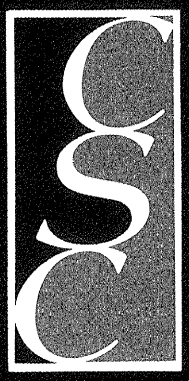
community sciences corporation



community sciences corporation

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000 Fax (505) 898-5195

DRAINAGE REPORT

FOR

PRIMROSE POINTE SUBDIVISION
UNIT 3 AMAFCA IMPROVEMENTS
(MAP #C-22)

MAY, 1996

PREPARED FOR

S&S ASSOCIATES, INC.
7820 PAN AMERICAN FREEWAY, NE
SUITE 4
ALBUQUERQUE, NEW MEXICO 87109
(505)857-9566

PREPARED BY

COMMUNITY SCIENCES CORPORATION
P. O. BOX 1328
CORRALES, NEW MEXICO 87048
(505)897-0000

KENT M. WHITMAN
NEW MEXICO
6170
REGISTERED PROFESSIONAL ENGINEER

Kent M. Whitman

KENT M. WHITMAN, P.E.

RECEIVED
MAY 21 1996

SURVEYING
LAND PLANNING
CIVIL ENGINEERING
DEVELOPMENT CONSULTANTS

BERNALILLO COUNTY

PWD SUBMITTAL

Use for all PWD applications EXCEPT Street Excavation

☒ NEW SUBMITTAL

☐ RESUBMITTAL

☐ FINAL SIGNOFF

TODAY'S DATE: MAY 17, 1996

CASE NO: SC5-95-7

OWNER

OWNER: S & S ASSOCIATES — PHONE: 857-9566

MAILING ADDRESS: 7820 PAN AMERICAN FREEWAY NE, SUITE 4 — CITY: ALBUQUERQUE — ZIP: 87109

AGENT

AGENT / CONTRACTOR: COMMUNITY SCIENCES CORPORATION — PHONE: 897-0000

MAILING ADDRESS: PO BOX 1328 — CITY: CORRALES — ZIP: 87048

STATE LICENSE NO: 01-808293-009 — EXP DATE: N/A — VOLUME: N/A — CLASS: N/A

ARCHITECT/ENGINEER: KENT M. WHITMAN — LICENSE NO.: 6170 — PHONE: 897-0000

SITE INFORMATION

SITE ADDRESS / DIRECTIONS: NE CORNER OF LOWELL STREET & WILSHIRE AVENUE — ZONE ATLAS NO.: C-22

LEGAL DESCRIPTION: TRACT XX, PRIMROSE POINTE, UNIT 1; TRACT YY-1, PRIMROSE POINTE, UNIT 2; LOTS 17, 18, 22 AND 23, BLOCK 7; LOTS 7, 8, 10 THROUGH 26, BLOCK 9; LOTS 8 THROUTH 15, BLOCK 11 OF TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES SITUATE WITHIN THE ELENA GALLEGOS GRANT "PROJECTED" SECTION 15, T11N, R4E, NMPM, BERNALILLO COUNTY, NEW MEXICO

LOT SIZE: 0.5 ACRES

EXISTING BUILDING(S) AND USE: SU PERMIT - RESIDENTIAL

PROPOSED BUILDING(S): RESIDENTIAL

UPC # 1 - 0 0 2 - 0 6 4 - 4 3 9 - 3 3 3 - 1 0 2 - 1 1

TYPE OF SUBMITTAL

- ☐ REPLAT
- ☐ MINOR SUBDIVISION
- ☐ MAJOR SUBDIVISION
- ☐ CONSTRUCTION DRAWINGS
- ☐ GRADING & DRAINAGE PLAN
- ☐ AS-CONSTRUCTED GRADING & DRAINAGE PLAN
- ☐ VARIANCE REQUEST
- ☐ LAND DIVISION
- ☐ TRAFFIC IMPACT ANALYSIS / TRAFFIC STUDY
- ☐ INFRASTRUCTURE LIST / DESIGN REVIEW
- ☐ SPECIAL USE PERMIT
- ☐ BARRICADING PERMIT
- ☐ BUILDING PERMIT
- ☐ INSPECTION
- ☒ OTHER (Specify): DRAINAGE REPORT COURTESY COPY

The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings, shall not be interpreted to be a permit for, or an approval of any variance or violation of any of the provisions of any COUNTY or STATE codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized COUNTY representative or COUNTY inspector form thereafter requiring the correction of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any COUNTY or STATE codes, ordinances, standards, or policies.

☐ Owner ☒ Agent ☐ Contractor Signature: Billy McCarty Date: MAY 17, 1996

COUNTY

BERNALILLO COUNTY USE ONLY

C/R's:

TOTAL FEE:

Receipt No.:

Received By:

DRAINAGE INFORMATION SHEET

PROJECT TITLE: PRIMROSE POINTE, UNIT 3 ZONE ATLAS/DRNG. FILE #: C-22

LEGAL DESCRIPTION: Tract XX, Primrose Pointe, Unit 1; Tract YY-1, Primrose Pointe, Unit 2; Lots 17, 18, 22 and 23, Block 7, Lots 7, 8, 10 Thru 26, Block 9; Lots 8 Thru 15, Block 11 of Tract 2, Unit 1, North Albuquerque Acres situate within the Elena Gallegos Grant "Projected" Section 15, T11N, R4E, NMPM, Bernalillo County, New Mexico

CITY ADDRESS: Lowell Street and Wilshire Avenue

ENGINEERING FIRM: COMMUNITY SCIENCES CORPORATION CONTACT: KENT M. WHITMAN

ADDRESS: P.O. BOX 1328, CORRALES, NM 87048 PHONE: (505)897-0000

OWNER: S&S ASSOCIATES, INC. CONTACT: LARRY STROUP

ADDRESS: 7820 PAN AMERICAN FREEWAY, NE, SUITE 4 PHONE: (505)857-9566
ALBUQUERQUE, NEW MEXICO 87109

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

__YES

_X_NO

___COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO:

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

_X_DRAINAGE REPORT

___DRAINAGE PLAN

__CONCEPTUAL GRADING/DRAINAGE PLAN

___GRADING PLAN

___EROSION CONTROL PLAN

___ENGINEER'S CERTIFICATION

TYPE OF APPROVAL SOUGHT:

___SKETCH PLAT APPROVAL

X PRELIMINARY PLAT APPROVAL

___SITE DEVELOPMENT PLAN APP.

___FINAL PLAT APPROVAL

___BUILDING PERMIT APPROVAL

___FOUNDATION PERMIT APPROVAL

___CERTIFICATION OF OCCUPANCY APPROVAL

___ROUGH GRADING PERMIT APPROVAL

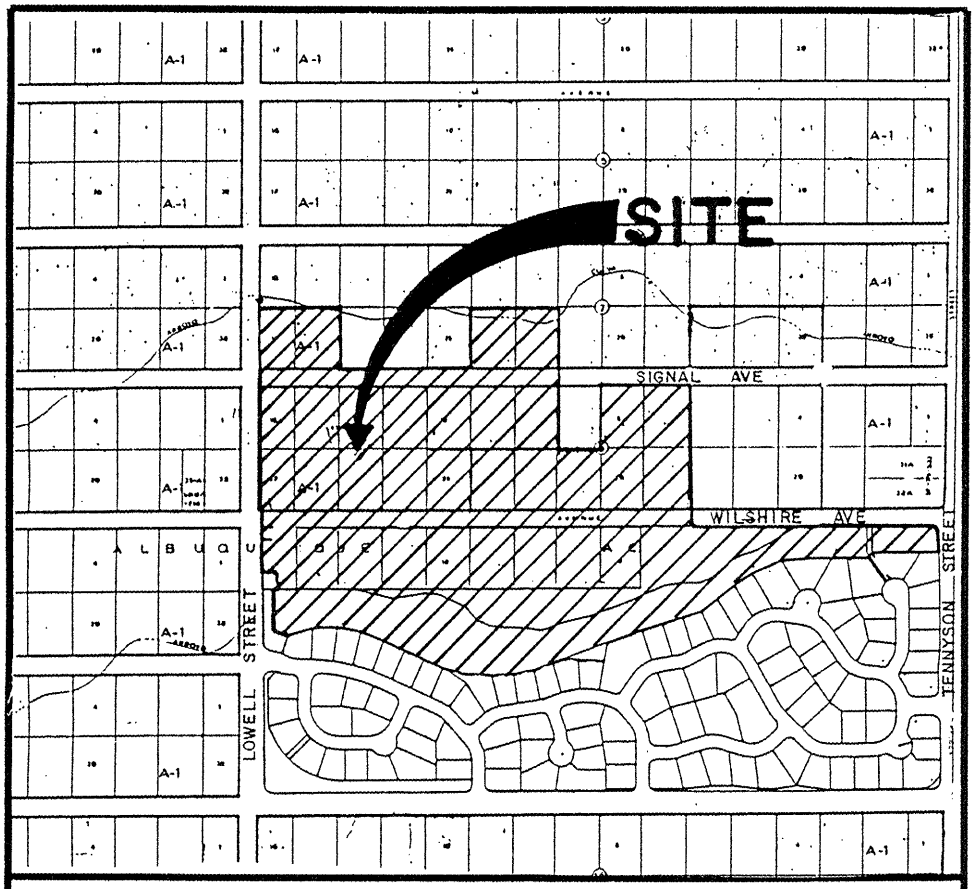
___GRADING/PAVING PERMIT APPROVAL

_X_OTHER: Courtesy Copy

SUBMITTED: May 17, 1996

BY: Billy McCarty Billy McCarty

CSC#207-07-036/207-07BK.REP



N.T.S. VICINITY MAP ZONE ATLAS C-22-Z

TABLE OF CONTENTS

I. PURPOSE AND SCOPE

S & S Associates, Inc. is currently planning the third and final stage of flood protection improvements along the North Domingo Baca Arroyo between Lowell Street and Tennyson Street. This report contains the design criteria necessary to complete the floodwall on the north side of the arroyo and the Lowell Street crossing structure, including transitions. **It also contains the calculations used for Units 1 and 2 construction in order to provide a comprehensive report for the North Domingo Baca Arroyo from Lowell Street to Tramway Boulevard.** No additional reports will be necessary for construction along the arroyo. The CLOMR/LOMR application to FEMA will combine the Hydrology from Addendum Number 5 to the Master Drainage Management Plan for Primrose Pointe with the design calculations presented in this report. The hydrology has not changed from Addendum Number 5 and therefore is not resubmitted at this time.

This report presents the final drainage management plan for the North Domingo Baca Arroyo within the Primrose Pointe Development for approval by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) in order that subsequent subdivision and development may commence.

II. SITE DESCRIPTION AND HISTORY

Primrose Pointe Units 1 through 4 are comprised of a portion of North Albuquerque Acres, Tract 2, Unit 1 as seen on the Vicinity Map at the beginning of this report. The existing terrain is comprised of sparsely vegetated soils which are classified as "Embudo gravely fine sand loam" (EmB) and "Embudo-Tijeras complex" (EtC) by the Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, NM, USSCS, 1977. The general slope of the ground is from east to west at approximately a 4% grade.

Primrose Pointe is divided by the North Domingo Baca Arroyo with Units 1 and 2 to the south and Units 3 and 4 to the north. Units 1 and 2 have already been constructed and include a floodwall and soil cement revetment along the south floodplain boundary from Lowell Street for approximately 2,100 feet to the east. This portion of the arroyo remains as a "naturalistic" earthen channel with native vegetation. Above the "naturalistic" channel, a soil cement scour pool has been constructed below a grouted rip-rap transition structure. The grouted rip-rap provides a horizontal transition from the upstream trapezoidal channel to the wider "naturalistic" channel. It also serves as an energy dissipater to restore the flow to "natural" conditions form the accelerated concrete channel flow. The upper 900 feet of improvements consist of a concrete lined channel, a double 10' x 6' concrete box culvert at Tennyson Street, and a transition to the existing concrete channel at Tramway Boulevard.

Primrose Pointe Units 1 and 2 include two detention ponds (NDB1 and NDB2) which discharge into the North Domingo Baca Arroyo. They have been designed to work in conjunction with a third pond (NDB4) in Unit 3 to maintain pre-development peak flow rates at Lowell Street under post-development conditions. Therefore, Primrose Pointe will not have a significant impact on the downstream floodplain. The following reports were used to establish the hydrology and hydraulics of the North Domingo Baca Arroyo for pre- and post-development conditions:

1. Master Drainage Management Plan for Primrose Pointe, Community Sciences Corporation, 1990.

2. Drainage Report for Primrose Pointe, Unit 1, Community Sciences Corporation, April 1994.
3. Drainage Report for Primrose Pointe, Unit 2, Community Sciences Corporation, April 1994.
4. Final Drainage Report for AMAFCA Infrastructure Primrose Pointe, Community Sciences Corporation, December, 1994.
5. Addendum Number 5 to the Master Drainage Management Plan for Primrose Pointe, Community Sciences Corporation, March 1996.
6. Drainage Report for Primrose Pointe Subdivision Units 3 and 4, In-tract Infrastructure, Community Sciences Corporation, May 1996.

III. REVISED HYDROLOGY/NORTH DOMINGO BACA ARROYO

The North Domingo Baca Arroyo was initially analyzed by Community Sciences Corporation (CSC) in 1990 as part of the MASTER DRAINAGE MANAGEMENT PLAN FOR PRIMROSE POINTE. The Hydrologic results were used throughout the Master Plan revisions until the February 3, 1993 revision was approved. The HYMO file was converted to AHYMO and used for the Primrose Pointe, Unit 1 and 2 Drainage Reports. Ponds NDB1, NDB2, NDB3, and NDB4 were designed according to this hydrology and maintained flows in the North Domingo Baca and its south tributary (See CSC's DRAINAGE REPORT FOR PRIMROSE POINTE SUBDIVISION UNIT 1, Revised April, 1994, Page 4A for a summary of hydrology results).

Meanwhile, in January, 1993, the City of Albuquerque revised Section 22.2 of the Design Process Manual (DPM) and Andrews, Asbury & Robert, Inc. (AAR) was contracted by AMAFCA to study the North Domingo Baca Arroyo above Primrose Pointe. The revised COA DPM Section 22.2 added a section for calculating the "time of concentration" for steep slopes. This new criteria accounts for overland flow transitioning between super critical and subcritical flow, which results in a longer "time of concentration". AAR redefined CSC's basins 101, 102 and 103 as A1, A2, A3, A4 and C as well as adding a split flow from Basin D in their report. Since AAR used the revised methodology for the steep portion of the watershed, the "time to peak" was delayed resulting in a lower flow through Primrose Pointe. The results were discussed between AAR, AMAFCA, and CSC and it was decided to use the AAR hydrology for the remainder of Primrose Pointe. TABLE 1 summarizes the difference in flow entering Primrose Pointe as a result of the revised hydrology. Since time is critical in the addition of the pond hydrographs to the main arroyo, the decreased flow entering Primrose Pointe is not proportional to the decrease in flow exiting the subdivision.

All four ponds and the Unit 1 portion of the revetment/floodwall were constructed with Unit 1 prior to CSC adopting the AAR hydrology. However, the Unit 2 improvements (revetment/floodwall and all improvements above the scourpool) utilized the revised hydrology. Since this point in the construction of the overall project completes development on the south side of the North Domingo Baca Arroyo, leaves the channel in a "naturalistic" state, and matches the pre-developed discharges as approved by the reports for Units 1 and 2, the revised Master Plan (Addendum Number 5) recognized Units 1 and 2 as part of the existing (pre-development) conditions. Therefore all improvements north of the North Domingo Baca Arroyo were re-evaluated in Addendum Number 5 for proposed (post-development) conditions. This is the most practical time to transition to the new standards and create a new basis for comparison.

IV. REVISED HYDRAULICS

The Primrose Pointe Unit 1 floodwall was designed and constructed based on the original hydrology and HEC-2 profiles created from the Master Plan and Unit 1 drainage reports. This established a 100 year discharge of 1502 cfs with a 15% bulking factor for a design discharge of 1710 cfs. The top portion of Table 3 is a copy from the Unit 1 report showing the minimum top of wall and maximum toe of revetment for this flow. After the Unit 2 final grading of the arroyo, surveyed cross sections were taken at approximate 200 foot intervals. A revised HEC-2 model was constructed from these cross sections. The lower section of Table 3 provides a comparison between the original flood protection criteria and what it would have been with the revised hydrology (Q_{100} = 1236 cfs, Q_{design} = 1400 cfs). Our analysis shows that hydraulics have not been significantly altered by the grading within the arroyo.

V. PROPOSED UNIT 3 DEVELOPMENT

Primrose Pointe Unit 3 will be the final stage of construction interfacing the North Domingo Baca Arroyo. Approximately 500 feet of floodwall and revetment will extend east of the Unit 3 boundary in order to connect to the portion constructed with Unit 2. This will have the Unit 4 area protected prior to its construction, and will complete the revetment from Lowell Street to the concrete channel at Tennyson Street. Unit 3 will also include the final construction of the park/pond (Pond NDB4), the Lowell Street crossing structure and transitions upstream and downstream of Lowell Street. Three pedestrian access points to the arroyo will also be provided from the north. One at the park, one at the west end of Camelot Place, and one just east of the Unit 3 boundary. The revetment at the park access will extend to one foot above the design water surface elevation in the arroyo, with the access crossing over the revetment. Similarly, the revetment will be extended to the floodwall freeboard elevation with access ramps over the revetments at the other two accesses. This will provide continuous levee protection throughout the residential area.

VI. LOWELL STREET CROSSING STRUCTURE

The Lowell Street crossing structure has been designed to maintain 1.4 foot of sediment in a quadruple 10' x 6' concrete box culvert (CBC). This will allow for a 3 foot flow depth and 1.6 foot of freeboard within the CBC. The elevation of the CBC will also provide for a 1 foot thick paving section above the deck at the future curb flow line of a 48 foot wide road section.

The upstream transition will be a 100 foot grouted rip-rap contraction at a 10% grade. The side slopes will transition from 6:1 at the entrance to a maximum of 2:1 as they approach the CBC. Wing walls will extend along the edge of the rip-rap and provide freeboard to a minimum of one foot above the energy grade line. The transition extends to the Unit 1 flood wall on the south and to the soil cement revetment along Pond NDB4 to the north. This will confine the flood plain to the CBC and prevent surface flows from crossing Lowell Street. The revetment along Pond NDB4 will extend from the design scour depth to a minimum of one foot above the design water surface elevation. The pond berm will provide additional freeboard protection although it will not be hard lined.

Pond NDB4 will have an emergency overflow weir which discharges over the soil cement revetment above the transition structure. The pond will also have a standpipe which discharges a maximum of 1.7 cfs to the transition structure via a storm drain pipe.

The downstream transition will also be grouted rip-rap with wing walls. It will match existing ground at the west property line of Lot 32, Block 12, Tract 2, Unit 1, NAA. The rip-rap invert will extend to the CBC at a 1.25 % grade. This will maintain the invert 1.4 feet above the invert of the CBC at the downstream end. The grouted rip-rap will have a 10 foot "ramp" from the invert of the CBC to the invert of the rip-rap to provide access for maintenance of the CBC (See Plan and Profile attached to the end of this section). Freeboard will be decreased till it matches the flood plain at the downstream end of this transition structure. Lot 32 will be filled adjacent to this structure to provide a buildable pad above the flood plain elevation and adequate drainage over the top of the transition structure.

