

LA CUEVA CORONA SUBDIVISION GRADING & DRAINAGE PLAN

General
La Cueva Corona Subdivision is a proposed 21 lot single family residential subdivision located at the northeast corner of Wyoming Boulevard and Corona Avenue. The property is located within the Nor Este Sector Development Plan area. The zoning was recently changed from RD-1 to R-D (Z-96-103). The preliminary plat for the proposed subdivision was reviewed on December 31, 1996 as DRB 96-521.

Method
The Hydrology for this Grading and Drainage Plan is based on the methods presented in the City of Albuquerque Development Process Manual, Volume 2, Design Criteria, Section 22.2 Hydrology, January 1993, Procedure for 40 acre and smaller basins.

Existing Undeveloped Conditions
The property is currently undeveloped and drains to the southwest at variable slopes of about 4%. Site soils are classified as Embudo Gravelly fine Sandy Loam and the hazard of water erosion is considered moderate. Site vegetation consists of native grasses and shrubs. As indicated by the FEMA Flood Insurance Rate Map Number 35001C0141D, no portion of the property is within the FEMA established flood boundary. Existing (Undeveloped) site drainage conditions are summarized in the Hydrology Summary table on this sheet.

Wyoming Boulevard and Corona Avenue border the property on the west and south, respectively. Existing Wyoming Boulevard is a 24' wide temporary asphalt pavement street in a 60' wide right-of-way. There is also a 6' wide paved pedestrian path along the east right-of-way line. Existing Corona Avenue is a 32' wide (face to face of curb) permanent residential street in a 55' right-of-way.

The property to the east is developed with single family houses which drain south to Corona Avenue via cross-lot concrete swales in the backyards. The existing development shields the La Cueva Corona property from offsite drainage from the east.

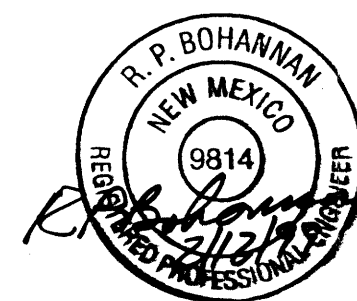
The property north of the site is partially developed with the Covenant United Methodist Church. The Church property generally drains to the west, but there is a small portion (0.55 ac.) of the undeveloped property which drains southwest onto the La Cueva Corona property. This offsite basin generates a Q100 peak flow rate of 1.0 cfs. In the grading and drainage plan prepared for development of the Church site (C19-D10), this runoff is assumed to be contained onsite, draining to the west.

Proposed Developed Conditions
It is proposed that the site be subdivided into 21 lots and developed with single-family residences. Each lot will be graded to drain to the proposed catch basins and storm drain improvements. The storm drain will be connected to the AMAFCA Wyoming Boulevard Storm Drain, which was designed to accept approximately 16 cfs. from this property. The estimated Q100 peak discharge is 16.48 cfs. The Wyoming Boulevard Storm will discharge to the existing North Domingo Baca Dam.

The Wyoming Boulevard Storm Drain was constructed by AMAFCA with funding assistance from the City of Albuquerque and private property owners.

As in the grading and drainage plan for the Church site, it is assumed that the minor offsite flow originating on the Church site will be contained on the Church site and will not enter La Cueva Corona. The wall to be constructed along the north property line will direct the flow to the west.

Erosion Control
All disturbed areas shall be surfaced, landscaped or revegetated upon development of the site. Contractors shall exercise reasonable care during construction to prevent the movement of sediment from the site. Temporary erosion control measures, including swales, berms, ponds, contour grading, straw bales and silt fencing will be implemented as necessary during construction to prevent sediment erosion from the site.



Walker Surveying
(PS No. 6401)

GRADING AND DRAINAGE CERTIFICATION

I HEREBY CERTIFY THAT I HAVE INSPECTED THE SITE GRADING AND DRAINAGE IMPROVEMENTS AND THAT THEY HAVE BEEN CONSTRUCTED AND ARE EXPECTED TO FUNCTION IN SUBSTANTIAL COMPLIANCE WITH THE INTENT OF THE APPROVED GRADING AND DRAINAGE PLAN. BACKYARD AND SIDEYARD SWALES, WHICH WILL BE FINE-GRADED BY INDIVIDUAL HOMEBUILDERS, ARE NOT INCLUDED IN THIS CERTIFICATION. THE AS-CONSTRUCTED INFORMATION SHOWN ON THIS PLAN WAS PROVIDED BY THE PROPOSER. PROPOSED CONTOURS HAVE NOT BEEN REVISED TO REFLECT AS-CONSTRUCTED ELEVATIONS AND SHOULD BE CONSIDERED APPROXIMATE.



