR 1926 SUBPART P TO DETERMINE SOIL TYPE A, B OR C.
6. THE INFORMATION PRESENTED IS A GUIDELINE TO EXCAVATION BASED ON OSHA 29 CFR 1926 SUBPART P. TO DETERMINE WHERE SHORING IS REQUIRED AND FOR FURTHER INFORMATION SEE OSHA 29 CFR 1926

SOIL TYPE	(X) HORIZONTAL	(Y) MULT BENCH
A	3/4	5'-0"
B	1	4'-0"
C	1 1/2	NA

RECOMMEND EXCAVATION GUIDELINES PER OSHA 29 CFR 1926 SUBPART P

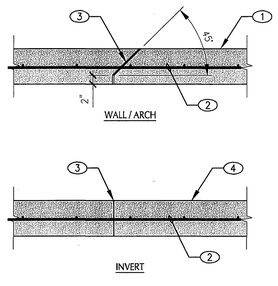
1 TYPICAL EXCAVATION REQUIREMENTS
NO SCALE



KEYNOTES:
1. D = 6d FOR #3 THRU #8
   D = 8d FOR #9, #10 AND #11
   D = 10d FOR #14 AND #18
2. EXTENSION 6"d" FOR #5 AND SMALLER 12"d" FOR #6 THRU #8
3. MINIMUM FINISHED BEND DIA FOR STIRRUPS AND TIES ONLY
   4d FOR #5 AND SMALLER
   6d FOR #6 THRU #8
   8d FOR #9 THRU #11

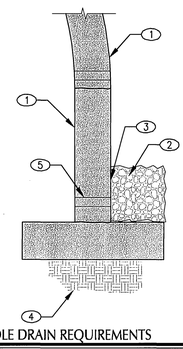
NOTES:
A. d = BAR DIA
B. ALL REINFORCEMENT SHALL BE BENT COLD UNLESS NOTED OTHERWISE ON PLANS OR DETAILS

4 STANDARD REBAR BENDING DETAILS
NO SCALE



KEYNOTES:
1. CONCRETE WALL OR ARCH
2. REINF PER DETAILS
3. CONSTRUCTION JOINT
4. INVERT

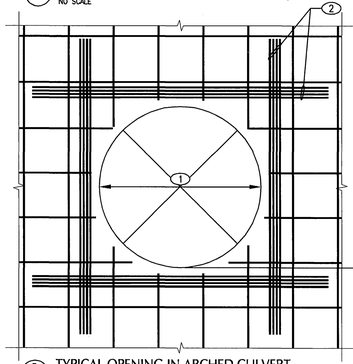
5 CONSTRUCTION JOINT IN WALL, ARCH, OR INVERT
NO SCALE



KEYNOTES:
1. CONCRETE WALL OR ARCH
2. (2) CUBIC FOOT OF FREE DRAIN MATERIAL WRAPPED IN FILTER FABRIC AT EACH WEEP HOLE
3. REMOVE WATER PROOFING AS OCCURS AT AREAS WHERE DRAIN ROCK TOUCHES CULVERT WALL
4. COMPACT BACKFILL, SEE GEOTECHNICAL REPORT
5. 2"ø WEEP HOLE EACH SIDE OF CULVERT, SEE PLANS AND DETAILS FOR SPACING

6 WEEP HOLE DRAIN REQUIREMENTS
NO SCALE

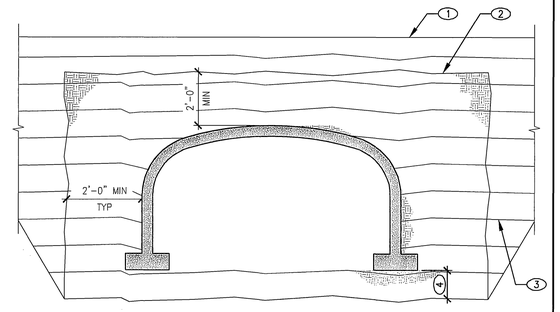
2 BACKFILL REQUIREMENTS (ELEVATION)
NO SCALE