VII. DESIGN CRITERIA AND ASSUMPTIONS

FEMA and AMAFCA flood plain design criteria and assumptions are as follows:

1. Minimum required channel depth is Critical Depth plus freeboard as required by FEMA for the "naturalist channel" and super critical depth plus freeboard for the concrete portion since all of the normal depths in this study reach are in the super-critical flow regime.

2. Freeboard calculated in accordance with City of Albuquerque Development Process Manual (energy grade line plus 1') or 3' of freeboard where the lined channel walls act as levees.

3. The box culverts at Tennyson Street and Lowell Street will be designed for supercritical open channel flow.

4. Sediment transport capacities through all concrete-lined sections must exceed the peak rate of sediment transport (37 cfs) as being delivered from the natural portion of the North Domingo Baca Arroyo above Tramway Lane. Hydraulic calculations for this purpose will be based on a conservatively estimated composite Manning's 'n' value where the bed is assumed to be covered by bed material type sediment and the flow regime is super-critical.

5. The scour depth at the vertical transition below Sta. 32+00 will be conservatively estimated by assuming Manning's 'n' value of 0.013 for the concrete-lined portions and a composite 'n' value assuming the bed for the rip-rap is covered with bed material. The top of the end-sill will be placed below the design invert of the natural channel at a depth equal to approximately 0.5 feet.

6. The equilibrium slope concept will be applied to the "naturalistic" channel (i.e., sediment transport capacity of "naturalistic" channel should approximately equal the sediment transport rate of the natural channel above Tramway Lane). The stable bank slope was determined to be 6:1 based on field observation of existing stable banks at the downstream end of the incised existing arroyo (approximately Sta. 24+50). This location was also identified in the Unit 1 Drainage Report as being in equilibrium with the channel above Tramway Lane. The equilibrium slope concept began at that location in Unit 1 and was utilized as the basis for removing a natural existing contraction between Sta. 25+00 and 27+00.

7. The total depth of scour will be taken as the local scour depth plus one-half (1/2) the antidune height. The soil cement portion of revetment will extend 1' below the design channel invert elevation minus the Total Scour Depth. These calculations and the structural details of the floodwalls in the "naturalistic" portions of the proposed Unit 2 channel are the same as those previously approved in the Unit 1 Drainage Report, supplemental material, and construction plans.

8. The hydrology and sediment transport calculations for the North Domingo Baca Arroyo between Tennyson Street and Lowell Street will be revised and finalized with this report. As documented in the Unit 1 report, there will be no adverse upstream or downstream impacts as a result of the development of these first four units.

9. The transition structures at the Lowell Street crossing structure will return the flow to its estimated undeveloped state at the downstream end of the development.

VIII. SEDIMENT TRANSPORT CALCULATIONS

Andrews, Asbury and Robert, Inc. (AAR) performed a detailed Sediment Transport Study above Tramway Lane as part of their CLOMR application for the North Domingo Baca Arroyo east of Tramway Boulevard. This supply reach analysis confirmed the one performed by Community Sciences Corporation (CSC) in the Unit 1 report. Therefore, the AAR peak 100-year bed material transport of 37.4 cfs for a discharge of 1236 cfs. was accepted as the sediment load entering Primrose Pointe.

The upper reach of unlined channel (Station 27+00 to 32+00) was designed with Unit 2 to be in "equilibrium" with the source. This resulted in a trapezoidal channel with a 40 foot bottom width and 6:1 side slopes at 4.30%. Since CSC designed the channel for a bulked flow of 1400 cfs, the design sediment transport rate was increased to 45.79 cfs (See Table 4).

Below Station 27+00, the channel returns to the natural flood plain path. Therefore, the revetment and flood wall follows the flood plain boundary and the arroyo bottom width varies. As can be seen on Table 4, as the arroyo geometry changes, the sediment bed load capacity (Q_s) varies considerable. However, at the entrance to the Lowell Street transition structure, the capacity is held to 47.63 cfs. Which is approximately equal to the supply load. At the bottom of Table 4, the sediment capacity for the Lowell Street crossing structure and the downstream transition has been summarized. This shows that the sediment entering Primrose Pointe is passed through the site with minimal impact on either the on-site or downstream reaches of the arroyo.

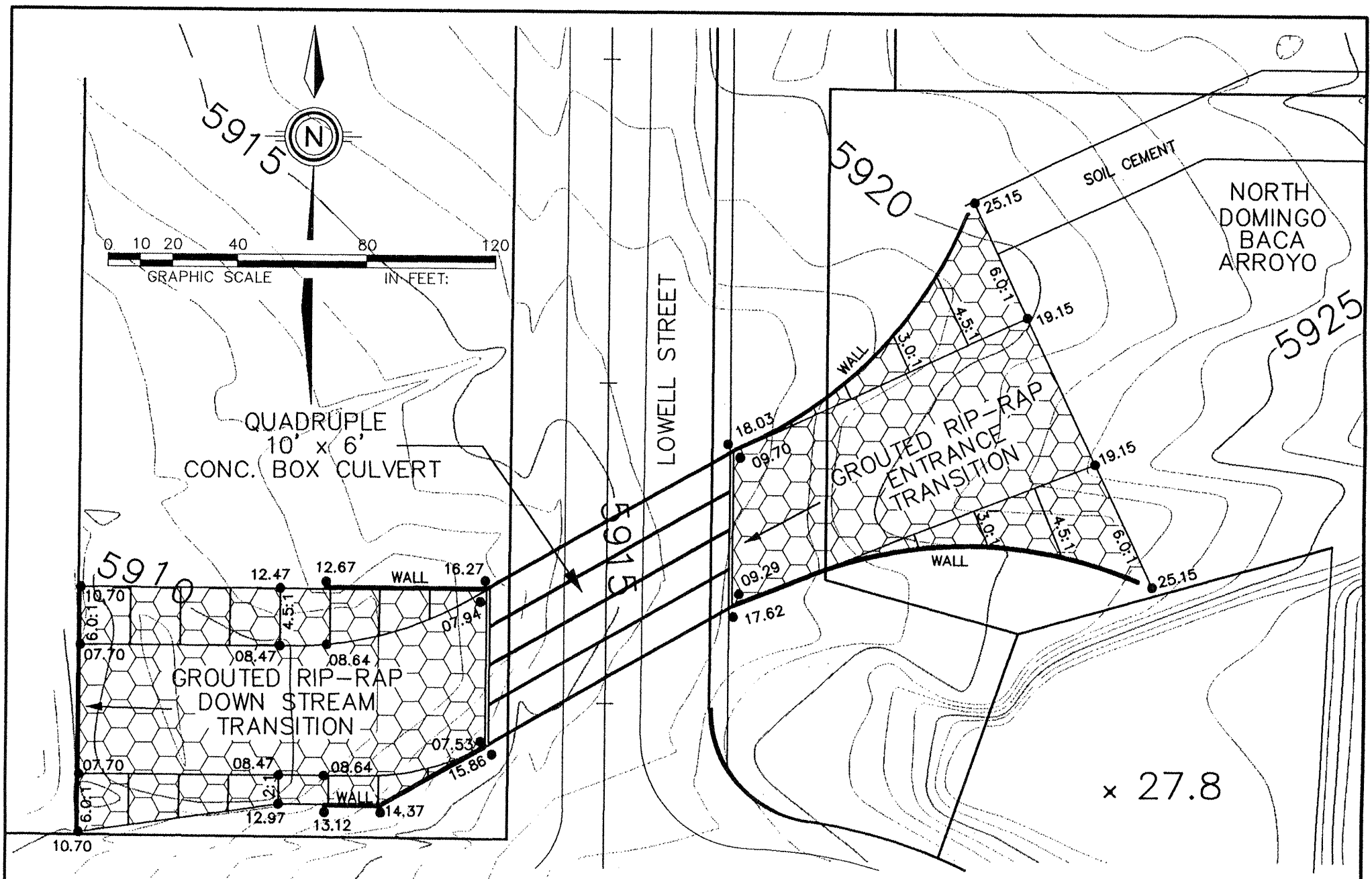
IX. GROUTED RIP-RAP CALCULATIONS

Avg. Velocity @ CBC = 13 fps
per Fig. 57, Pg. 101 of Hydraulic Engineering Circular No. 11, FHWA, March 1989
Blanket Thickness = 1.5'

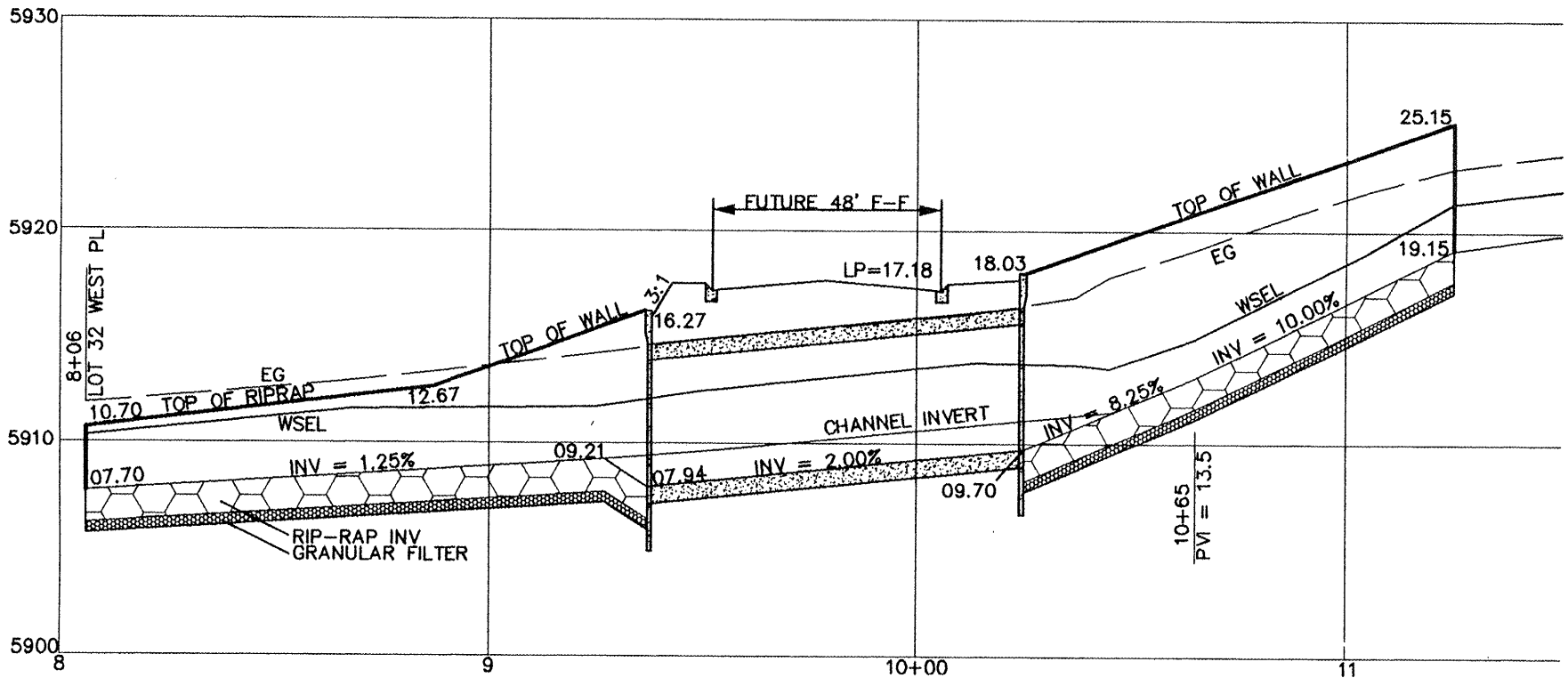
d_{max} = 1.5'
d_{50} =0.67(1.5) = 1.0'
per Table 6, Pg. 104 use "Facing" Class

Equivalent Diameter (ft)	Weight	% Larger than given Rock Size
1.25	200 lb.	0 - 5
1.00	75 lb.	50 - 100
0.50	25 lb.	95 - 100

Min. 8" grout penetration
Use 1.5' rip-rap blanket
Use 0.5' granular filter per Pg. 102 of Circular #11



PLAN VIEW



PROFILE
NOT TO SCALE

LOWELL STREET CROSSING STRUCTURE

TABLES

TABLE 1

NORTH DOMINGO BACA FLOW AT TENNYSON STREET

	CSC				AAR			
RETURN PERIOD (years)	CONT AREA (sq mi)	PEAK FLOW (cfs)	VOLUME (ac-ft)	TIME TO PEAK (hrs)	CONT AREA (sq mi)	PEAK FLOW (cfs)	VOLUME (ac-ft)	TIME TO PEAK (hrs)
2	0.89340	232.14	12.154	1.665	0.91094	190.87	12.538	2.031
10	0.89340	777.86	34.130	1.665	0.91094	612.55	35.484	1.865
100	0.89340	1501.54	66.199	1.632	0.91094	1235.45	68.790	1.732

TABLE 2

NORTH DOMINGO BACA FLOW AT LOWELL STREET

RETURN PERIOD (years)	PRE-DEVELOPMENT PEAK FLOWS (cfs)	POST-DEVELOPMENT PEAK FLOWS (cfs)	PRE-DEVELOPMENT VOLUME (ac-ft)	POST-DEVELOPMENT VOLUME (ac-ft)
2	194.93	195.60	13.808	14.203
10	638.14	643.20	38.559	40.468
100	1273.63	1282.02	74.955	77.530

TABLE 3

REQUIRED FLOODWALL HEIGHT & DEPTH CALCULATIONS

STATION	Q	WSEL	CRIWS	EG	DEPTH	AREA	TW	VEL	HYD DEPTH	FROUDE	LOCAL SCOUR	HALF ANTIDUNE	TOTAL SCOUR	FB EG+1.0' WSEL	FB CRIWS +3'-WSEL	TOP OF WALL	TOTAL WALL	MAX TOE ELEV
31.00	1710	210.77	211.12	212.63	5.69	156.03	68.00	10.96	2.29	1.28	9.94	1.64	11.59	2.87	3.35	214.12	21.63	192.49
30.50	1710	205.66	206.92	209.31	2.63	111.57	52.41	15.33	2.13	1.85	10.43	3.21	13.64	4.65	4.26	210.31	21.92	188.39
30.00	1710	203.14	203.79	205.42	2.22	141.08	74.33	12.12	1.90	1.55	8.77	2.01	10.78	3.28	3.65	206.79	17.65	189.14
29.50	1710	201.03	201.44	202.73	2.22	163.74	86.58	10.44	1.89	1.34	8.33	1.49	9.82	2.69	3.41	204.44	16.45	187.99
29.00	1710	199.23	199.52	200.77	2.35	172.02	81.42	9.94	2.11	1.21	8.99	1.35	10.34	2.53	3.29	202.52	16.98	185.54
28.50	1710	197.83	197.95	199.30	3.33	175.62	66.96	9.74	2.62	1.06	10.69	1.30	11.99	2.47	3.12	200.95	19.44	181.51
28.00	1710	195.60	196.22	197.63	3.33	149.46	64.79	11.44	2.31	1.33	10.13	1.79	11.92	3.03	3.62	199.22	19.87	179.35
27.50	1710	193.83	194.52	195.99	2.95	145.04	68.50	11.79	2.12	1.43	9.53	1.90	11.42	3.16	3.69	197.52	19.06	178.46
27.00	1710	191.21	191.86	193.50	2.83	141.01	67.51	12.13	2.09	1.48	9.51	2.01	11.52	3.28	3.65	194.86	19.00	175.86
26.50	1710	187.57	188.38	190.24	2.33	130.48	76.04	13.11	1.72	1.76	8.28	2.35	10.62	3.67	3.81	191.38	17.76	173.62
26.00	1710	185.88	186.14	187.42	2.77	172.06	77.71	9.94	2.21	1.18	9.35	1.35	10.70	2.53	3.26	189.14	17.73	171.41
25.50	1710	183.10	183.74	185.15	2.44	148.87	83.91	11.49	1.77	1.52	8.15	1.80	9.95	3.05	3.64	186.74	17.03	169.71
25.00	1710	180.94	181.36	182.55	2.35	168.29	92.70	10.16	1.82	1.33	7.98	1.41	9.39	2.60	3.42	184.36	16.16	168.20
24.50	1710	179.19	179.39	180.64	2.61	176.86	84.69	9.67	2.09	1.18	8.82	1.28	10.10	2.45	3.20	182.39	16.91	165.48
24.00	1710	177.54	177.79	178.88	2.96	184.02	102.04	9.29	1.80	1.22	7.70	1.18	8.88	2.34	3.25	180.79	16.09	164.70
23.50	1710	174.97	175.41	176.65	2.27	164.02	98.28	10.43	1.67	1.42	7.50	1.49	8.99	2.69	3.44	178.41	15.70	162.71
23.00	1710	173.27	173.44	174.49	2.64	193.08	103.62	8.86	1.86	1.14	7.79	1.07	8.86	2.22	3.17	176.44	15.67	160.77
22.50	1710	170.89	171.26	172.45	2.42	170.44	104.25	10.03	1.63	1.38	7.28	1.37	8.65	2.56	3.37	174.26	15.44	158.82
22.00	1710	168.57	168.91	169.95	2.30	181.88	124.00	9.40	1.47	1.37	6.51	1.21	7.71	2.37	3.34	171.91	14.35	157.56
21.50	1710	165.99	166.34	167.38	2.33	181.03	128.00	9.45	1.41	1.40	6.32	1.22	7.54	2.39	3.35	169.34	14.22	155.12
20.50	1710	161.73	161.96	162.81	1.76	205.90	165.00	8.31	1.25	1.31	5.46	0.94	6.40	2.07	3.23	164.96	12.39	152.57
19.50	1710	158.03	158.24	159.04	2.14	212.43	162.99	8.05	1.30	1.24	5.60	0.89	6.49	2.01	3.21	161.24	12.84	148.40
19.00	1710	155.69	156.04	156.95	1.96	189.85	164.23	9.01	1.16	1.48	5.26	1.11	6.37	2.26	3.35	159.04	12.68	146.36
18.00	1710	151.91	152.09	152.80	1.94	225.48	205.00	7.58	1.10	1.27	4.77	0.78	5.55	1.89	3.18	155.09	11.67	143.42
17.50	1710	148.72	149.07	149.93	4.01	193.31	178.33	8.85	1.08	1.50	4.95	1.07	6.02	2.22	3.35	152.07	14.38	137.69
17.00	1710	147.36	147.54	148.16	3.50	238.85	242.00	7.16	0.99	1.27	4.27	0.70	4.97	1.80	3.18	150.54	12.65	137.89
16.50	1710	145.77	145.77	146.41	3.91	266.04	237.00	6.43	1.12	1.07	4.59	0.56	5.16	1.64	3.00	148.77	13.07	135.70
16.00	1710	143.12	143.37	144.05	3.27	221.01	237.27	7.74	0.93	1.41	4.18	0.82	4.99	1.93	3.25	146.37	12.51	133.86
15.50	1710	141.17	141.17	141.89	4.87	250.37	214.71	6.83	1.17	1.11	4.83	0.64	5.47	1.72	3.00	144.17	14.34	129.83
15.00	1710	139.29	139.41	140.10	4.42	236.58	188.00	7.23	1.26	1.14	5.25	0.71	5.96	1.81	3.12	142.41	14.50	127.91
14.50	1710	136.75	137.09	137.96	3.46	194.06	143.10	8.81	1.36	1.33	5.96	1.06	7.02	2.21	3.34	140.09	14.82	125.27
14.00	1710	134.51	134.76	135.71	3.17	193.98	126.39	8.82	1.53	1.25	6.62	1.06	7.68	2.21	3.25	137.76	15.10	122.66
13.50	1710	132.34	132.40	133.25	3.23	223.82	146.00	7.64	1.53	1.09	6.30	0.80	7.10	1.91	3.06	135.40	14.39	121.01
13.00	1710	130.27	130.47	131.39	3.30	201.31	140.00	8.49	1.44	1.25	6.19	0.98	7.17	2.12	3.20	133.47	14.67	118.80
12.50	1710	127.84	127.96	128.84	2.93	213.69	138.00	8.00	1.55	1.13	6.45	0.87	7.33	1.99	3.12	130.96	14.38	116.58
12.00	1710	126.00	126.16	127.06	2.91	207.35	140.00	8.25	1.48	1.19	6.28	0.93	7.21	2.06	3.16	129.16	14.28	114.88
11.50	1710	122.84	123.11	124.06	3.22	193.06	135.55	8.86	1.42	1.31	6.23	1.07	7.30	2.22	3.27	126.11	14.79	111.32
11.00	1710	121.34	121.35	122.26	2.90	221.61	122.51	7.72	1.81	1.01	7.26	0.81	8.08	1.93	3.01	124.35	14.99	109.36
10.50	1710	118.62	119.09	120.11	2.58	174.84	129.09	9.78	1.35	1.48	6.17	1.31	7.47	2.49	3.47	122.09	14.52	107.57

Data as originally compiled in Primrose Pointe Unit 1 report.