R. P. Bohannon, P.E.
N.M.P.E. No. 9814
Date: 1/5/99

GENERAL NOTES

- ALL WORK DETAILED ON THESE PLANS, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS AMENDED THRU UPDATE NO. 6.
- A CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 260-1990, FOR LOCATION OF EXISTING UTILITIES.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
- MAINTENANCE OF DRAINAGE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY ON WHICH THEY ARE CONSTRUCTED. ROOF DRAINS AND APPURTENANCES SHALL BE REGULARLY INSPECTED AND OBSTRUCTIONS REMOVED.
- ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
- DISPOSAL OF ALL WASTE MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONSTRUCTION SAFETY: THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL REMAIN THE CONTRACTOR'S SOLE RESPONSIBILITY.
- THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
- THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.
- THE CONTRACTOR SHALL EXERCISE CARE SO AS NOT TO DISTURB OR DAMAGE EXISTING FEATURES TO REMAIN DURING ALL PHASES OF CONSTRUCTION.
- ALL SIDEWALKS SHALL HAVE A 2% CROSS-SLOPE UNLESS OTHERWISE INDICATED.

BENCHMARK

US&GS STATION "HEAVEN"
LOCATED 70.4' SOUTH OF
PASO DEL NORTE CENTERLINE
AND 180' EAST OF "GATE" OF
HEAVEN CEMETERY ENTRANCE.
ELEV. = 5378.79
(PAGE B-23)

LEGAL DESCRIPTION

LA CUEVA CORONA SUBDIVISION
A REPLAT OF
LOTS 28 THROUGH 32, BLOCK 16,
TRACT 2, UNIT 3
NORTH ALBUQUERQUE ACRES
93C-125 FILED 5/4/93