KEYNOTES:
1. OPENING DIAMETER 4'-0" MAX UNO
2. NUMBER OF ADDED BARS EQUAL TO THE NUMBER OF BARS INTERRUPTED BY OPENING.
3. U.N.O. EXTEND BARS PAST EDGE OF OPENING EQUAL TO LAP LENGTH OF BAR PER LAP SCHEDULE

NOTES:
A. LOCATION AS SHOWN PER CIVIL DRAWINGS AS OCCURS

3 TYPICAL OPENING IN ARCHED CULVERT
NO SCALE



KEYNOTES:
1. FINISHED GRADE
2. MIN LIMITS OF STRUCTURAL BACKFILL ZONE (SEE NOTES BELOW FOR STRUCTURAL BACKFILL REQUIREMENTS). FOR FILL HEIGHT LESS THAN 2'-0" THE FINISH GRADE SHALL BE THE BOUNDARY LINE FOR THE BACKFILL ZONE.
3. BACKFILLING OPERATIONS OUTSIDE THE STRUCTURAL BACKFILL ZONE SHALL BE PER THE GEOTECHNICAL REPORT.
4. SCARIFY 12" MIN AND COMPACT PER NOTE B

NOTES:
A. THE MIN REQUIREMENTS FOR SUBBASE PREP AND BACKFILL ARE LISTED BELOW. GEOTECHNICAL ENGINEER MAY REQUIRE ADDITIONAL
B. BACKFILL WITHIN 2'-0" OF ARCH OR STEM WALLS SHALL CONSIST OF WELL GRADED 3" MINUS GRANULAR MATERIAL OF A MIN SOIL CLASS OF SM OR SP PER THE UNIFIED CLASSIFICATION SYSTEM, ASTM D-2487-69. AND COMPACTED TO 95% DRY DENSITY. WHERE SUB BASE PREPARATION IS NOT SPECIFIED BY THE GEOTECNICAL REPORT EXISTING SUBASE SHALL BE SCARIFIED FOR 1'-0" DEPTH, FREE OF CLAY AND SILT DEPOSITS, AND COMPACTED TO 95% OF DRY DENSITY. 6" OF WELL GRADED 3" MINUS GRANULAR MATERIAL IS TO BE PLACED ON EXISTING COMPACTED SUBASE AND PROPERLY COMPACTED TO 95% OF DRY DENSITY. 8" OF WELL GRADED 3" MINUS GRANULAR MATERIAL COMPACTED TO 95% DRY DENSITY SHALL BE REQUIRED WHEN COBBLES 12" IN DIA ARE FOUND.
C. PLACEMENT OF THE FILL AT THE STEM WALLS AND OVER THE ARCH MAY BEGIN WHEN THE CONCRETE STRENGTH HAS REACHED 2800 psi COMPRESSIVE STRENGTH. FILL SHALL BE PLACED IN 8" MAXIMUM VERTICAL LIFTS AND COMPACTED TO 95% OF DRY DENSITY. LIFTS SHALL BE PLACED SYMMETRICALLY EACH SIDE ALONG THE FULL LENGTH OF CULVERT WITH A MAXIMUM BACKFILL LIFT HEIGHT DIFFERENTIAL OF 1'-0". MAXIMUM DRY DENSITY SHALL BE DETERMINED PER THE GEOTECHNICAL REPORT. BACKFILL SHALL BE COMPACTED PER GEOTECHNICAL REPORT.
D. NO EQUIPMENT WEIGHING MORE THAN A 3 YARD RUBBER TIRE LOADER (928 CATERPILLAR OR EQUIVALENT) SHALL BE ALLOWED TO PASS OVER THE STRUCTURE UNTIL THE SPECIFIED FILL IS IN PLACE. HEAVY EQUIPMENT SUCH AS SCRAPERS AND CRANES SHALL NOT BE ALLOWED TO PASS OVER THE STRUCTURE UNLESS SPECIFIC WRITTEN PERMISSION IS OBTAINED BY THE STRUCTURAL ENGINEER.
E. SHOTCRETE REBOUND MAY BE USED AS BACKFILL.