STATION	Q	WSEL	CRIWS	EG	DEPTH	AREA	TW	VEL	HYD DEPTH	FROUDE	LOCAL SCOUR	HALF ANTIDUNE	TOTAL SCOUR	FB EG+1.0' WSEL	FB CRIWS +3'-WSEL	TOP OF WALL	TOTAL WALL	MAX TOE ELEV
32.00	1400.00	6011.23	6011.99	6013.70	2.10	111.01	65.30	12.61	1.70	1.70	8.10	2.17	10.27	3.47	3.76	6014.99	17.13	5997.86
31.35	1400.00	6007.92	6008.70	6010.47	1.70	109.29	81.09	12.81	1.35	1.94	6.71	2.24	8.95	3.55	3.78	6011.70	15.43	5996.27
29.05	1400.00	5998.44	5998.96	6000.26	2.09	129.23	79.91	10.83	1.62	1.50	7.39	1.60	9.00	2.82	3.52	6001.96	15.61	5986.35
27.45	1400.00	5989.89	5990.64	5992.48	2.25	108.42	85.49	12.91	1.27	2.02	6.40	2.28	8.67	3.59	3.75	5993.64	15.67	5977.97
25.60	1400.00	5982.87	5983.31	5984.53	2.61	135.44	77.77	10.34	1.74	1.38	7.75	1.46	9.21	2.66	3.44	5986.31	16.26	5970.05
23.65	1400.00	5975.25	5975.90	5977.39	2.13	119.14	84.42	11.75	1.41	1.74	6.78	1.89	8.66	3.14	3.65	5978.90	15.44	5963.46
22.64	1400.00	5971.81	5972.30	5973.45	2.32	136.10	87.35	10.29	1.56	1.45	7.05	1.45	8.49	2.64	3.49	5975.30	15.30	5960.00
21.50	1450.00	5965.35	5966.26	5968.21	1.99	106.73	73.49	13.59	1.45	1.99	7.29	2.52	9.81	3.87	3.91	5969.26	16.71	5952.55
19.62	1450.00	5957.07	5957.60	5958.82	1.93	136.58	100.48	10.62	1.36	1.60	6.35	1.54	7.89	2.75	3.53	5960.60	14.35	5946.25
17.73	1450.00	5947.74	5948.18	5949.23	1.58	148.05	171.94	9.79	0.86	1.86	4.23	1.31	5.54	2.49	3.44	5951.18	11.56	5939.62
16.48	1450.00	5943.20	5943.61	5944.57	3.01	154.25	88.60	9.40	1.74	1.26	7.52	1.21	8.72	2.37	3.41	5946.61	16.14	5930.47
15.17	1450.00	5937.27	5938.30	5940.36	2.78	102.75	48.81	14.11	2.11	1.71	10.05	2.72	12.77	4.09	4.03	5941.36	20.64	5920.72
13.80	1450.00	5930.43	5931.32	5933.37	1.69	105.50	73.94	13.74	1.43	2.03	7.21	2.58	9.79	3.93	3.89	5934.37	16.42	5917.95
11.65	1450.00	5922.41	5922.87	5924.09	2.11	139.13	80.57	10.42	1.73	1.40	7.72	1.48	9.20	2.69	3.46	5925.87	15.77	5910.10

Data based on Primrose Pointe Unit 2 final arroyo improvements and construction.

TABLE 4

100 YEAR SEDIMENT TRANSPORT CALCULATIONS

HEC-2 SECNO	Q (cfs)	VCH (fps)	TOPWID (ft)	AREA (sf)	D (ft)	Cw (ppm)	Qs (cfs)	HEC-2 SECNO
32.00	1400.00	12.61	65.30	111.01	1.70	2320	131.36	32.00
31.35	1400.00	12.81	81.09	109.29	1.35	2320	208.83	31.35
29.05	1400.00	10.83	79.91	129.23	1.62	2320	68.66	29.05
27.45	1400.00	12.91	85.49	108.42	1.27	2320	239.92	27.45
25.60	1400.00	10.34	77.77	135.44	1.74	2320	48.59	25.60
23.65	1400.00	11.75	84.42	119.14	1.41	2320	127.62	23.65
22.64	1400.00	10.29	87.35	136.10	1.56	2320	57.17	22.64
21.50	1450.00	13.59	73.49	106.73	1.45	2320	253.78	21.50
19.62	1450.00	10.62	100.48	136.58	1.36	2320	86.57	19.62
17.73	1450.00	9.79	171.94	148.05	0.86	2320	125.36	17.73
16.48	1450.00	9.40	88.60	154.25	1.74	2320	31.83	16.48
15.17	1450.00	14.11	48.81	102.75	2.11	2320	163.48	15.17
13.80	1450.00	13.74	73.94	105.50	1.43	2320	275.40	13.80
11.65	1450.00	10.42	80.57	139.13	1.73	2320	52.95	11.65
11.25	1450.00	10.39	76.47	139.50	1.82	2320	**47.63**	**11.25**
11.05	1450.00	13.59	64.93	106.66	1.64	2320	206.46	11.05
10.85	1450.00	15.15	56.99	95.68	1.68	2320	335.77	10.85
10.65	1450.00	16.27	51.24	89.13	1.74	2320	446.17	10.65
10.45	1450.00	16.48	41.64	88.00	2.11	2320	342.85	10.45
10.37	1450.00	14.12	41.63	102.71	2.47	2320	125.88	10.37
10.13	1450.00	12.07	39.99	120.15	3.00	2320	42.60	10.13
9.49	1450.00	12.44	39.99	116.58	2.92	2320	51.80	9.49
9.25	1450.00	12.80	47.09	113.27	2.41	2320	81.89	9.25
8.68	1450.00	9.22	60.37	157.30	2.61	2320	14.79	8.68
8.06	1450.00	9.96	71.37	145.54	2.04	2320	32.27	8.06
*	1236.00	10.14	67.27	121.89	1.81	2320	36.54	*
*	1400.00	10.56	69.16	132.61	1.92	2320	**45.79**	*

* "NATURALISTIC" CHANNEL DESIGN WITH EQUILIBRIUM SLOPE OF 4.30% **Qs = 45.79 cfs.**

CAPACITY AT ENTERANCE TO LOWELL ST. TRANSITION (STATION 11+25) **Qs = 47.63 cfs.**

AVERAGE CBC CAPACITY (STATIONS 9+49 AND 10+13) **Qs = 47.20 cfs.**

AVERAGE CAPACITY BELOW LOWELL ST. (STATIONS 8+06 THROUGH 9+25) **Qs = 42.99 cfs.**

APPENDIX A

DESIGN CALCULATIONS
(FROM FINAL DRAINAGE REPORT FOR AMAFCA INFRASTRUCTURE, PRIMROSE POINTE UNIT 2)

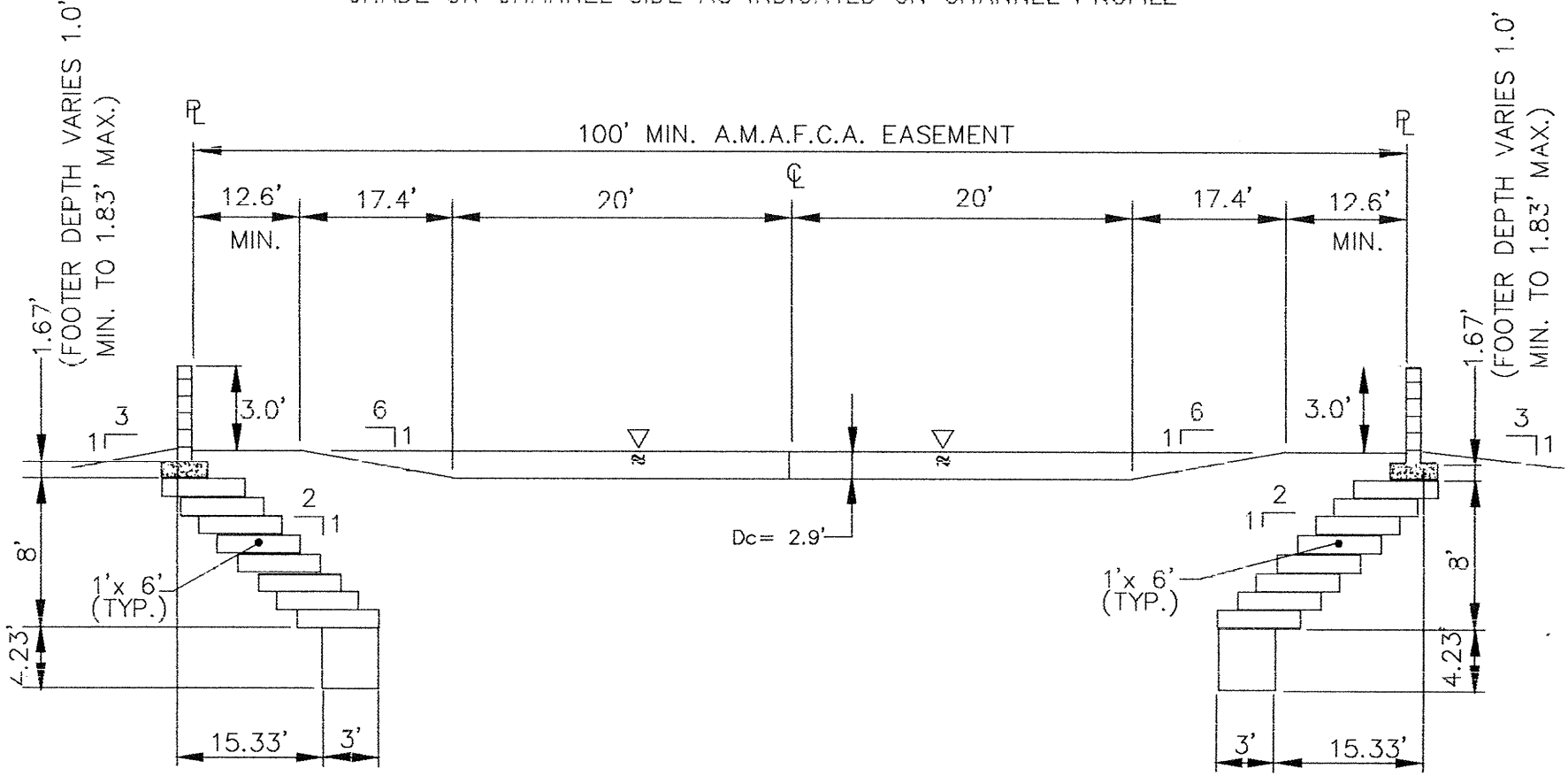
TYPICAL SECTIONS

CHANNEL DESIGN CALCULATIONS

VERTICAL TRANSITION (DROP STRUCTURE) SCOUR CALCULATIONS

WILSHIRE AVE. & TENNYSON STREET INLET CALCULATIONS

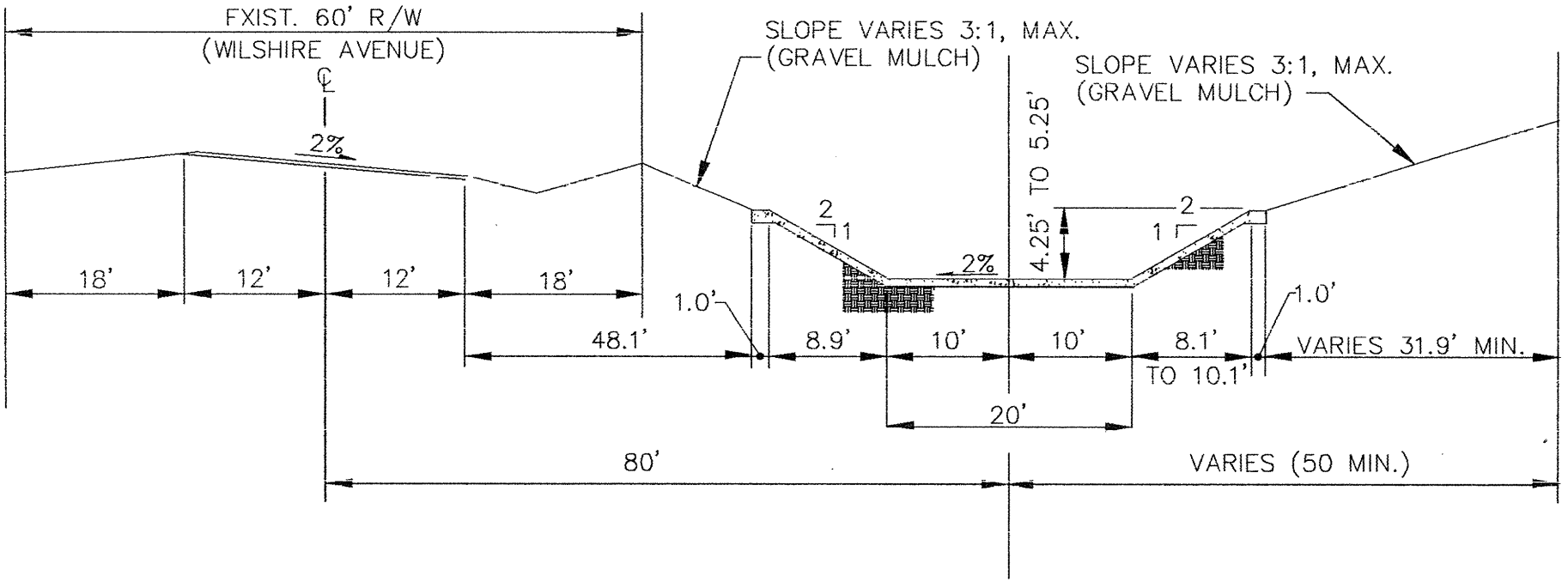
NOTE:
SLOPE IN REAR YARDS VARIES (2:1 MAX.) AND FINISHED GRADE ON LOT SIDE MAY BE AS MUCH AS 2.33' HIGHER THAN FINISHED GRADE ON CHANNEL SIDE AS INDICATED ON CHANNEL PROFILE



TYPICAL "NATURALISATIC" CHANNEL SECTION

STA. 27+00.00 TO STA. 32+00.00

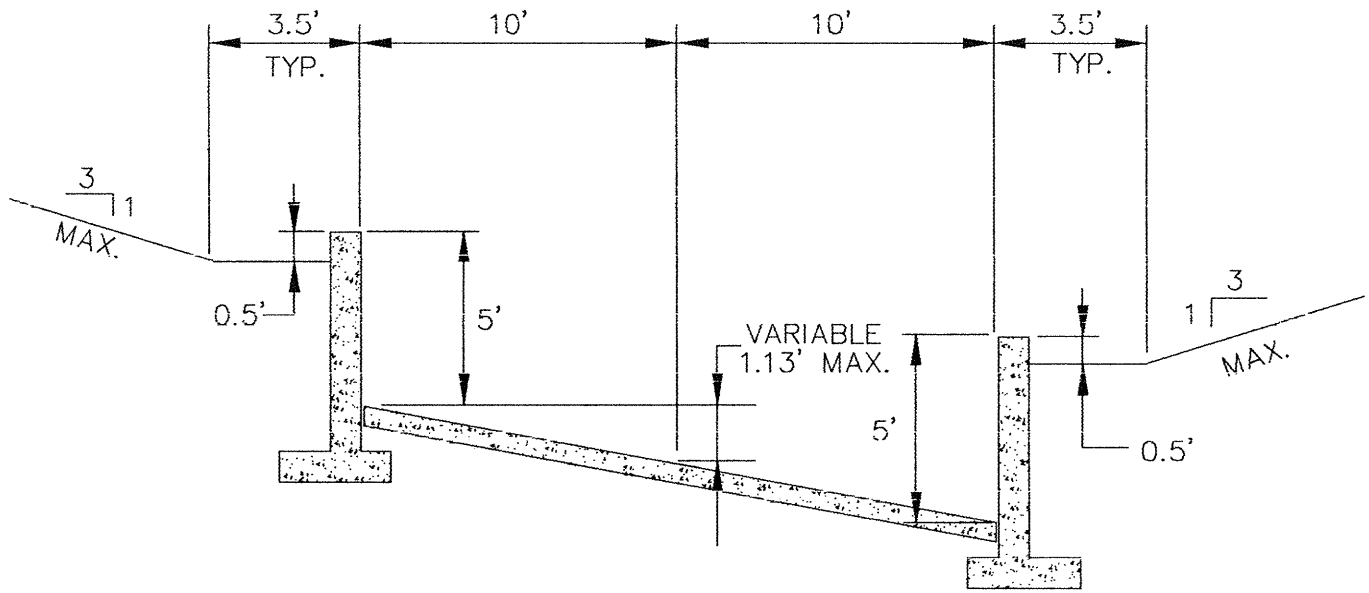
N.T.S.



TYPICAL CONCRETE TRAPEZOIDAL CHANNEL SECTION

STA. 33+00.00 TO STA. 36+77.00

N.T.S.



TYPICAL RECTANGULAR CHANNEL SECTION

STA. 37+93 TO STA. 39+81.00

N.T.S.

CHANNEL DESIGN CALCULATIONS

I. Concrete Trapezoidal Channel
Sta. 33+00 to Sta. 36+77

a) Hydraulic Calculations

HEC-2 SECNO 33.10

Qdesign = 1236 cfs X 1.13 = 1400 cfs
n = 0.013 (see discussion at the end of these calculations)
So = 3.35%
Vn = 29.93 fps
dn = 1.97 ft
A = 46.78 ft^2
Top Width (TW) = 27.81 ft
Hydraulic Depth (Y) = A/TW = 1.68 ft
Fn = $Vn/(32.2 \times Y)^{0.5}$ = 4.07
Free board = $0.7(2 + 0.025\ vd^{1/3})$ = 2.06 ft
Required depth = 1.97 + 2.06 = 4.03 ft

Design Depth = 4.25 ft at CL and 5.25 ft for levee conditions

b) Sediment Transport Capacity

Unbulked flow	Q = 1236 cfs	CW = 0.011902
	v = 28.58 fps	TW = 27.31 ft
	d = 1.84 ft	Y = 1.58 ft
	A = 43.28 ft^2	

$Qs = 1.15 \times 10^{-6} (v^{5.81})(Y^{-0.67})(1\text{-}Cw)^{-2.09}(TW)$
$= 1.15 \times 10^{-6} (28.58^{5.81})(1.58^{-0.67})(0.988)^{-2.09}(27.31)$

Qs = 6.817 cfs

Since Qs cap (6817 cfs) is much greater than the provided QS (37 cfs), a composite roughness coefficient was not calculated. This is in accordance with the "Sediment and Erosion Design Guide," March 1994. 'Resistance to flow in concrete-lined channels', page 3-16. Conjugate depth criteria is not applicable as an approximation of the required depth to contain roll waves since the normal depth Froude Number is so high. Therefore, use 5.25 foot depth where levee criteria is applicable and 4.25 feet depth everywhere else.