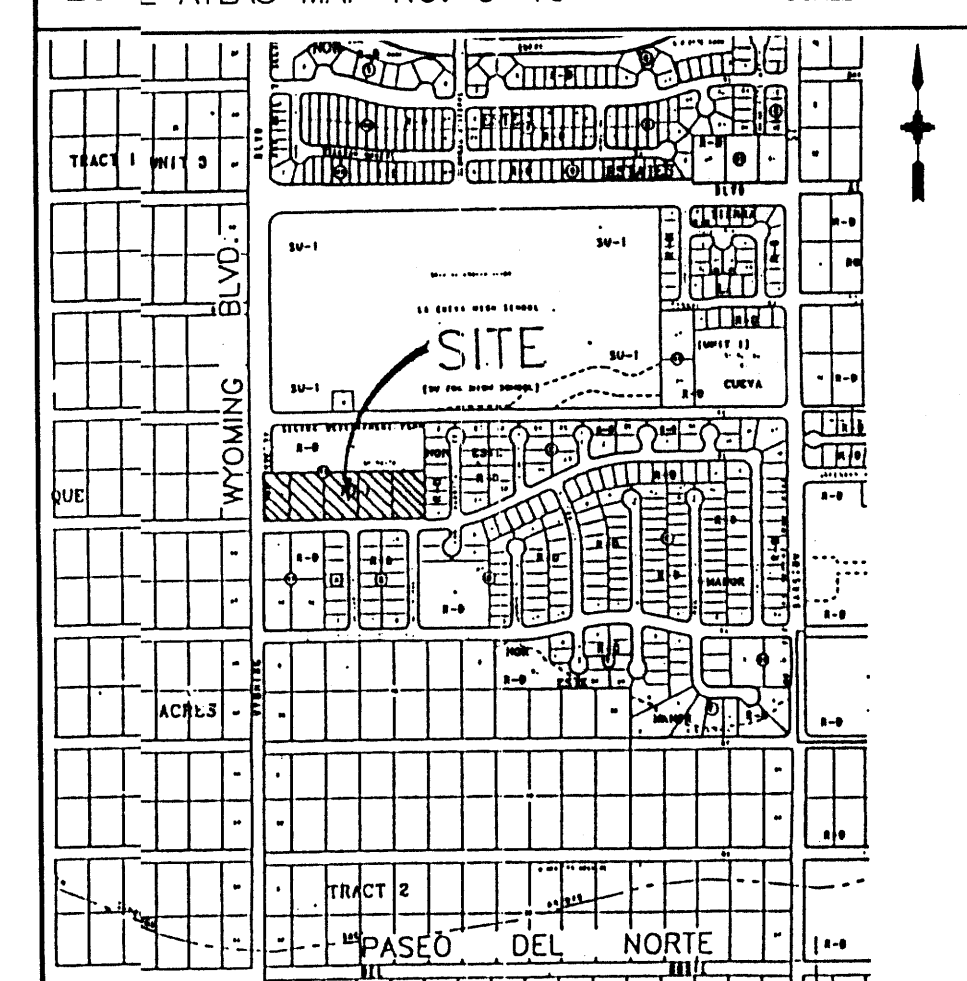
HYDROLOGY SUMMARY

PROJECT NAME: LA CUEVA CORONA
JOB NUMBER: 4380

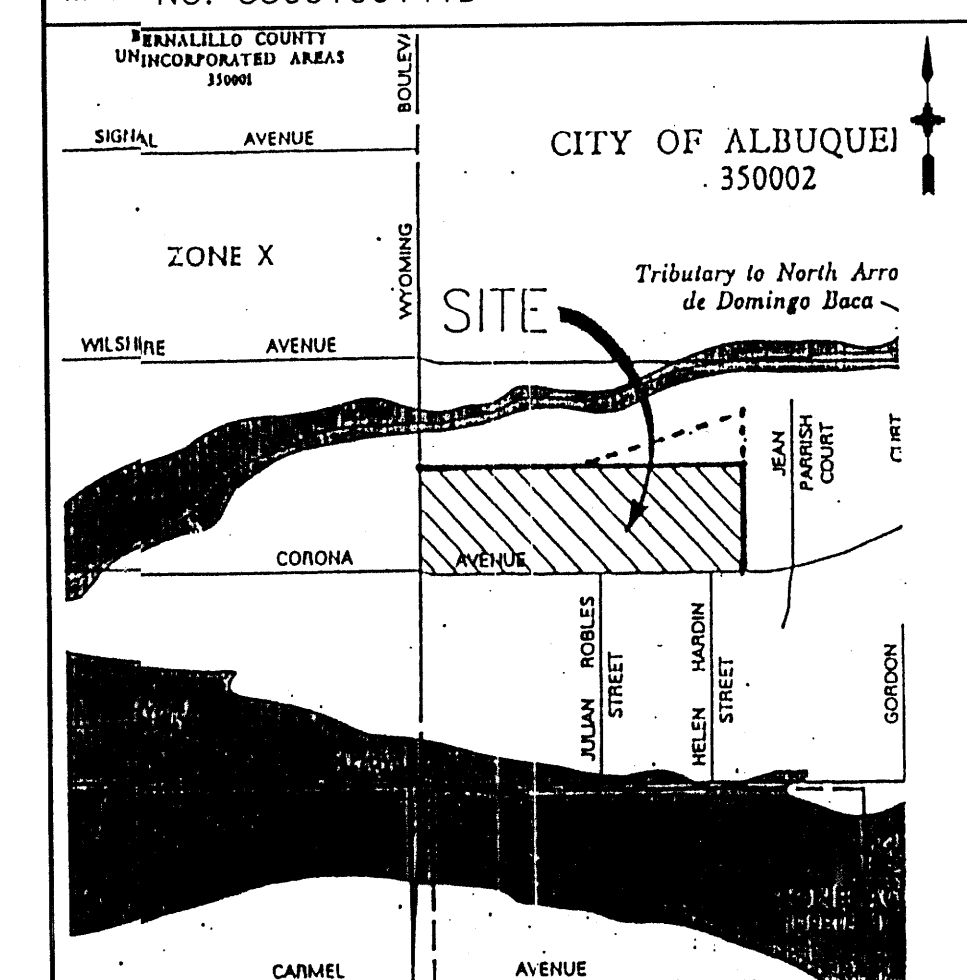
BASIN	COND.	DESCRIPTION	AREA (acres)	LAND TREATMENTS				Q (cfs)	2 YEAR VOLUME (ac.ft.)		10 YEAR VOLUME (ac.ft.)		100 YEAR VOLUME (ac.ft.)	
				A	B	C	D		6 HR	24 HR	6 HR	24 HR	6 HR	24 HR
1	UNDEV	OFFSITE LOT 5-A, SE COR UNDEVELOPED	0.5500	100.0%	0.0%	0.0%	0.0%	0.00	0.0000	0.0000	0.32	0.0087	1.03	0.0303
2	UNDEV	OFFSITE AREA UNDEVELOPED	0.2634	100.0%	0.0%	0.0%	0.0%	0.00	0.0000	0.0000	0.15	0.0042	0.049	0.0145
3	UNDEV	ONSITE UNDEVELOPED	4.9967	100.0%	0.0%	0.0%	0.0%	0.00	0.0000	0.0000	2.38	0.0649	0.649	0.2253
4	DEV	ONSITE DEVELOPED	4.0967	0.0%	25.0%	25.0%	50.0%	5.19	0.1741	0.2112	10.21	0.3397	0.3966	0.5915

PRECIP. ZONE	RAINFALL DEPTHS (INCHES) AT 100-YEAR STORM			
	1 HOUR	6 HOUR	24 HOUR	4 DAY 10 DAY
3	2.14	2.60	3.10	3.95 4.90