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ENGINEER R.E. NO. C57725

REGISTERED PROFESSIONAL ENGINEER JOSEPH H. WISE C57725 EXP. DEC. 31, 2007 CIVIL STATE OF CALIFORNIA
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Under the Supervision of: R.C.E. 53390 Exp. 06.30.07 Date:

BENCHMARK: F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7.
PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-C2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C—

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

APPROVED BY	DATE	BY
PRINCIPAL ENGINEER	10/27/06	DH
~~PARK DEPARTMENT~~		
~~TRAFFIC DIVISION~~		
~~STREET SERVICES~~		

APPROVED BY: CITY ENGINEER
DATE: 10/27/06

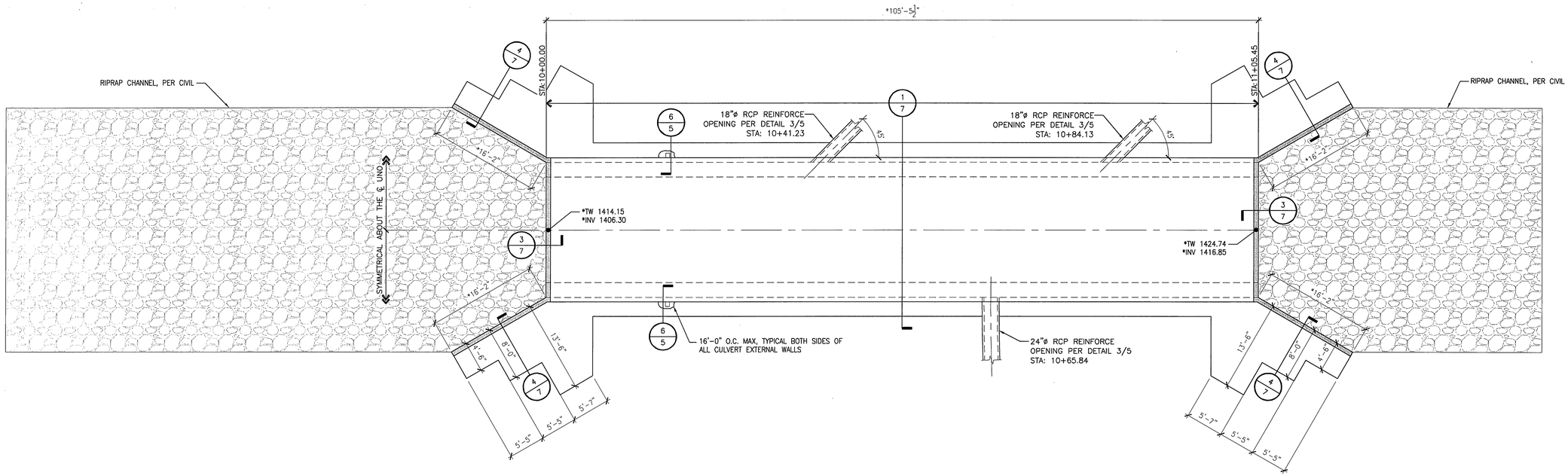
STORM DRAIN PLAN
TRACT 29628
APN 243-380-012, 268-320-015

HORIZ. SCALE: VERT. SCALE:

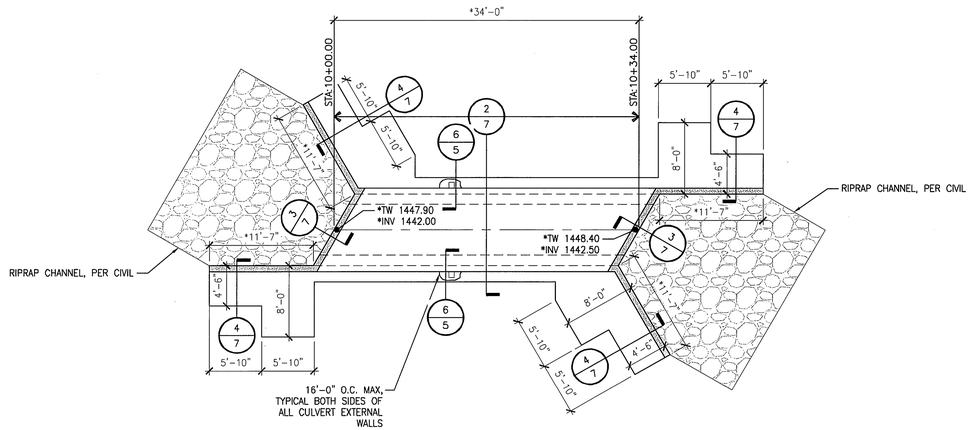
PW 03-0415
ACCOUNT NO.
D-738
SHEET 6 OF 8
J.N. 6124