II. "Naturalistic" Channel Section
Sta. 27+00 to Sta. 32+00

a) Sediment Transport

Q_{100} = 1236 cfs	40 ft. bottom width
So = 4.30%	6:1 side slopes
n = 0.045 (for re-vegetated channel)	
Vn = 10.14 fps	dn = 2.27 ft
TW = 67.27 ft	Y = 1.81 ft
A = 121.89 ft^2	Fn = 1.33

CW = 11902 ppm (from Unit 1 report, page 20)

$Qs = 1.15 \times 10^{-6} V^{5.81} Y^{-0.67} (1-CW)^{-2.09} (TW)$
Qs = 36.5 cfs (close enough to 37.5 cfs delivered from above Tramway Lane)

b) Scour

Local Scour (Ys) = $4\ Fn^{0.33} Y$
$= 4(1.33^{033})1.81 = 7.95$ ft.

Antidune Height (ha) = $0.14(\frac{2\pi V^2}{g})$
$= 0.14(2\pi)(10.14^2)/32.2 = 2.80$ ft

Total Scour = YS + 1/2 ha = 9.36 ft

c) Free board

Dc = 2.89 ft (for Qdesign = 1400 cfs)
Vc = 8.47 fps
Levee Freeboard = 3.00 ft

Required Depth = 5.90 ft

III. Rectangular Channel Section
Sta. 37+93 to Sta. 39+81

a) Invert Banking

Qdesign = 1400 cfs
V = 38.15 fps (average velocity throughout the section)
Width = 20 ft
Radius = 400 ft
C = 0.5 (for spiral curves with invert banking)
g = 32.2 ft/sec^2

$\Delta Y = \frac{CV^2W}{gr} = 1.13$ ft = superelevation from CL to side wall of channel

L min = $30\Delta Y$ = 33.9'

Easement curves of twice the central curve approximate spiral transitions. Therefore, using 30 ft. long, 800 ft. radii curves entering and exiting a central curve of 400 ft. radii was selected for the design of the transition to the existing channel. This design is based on the U.S. Army Corps. of Engineers' "Channel Transitions and Curves" publication for supercritical flow. With invert banking, additional wall height freeboard is not required above the normal free board and wave effects will be minimized.

b) Free board

Dn = 1.83 ft
Required Depth = 4.83 ft
Freeboard = 3.00 ft
Design Depth = 5 ft

VERTICAL TRANSITION (DROP STRUCTURE) SCOUR CALCULATIONS

a) Upstream Conditions (Sta. 32+00)

Qdesign = 1400 cfs	n = 0.035
Vn = 12.65 fps	EG = 6013.70
dn = 2.09 ft	Invert = 6009.13
So = 3.35%	BW = 40 ft

b) Downstream Conditions (Sta. 31+40) (Conservatively calculated based on critical depth)

Vc = 8.47 ft	n = 0.045
So = 4.30%	EG = 6010.56
dc = 2.89 ft	Invert = 6005.55

c) Scour Depth

$ds = KH+^{0.225}q^{0.54} - dm$
K = 1.32
H+ = EG up - EG down = 3.14 ft
q = discharge per unit width = 1400 cfs/40 ft = 35 cfs/ft
dn = tail water depth = 2.89 ft

ds = 8.75 ft

Set invert at 5995.83
Total drop is 6009.13 to 5995.85 = 10.28 ft
The time it takes an object to fall that height is:

$t\ (sec) = (2y/g)^{0.5}$
$= (2 \times 10.28/32.3)^{0.5}$
t (sec) = 0.80 sec

The water would hit the bottom at Sta. 31+89.89 (12.65 fps x 0.80 sec = 10.11 ft). This is along the soil cement slope. Therefore, the upstream face of the soil cement will be exposed as scour occurs. A level section will be constructed at the bottom of the soil cement and then rise at a 2:1 slope to the crest (Sta. 31+40, crest elevation = 6005.83).

WILSHIRE AVE. & TENNYSON ST. INLET CALCULATIONS

a) Wilshire Ave. Inlet
Type "D" Inlet with 50% clogging

The area draining to the Wilshire Inlet is 0.0077 mi^2 which is 28% of Primrose Pointe Unit 1 drainage basin 104.14 and will collect 16 cfs.

Orifice Capacity

$Q = 0.65A\sqrt{2gH}$

$H = \left[\frac{Q}{0.65A}\right]^2 / 2g$

Qdesign = 16 cfs

$g = 32.2$ ft/sec^2

$A = 1/2 \times 4.1 = 2.05$ ft^2

H = 2.24 ft Orifice controls

Weir Capacity

$Q = 3.0\ LH^{1.5}$

$H = (Q/3.0L)^{2/3}$

H = 0.63 ft

Q = 16 cfs

L = 10.67 ft

Set Grate Elevation

Pipe Capacity
$Q = KS^{1/2}$ for 24" RCP K = 226.2
Therefore friction slope = 0.50%

Pipe invert out @ ROW = 07.98; HGL = 09.98
Inlet invert = (8 LF x 0.50%) + 07.98 = 08.02; HGL = 10.02

Q = 16 cfs A = 3.14 ft^2 V = 5.09 fps
Minimum grate elevation = 10.02 + 1.2 $V^2/2g$ + 0.5

Minimum Grade Elevation = 10.52 + 0.48 = 11.00

100-year WSEL = 11.00 + 2.24 = 13.24

Emergency overflow weir = Top of floodwall (elevation 13.86)

Based on the weir capacity calculations use a 12 ft weir over the floodwall.

b) Tennyson Street Type "C" Triple Grate Inlet

Basin 103 (Unit 1 report) = 0.0462 mi^2 (Q_{100} = 130.16 cfs)

Area flowing to Tennyson Street = 0.0161 mi^2 = 35% of basin 103.
Qdesign = 130.16 x 0.35 = 45.5 cfs
45.5 /2 = Q = 22.75 cfs (1/2 street section)

Orifice Capacity

$$H = \left(\frac{Q}{0.65A}\right)^2 / 2g$$

Q = 22.75 cfs

H = 0.50 ft

A = 6.15 ft^2 (with 50% clogging)

Weir Capacity

$H = (Q/3.0L)^{2/3}$

L = 14 ft

H = 0.66 ft Weir Controls

c) Tennyson Street Temporary Inlet

A = 3.44 ft x 2.67 ft = 9.17 ft^2

L = 2(4 ft) + 2(3 ft) = 14 ft

Orifice Capacity

$$A = \frac{Q}{0.65\sqrt{2gh}}$$

Q = 22.75 cfs

A = 5.54 ft^2

H = TC - grate = 39.17 - 38.55

5.54/9.17 = 0.60 (40% clogging factor)

H = 0.62 ft

Since L = 14 ft equals the triple grate type "C" inlet, the weir capacity is the same and is approximately equal to the orifice capacity with 40% clogging.

d) Box Culvert Penetration

Orifice Capacity (3 ft diameter)

$$H = \left(\frac{Q}{0.65A}\right)^2 / 2g$$

Q = 22.75 cfs

H = 0.38 ft

A= 7.06 ft^2

Weir capacity

$H = (Q/3.0\ L)^{2/3}$

L = 1/2πd = 4.71 ft

H = 1.37 ft Weir controls

The 100-year water surface equals the top of curb (elevation 6039.17). Total head loss through the temporary inlet is 1.37 ft + 0.66 ft = 2.03 ft. The top of the box culvert is 2.08 ft below top of curb. Therefore, both inlets will function together and maintain a 100-year WSEL = 6039.17 at the top of curb.

APPENDIX B

HEC-2 SUPERCRITICAL OUTPUT

```
1*****************************************                    ***********************************
*
 *  HEC-2 WATER SURFACE PROFILES          *                    *  U.S. ARMY CORPS OF ENGINEERS
*
 *                                        *                    *  HYDROLOGIC ENGINEERING CENTER
*
 *  Version   4.6.2;  May 1991            *                    *  609 SECOND STREET, SUITE D
*
 *                                        *                    *  DAVIS, CALIFORNIA 95616-4687
*
 *  RUN DATE    17MAY96    TIME   11:21:41 *                    *         (916) 756-1104
*
 *****************************************                    ***********************************
*
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                                        X     X  X       X     X          X     X
                                        X     X  X       X                      X
                                        XXXXXXX  XXXX    X         XXXXX    XXXXX
                                        X     X  X       X                X
                                        X     X  X       X     X          X
                                        X     X  XXXXXXX   XXXXX          XXXXXXX
1
   17MAY96      11:21:41                                                                  PAGE    1
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                                                                        THIS RUN EXECUTED 17MAY96    11:21:41
 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 ************************************


T1      PRIMROSE POINTE UNIT 3 FLOODPLAIN ANALYSIS
T2      SUPERCRITICAL FLOW FROM TRAMWAY BLVD. TO NAA LOT 32
T3      UNBULKED 100 YR-6 HR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

               2.                  1.      .037                              6068.49

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.                 -1.                                     -1.


J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10.      -10.

J6  IHLEQ     ICOPY     SUBDIV    STRTDS    RMILE

     1.
```

```
QT      2.0      1236.      1400.
NC    0.013      0.013      0.013        0.1         0.3

  Begin bridge at Tramway Blvd. (model as channel as WSEL below low chord
  and no piers)
   TrwyBlvd 100 yr flow is 1236 cfs with bulking factor of 1.04 = 1285 cfs

X1    43.85        6.       100.       123.        157.       157.       157.
GR    6072.      100.    6069.25      100.1    6065.87      106.5    6065.87      116.5    6069.25      122.9
GR    6072.      123.

  Begin existing concrete channel between Tramway Blvd. and Tennyson St.


X1    42.28        6.       100.       123.         52.        52.        52.
GR    6065.      100.    6062.25      100.1    6059.07      106.5    6059.07      116.5    6062.25      122.9
GR    6065.      123.

X1    41.76        7.       100.     147.36         50.        50.        50.
GR   6058.8      100.    6059.26      113.3    6054.25     124.34    6053.92      128.2    6053.92     130.72
GR   6059.2    144.24     6060.2     147.36
1
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X1    41.26        9.       100.     166.11        100.       100.       100.
GR   6056.4      100.    6055.99      107.31   6056.16      112.76    6051.19     123.94    6051.19     133.55
GR   6056.2    144.32    6056.17      150.27   6056.89      155.67    6056.85     166.11

X1    40.26        6.       100.       145.       14.55      14.55      14.55
GR    6052.      100.     6051.3       107.5    6046.24        118.    6046.24        128.     6051.2        139.
GR    6052.      145.

X1    40.11                                                    5.         5.         5.                  -0.74

  Begin transition to rectangular channel.


NC    0.013      0.013      0.013        0.3         0.5
X1    40.06        6.         0.       28.33         5.         5.         5.                 6000.115
GR    49.96        0.      49.13          0.      44.96       8.33      44.96        20.      49.13        28.33
GR    49.96      28.33

X1    40.01        6.         0.       26.67         5.         5.         5.                 6000.23
GR    49.42        0.      47.75          0.      44.42       6.67      44.42        20.      47.75        26.67
GR    49.42      26.67

X1    39.96        6.         0.          25.        5.         5.         5.                 6000.345
GR    48.88        0.      46.38          0.      43.88          5.     43.88        20.      46.38          25.
GR    48.88        25.

X1    39.91        6.         0.       23.33         5.         5.         5.                 6000.46
GR    48.34        0.         45.         0.      43.34       3.34      43.34        20.         45.       23.33
GR    48.34      23.33

X1    39.86        6.         0.       21.67         5.         5.         5.                 6000.575
GR    47.80        0.      43.63          0.      42.80       1.67      42.80        20.      43.63        21.67
GR    47.80      21.67

  Begin rectangular channel.


X1    39.81        4.         0.          20.        6.45       6.45       6.45                6000.70
```

```
GR    47.25       0.      42.25       0.      42.25      20.      47.25      20.

NC    0.013     0.013     0.013      0.1       0.3
X1    39.75                                   145.       145.     145.              -0.41

X1    38.30                                   20.        20.      20.               -9.14
```

Begin transition to double 10' X 6' concrete box culvert at Tennyson St.


```
X1    38.10       4.        0.      20.08      2.2        2.2      2.2               6000.
GR    40.05       0.      32.14       0.      32.14      20.08    40.05     20.08

NC    0.013     0.013     0.013      0.3       0.5
X1    38.08       4.        0.      20.11      5.14       5.14     5.14              6000.
GR    41.05       0.      32.00       0.      32.00      20.11    41.05     20.11

X1    38.03       8.        0.      20.22       5.         5.      5.                6000.
GR    40.05       0.      31.68       0.      31.68       9.9    33.71      9.91    33.71     10.39
GR    31.68     10.40     31.68      20.22    40.05      20.22

X1    37.98       8.        0.      20.22       5.         5.      5.                6000.
GR    40.05       0.      31.37       0.      31.37       9.9    35.38      9.91    35.38     10.39
GR    31.37     10.40     31.37      20.22    40.05      20.22
```

Begin double 10' X 6' concrete box culvert at Tennyson St.
(model as channel as WSEL below low chord)

```
NC    0.013     0.013     0.013      0.1       0.3
X1    37.93       8.        0.      20.50      70.        70.      70.               6031.05
GR      6.        0.        0.        0.        0.       9.99      6.       10.        6.       10.5
GR      0.      10.51       0.      20.50       6.       20.50

X1    37.23                                   2.66       2.66     2.66              -4.41
```

Begin transition to trapezoidal concrete channel.

```
X1    37.20       6.        0.      21.48      20.        20.      20.               6000.
GR    38.83       0.      26.80       0.      26.54      0.53     26.56     21.00    26.80     21.48
GR    38.41     21.48

X1    37.00       6.        0.      28.81      22.34      22.34    22.34             6000.
GR    34.51       0.      28.02       0.      25.78      4.48     25.98     24.72    28.02     28.81
GR    33.33     28.81

X1    36.78       4.        0.       37.       7.66       7.66     7.66              6024.93
GR     4.45       0.        0.       8.9       0.4       28.9      4.45      37.
```

Begin trapezoidal concrete channel.

```
NC    0.013     0.013     0.013      0.1       0.3
X1    36.70                                   20.        20.      20.               -0.257

X1    36.50                                   200.       200.     200.              -0.670
```

```
X1    34.50                                  150.    150.    150.              -6.700

NC    0.013    0.013    0.013    0.3     0.5
X1    33.00      4.       0.    76.13     10.     10.     10.               6000.
X3      10.                     32.41  6018.60   65.05  6018.11
GR    18.60      0.     12.27    38.73    12.67   58.73   15.57    76.13

  Begin Grouted rip rap.

NC    0.035    0.035    0.035    0.6     0.8
X1    32.90      4.       0.     82.     20.     20.     20.               6000.
X3      10.                     23.26  6018.53   59.94  6018.11
GR    17.15      0.     12.05    30.6     12.25   52.6    17.15    82.

NC    0.035    0.035    0.035    0.1     0.3
X1    32.70      4.       0.     86.     20.     20.     20.               6000.
X3      10.                     20.62  6018.53   65.38  6018.11
GR    16.47      0.     11.47    30.     11.47   56.     16.47    86.

X1    32.50      4.       0.     90.     20.     20.     20.               6000.
X3      10.                     18.58  6018.53   71.42  6018.11
GR    15.80      0.     10.80    30.     10.80   60.     15.80    90.

X1    32.30      4.       0.     94.     20.     20.     20.               6000.
X3      10.                     16.54  6017.20   77.46  6016.78
GR    15.13      0.     10.13    30.     10.13   64.     15.13    94.

X1    32.10      4.       0.     98.     10.     10.     10.               6000.
X3      10.                     14.50  6015.86   83.50  6016.11
GR    14.46      0.      9.46    30.      9.46   68.     14.46    98.

  Begin "existing" channel

NC    0.034    0.034    0.034    0.1     0.3
X1    32.00      4.       0.    100.     65.     65.     65.               6000.
X3      10.                     13.48  6015.86   86.52  6015.44
GR    14.13      0.      9.13    30.      9.13   70.     14.13   100.

X1    31.35      5.       0.00  100.41    230.    230.    230.              6000.
GR     9.42      0.00     9.90    1.33     6.64   17.30    6.22    82.56    9.39    100.41

X1    29.05      6.       0.00  100.94    160.    160.    160.              5900.
GR   103.84      0.00   100.26    0.00    96.35   21.78   96.80    80.23   100.03   99.57
GR   100.15    100.94

X1    27.45      8.       0.00  112.91    185.    185.    185.              5900.
GR    94.33      0.00    94.25    1.35    90.24    2.43   87.64    23.22    89.47    89.08
GR    92.82    102.23    92.89  109.91    92.92  112.91
1
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X1    25.60      7.       0.00  109.19    195.    195.    195.              5900.
GR    85.44      0.00    84.39   12.51    81.65   26.16   80.26    88.54    83.24    99.16
GR    83.34     99.50    83.95  109.19

X1    23.65      6.       0.00  105.82    101.    101.    101.              5900.
GR    76.33      0.00    76.08    3.51    73.12   36.18   73.33    69.60    75.14    96.41
GR    76.34    105.82
```

```
X1    22.64      8.      0.00    128.49     114.     114.     114.              5900.
GR    73.87      0.00    73.01    17.99     69.94    40.73    69.49    82.56    71.00    101.69
GR    72.29    121.42    72.47   124.04     72.75   128.49

QT     2.      1273.    1450.
X1    21.50      8.      0.00    157.53     188.     188.     188.              5900.
GR    66.73      0.00    66.65     7.59     66.13    28.61    63.36    47.80    63.91     98.23
GR    67.58    121.94    67.50   148.02     67.15   157.53

X1    19.62      9.      0.00    196.21     189.     189.     189.              5900.
GR    58.94      0.00    57.95    36.73     56.06    69.89    55.99    87.12    55.14     90.62
GR    55.32    142.61    58.01   158.09     58.50   186.94    58.47   196.21

X1    17.73      9.      0.00    260.45     125.     125.     125.              5900.
GR    47.99      0.00    46.54    76.08     47.46   106.96    46.16   126.00    46.72    176.53
GR    50.00    204.43    50.13   232.72     49.46   242.21    49.35   260.45

X1    16.48      9.      0.00    282.03     131.     131.     131.              5900.
GR    46.92      0.00    44.56    62.90     42.77   127.62    40.32   136.44    40.19    172.48
GR    42.79    188.92    43.59   212.46     44.59   272.70    44.67   282.03

X1    15.17      9.      0.00    223.10     137.     137.     137.              5900.
GR    42.66      0.00    42.38     7.56     38.09    58.04    34.66    68.17    34.49     95.68
GR    37.31    109.54    37.85   178.19     38.46   213.84    39.02   223.10

X1    13.80      7.      0.00    165.92     215.     215.     215.              5900.
GR    36.79      0.00    31.76    45.93     28.74    56.14    28.97   116.07    31.21    128.75
GR    33.28    156.31    34.02   165.92

X1    11.65      9.      0.00    150.33      40.0     40.0     40.0              5900.
GR    23.54      0.00    24.18    30.48     21.84    37.13    21.95    41.78    20.30     48.61
GR    20.32    103.46    22.28   114.66     24.61   140.82    25.50   150.33
```