VICINITY MAP ZONE ATLAS MAP NO. C-19



FEMA FLOOD INSURANCE RATE MAP MAP NO. 35001C0141D

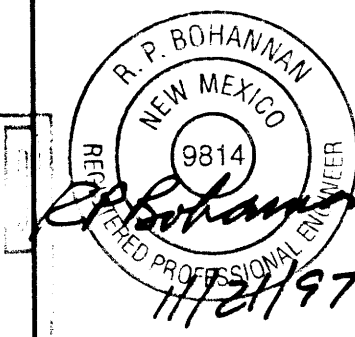


LEGEND

DESCRIPTION	NEW	EXISTING
CONTOURS	5084	5084
SPOT ELEVATIONS	5084	5084
DRAINAGE AREA BOUNDARY	5084	5084
DRAINAGE DIVIDE	5084	5084
WATER BLOCK	5084	5084
DIRECTION OF FLOW	5084	5084
ASPHALT PAVING	5084	5084
LANDSCAPING	5084	5084
RETAINING WALL	5084	5084
GARDEN WALL	5084	5084
SWALE	5084	5084
PROPERTY LINE	5084	5084
FENCE	5084	5084
CATCH BASIN	5084	5084
STORM DRAIN M.H. & LINE	5084	5084
SANITARY SEWER M.H. & LINE	5084	5084
FIRE HYDRANT & WATER LINE	5084	5084
REDUCERS	5084	5084
WATER VALVES	5084	5084
WATER CONNECTIONS	5084	5084
WATER JOINTS	5084	5084
CONCRETE	5084	5084
GAS LINE	5084	5084
UNDERGROUND TELEPHONE	5084	5084
CABLE TELEVISION	5084	5084
POWER/TELEPHONE POLE	5084	5084
UNDERGROUND ELECTRICAL	5084	5084
CURB ELEVATION	5084	5084
HYDROLOGICAL ANALYSIS PT.	5084	5084