INDEXED 11-08-06 GH

* DIMENSIONS SHOWN ARE APPROXIMATED BASED ON THE CIVIL DRAWINGS. REFERENCE CIVIL DRAWINGS FOR EXACT DIMENSIONS AND STATIONS.



PLAN VIEW STORM DRAIN LINE D SCALE: 1/8"=1'-0"



PLAN VIEW STORM DRAIN LINE E SCALE: 1/8"=1'-0"

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DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

APPROVED BY	DATE	BY
PRINCIPAL ENGINEER	10/27/06	PK
~~PARK DEPARTMENT~~		
~~TRAFFIC DIVISION~~		
~~STREET SERVICES~~		

APPROVED BY
CITY ENGINEER
DATE 6/27/07

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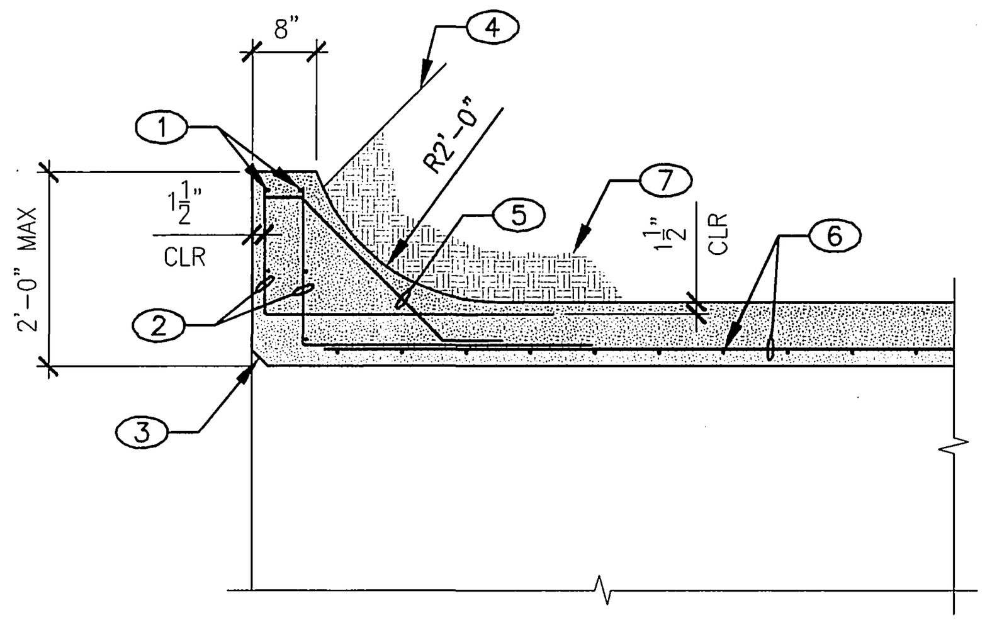
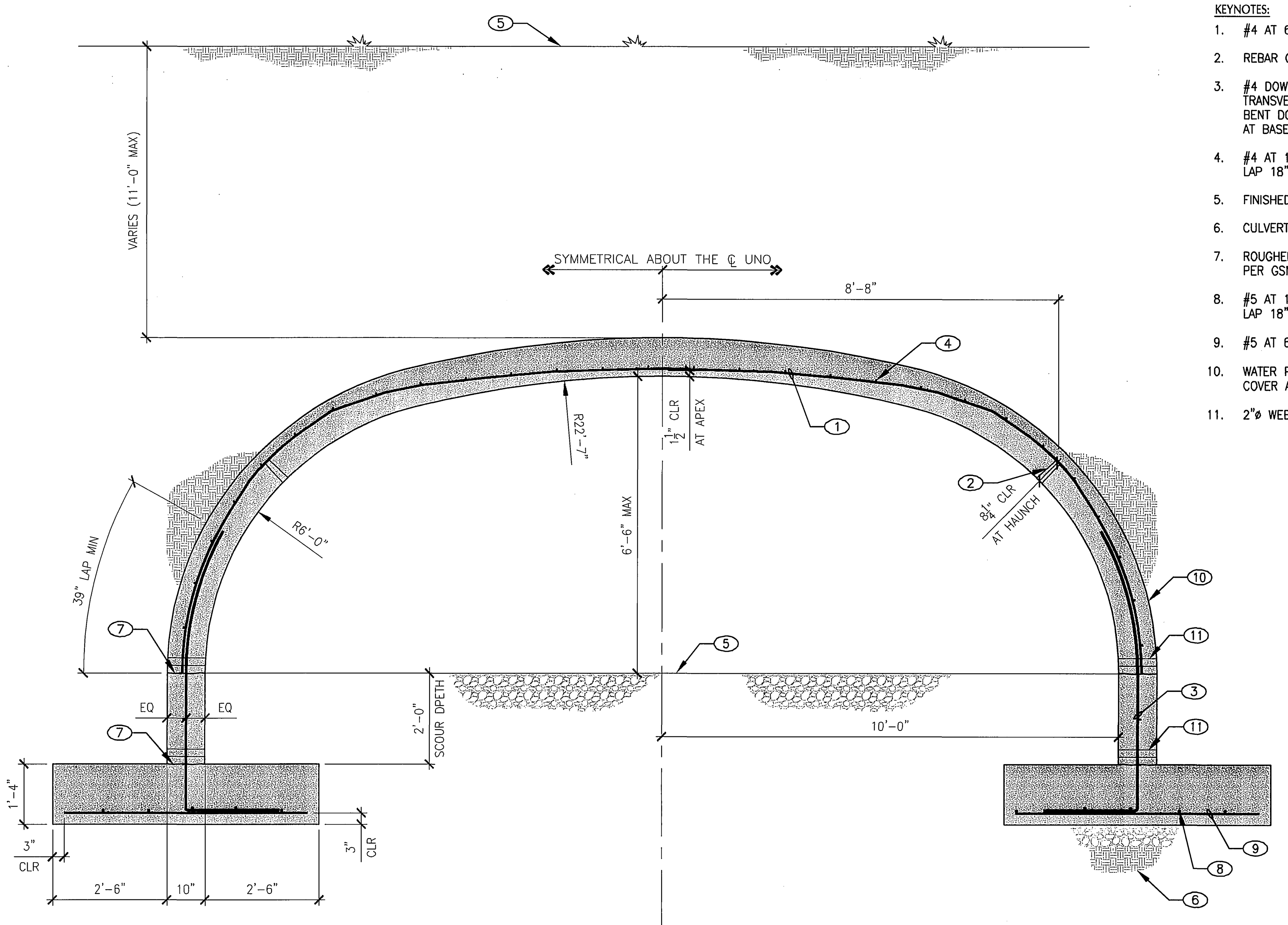