Begin transition to quadruple 10' X 6' concrete box culvert at Lowell St.

```
NC    0.034     0.034    0.034     0.3       0.5
X1    11.25      4.       0.      86.       20.      20.      20.              5900.00
GR    22.15      0.      19.15    18.       19.15    68.      22.15    86.
```



```
X1    11.05      4.       0.      74.91     20.      20.      20.              5900.00
GR    20.15      0.      17.15    13.50     17.15    61.41    20.15    74.91

X1    10.85      4.       0.      63.82     20.      20.      20.              5900.00
GR    18.15      0.      15.15     9.00     15.15    54.82    18.15    63.82

X1    10.65      4.       0.      52.73     20.      20.      20.              5900.00
GR    15.40      0.      13.15     4.50     13.15    48.23    15.40    52.73

X1    10.45      4.       0.      41.64      8.       8.       8.              5900.00
GR    15.50      0.      11.50     0.       11.50    41.64    15.50    41.64

X1    10.37      4.       0.      41.63     24.      24.      24.              5900.00
GR    17.84      0.      11.34     0.       11.34    41.63    17.84    41.63
```

Begin triple 10' X 6' concrete box culvert at Lowell St.
(model as channel as WSEL below low chord)

```
NC    0.025     0.025     0.025      0.3       0.5
X1    10.13      16.        0.     41.62      64.       64.       64.              5900.00
GR    14.86       0.      10.86      0.      10.86      9.99     14.86     10.     14.86     10.54
GR    10.86     10.55     10.86     20.53    14.86     20.54     14.86    21.08    10.86     21.09
GR    10.86     31.07     14.86     31.08    14.86     31.61     10.86    31.62    10.86     41.61
GR    14.86     41.62

X1     9.49                                  24.       24.       24.              -1.28
```

Begin transition to "exising" channel west of Lowell St.

```
NC    0.034     0.034     0.034      0.3       0.5
X1     9.25       4.        0.00    52.00     57.3      57.3      57.3             5900.00
GR    14.19       0.       9.19      10.0     9.19      52.00     15.99    52.00

X1     8.68       4.        0.00    67.00     61.35     61.35     61.35            5900.00
GR    12.47       0.       8.47      18.      8.47      58.00     12.97    67.00

X1     8.06       4.        0.00    76.00                                         5900.00
GR    10.70      0.00      7.70      18.00    7.70      58.00     10.70    76.00
1
```


IHLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

1


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T1      PRIMROSE POINTE UNIT 3 FLOODPLAIN ANALYSIS
T2      SUPERCRITICAL FLOW FROM TRAMWAY BLVD. TO NAA LOT 32
T3      BULKED 100 YR-6 HR STORM

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

    -10.        3.                1.       .037                                 6068.49