ADD 30" SD TO WYOMING SD; DELETE POND; REVISE WYOMING R/W	JML	11/97
NO.	REVISIONS	BY DATE

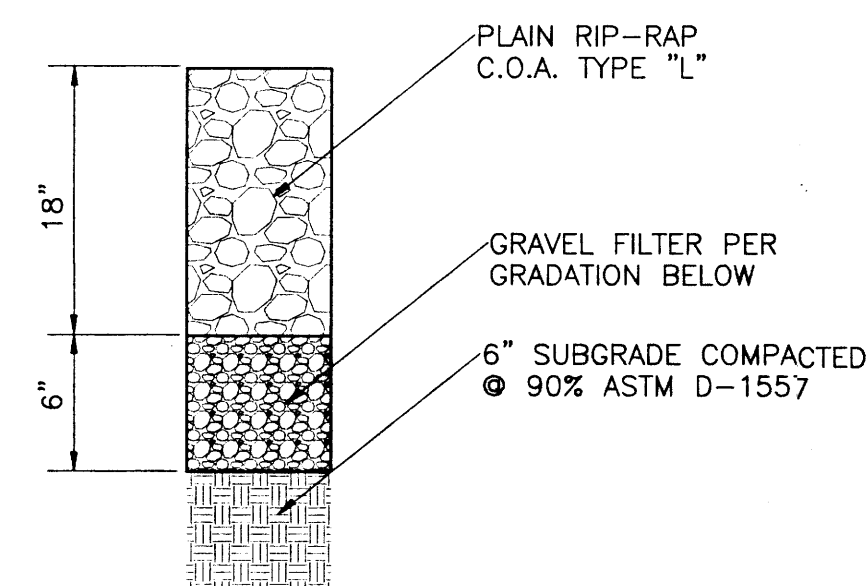
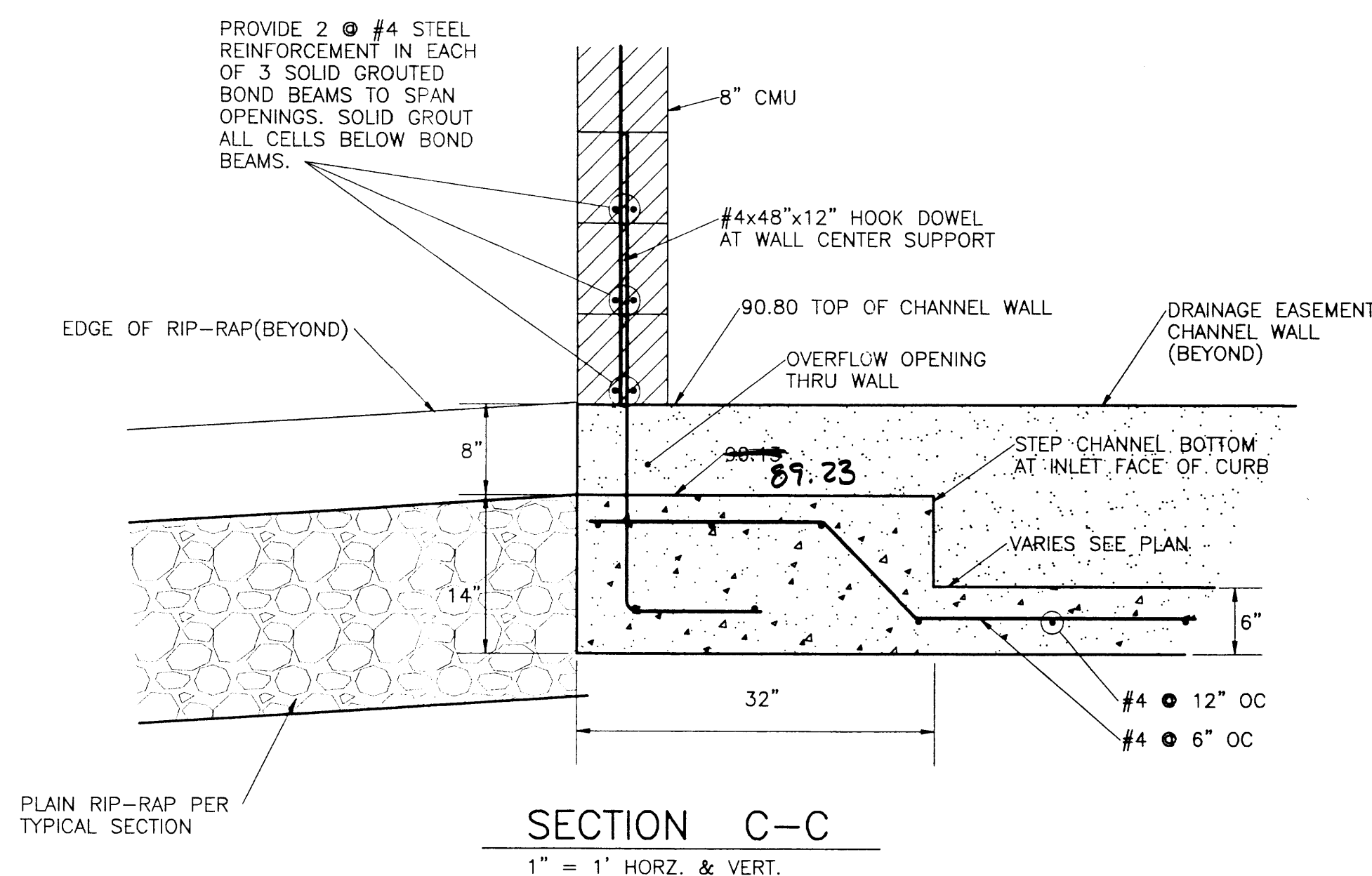
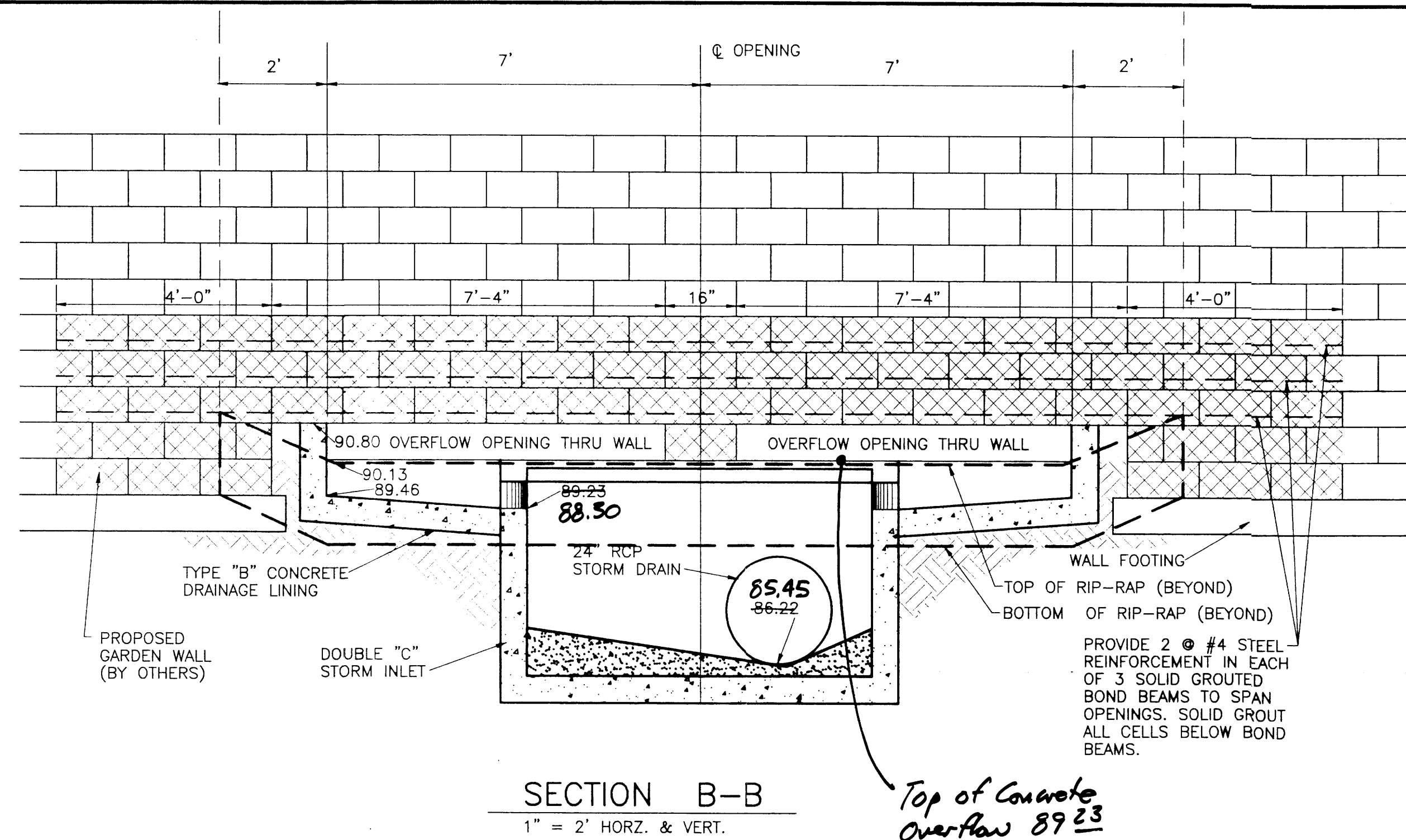
LA CUEVA CORONA SUBDIVISION GRADING & DRAINAGE PLAN



Easterling & Associates, Inc.