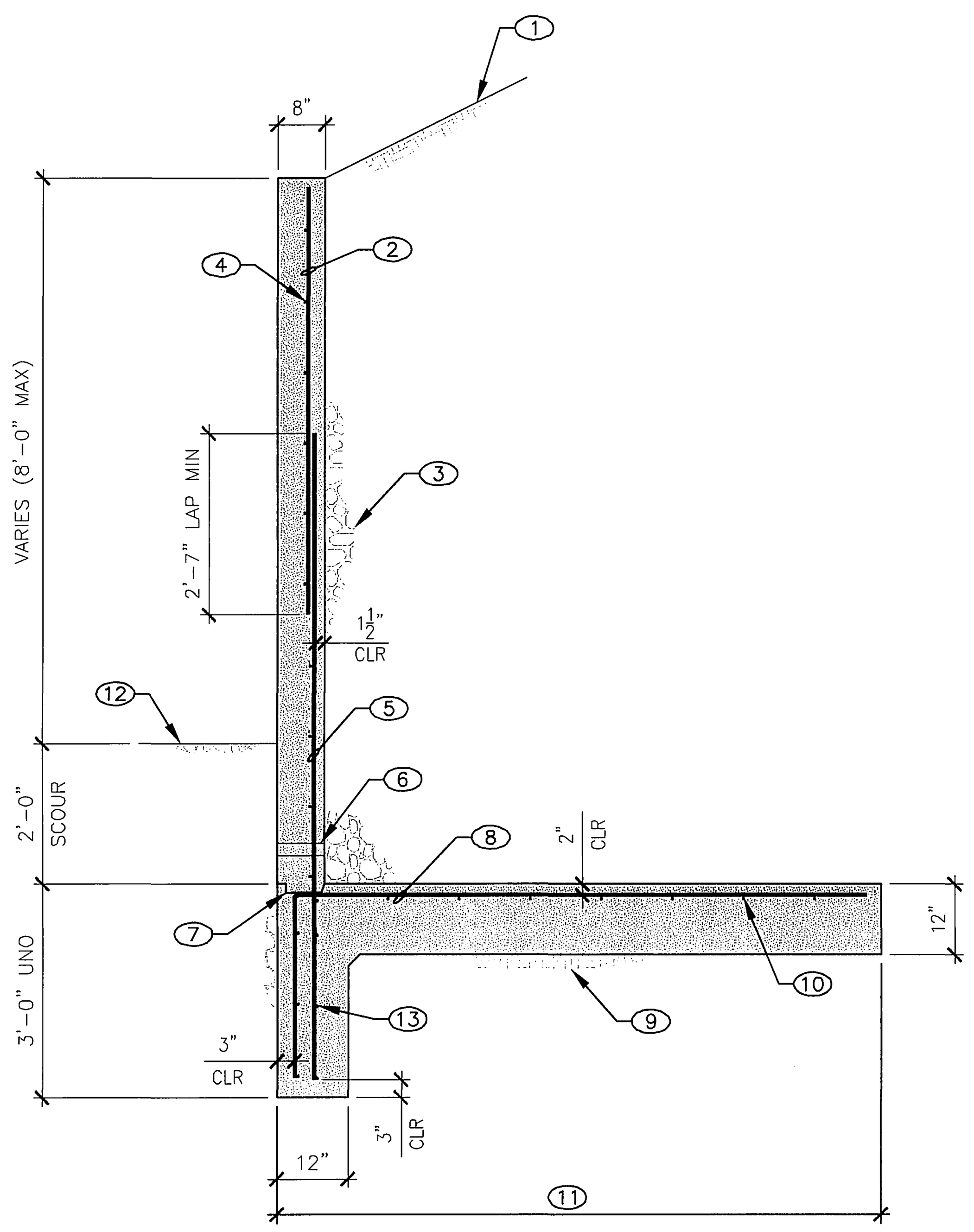
3 TYPICAL HEADWALL DETAIL
NO SCALE

KEYNOTES:
1. #4 HORIZ EA FACE AT 12" O.C.
2. #4 VERT DOWEL AT 18" O.C. W/ 36" LONG HOOK AT BASE
3. 2" CHAMFER
4. FINAL GRADE PER CIVIL DWGS
5. #4 AT 18" O.C. PLACE RADIALLY AROUND ARCH
6. CULVERT REINFORCING, SEE SECTION
7. BACK FILL MATERIAL AND PROCEDURE PER GSN



1 20'-0" x 6'-6" ARCHED CULVERT SECTION
NO SCALE

KEYNOTES:
1. #4 AT 6" O.C. TRANSVERSE
2. REBAR CHAIR POINT (TYP)
3. #4 DOWEL AT 6" O.C. TRANSVERSE LAP AND MATCH BENT DOWEL W/ 24" HOOK AT BASE
4. #4 AT 12" O.C. LONGITUDINAL LAP 18" MIN
5. FINISHED GRADE, PER CIVIL
6. CULVERT BEDDING PER GSN
7. ROUGHEN CONSTRUCTION JOINT, PER GSN
8. #5 AT 12" O.C. LONGITUDINAL LAP 18" MIN
9. #5 AT 6" O.C. TRANS
10. WATER PROOF MEMBRANE COVER ARCH AND WALL ONLY
11. 2"ø WEEP HOLE PER PLAN