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.                 -1.                                     -1.
```

IHLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

1

THIS RUN EXECUTED 17MAY96 11:21:44

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

UNBULKED 100 YR-6 HR STO

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01
43.850	.00	.00	.00	6065.87	1236.00	6068.42	6071.30	6084.97	370.19	32.65	37.86	64.
43.850	.00	.00	.00	6065.87	1400.00	6068.59	6071.69	6086.51	374.31	33.97	41.21	72.
42.280	157.00	.00	.00	6059.07	1236.00	6061.54	6064.44	6078.83	402.79	33.37	37.04	61.
42.280	157.00	.00	.00	6059.07	1400.00	6061.71	6064.83	6080.33	404.39	34.63	40.43	69.
41.760	52.00	.00	.00	6053.92	1236.00	6056.76	6059.90	6076.34	469.74	35.50	34.81	57.
41.760	52.00	.00	.00	6053.92	1400.00	6056.93	6060.17	6077.83	469.60	36.69	38.16	64.
41.260	50.00	.00	.00	6051.19	1236.00	6053.52	6056.94	6073.80	516.39	36.14	34.20	54.
41.260	50.00	.00	.00	6051.19	1400.00	6053.67	6057.16	6075.30	511.66	37.32	37.51	61.
40.260	100.00	.00	.00	6046.24	1236.00	6048.54	6051.87	6068.61	509.36	35.95	34.38	54.
40.260	100.00	.00	.00	6046.24	1400.00	6048.70	6052.09	6070.16	506.13	37.18	37.66	62.
40.110	14.55	.00	.00	6045.50	1236.00	6047.80	6051.13	6067.87	509.36	35.95	34.38	54.
40.110	14.55	.00	.00	6045.50	1400.00	6047.96	6051.35	6069.42	506.13	37.18	37.66	62.
40.060	5.00	.00	.00	6045.08	1236.00	6047.22	6050.17	6067.53	531.07	36.17	34.17	53.
40.060	5.00	.00	.00	6045.08	1400.00	6047.38	6050.51	6069.09	524.95	37.39	37.45	61.
40.010	5.00	.00	.00	6044.65	1236.00	6046.62	6049.52	6067.18	572.65	36.39	33.97	51.
40.010	5.00	.00	.00	6044.65	1400.00	6046.77	6049.87	6068.74	563.69	37.61	37.22	58.
39.960	5.00	.00	.00	6044.23	1236.00	6046.04	6048.95	6066.82	617.10	36.58	33.79	49.
39.960	5.00	.00	.00	6044.23	1400.00	6046.18	6049.31	6068.38	605.39	37.81	37.03	56.
39.910	5.00	.00	.00	6043.80	1236.00	6045.48	6048.47	6066.44	664.13	36.74	33.64	47.
39.910	5.00	.00	.00	6043.80	1400.00	6045.61	6048.85	6068.01	637.64	37.98	36.86	55.
39.860	5.00	.00	.00	6043.38	1236.00	6044.99	6048.10	6066.08	651.19	36.85	33.54	48.
39.860	5.00	.00	.00	6043.38	1400.00	6045.13	6048.48	6067.65	626.02	38.09	36.76	55.

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01
39.810	5.00	.00	.00	6042.95	1236.00	6044.63	6047.85	6065.75	642.89	36.88	33.52	48.
39.810	5.00	.00	.00	6042.95	1400.00	6044.79	6048.27	6067.34	618.57	38.11	36.74	56.
39.750	6.45	.00	.00	6042.54	1236.00	6044.21	6047.44	6065.33	642.89	36.88	33.52	48.
39.750	6.45	.00	.00	6042.54	1400.00	6044.37	6047.86	6066.94	619.08	38.12	36.73	56.
38.300	145.00	.00	.00	6033.40	1236.00	6035.08	6038.29	6056.02	634.14	36.72	33.66	49.
38.300	145.00	.00	.00	6033.40	1400.00	6035.23	6038.72	6057.91	624.26	38.22	36.63	56.
38.100	20.00	.00	.00	6032.14	1236.00	6033.82	6037.02	6054.74	636.13	36.71	33.67	49.
38.100	20.00	.00	.00	6032.14	1400.00	6033.96	6037.44	6056.66	627.11	38.23	36.62	55.

38.080	2.20	.00	.00	6032.00	1236.00	6033.66	6036.88	6054.60	637.54	36.72	33.66	48.
38.080	2.20	.00	.00	6032.00	1400.00	6033.82	6037.30	6056.52	628.20	38.23	36.62	55.
38.030	5.14	.00	.00	6031.68	1236.00	6033.39	6036.59	6054.16	743.06	36.58	33.79	45.
38.030	5.14	.00	.00	6031.68	1400.00	6033.54	6037.00	6056.09	743.02	38.10	36.74	51.
37.980	5.00	.00	.00	6031.37	1236.00	6033.08	6036.33	6053.73	736.66	36.47	33.89	45.
37.980	5.00	.00	.00	6031.37	1400.00	6033.24	6036.75	6055.65	736.69	37.99	36.85	51.
37.930	5.00	.00	.00	6031.05	1236.00	6032.75	6035.97	6053.35	740.09	36.42	33.94	45.
37.930	5.00	.00	.00	6031.05	1400.00	6032.89	6036.40	6055.27	741.15	37.97	36.87	51.
37.230	70.00	.00	.00	6026.64	1236.00	6028.37	6031.54	6048.07	691.98	35.61	34.71	46.
37.230	70.00	.00	.00	6026.64	1400.00	6028.52	6031.96	6049.97	695.35	37.16	37.67	53.
37.200	2.66	.00	.00	6026.54	1236.00	6028.17	6031.24	6047.89	606.29	35.64	34.68	50.
37.200	2.66	.00	.00	6026.54	1400.00	6028.32	6031.65	6049.79	600.55	37.19	37.65	57.
37.000	20.00	.00	.00	6025.78	1236.00	6027.39	6030.03	6046.42	656.70	35.01	35.31	48.
37.000	20.00	.00	.00	6025.78	1400.00	6027.50	6030.38	6048.34	662.51	36.63	38.22	54.
36.780	22.34	.00	.00	6024.93	1236.00	6026.69	6029.34	6044.72	599.64	34.08	36.27	50.
36.780	22.34	.00	.00	6024.93	1400.00	6026.80	6029.63	6046.61	608.73	35.72	39.19	56.
36.700	7.66	.00	.00	6024.67	1236.00	6026.45	6029.10	6044.18	584.48	33.79	36.58	51.
36.700	7.66	.00	.00	6024.67	1400.00	6026.56	6029.38	6046.06	594.30	35.44	39.51	57.
36.500	20.00	.00	.00	6024.00	1236.00	6025.30	6028.43	6042.83	549.82	33.11	37.32	52.
36.500	20.00	.00	.00	6024.00	1400.00	6025.91	6028.71	6044.68	561.19	34.77	40.26	59.
34.500	200.00	.00	.00	6017.30	1236.00	6019.29	6021.73	6032.59	378.69	29.26	42.24	63.
34.500	200.00	.00	.00	6017.30	1400.00	6019.41	6022.01	6034.12	389.11	30.77	45.49	70.
33.000	150.00	.00	.00	6012.27	1236.00	6014.04	6016.20	6026.01	409.78	27.77	44.51	61.
33.000	150.00	.00	.00	6012.27	1400.00	6014.14	6016.50	6027.36	412.66	29.18	47.99	68.
* 32.900	10.00	.00	.00	6012.05	1236.00	6013.93	6015.66	6021.44	1593.80	22.00	56.18	30.
* 32.900	10.00	.00	.00	6012.05	1400.00	6014.02	6015.95	6022.59	1690.12	23.49	59.60	34.

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SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01F
32.700	20.00	.00	.00	6011.47	1236.00	6013.38	6014.66	6018.15	955.31	17.53	70.53	39.
32.700	20.00	.00	.00	6011.47	1400.00	6013.46	6014.91	6019.02	1050.83	18.93	73.96	43.
32.500	20.00	.00	.00	6010.80	1236.00	6012.81	6013.77	6016.15	649.96	14.67	84.23	48.
32.500	20.00	.00	.00	6010.80	1400.00	6012.88	6013.99	6016.79	716.44	15.86	88.25	52.
32.300	20.00	.00	.00	6010.13	1236.00	6012.19	6012.96	6014.80	492.07	12.96	95.33	55.
32.300	20.00	.00	.00	6010.13	1400.00	6012.28	6013.16	6015.27	537.57	13.89	100.80	60.
32.100	20.00	.00	.00	6009.46	1236.00	6011.49	6012.18	6013.78	430.75	12.16	101.61	59.
32.100	20.00	.00	.00	6009.46	1400.00	6011.61	6012.37	6014.16	448.86	12.83	109.15	66.
32.000	10.00	.00	.00	6009.13	1236.00	6011.10	6011.81	6013.35	404.42	12.04	102.69	61.
32.000	10.00	.00	.00	6009.13	1400.00	6011.23	6011.99	6013.70	413.33	12.61	111.01	68.
31.350	65.00	.00	.00	6006.22	1236.00	6007.81	6008.53	6010.15	579.40	12.25	100.87	51.
31.350	65.00	.00	.00	6006.22	1400.00	6007.92	6008.70	6010.47	579.72	12.81	109.29	58.

	29.050	230.00	.00	.00	5996.35	1236.00	5998.31	5998.79	5999.98	324.38	10.37	119.14	68.
	29.050	230.00	.00	.00	5996.35	1400.00	5998.44	5998.96	6000.26	325.44	10.83	129.23	77.
*	27.450	160.00	.00	.00	5987.64	1236.00	5989.79	5990.49	5992.17	642.88	12.38	99.80	48.
*	27.450	160.00	.00	.00	5987.64	1400.00	5989.89	5990.64	5992.48	637.94	12.91	108.42	55.
*	25.600	185.00	.00	.00	5980.26	1236.00	5982.74	5983.13	5984.25	266.44	9.86	125.33	75.
*	25.600	185.00	.00	.00	5980.26	1400.00	5982.87	5983.31	5984.53	269.24	10.34	135.44	85.
	23.650	195.00	.00	.00	5973.12	1236.00	5975.13	5975.74	5977.12	459.83	11.33	109.14	57.
	23.650	195.00	.00	.00	5973.12	1400.00	5975.25	5975.90	5977.39	457.80	11.75	119.14	65.
	22.640	101.00	.00	.00	5969.49	1236.00	5971.68	5972.13	5973.20	304.04	9.89	125.02	70.
	22.640	101.00	.00	.00	5969.49	1400.00	5971.81	5972.30	5973.45	307.68	10.29	136.10	79.
	21.500	114.00	.00	.00	5963.36	1273.00	5965.22	5966.01	5967.90	606.12	13.13	96.95	51.
	21.500	114.00	.00	.00	5963.36	1450.00	5965.35	5966.26	5968.21	590.18	13.59	106.73	59.
	19.620	188.00	.00	.00	5955.14	1273.00	5956.97	5957.44	5958.54	380.10	10.07	126.40	65.
	19.620	188.00	.00	.00	5955.14	1450.00	5957.07	5957.60	5958.82	393.37	10.62	136.58	73.
	17.730	189.00	.00	.00	5946.16	1273.00	5947.66	5948.08	5949.04	619.35	9.43	135.05	51.
	17.730	189.00	.00	.00	5946.16	1450.00	5947.74	5948.18	5949.23	613.64	9.79	148.05	58.
*	16.480	125.00	.00	.00	5940.19	1273.00	5942.83	5943.38	5944.41	220.07	10.06	126.52	85.
*	16.480	125.00	.00	.00	5940.19	1450.00	5943.20	5943.61	5944.57	222.71	9.40	154.25	97.
	15.170	131.00	.00	.00	5934.49	1273.00	5937.03	5938.14	5940.04	424.36	13.92	91.44	61.
	15.170	131.00	.00	.00	5934.49	1450.00	5937.27	5938.30	5940.36	393.86	14.11	102.75	73.
	13.800	137.00	.00	.00	5928.74	1273.00	5930.34	5931.12	5932.94	593.67	12.94	98.36	52.
	13.800	137.00	.00	.00	5928.74	1450.00	5930.43	5931.32	5933.37	619.75	13.74	105.50	58.

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01
*	11.650	215.00	.00	.00	5920.30	1273.00	5922.24	5922.68	5923.82	283.10	10.07	126.45	75.
*	11.650	215.00	.00	.00	5920.30	1450.00	5922.41	5922.87	5924.09	276.58	10.42	139.13	87.
	11.250	40.00	.00	.00	5919.15	1273.00	5921.22	5921.60	5922.73	245.47	9.83	129.45	81.
	11.250	40.00	.00	.00	5919.15	1450.00	5921.35	5921.80	5923.02	255.35	10.39	139.50	90.
*	11.050	20.00	.00	.00	5917.15	1273.00	5918.87	5919.71	5921.59	529.09	13.22	96.29	55.
*	11.050	20.00	.00	.00	5917.15	1450.00	5919.04	5919.92	5921.91	503.28	13.59	106.66	64.
	10.850	20.00	.00	.00	5915.15	1273.00	5916.85	5917.85	5920.22	644.96	14.73	86.44	50.
	10.850	20.00	.00	.00	5915.15	1450.00	5917.02	5918.08	5920.59	611.02	15.15	95.68	58.
	10.650	20.00	.00	.00	5913.15	1273.00	5914.86	5915.95	5918.71	711.52	15.76	80.77	47.
	10.650	20.00	.00	.00	5913.15	1450.00	5915.02	5916.19	5919.13	677.68	16.27	89.13	55.
	10.450	20.00	.00	.00	5911.50	1273.00	5913.42	5914.56	5917.36	625.15	15.92	79.97	50.
	10.450	20.00	.00	.00	5911.50	1450.00	5913.61	5914.84	5917.83	596.22	16.48	88.00	59.
*	10.370	8.00	.00	.00	5911.34	1273.00	5914.32	5914.40	5915.96	154.92	10.29	123.73	102.
	10.370	8.00	.00	.00	5911.34	1450.00	5913.80	5914.68	5916.90	363.32	14.12	102.71	76.
	10.130	24.00	.00	.00	5910.86	1273.00	5913.92	5914.01	5915.61	131.27	10.43	122.03	111.
*	10.130	24.00	.00	.00	5910.86	1450.00	5913.87	5914.30	5916.13	177.94	12.07	120.15	108.

	9.490	64.00	.00	.00	5909.58	1273.00	5912.28	5912.73	5914.44	187.16	11.82	107.73	93.
	9.490	64.00	.00	.00	5909.58	1450.00	5912.49	5913.02	5914.90	193.85	12.44	116.58	104.
	9.250	24.00	.00	.00	5909.19	1273.00	5911.55	5912.16	5913.84	285.44	12.15	104.77	75.
*	9.250	24.00	.00	.00	5909.19	1450.00	5911.73	5912.43	5914.27	290.07	12.80	113.27	85.
*	8.680	57.30	.00	.00	5908.47	1273.00	5911.37	5911.37	5912.60	129.43	8.89	143.13	111.
*	8.680	57.30	.00	.00	5908.47	1450.00	5911.60	5911.60	5912.92	127.05	9.22	157.30	128.
	8.060	61.35	.00	.00	5907.70	1273.00	5910.16	5910.43	5911.55	196.03	9.47	134.47	90.
	8.060	61.35	.00	.00	5907.70	1450.00	5910.31	5910.64	5911.85	202.53	9.96	145.54	101.

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UNBULKED 100 YR-6 HR STO

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
43.850	1236.00	6068.42	.00	.00	-.07	19.67	.00
43.850	1400.00	6068.59	.17	.00	.10	20.30	.00
42.280	1236.00	6061.54	.00	-6.88	.00	19.95	157.00
42.280	1400.00	6061.71	.16	-6.89	.00	20.63	157.00
41.760	1236.00	6056.76	.00	-4.78	.00	19.20	52.00
41.760	1400.00	6056.93	.17	-4.78	.00	20.01	52.00
41.260	1236.00	6053.52	.00	-3.25	.00	19.83	50.00
41.260	1400.00	6053.67	.15	-3.26	.00	20.55	50.00
40.260	1236.00	6048.54	.00	-4.98	.00	19.88	100.00
40.260	1400.00	6048.70	.16	-4.97	.00	20.58	100.00
40.110	1236.00	6047.80	.00	-.74	.00	19.88	14.55
40.110	1400.00	6047.96	.17	-.74	.00	20.58	14.55
40.060	1236.00	6047.22	.00	-.58	.00	20.23	5.00
40.060	1400.00	6047.38	.16	-.58	.00	20.87	5.00
40.010	1236.00	6046.62	.00	-.60	.00	21.21	5.00
40.010	1400.00	6046.77	.15	-.61	.00	21.82	5.00
39.960	1236.00	6046.04	.00	-.57	.00	22.26	5.00
39.960	1400.00	6046.18	.13	-.59	.00	22.83	5.00
39.910	1236.00	6045.48	.00	-.56	.00	23.33	5.00
39.910	1400.00	6045.61	.13	-.57	.00	23.33	5.00
39.860	1236.00	6044.99	.00	-.49	.00	21.67	5.00
39.860	1400.00	6045.13	.14	-.48	.00	21.67	5.00
39.810	1236.00	6044.63	.00	-.37	.00	20.00	5.00
39.810	1400.00	6044.79	.16	-.34	.00	20.00	5.00
39.750	1236.00	6044.21	.00	-.41	.00	20.00	6.45
39.750	1400.00	6044.37	.16	-.41	.00	20.00	6.45
38.300	1236.00	6035.08	.00	-9.13	.00	20.00	145.00

38.300	1400.00	6035.23	.15	-9.15	.00	20.00	145.00
38.100	1236.00	6033.82	.00	-1.26	.00	20.08	20.00
38.100	1400.00	6033.96	.14	-1.27	.00	20.08	20.00
38.080	1236.00	6033.66	.00	-.15	.00	20.11	2.20
38.080	1400.00	6033.82	.15	-.15	.00	20.11	2.20

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
38.030	1236.00	6033.39	.00	-.27	.00	19.74	5.14
38.030	1400.00	6033.54	.15	-.27	.00	19.74	5.14
37.980	1236.00	6033.08	.00	-.31	.00	19.73	5.00
37.980	1400.00	6033.24	.16	-.30	.00	19.73	5.00
37.930	1236.00	6032.75	.00	-.33	.00	19.99	5.00
37.930	1400.00	6032.89	.14	-.35	.00	19.99	5.00
37.230	1236.00	6028.37	.00	-4.38	.00	19.99	70.00
37.230	1400.00	6028.52	.15	-4.37	.00	19.99	70.00
37.200	1236.00	6028.17	.00	-.21	.00	21.48	2.66
37.200	1400.00	6028.32	.15	-.20	.00	21.48	2.66
37.000	1236.00	6027.39	.00	-.78	.00	26.31	20.00
37.000	1400.00	6027.50	.11	-.81	.00	26.75	20.00
36.780	1236.00	6026.69	.00	-.70	.00	26.26	22.34
36.780	1400.00	6026.80	.11	-.71	.00	26.70	22.34
36.700	1236.00	6026.45	.00	-.24	.00	26.31	7.66
36.700	1400.00	6026.56	.11	-.24	.00	26.75	7.66
36.500	1236.00	6025.80	.00	-.64	.00	26.42	20.00
36.500	1400.00	6025.91	.11	-.65	.00	26.86	20.00
34.500	1236.00	6019.29	.00	-6.51	.00	27.15	200.00
34.500	1400.00	6019.41	.12	-6.50	.00	27.63	200.00
33.000	1236.00	6014.04	.00	-5.25	.00	32.64	150.00
33.000	1400.00	6014.14	.10	-5.27	.00	32.64	150.00
* 32.900	1236.00	6013.93	.00	-.11	.00	36.68	10.00
* 32.900	1400.00	6014.02	.09	-.12	.00	36.68	10.00
32.700	1236.00	6013.38	.00	-.54	.00	44.76	20.00
32.700	1400.00	6013.46	.07	-.56	.00	44.76	20.00
32.500	1236.00	6012.81	.00	-.58	.00	52.84	20.00
32.500	1400.00	6012.88	.08	-.58	.00	52.84	20.00
32.300	1236.00	6012.19	.00	-.62	.00	58.69	20.00
32.300	1400.00	6012.28	.09	-.60	.00	59.79	20.00
32.100	1236.00	6011.49	.00	-.70	.00	62.31	20.00
32.100	1400.00	6011.61	.12	-.67	.00	63.74	20.00
32.000	1236.00	6011.10	.00	-.38	.00	63.75	10.00
32.000	1400.00	6011.23	.13	-.37	.00	65.30	10.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	31.350	1236.00	6007.81	.00	-3.29	.00	79.99	65.00
	31.350	1400.00	6007.92	.11	-3.31	.00	81.09	65.00
	29.050	1236.00	5998.31	.00	-9.51	.00	78.44	230.00
	29.050	1400.00	5998.44	.13	-9.48	.00	79.91	230.00
*	27.450	1236.00	5989.79	.00	-8.52	.00	84.28	160.00
*	27.450	1400.00	5989.89	.10	-8.55	.00	85.49	160.00
*	25.600	1236.00	5982.74	.00	-7.05	.00	76.65	185.00
*	25.600	1400.00	5982.87	.13	-7.02	.00	77.77	185.00
	23.650	1236.00	5975.13	.00	-7.61	.00	82.01	195.00
	23.650	1400.00	5975.25	.12	-7.62	.00	84.42	195.00
	22.640	1236.00	5971.68	.00	-3.44	.00	84.42	101.00
	22.640	1400.00	5971.81	.13	-3.44	.00	87.35	101.00
	21.500	1273.00	5965.22	.00	-6.46	.00	71.68	114.00
	21.500	1450.00	5965.35	.13	-6.46	.00	73.49	114.00
	19.620	1273.00	5956.97	.00	-8.25	.00	98.09	188.00
	19.620	1450.00	5957.07	.10	-8.28	.00	100.48	188.00
	17.730	1273.00	5947.66	.00	-9.31	.00	167.27	189.00
	17.730	1450.00	5947.74	.08	-9.33	.00	171.94	189.00
*	16.480	1273.00	5942.83	.00	-4.83	.00	64.91	125.00
*	16.480	1450.00	5943.20	.36	-4.54	.00	88.60	125.00
	15.170	1273.00	5937.03	.00	-5.81	.00	46.95	131.00
	15.170	1450.00	5937.27	.24	-5.93	.00	48.81	131.00
	13.800	1273.00	5930.34	.00	-6.69	.00	73.06	137.00
	13.800	1450.00	5930.43	.10	-6.83	.00	73.94	137.00
*	11.650	1273.00	5922.24	.00	-8.09	.00	78.50	215.00
*	11.650	1450.00	5922.41	.16	-8.03	.00	80.57	215.00
	11.250	1273.00	5921.22	.00	-1.02	.00	74.88	40.00
	11.250	1450.00	5921.35	.12	-1.06	.00	76.47	40.00
*	11.050	1273.00	5918.87	.00	-2.35	.00	63.47	20.00
*	11.050	1450.00	5919.04	.17	-2.31	.00	64.93	20.00
	10.850	1273.00	5916.85	.00	-2.02	.00	56.01	20.00
	10.850	1450.00	5917.02	.17	-2.02	.00	56.99	20.00
	10.650	1273.00	5914.86	.00	-1.99	.00	50.58	20.00
	10.650	1450.00	5915.02	.17	-2.00	.00	51.24	20.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