CONSULTING ENGINEERS
2600 The American Rd., SE, Suite 100
Rio Rancho, New Mexico 87124
(505) 898-8021 FAX (505) 898-8501

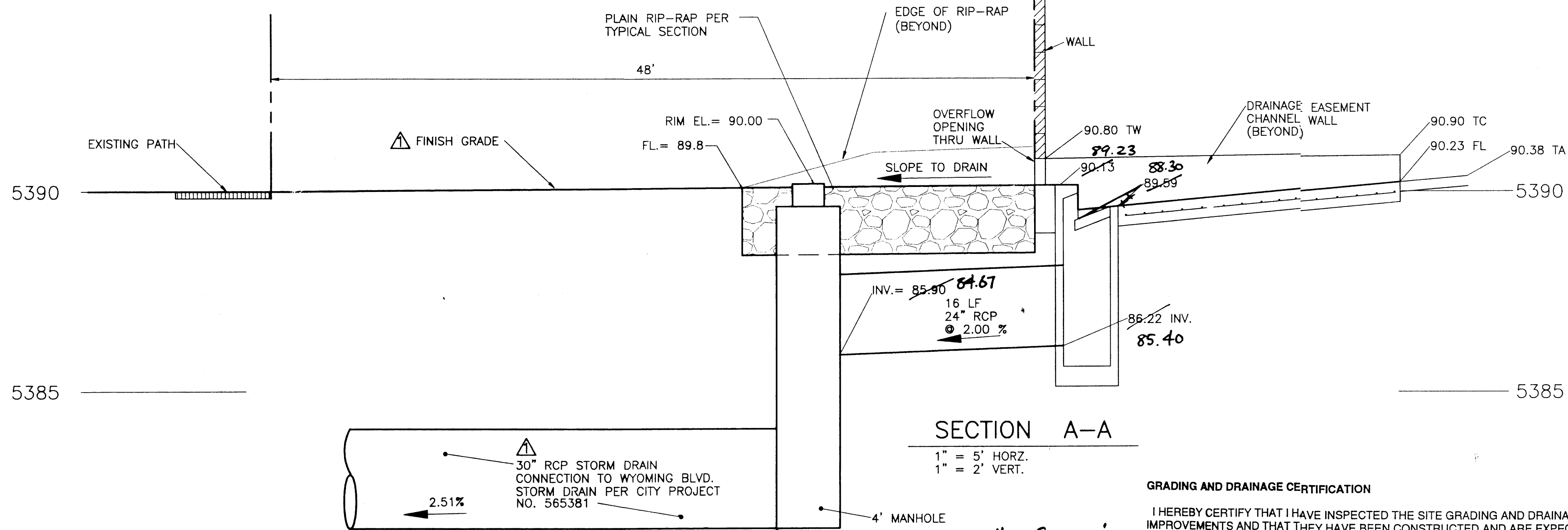
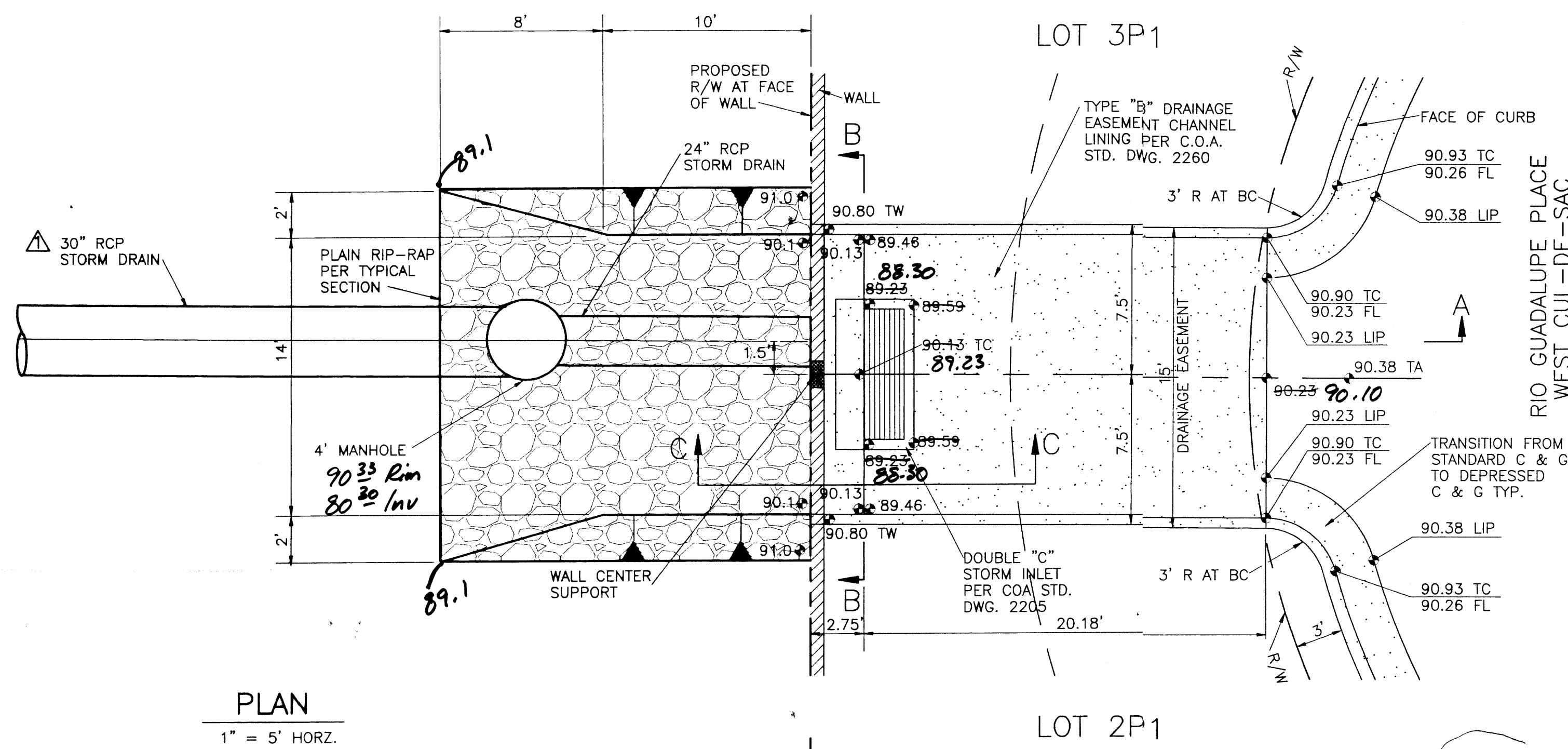
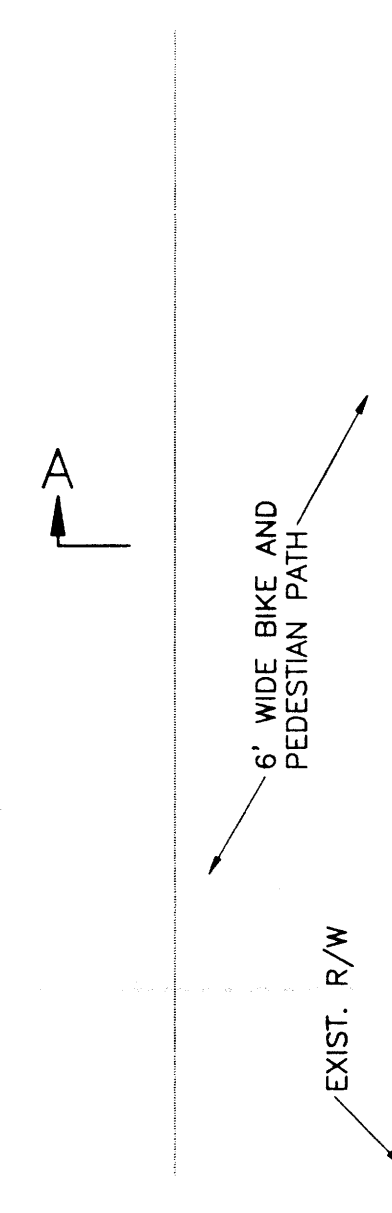
DESIGNED BY RPB	DRAWN BY DEC	CHECKED BY RPB	SHEET 1
JOB NO. 4380	DATE 3/97	OF 3	