4 WING WALL SECTION
NO SCALE

KEYNOTES:
1. FINSIHED GRADE PER CIVIL DWGS
2. #4 VERT AT 18" O.C.
3. BACKFILL MATERIAL AND PROCEDURES PER GEOTECHNICAL REPORT, AND PROVIDE 12" MIN FREE DRAIN GRANULAR BACKFILL FULL HEIGHT OF WALL
4. #4 AT 12" O.C. HORIZ
5.

RETAINED HEIGHT	VERT DOWEL
UP TO 4'-0"	#4 VERT AT 18" O.C.
4'-1" - 6'-0"	#4 VERT x 64" AT 10" O.C.
6'-1" - 8'-6"	#5 VERT x 81" AT 7" O.C.

6. 2"ø WEEP HOLE PER PLAN
7.

RETAINED HEIGHT	KEY SIZE
UP TO 4'-0"	1 1/2" DEEP x 4"
4'-1" - 6'-0"	1 1/2" DEEP x 5"
6'-1" - 8'-6"	1 1/2" DEEP x 6 1/2"

8.

RETAINED HEIGHT	TRANS FTG REINF
UP TO 4'-0"	#4 AT 18" O.C.
4'-1" - 6'-0"	#4 AT 12" O.C.
6'-1" - 8'-6"	#5 AT 9" O.C.

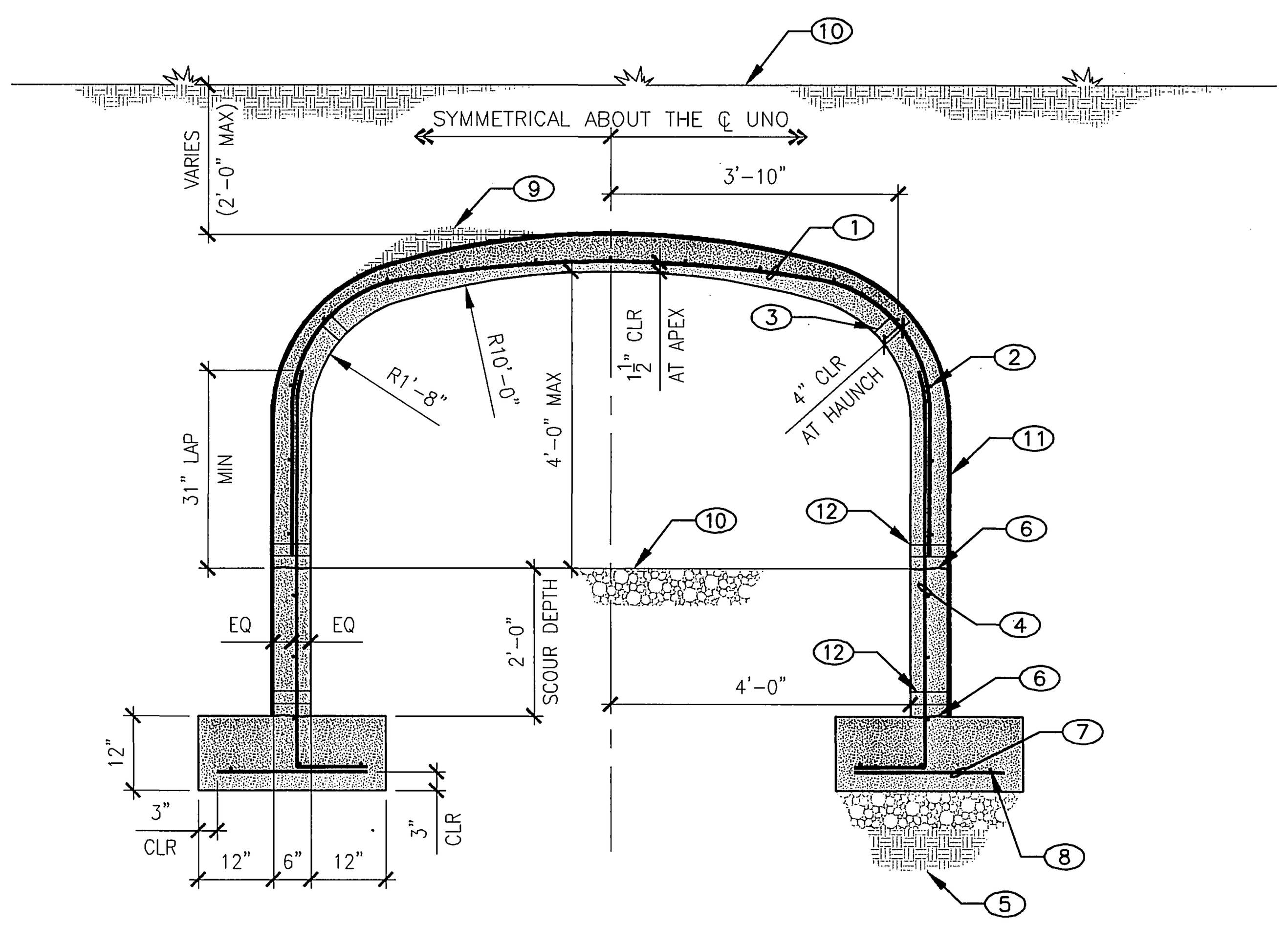
9. BEDDING PER GSN
10. #4 AT 12" O.C. LONGITUDINAL
11.