	10.450	1273.00	5913.42	.00	-1.44	.00	41.64	20.00
	10.450	1450.00	5913.61	.19	-1.41	.00	41.64	20.00
*	10.370	1273.00	5914.32	.00	.90	.00	41.63	8.00
	10.370	1450.00	5913.80	-.52	.19	.00	41.63	8.00
	10.130	1273.00	5913.92	.00	-.40	.00	39.99	24.00
*	10.130	1450.00	5913.87	-.05	.06	.00	39.99	24.00
	9.490	1273.00	5912.28	.00	-1.64	.00	39.99	64.00
	9.490	1450.00	5912.49	.22	-1.37	.00	39.99	64.00
	9.250	1273.00	5911.55	.00	-.73	.00	46.72	24.00
*	9.250	1450.00	5911.73	.18	-.77	.00	47.09	24.00
*	8.680	1273.00	5911.37	.00	-.18	.00	58.83	57.30
*	8.680	1450.00	5911.60	.24	-.12	.00	60.37	57.30
	8.060	1273.00	5910.16	.00	-1.21	.00	69.48	61.35
	8.060	1450.00	5910.31	.15	-1.30	.00	71.37	61.35

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SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 32.900 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 32.900 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 27.450 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 27.450 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 25.600 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 25.600 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 16.480 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 16.480 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.650 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 11.650 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 11.050 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 11.050 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.370 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 10.130 PROFILE= 2 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 10.130 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 9.250 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 8.680 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.680 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 8.680 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 8.680 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.680 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 8.680 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL

community sciences corporation

community sciences corporation

3900 East Camelback Road, Suite 611
Phoenix, Arizona 85018
Tel: (602) 955-7097 Fax: (602) 955-7169

P.O. Box 1328
Corrales, New Mexico 87048
Tel: (505) 897-0000 Fax: (505) 898-5195

DRAINAGE REPORT

FOR

PRIMROSE POINTE SUBDIVISION
UNIT 4, IN TRACT INFRASTRUCTURE
(MAP #C-22)

JANUARY, 1999

PREPARED FOR

S&S ASSOCIATES, INC.
7820 PAN AMERICAN FREEWAY, NE
SUITE 4
ALBUQUERQUE, NEW MEXICO 87109
(505) 857-9566

PREPARED BY

COMMUNITY SCIENCES CORPORATION
P.O. BOX 1328
CORRALES, NEW MEXICO 87048
(505) 897-0000

JAMES L. CONDIT
NEW MEXICO
11668
1-28-99
REGISTERED PROFESSIONAL ENGINEER

James L. Condit

JAMES L. CONDIT, P.E.

SURVEYING
LAND PLANNING
CIVIL ENGINEERING
DEVELOPMENT CONSULTING
LAND DEVELOPMENT IMPLEMENTATION

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Tables

Appendices

I. PURPOSE AND SCOPE

S&S Associates, Inc., is currently planning for the development of Primrose Pointe, Unit 4. The proposed Unit 4 development consists of approximately 26.89 acres and is to be subdivided into 55 single family residential lots, 3 tracts (including a well site), and 2 parcels.

The Drainage Report for Primrose Pointe Subdivision, Unit 3 &4, In Tract Infrastructure (Map #C-22) created in May, 1996 shows detailed calculations and flows for both Units 3 & 4 as part of the same basin. The drainage now proposed for flows internal to Unit 4 remains the same as what was previously approved in that Drainage Report. Since these flows and calculations have not changed, this report is, at the request of Bernalillo County, essentially a summary description of previous reports.

II. SITE DESCRIPTION AND HISTORY

Primrose Pointe Unit 4 is comprised of a portion of North Albuquerque Acres, Tract 2, Unit 1 as seen on the Vicinity Map at the beginning of this report. The North Domingo Baca Arroyo bounds this unit to the south, the La Cueva Arroyo to the north, Lowell Street and Primrose Point Unit 3 to the west, and Tennyson Street to the east. The North Domingo Baca Arroyo was previously improved according to AMAFCA standards in Units 2 & 3. The La Cueva Arroyo will be improved in future Units as called for in the Prudent Limit Study for the La Cueva Arroyo Through Primrose Pointe, and a Conditional Letter of Map Revision (CLOMR) has been approved by Bernalillo County and submitted to the Federal Emergency Management Agency (FEMA). The site has been previously studied by the following reports:

1) Master Drainage Management Plan for Primrose Pointe, Community Sciences Corporation, June 1990 with revisions through February 3, 1993.
2) Drainage Report for Primrose Pointe, Unit 1, Community Sciences Corporation., April 1994.
3) Drainage Report for Primrose Pointe, Unit 2, Community Sciences Corporation., April 1994.
4) Final Drainage Report for AMAFCA Infrastructure Primrose Pointe, Unit 2, December 1994.
5) Addendum Number 5 to the Master Drainage Management Plan for Primrose Pointe, Community Sciences Corporation, March 1996.
6) Drainage Report for Primrose Pointe Subdivision, Unit 3&4, In Tract Infrastructure (Map #C-22), Community Sciences Corporation., May 1996.
7) Drainage Report for Primrose Pointe Subdivision, Unit 3 AMAFCA Improvements (Map #C-22), Community Sciences Corporation., May 1996.
8) Prudent Limit Study for the La Cueva Arroyo Through Primrose Pointe, Community Sciences Corporation, May 1998.

III. EXISTING CONDITIONS

The existing terrain is comprised of sparsely vegetated soils which are classified as "Embudo gravelly fine sandy loam" (EmB) and "Embudo-Tijeras complex" (etc.) by the Soil Survey of Bernalillo County and Parts of Sandoval and Velencia Counties, NM, USSCS, 1977. The general slope of the ground is from east to west at approximately a 4% grade. Pond NDB4 has been constructed with Unit 3 as specified in the Drainage Report for Unit 3&4. It intercepts runoff flows from Unit 3, and slowly discharges the storm water into the North Domingo Baca Arroyo after the main storm has passed. A floodwall and revetment along the North Domingo Baca Arroyo boundary to the south of Unit 4 has been constructed as part of Unit 3, as well as a storm drain system.

IV. PROPOSED CONDITIONS

A summary of the proposed drainage needed for Unit 4 will follow. For more details on flow quantities, arroyo boundaries and basin volumes see the Drainage Report for Primrose Pointe Subdivision, Unit 3 &4, In Tract Infrastructure (Map #C-22) from May, 1996 and the Prudent Limit Study for the La Cueva Arroyo Through Primrose Pointe from May, 1998.

An area of approximately 6.2 acres east of Unit 4 is already developed and is not a part of this unit. However, the runoff from this area crosses Unit 4. Basin Out 1.1 (see Appendix B) will discharge to an inlet at the well site. Upon development of the well, this inlet (see Table 2) will connect to the existing inlet, which was constructed as part of the Unit 2 AMAFCA Improvements and discharges directly to the North Domingo Baca Arroyo. The flow from Basin Out.1 (see Appendix B) enters Unit 4 via a series of openings in the property wall (approximately 15' wide). This will be conveyed to the cul-de-sac through an easement.

Runoff flows from Scarlet Gem Court and portions of Pristine Drive will be directed to the end of the cul-de-sac on Scarlet Gem Court. An inlet will connect to the existing storm drain in Unit 3, thereby directing these flows to the existing pond (see Table 2). Pond volume capacity for this storm drain runoff is available (see Drainage Report for Unit 3&4).

Based upon the maximum erosion setback for the La Cueva Arroyo as calculated in the Prudent Limit Study, lot lines adjacent to the Arroyo were adjusted from the locations shown in the Drainage Report for Unit 3&4. Lot elevations for Lots 2, 3, and 4 of Block 13 were raised 0.5' to maintain an elevation above the 100-year storm event (see Appendix C – Plate 2). Two feet of floodwall protection will be added to the bottom of the walls adjacent to the Arroyo on Lots 2 and 3 of Block 12 and Lots 1, 2 and 3 of Block 13 for freeboard (see Table 4 and Appendix A).

Since that time a prudent limit study has been completed for the La Cueva Arroyo on the North side of Primrose Unit 4. This study redefined the boundaries of the undisturbed La Cueva Arroyo in its natural state. The Existing Thalwag for La Cueva Arroyo is left in place, and an easement has been provided for the "prudent limit" boundaries of the flows.

V. DESIGN CRITERIA

A. Flood Control Regulations

The drainage plan presented in this report was designed to comply with AMAFCA resolution 80.15, which requires proposed land development projects to be designed such that no flooding of private properties will occur during any storm up to and including the 100-year frequency event. Additionally, this drainage plan was designed to comply with current Bernalillo County drainage regulations which reflect the majority of provisions found in the "City of Albuquerque Drainage Ordinance" and Chapter 22 of the Development Process Manual (DPM).

1. 100-year storm

    a. Stormwater flow depth not to exceed the top of curb in any street.

    b. Pool depth to be contained within right-of-way.

2. 10-year storm

    a. Local streets– velocity times depth less than 6.5.

    b. Arterial streets:

        i. Flow not to exceed a depth of 0.50 ft.
        ii. Velocity times depth less than 6.5
        iii. One driving lane in each direction free of stormwater

B. Engineering Parameters

In accordance with AMAFCA criteria, all hydrological analysis (as it relates to peak rates of runoff) is based on the 100-year frequency, 6-hour duration storm, as represented in Section 22.2, Hydrology, of the "Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993".

Ten-year, 6-hour values were also used for subcatchments, in accordance with City drainage policies regarding street flow.

The nine rainfalls pertinent to the study are as follows:

	2-Year	10-Year	100-Year
One-hour	0.94"	1.63"	2.25"
Six-hour	1.26"	1.93"	2.90"
Twenty-four-hour	1.58"	2.43"	3.65"

VI. COMPUTATIONAL PROCEDURES

Hydrological computations were accomplished by means of the January 1994 version of the AHYMO Computer Program and HEC-2. The input parameters and resulting flows for the basins internal to the site are summarized in Table 1. Summary AHYMO printouts based on these parameters are provided in Appendix D. Summary HEC-2 printouts for flows, water surface elevations and energy grade lines for the La Cueva Arroyo are provided in Appendix C, along with AHYMO 100-year sediment transport printouts.

Flow characteristics for conveyance swales, channels, and streets were analyzed based on the Manning equation for uniform flow as shown in Table 3. Streets are assumed to have a 2% cross slope from lip of gutter to crown and a standard curb and gutter per Bernalillo County details. Finished grade at the right-of-way is 0.33' above top of curb.

VII. EROSION CONTROL

Control of excessive soil erosion into County streets and drainage improvements will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. The Preliminary Grading & Drainage Plan in Appendix B illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to County rights-of-way or public easements.

TABLES

TABLE 1
HYDROLOGIC PARAMETERS

EXISTING CONDITIONS

BASIN I.D.	AREA (sq mi)	CONTRIBUTING BASIN	SUM AREA (sq mi)	Tc (min)	LAND TREATMENT A	B	C	D	INCREMENTAL Q_{100} (cfs)	Q_{10} (cfs)	Q_2 (cfs)	TOTAL **Q_{100} (cfs)**	**Q_{10} (cfs)**	**Q_2 (cfs)**
OUT.1	0.01039	----------	----------	12	43	20	20	17	21.06	11.53	3.90	**21.06**	**11.53**	**3.90**
140.10	0.03683	OUT.1	0.04722	12	47	53	0	0	60.86	28.39	4.67	**81.93**	**39.87**	**8.51**

NOTE: Basins are from ADDENDUM NUMBER 5. AHYMO is not resubmitted with this report.
OUT.1 represents all out parcels draining to the temporary retention pond.
140.1 represents all developable land draining to the North Domingo Baca Arroyo.

DEVELOPED CONDITIONS

BASIN I.D.	AREA (sq mi)	CONTRIBUTING BASIN	SUM AREA (sq mi)	Tc (min)	LAND TREATMENT A	B	C	D	INCREMENTAL Q_{100} (cfs)	Q_{10} (cfs)	Q_2 (cfs)	TOTAL **Q_{100} (cfs)**	**Q_{10} (cfs)**	**Q_2 (cfs)**
OUT1.1	**0.00531**	----------	----------	**12**	**43**	**20**	**20**	**17**	**10.78**	**5.90**	2.00	**10.78**	**5.90**	**2.00**
OUT.1	0.00402	----------	----------	12	43	20	20	17	8.16	4.47	1.51	**8.16**	**4.47**	**1.51**
140.11	0.01090	OUT.1	0.01492	12	0	35	35	30	27.40	17.40	7.79	**35.57**	**21.86**	**9.30**
140.12	0.00934	140.11	0.02426	12	0	35	35	30	23.48	14.91	6.67	**59.05**	**36.77**	**15.98**
OUT.2	0.00139	140.12	0.02565	12	43	20	20	17	2.84	1.55	0.53	**61.89**	**38.32**	**16.50**
140.13	0.01107	OUT.2	0.03672	12	0	35	35	30	27.83	17.67	7.91	**89.72**	**55.99**	**24.41**
140.14	0.00736	----------	----------	12	0	35	35	30	18.51	11.75	5.26	**18.51**	**11.75**	**5.26**
140.15	0.00693	104.14	0.01429	12	0	35	35	30	17.43	11.06	4.95	**35.94**	**22.81**	**10.21**
----------	----------	104.13	0.05101	12	0	35	35	30	----------	----------	----------	**125.66**	**78.80**	**34.63**
140.16	0.00577	140.15	0.05678	12	0	35	35	30	14.52	9.21	4.13	**140.17**	**88.02**	**38.75**
140.17	0.00415	140.16	0.06093	12	0	35	35	30	10.45	6.63	2.97	**150.62**	**94.65**	**41.72**
140.18	0.00783	140.17	0.06876	12	0	35	35	30	19.69	12.50	5.60	**170.31**	**107.15**	**47.32**
140.00	**0.00578**	**140.18**	**0.07454**	12	50	50	0	0	**9.48**	**4.38**	0.70	**179.79**	**111.42**	**47.97**
140.20	**0.00430**	----------	----------	12	0	36.5	36.5	27	**10.66**	**6.72**	2.95	**10.66**	**6.72**	**2.95**

NOTE: Basins OUT1.1 and 140.20 direct discharge to the North Domingo Baca Arroyo.
All other basins contribute to POND NDB4 prior to discharging to the arroyo.

TABLE 2

INLET DEPTH CALCULATIONS

STREET	STATION	INLET NUMBER	INLET TYPE	CFS INTERCEPTED	CFS DISCHARGED	DIAMETER (in.)	INVERT AT INLET OUTFALL	HGL AT INLET OUTFALL	V100 (fps)	HGL IN INLET*	MINIMUM TOP OF GRATE**	ACTUAL TOP OF GRATE
SCARLET GEM COURT	9+60.00	1	DOUBLE C	18.51	18.51	18	69.55	71.01	10.48	73.06	73.56	73.89
WELL SITE		18	SINGLE D	10.78	10.78	24	8.31	9.57	3.43	9.79	10.29	12.40

The **"STATION"** locations and "ACTUAL TOP OF GRATE" elevations given are approximate and will be adjusted with the final design.

* The "**HGL IN INLET"** equals 1.2 (V^2/64.4) = HGL since the hgl is greater than or equals the pipe soffit unless calculated as part of STORM PLUS.

** The **"MINIMUM TOP OF GRATE"** equals "HGL IN INLET" + 0.5

The top of the grate equals top of curb minus 10''.

TABLE 3
STREET FLOW CHARACTERISTICS

STREET	CURB TYPE	LOCATION	% SLOPE	Q	Dn	Dc	Vn	Vc	EG	F	*POOL DEPTH
SCARLET GEM COURT	MNT	10+50	4.00	18.51	0.30	0.40	4.61	2.63	0.64	2.33	0.53
PRISTINE COURT	MNT	10+25	4.00	21.86	0.32	0.42	4.78	2.80	0.68	2.27	0.57
PRISTINE COURT	MNT	11+50	8.00	21.86	0.29	0.42	6.23	2.80	0.89	3.36	0.57
ROYALGLO DRIVE	MNT	12+75	2.90	15.47	0.30	0.37	3.91	2.50	0.54	1.99	0.49
PRISTINE DRIVE	STND	10+50	1.00	35.57	0.53	0.57	3.78	3.30	0.75	1.24	0.78
SIGNAL AVENUE	STND	19+50	4.00	35.57	0.43	0.57	5.76	3.30	0.95	2.32	0.78
SIGNAL AVENUE	STND	18+50	7.00	35.57	0.40	0.57	6.88	3.30	1.13	3.02	0.78
SIGNAL AVENUE	STND	16+25	3.00	47.31	0.49	0.64	5.91	3.65	1.03	2.09	0.90
ROYALGLO DRIVE	STND	11+50	0.50	19.69	0.49	0.46	2.43	2.73	0.58	0.86	