RIP-RAP TYPICAL SECTION

NOTE: FILTER MATERIAL SHALL BE INCIDENTAL TO RIP-RAP

SCREEN OR SIEVE SIZE	% PASSING
1-1/2"	100
3/4"	70-100
3/8"	50-75
NO. 4	30-55
NO. 8	20-40
NO. 16	10-30
NO. 30	5-20
NO. 50	0-10
NO. 100	0-5
NO. 200	—



GRADING & DRAINAGE PLAN HYDRAULIC CALCULATIONS

- Check flow depth in street with mountable curb (roll type).
By Manning formula: $Q = 4.49 \cdot (1.486/n) \cdot R^{2/3} \cdot S^{1/2}$
Q100/6HR peak flow rate: 16.48 cfs
1/2 street flow rate: 8.12 cfs
Bottom Width: 0.00 ft
Sideslope 1: 4.8 : 1
Sideslope 2: 50 : 1
Longitudinal Slope: 0.0340 ft/ft
Manning's "n": 0.017
Normal Depth: 0.27 ft
Velocity: 4.22 ft/sec
Froude: 2.04
- Check flow depth over weir into drainage rundown at west end of cul-de-sac.
Weir Equation: $Q = CLH^{3/2}$
 $H = (Q/CL)^{2/3} = (16.48/(2.75 \cdot 14))^{2/3} = 0.57$ ft
- Check flow depth over weir into Double Type "C" inlet.
Weir Equation: $Q = CLH^{3/2}$
 $H = (Q/CL)^{2/3} = (16.48/(2.75 \cdot 10.5))^{2/3} = 0.69$ ft
- Check flow depth over weir.
Weir Equation: $Q = CLH^{3/2}$
 $H = (Q/CL)^{2/3} = (16.48/(2.75 \cdot 14))^{2/3} = 0.57$ ft
- Determine "V" Depth for 24" SD at Double "C" inlet.
 $V = C.F. + 0.5 + (1.2 \cdot (V^2/(2g) + d/\cos(\theta)))$
 $V = (10.75/12) + 0.5 + (1.2 \cdot ((16.48/(\pi \cdot 2))^{2/3} / (2 \cdot 32.2)) + 2.00/(\cos(0.009))) = 3.91$ ft
- Determine friction slope for 24" RCP SD with 16.48 cfs.
 $S_f = ((Q/n)/(1.486 \cdot R^{2/3}))^2$
 $S_f = ((16.48/0.013)/(1.486 \cdot (\pi \cdot 2)^{2/3}))^2 = 0.0053$ ft/ft