RETAINED HEIGHT	FOOTING WIDTH
UP TO 4'-0"	3'-6"
4'-1" - 6'-0"	5'-6"
6'-1" - 8'-6"	8'-6"

12. GRADE PER CIVIL DWGS
13. #4 CONT AT 12" O.C. EF

NOTE:

A. AT CONTRACTOR'S OPTION, VERT REINF PER KEYNOTE 5 MAY BE EXTENDED FULL WALL HEIGHT AND VERT REINF PER KEYNOTE 2 MAY BE ELIMINATED



2 8'-0" x 4'-0" ARCHED CULVERT SECTION
NO SCALE

KEYNOTES:
1. #4 AT 6" O.C. TRANSVERSE
2. #4 LONGITUDINAL AT 12" O.C. LAP 18" MIN
3. REBAR CHAIR POINT
4. #4 DOWEL AT 6" O.C. W/ 12" HOOK AT BASE
5. BEDDING PER GSN
6. ROUGHEN CONSTRUCTION JOINT, PER GSN
7. #4 TRANSVERSE AT 12" O.C.
8. #4 LONGITUDINAL AT 12" O.C. LAP 18" MIN
9. BACKFILL PER GSN
10. FINISHED GRADE, PER CIVIL
11. WATER PROOF MEMBRANE COVER ARCH AND WALL ONLY
12. 2"ø WEEP HOLE PER PLAN

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R.C.E. 53390 Exp. 06.30.07 Date:

BENCHMARK: F7 - K3
CITY OF RIVERSIDE REFERENCE LL47/7. PK NAIL AND CITY ENGINEER TAG IN THE BASE OF A STREET LIGHT ALONG THE SOUTHERLY CURB OF OVERLOOK PARKWAY 175 FEET EAST OF CHATEAU RIDGE DRIVE, TRANSFER FROM F7-C2 BY CITY SURVEY CREW 6/10/2002.
ELEVATION: 1426.960

MARK	REVISIONS	APPR.	DATE

DESIGNED BY: RICK DRAWN BY: RICK CHECKED BY: C-

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

APPROVED BY	DATE	BY
PRINCIPAL ENGINEER	10/27/06	DH
~~PARK DEPARTMENT~~		
~~TRAFFIC DIVISION~~		
~~STREET SERVICES~~		

APPROVED BY [signature]
CITY ENGINEER
DATE 10/27/06

STORM DRAIN PLAN
TRACT 29628
APN 243-380-012, 268-320-015
HORIZ. SCALE: VERT. SCALE:

PW 03-0415
ACCOUNT NO.
D-738
SHEET 8 OF 8
J.N. 6124

RR
INDEXED 11-08-06 GH