- Check capacity of 30" RCP SD for future flows.
Assume La Cueva Corona flows + free discharge from Convent United Methodist Church (see grading & drainage plan, backyard and sideyard swales, which will be fine graded by individual homeowners, are not included in this certification. The as-constructed information shown on this plan was provided by owner. Proposed contours have not been revised to reflect as-constructed elevations and should be considered approximate.)
Q total = 16.48 + 17.10 = 33.58 cfs
(a) Inlet Control: $Q = CA \cdot \sqrt{2gh}$
 \Rightarrow Required $h = \frac{1}{2g} \left(\frac{Q}{CA} \right)^2 = \frac{1}{64.4} \left(\frac{33.58}{0.6 \cdot 4.91} \right)^2 = 2.0'$ O.K.
(b) Pipe Control: $Q = \left(\frac{2}{3} \right) \left(\frac{1+K}{2g} \right) \left(\frac{n^2}{2.21 R^{4/3}} \right)$
 $= \left(\frac{33.58^2}{4.91} \right) \left(\frac{1+0.2}{64.4} + \frac{(0.013)^2 (96)}{2.21 (0.63)^{4/3}} \right)$
 $= 1.5'$ O.K.

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R. P. BOHANNAN, P.E.
N.M.P.E. No. 9814
Date: 1/5/99

	ADD 30"SD TO WYOMING SD; DELETE POND	JML	11/97
NO.	REVISIONS	BY	DATE

LA CUEVA CORONA SUBDIVISION DRAINAGE DETAILS

Easterling & Associates, Inc.
CONSULTING ENGINEERS
2600 AMERICAN RD. SE., SUITE 100
Rio Rancho, New Mexico 87124
(505) 898-8021 FAX (505) 898-8501

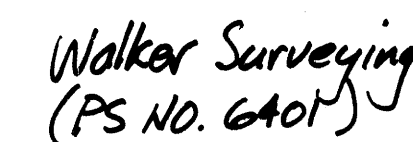
DESIGNED BY RBP	DRAWN BY DEC	CHECKED BY RBP	SHEET 2
JOB NO. 4380	DATE 3/97	OF 3	



1. Compact subgrade to 95% maximum density (12" min. depth) (ASTM D1557). If clay or loose sand is encountered, contact engineer before proceeding.
2. Compact backfill to 90% of maximum density (ASTM D1557)
3. Maintain 2" minimum clearance between all reinforcing bars and outside surface of formed concrete, 3" between bars and outside surface of concrete poured against earth.
4. All block and plaster cells are to be grouted solid.
5. Concrete for footings and filling of cells is to be 3,000 p.s.i. at 28 days, with 3/4" maximum size aggregate and a maximum slump of 5".
6. Concrete for mortar is to be 2,000 p.s.i. at 28 days.
7. Wall blocks are to be standard masonry units (8"x16"), and plaster blocks are to be sized appropriately for the intended application. Color - Desert Tan or as directed by owner.
8. Install Dur-O-Wal (or engineer approved equal), or bond beam with 2 \bullet #4 rebar longitudinal, every third course (24" OC, max.).
9. Construct pilasters at 16' on centers (maximum), and as appropriate for corners, junctions, angle points and ends.
10. Drainage for retained earth will be provided by aggregate backfill and un-mortared joints.
11. The top course of block shall use 2" solid masonry units as caps, unless a 6" party wall is to be installed on top of retaining wall.
12. Top of pilastere shall use 2" solid masonry units each of appropriate size.
13. Drain blocks for party walls shall consist of standard masonry units turned face down to be installed through 6" party wall on top of retainers and after wall is complete. They shall be installed at locations specified by owner.



NTS
(SEE SHEET 1 OF 3)



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R. P. Bohannon 1/5/99
R. P. Bohannon, P.E. Date:
N.M.P.E. No. 9814

LA CUEVA CORONA
SUBDIVISION

RETAINING WALL DETAILS

CONSULTING ENGINEERS
2600 AMERICAN RD. SE., SUITE 100
Rio Rancho, New Mexico 87124
(505) 898-8021 FAX (505) 898-8501

DESIGNED BY: RPB	DRAWN BY: DEC	CHECKED BY: RPB	SHEET 3 OF 3
JOB NO: 4380		DATE: 3/97	