*** POOL DEPTH =Dc + 1.25 (Vc^2)/(2g)**

TABLE 4

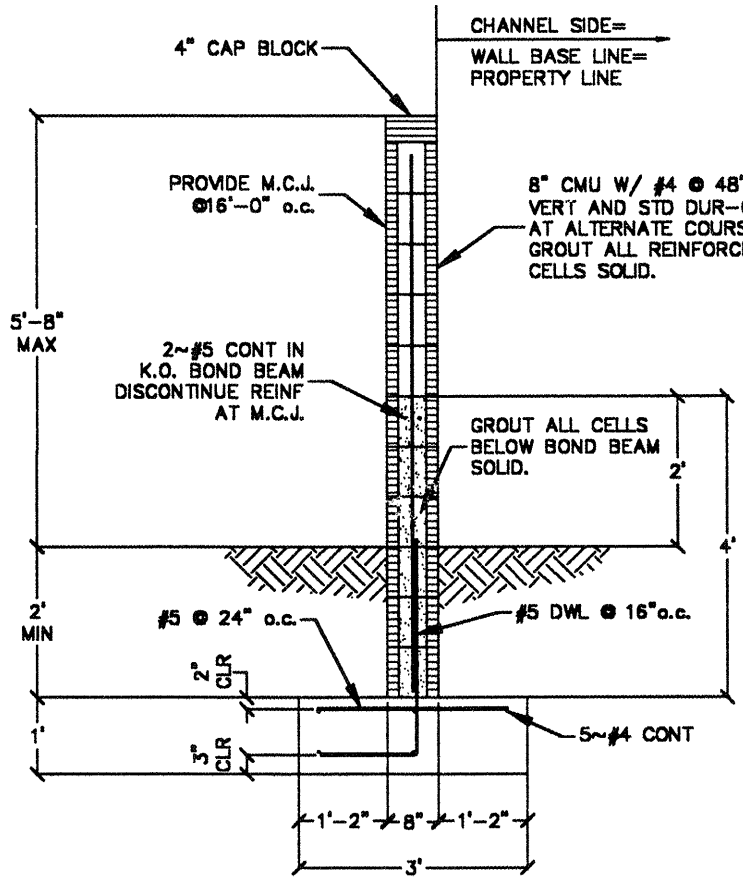
PRIMROSE POINTE UNIT 4

LOT ELEVATIONS AND
100-YEAR WATER SURFACE

STA	WATER SURFACE ELEV	ENERGY GRADE LINE ELEV	LOT ELEV	LOT NO
13+00	41.21	42.00	41.5	1 of 13
14+00	45.45	46.07	46.8	2 of 13
15+00	49.29	50.34	49.8	3 of 13
16+00	54.07	54.85	58.9	5 of 13
17+00	57.58	58.60	64.6	6 of 13
18+00	61.85	62.67	64.6	6 of 13
19+00	65.44	66.72	70.4	24 of 13
20+00	70.21	70.82	73.4	25 of 13
21+00	73.19	74.13	76.9	26 of 13
22+00	77.32	77.91	84.4	3 of 12
23+00	80.99	81.88	84.4	3 of 12
24+00	85.79	86.60	84.4	3 of 12
25+00	89.74	90.57	97.4	2 of 12
26+00	93.64	94.09	97.4	2 of 12
27+00	97.25	97.87	97.4	2 of 12

APPENDIX A

FLOODWALL DETAIL



FLOODWALL NOTES:

1. ALL MASONRY UNITS SHALL HAVE AN AVERAGE GROSS COMPRESSIVE STRENGTH OF 1000 PSI @ 28 DAYS. MASONRY UNITS SHALL BE MANUFACTURED WITH SCORIA AGGREGATE AND BE CURED BY HIGH PRESSURE STEAM.

2. ALL MORTAR SHALL BE TYPE S WITH A STRENGTH OF 1500 PSI @ 28 DAYS.

3. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI @ 28 DAYS.

4. CELLS CONTAINING REBAR SHALL BE GROUTED SOLID FROM THE BOTTOM TO THE TOP OF THE WALL IN ACCORDANCE WITH UBC REGULATIONS. CLEANOUTS SHALL BE PROVIDED AT THE BOTTOM OF WALLS AT ALL CELLS TO BE GROUTED WHERE THE GROUT POUR EXCEEDS 4' IN HEIGHT.

TYPICAL FLOODWALL

PRIMROSE POINTE UNIT 4
LOTS 2 & 3 OF BLOCK 12
LOTS 1, 2, & 3 OF BLOCK 13
FOR LOTLINES ADJACENT TO LA CUEVA ARROYO.

APPENDIX B

PRELIMINARY GRADING

&

DRAINAGE PLAN

(WEST, EAST, AND CROSS-SECTION)

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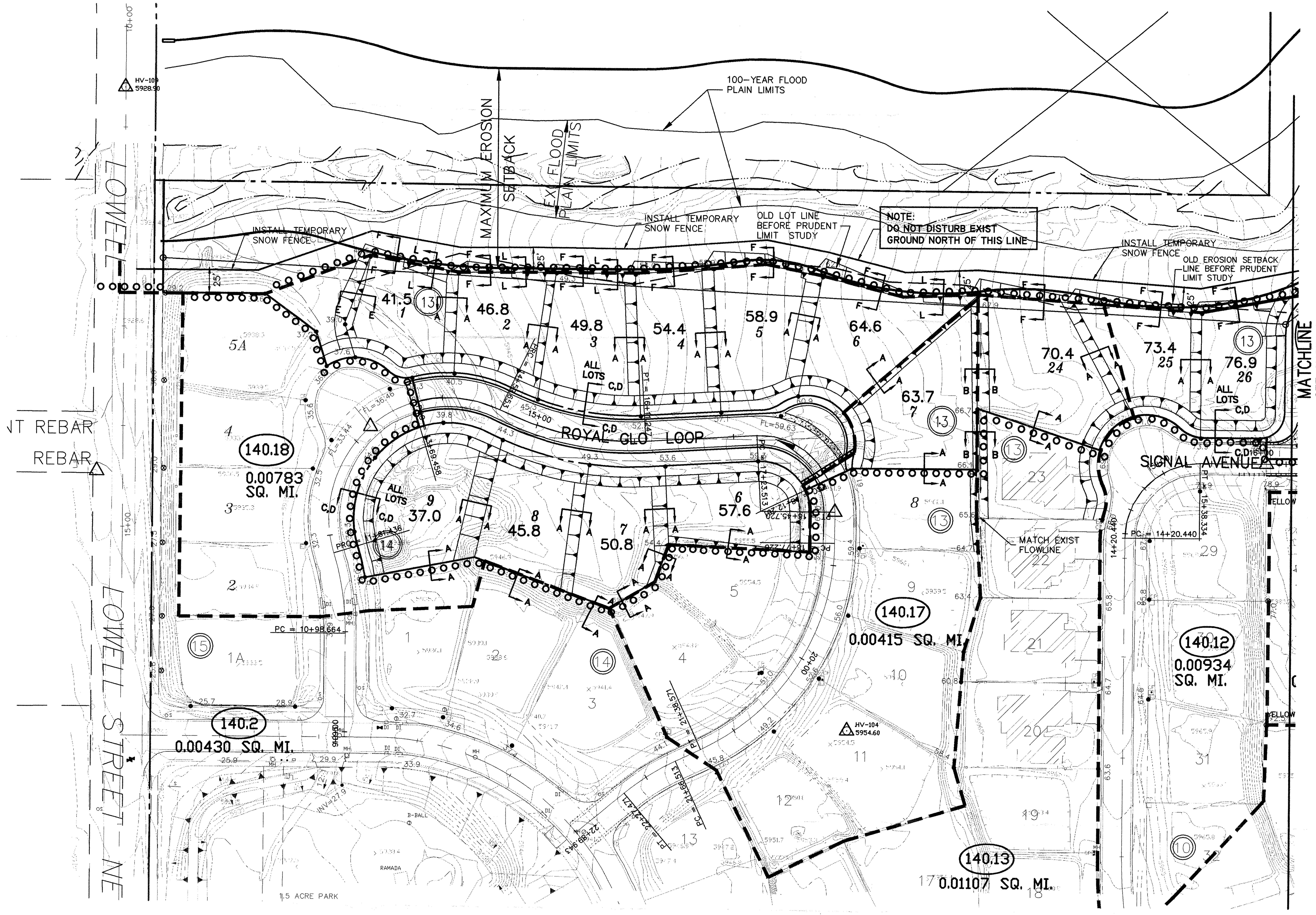

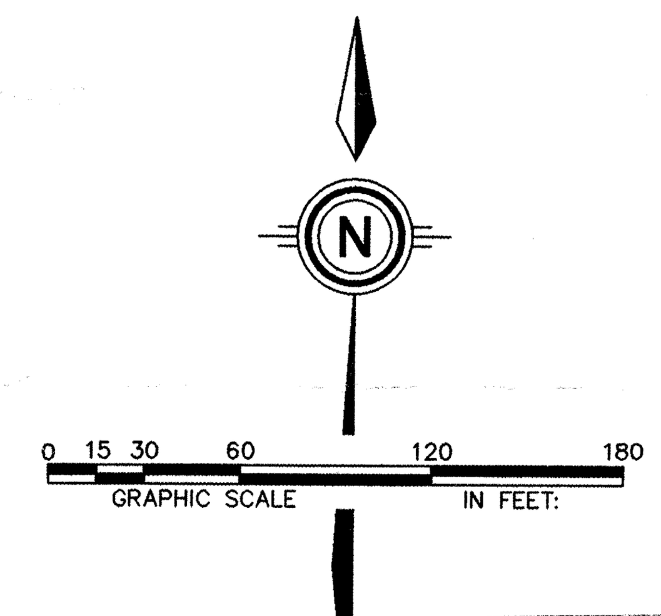

GRADING NOTES:

1. CONTRACTOR SHALL FOLLOW THE RECOMMENDATION FOR SITE PREPARATION, VEGETATIVE REMOVAL, AND CONSTRUCTION OF STRUCTURAL FILL DETAILED IN THE PROJECT SOILS INVESTIGATION REPORT. ALL FILL SHALL COMPLY WITH GEOTECHNICAL SOILS REPORT REQUIREMENTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER IN THE FIELD.

2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE WIND-BORN DUST CONTROL PER BERNALILLO COUNTY REGULATIONS.

3. CONTRACTOR MUST OBTAIN TOP SOIL DISTURBANCE PERMIT PRIOR TO MASS GRADING OPERATION.

4. INDIVIDUAL LOT DRAINAGE MUST BE DIRECTED TO DESIGNATED DRAINAGE FACILITIES OR TO THE PUBLIC STREET. NO DRAINAGE IS ALLOWED TO TRANSVERSE FROM ONE PRIVATE LOT TO ANOTHER EXCEPT AS NOTED ON THE GRADING PLAN VIA PRIVATE DRAINAGE EASEMENTS.

5. ALL SIDE AND REAR YARDS MUST BE GRADED IN ACCORDANCE WITH SECTION A-A THROUGH M-M AS INDICATED ON THE PLAN.

6. EROSION CONTROL BERMS ARE TO REMAIN IN PLACE ON INDIVIDUAL LOTS UNTIL FINAL GRADING FOR HOUSE CONSTRUCTION.

SPECIAL NOTE:

THIS GRADING PLAN IS INTENDED TO DESCRIBE THE CONDITION OF THE SITE FOLLOWING MASS GRADING OPERATIONS. PAD ELEVATIONS HAVE BEEN SET SUCH THAT THEY WILL ALLOW FOR PROPER DRAINAGE OF EACH LOT TO STREET AND/OR PUBLIC DRAINAGE FACILITIES. HOWEVER, THE DETAILS OF HOW LOTS WILL BE FINE-GRADED TO ACCOMPLISH THIS OBJECTIVE CANNOT BE ESTABLISHED UNTIL SPECIFIC HOMES ARE SITED TO SPECIFIC LOTS. HOME BUILDERS ARE ADVISED TO PAY PARTICULAR NOTICE TO THE FINAL GRADING OF THEIR LOT(S) TO ENSURE THAT PROPER LOT DRAINAGE IS PROVIDED WHICH WILL MAINTAIN THE INTENDED DRAINAGE PATTERNS AND ALSO PROTECT THE INTEGRITY OF THE HOMES THEY BUILD. DRAINAGE FROM EACH LOT MUST BE DIRECTED TO STREETS AND/OR PUBLIC DRAINAGE FACILITIES WITHOUT ENTERING OR THREATENING ADJACENT PRIVATE PROPERTIES.

IN SOME CASES, EMBANKMENT SLOPES SHOWN ARE IN EXCESS OF THE NOMINAL 3 HORIZONTAL TO 1 VERTICAL SLOPE CONSIDERED PERMANENTLY STABLE. THIS HAS BEEN DONE TO FACILITATE OTHER CONSTRUCTION ACTIVITIES AND THE THOROUGH COMPACTION OF ALL POTENTIAL BUILDING AREAS. AS SUCH, THESE SLOPES ARE CONSIDERED INTERIM, AND FINAL LOT GRADING BY THE BUILDER WILL RESULT IN THE PROPER STABILIZATION OF THESE SLOPES BY FLATTENING THEM TO A NOMINAL 3 HORIZONTAL TO 1 VERTICAL SLOPE OR OTHERWISE STABILIZING THEM THROUGH STRUCTURAL MEANS.

LEGEND

- • TC=98.43 PROPOSED TOP OF CURB ELEVATION
- • 99.0 PROPOSED SPOT ELEVATION
- ⊗ 09.0 EXISTING SPOT ELEVATION (GRND & TC)
- PROPOSED CONCRETE VALLEY GUTTER
- EXISTING CURB & GUTTER
- PROPOSED MOUNTABLE CURB & GUTTER
- PROPOSED STANDARD CURB & GUTTER
- 4973 EXISTING CONTOUR W/ INDEX ELEVATION
- SWALE
- FLOW ARROW
- (10) BLOCK NO.
- —30" SD— EXISTING STORM DRAIN
- —30" SD— PROPOSED STORM DRAIN
- WATER BLOCK
- EXISTING FLOOD WALL
- PROPOSED FLOOD WALL
- PROPOSED SLOPE
- ■ PROPOSED STORM SEWER CATCH BASIN
- O O O O UNIT BOUNDARY
- LIMITS OF DISTURBANCE. INSTALL TEMPORARY SNOW FENCE
- FRONT SLOPE TRANSITION. INDICATES FINAL GRADE SLOPE TRANSITION.

PROJECT BENCHMARKS:

I.D.	DESCRIPTION & ELEVATION
BM1	THE STATION IS A STANDARD ACS BRASS TABLET STAMPED "2-C23", LOCATED 115'± NORTH OF THE INTERSECTION OF CEDAR HILLS ROAD AND TRAMWAY BOULEVARD, ON THE EAST SIDE OF TRAMWAY BOULEVARD. ELEVATION = 6087.60'.
TBM2	THE STATION IS A CHISELED "BOX" IN THE NORTHEASTERLY CORNER OF A 20' WIDE CONCRETE MAINTENANCE ACCESS RAMP, LOCATED 458'± WEST OF THE CENTERLINE OF TENNEYSON STREET AND 20'± SOUTH OF THE SOUTH EDGE OF WILSHIRE AVENUE. ELEVATION = 6018.13'.
TBM3	THE STATION IS A CHISELED "BOX" IN THE SOUTHEASTERLY CORNER OF A CONCRETE MAIL BOX PAD, LOCATED AT THE SOUTHWESTERLY CORNER OF THE INTERSECTION OF CORONA AVENUE AND LOWELL STREET. ELEVATION = 5917.98'.

JAMES L. CONDIT
NEW MEXICO
11668
3/25/99
REGISTERED PROFESSIONAL ENGINEER

REVISIONS NO.	DATE	DESCRIPTION	BY
1	3/25/99	Added Floodplain Limits Erosion Setback Limits	GLD
2			
3			
4			

PRIMROSE POINTE UNIT-4

PRELIMINARY GRADING AND DRAINAGE PLAN WEST

DATE: JAN, 1999
SCALE: 1"=60'
DESIGNED: BOM/AM/GLD
DRAWN: DLW/JTS/GLD
JOB NO.: 207-11-036

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1328 Corrales, N.M. 87048

SHEET 1 OF 3

XREF: 20711BM.DWG
XREF: ND-PG1.DWG
ND-PG1.DWG
20711036/U4-GD1.DWG
U4-pg1.dwg 12199 93824

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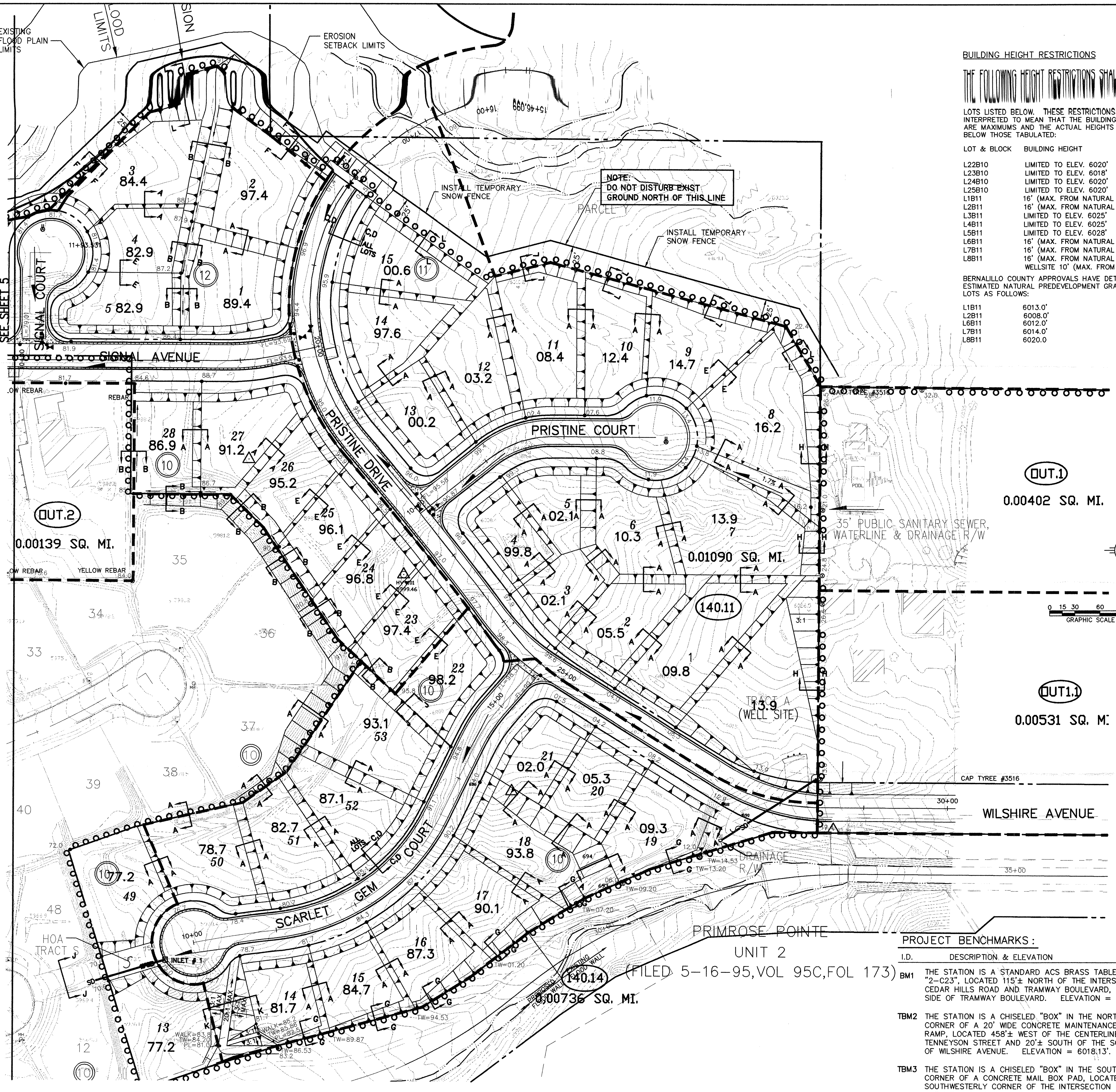

BUILDING HEIGHT RESTRICTIONS

THE FOLLOWING HEIGHT RESTRICTIONS SHALL APPLY TO THE LOTS LISTED BELOW. THESE RESTRICTIONS SHALL BE INTERPRETED TO MEAN THAT THE BUILDING HEIGHTS INDICATED ARE MAXIMUMS AND THE ACTUAL HEIGHTS WILL BE AT OR BELOW THOSE TABULATED:

LOT & BLOCK	BUILDING HEIGHT
L22B10	LIMITED TO ELEV. 6020'
L23B10	LIMITED TO ELEV. 6018'
L24B10	LIMITED TO ELEV. 6020'
L25B10	LIMITED TO ELEV. 6020'
L1B11	16' (MAX. FROM NATURAL GRADE)
L2B11	16' (MAX. FROM NATURAL GRADE)
L3B11	LIMITED TO ELEV. 6025'
L4B11	LIMITED TO ELEV. 6025'
L5B11	LIMITED TO ELEV. 6028'
L6B11	16' (MAX. FROM NATURAL GRADE)
L7B11	16' (MAX. FROM NATURAL GRADE)
L8B11	16' (MAX. FROM NATURAL GRADE)
	WELLSITE 10' (MAX. FROM NATURAL GRADE)

BERNALILLO COUNTY APPROVALS HAVE DETERMINED THE ESTIMATED NATURAL PREDEVELOPMENT GRADES FOR CERTAIN LOTS AS FOLLOWS:

L1B11	6013.0'
L2B11	6008.0'
L6B11	6012.0'
L7B11	6014.0'
L8B11	6020.0

GRADING NOTES:

1. CONTRACTOR SHALL FOLLOW THE RECOMMENDATION FOR SITE PREPARATION, VEGETATIVE REMOVAL, AND CONSTRUCTION OF STRUCTURAL FILL DETAILED IN THE PROJECT SOILS INVESTIGATION REPORT. ALL FILL SHALL COMPLY WITH GEOTECHNICAL SOILS REPORT REQUIREMENTS, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER IN THE FIELD.

2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE WIND-BORN DUST CONTROL PER BERNALILLO COUNTY REGULATIONS.

3. CONTRACTOR MUST OBTAIN TOP SOIL DISTURBANCE PERMIT PRIOR TO MASS GRADING OPERATION.

4. INDIVIDUAL LOT DRAINAGE MUST BE DIRECTED TO DESIGNATED DRAINAGE FACILITIES OR TO THE PUBLIC STREET. NO DRAINAGE IS ALLOWED TO TRANSVERSE FROM ONE PRIVATE LOT TO ANOTHER EXCEPT AS NOTED ON THE GRADING PLAN VIA PRIVATE DRAINAGE EASEMENTS.

5. ALL SIDE AND REAR YARDS MUST BE GRADED IN ACCORDANCE WITH SECTION A-A THROUGH M-M AS INDICATED ON THE PLAN.

6. EROSION CONTROL BERMS ARE TO REMAIN IN PLACE ON INDIVIDUAL LOTS UNTIL FINAL GRADING FOR HOUSE CONSTRUCTION.

SPECIAL NOTE:

THIS GRADING PLAN IS INTENDED TO DESCRIBE THE CONDITION OF THE SITE FOLLOWING MASS GRADING OPERATIONS. PAD ELEVATIONS HAVE BEEN SET SUCH THAT THEY WILL ALLOW FOR PROPER DRAINAGE OF EACH LOT TO STREET AND/OR PUBLIC DRAINAGE FACILITIES. HOWEVER, THE DETAILS OF HOW LOTS WILL BE FINE-GRADED TO ACCOMPLISH THIS OBJECTIVE CANNOT BE ESTABLISHED UNTIL SPECIFIC HOMES ARE SITED TO SPECIFIC LOTS. HOME BUILDERS ARE ADVISED TO PAY PARTICULAR NOTICE TO THE FINAL GRADING OF THEIR LOT(S) TO ENSURE THAT PROPER LOT DRAINAGE IS PROVIDED WHICH WILL MAINTAIN THE INTENDED DRAINAGE PATTERNS AND ALSO PROTECT THE INTEGRITY OF THE HOMES THEY BUILD. DRAINAGE FROM EACH LOT MUST BE DIRECTED TO STREETS AND/OR PUBLIC DRAINAGE FACILITIES WITHOUT ENTERING OR THREATENING ADJACENT PRIVATE PROPERTIES.

IN SOME CASES, EMBANKMENT SLOPES SHOWN ARE IN EXCESS OF THE NOMINAL 3 HORIZONTAL TO 1 VERTICAL SLOPE CONSIDERED PERMANENTLY STABLE. THIS HAS BEEN DONE TO FACILITATE OTHER CONSTRUCTION ACTIVITIES AND THE THOROUGH COMPACTION OF ALL POTENTIAL BUILDING AREAS. AS SUCH, THESE SLOPES ARE CONSIDERED INTERIM, AND FINAL LOT GRADING BY THE BUILDER WILL RESULT IN THE PROPER STABILIZATION OF THESE SLOPES BY FLATTENING THEM TO A NOMINAL 3 HORIZONTAL TO 1 VERTICAL SLOPE OR OTHERWISE STABILIZING THEM THROUGH STRUCTURAL MEANS.

LEGEND

- TC=98.43 PROPOSED TOP OF CURB ELEVATION
- 99.0 PROPOSED SPOT ELEVATION
- 09.0 EXISTING SPOT ELEVATION (GRND & TC)
- PROPOSED CONCRETE VALLEY GUTTER
- EXISTING CURB & GUTTER
- PROPOSED MOUNTABLE CURB & GUTTER
- PROPOSED STANDARD CURB & GUTTER
- 4973 EXISTING CONTOUR W/ INDEX ELEVATION
- SWALE
- FLOW ARROW
- (10) BLOCK NO.
- 30" SD EXISTING STORM DRAIN
- 30" SD PROPOSED STORM DRAIN
- WATER BLOCK
- EXISTING FLOOD WALL
- PROPOSED FLOOD WALL
- PROPOSED SLOPE
- PROPOSED STORM SEWER CATCH BASIN
- UNIT BOUNDARY
- LIMITS OF DISTURBANCE. INSTALL TEMPORARY SNOW FENCE
- FRONT SLOPE TRANSITION. INDICATES FINAL GRADE SLOPE TRANSITION.

PROJECT BENCHMARKS:

I.D.	DESCRIPTION & ELEVATION
BM1	THE STATION IS A STANDARD ACS BRASS TABLET STAMPED "2-C23", LOCATED 115'± NORTH OF THE INTERSECTION OF CEDAR HILLS ROAD AND TRAMWAY BOULEVARD, ON THE EAST SIDE OF TRAMWAY BOULEVARD. ELEVATION = 6087.60'.
TBM2	THE STATION IS A CHISELED "BOX" IN THE NORTHEASTERLY CORNER OF A 20' WIDE CONCRETE MAINTENANCE ACCESS RAMP, LOCATED 458'± WEST OF THE CENTERLINE OF TENNEYSON STREET AND 20'± SOUTH OF THE SOUTH EDGE OF WILSHIRE AVENUE. ELEVATION = 6018.13'.
TBM3	THE STATION IS A CHISELED "BOX" IN THE SOUTHEASTERLY CORNER OF A CONCRETE MAIL BOX PAD, LOCATED AT THE SOUTHWESTERLY CORNER OF THE INTERSECTION OF CORONA AVENUE AND LOWELL STREET. ELEVATION = 5917.98'.

JAMES L. CONDIT NEW MEXICO 11668 3/25/99 REGISTERED PROFESSIONAL ENGINEER

James L. Condit

REVISIONS

NO.	DATE	DESCRIPTION	BY
1	3/25/99	Added Flood Plain Limits Erosion Setback Limits	GLD
2			
3			
4			

PRIMROSE POINTE UNIT-4

PRELIMINARY GRADING AND DRAINAGE PLAN EAST

DATE: JAN, 1999
SCALE: 1"=60'
DESIGNED: BOM/GLD
DRAWN: DLW/JTS/GLD
JOB NO.: 207-11-036

community sciences corporation
LAND PLANNING P.O. Box 1328 ENGINEERING SURVEYING Corrales, N.M. 87048

SHEET 2 OF 3

XREF: 20711BM.DWG
XREF: ND-PG1.DWG

U4-pg2.dwg 12199 93601

20711036\U4-GOXHBT.DWG

APPENDIX C

FROM THE PRUDENT LMIT STUDY FOR THE LA CUEVA ARROYO:

HEC-2 SUMMARY OUTPUT FOR WATER SURFACE & ENERGY GRANE LINE ELEVATION

AHYMO 100-YEAR SUMMARY OUTPUT FOR SEDIMENT TRANSPORT

PLATE 2- LA CUEVA ARROYO PLAN & PROFILE

THIS RUN EXECUTED 04MAY98 14:25:07

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YR DESIGN STORM

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	37.000	.00	.00	.00	6039.30	466.00	6042.79	6042.79	6044.15	221.59	9.35	49.82	31.30
*	37.000	.00	.00	.00	6039.30	126.00	6040.88	6040.88	6041.57	261.13	6.67	18.90	7.80
*	36.000	100.00	.00	.00	6036.30	466.00	6037.93	6038.35	6039.35	735.91	9.58	48.63	17.18
	36.000	100.00	.00	.00	6036.30	126.00	6037.33	6037.42	6037.80	480.67	5.50	22.92	5.75
*	35.000	100.00	.00	.00	6032.00	466.00	6034.22	6034.22	6034.77	276.36	5.97	78.06	28.03
*	35.000	100.00	.00	.00	6032.00	126.00	6033.61	6033.61	6033.84	330.19	3.85	32.70	6.93
*	34.000	100.00	.00	.00	6027.50	466.00	6028.92	6029.25	6030.07	651.88	8.61	54.14	18.25
*	34.000	100.00	.00	.00	6027.50	126.00	6028.22	6028.38	6028.80	669.59	6.14	20.52	4.87
	33.000	100.00	.00	.00	6022.80	466.00	6024.68	6024.76	6025.29	328.17	6.27	74.30	25.72
*	33.000	100.00	.00	.00	6022.80	126.00	6024.03	6024.03	6024.30	328.89	4.16	30.32	6.95
*	32.000	100.00	.00	.00	6017.00	466.00	6018.53	6018.82	6019.44	835.37	7.64	61.03	16.12
*	32.000	100.00	.00	.00	6017.00	126.00	6018.02	6018.17	6018.49	827.83	5.55	22.71	4.38
*	31.000	100.00	.00	.00	6013.70	466.00	6015.20	6015.20	6015.66	267.08	5.42	85.93	28.51
*	31.000	100.00	.00	.00	6013.70	126.00	6014.55	6014.55	6014.79	343.82	3.93	32.07	6.80
*	30.000	100.00	.00	.00	6009.50	466.00	6010.77	6010.97	6011.51	558.25	6.86	67.92	19.72
	30.000	100.00	.00	.00	6009.50	126.00	6010.32	6010.37	6010.61	491.86	4.35	28.95	5.68
	29.000	100.00	.00	.00	6005.00	466.00	6006.04	6006.18	6006.72	407.30	6.63	70.30	23.09
	29.000	100.00	.00	.00	6005.00	126.00	6005.46	6005.52	6005.77	477.29	4.40	28.63	5.77
	28.000	100.00	.00	.00	6000.50	466.00	6001.71	6001.91	6002.60	413.13	7.55	61.71	22.93
	28.000	100.00	.00	.00	6000.50	126.00	6001.08	6001.12	6001.41	396.26	4.64	27.16	6.33
	27.000	100.00	.00	.00	5996.10	466.00	5997.25	5997.42	5997.87	516.29	6.34	73.53	20.51
	27.000	100.00	.00	.00	5996.10	126.00	5996.75	5996.80	5997.04	476.39	4.32	29.19	5.77

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	**26.000**	**100.00**	**.00**	**.00**	**5991.80**	**466.00**	**5993.64**	**5993.64**	**5994.09**	**272.48**	**5.42**	**85.99**	**28.23**
	26.000	**100.00**	**.00**	**.00**	**5991.80**	**126.00**	**5992.66**	**5992.69**	**5993.02**	**337.08**	**4.83**	**26.08**	**6.86**
	25.000	**100.00**	**.00**	**.00**	**5987.30**	**570.00**	**5989.74**	**5989.92**	**5990.57**	**424.10**	**7.31**	**78.00**	**27.68**
	25.000	**100.00**	**.00**	**.00**	**5987.30**	**152.00**	**5988.54**	**5988.69**	**5989.28**	**403.26**	**6.93**	**21.95**	**7.57**
	24.000	100.00	.00	.00	5984.00	570.00	5985.79	5985.96	5986.60	371.13	7.21	79.06	29.59
	24.000	100.00	.00	.00	5984.00	152.00	5984.96	5985.01	5985.35	363.24	5.03	30.20	7.98
	23.000	100.00	.00	.00	5980.10	570.00	5980.99	5981.23	5981.88	569.75	7.57	75.29	23.88
	23.000	100.00	.00	.00	5980.10	152.00	5980.51	5980.57	5980.83	536.58	4.48	33.94	6.56
*	22.000	100.00	.00	.00	5975.70	570.00	5977.32	5977.34	5977.91	264.66	6.14	92.81	35.04
*	22.000	100.00	.00	.00	5975.70	152.00	5976.63	5976.63	5976.89	335.70	4.06	37.47	8.30
	21.000	100.00	.00	.00	5972.00	570.00	5973.19	5973.43	5974.13	484.48	7.79	73.22	25.90
	21.000	100.00	.00	.00	5972.00	152.00	5972.61	5972.66	5972.94	451.43	4.65	32.66	7.15
*	20.000	100.00	.00	.00	5967.80	570.00	5970.21	5970.21	5970.82	251.74	6.29	90.59	35.93
*	20.000	100.00	.00	.00	5967.80	152.00	5969.22	5969.22	5969.61	292.25	4.99	30.45	8.89
*	19.000	100.00	.00	.00	5963.90	570.00	5965.44	5965.81	5966.72	555.54	9.07	62.83	24.18
*	19.000	100.00	.00	.00	5963.90	152.00	5964.72	5964.85	5965.24	578.25	5.81	26.15	6.32
	18.000	100.00	.00	.00	5960.00	570.00	5961.85	5961.94	5962.67	275.58	7.25	78.62	34.34
*	18.000	100.00	.00	.00	5960.00	152.00	5960.98	5960.98	5961.32	295.45	4.71	32.30	8.84
	17.000	100.00	.00	.00	5956.10	570.00	5957.58	5957.86	5958.60	535.44	8.07	70.61	24.63
	17.000	100.00	.00	.00	5956.10	152.00	5956.99	5957.06	5957.37	494.81	4.93	30.84	6.83
*	16.000	100.00	.00	.00	5952.30	570.00	5954.07	5954.12	5954.85	252.76	7.06	80.71	35.85
	16.000	100.00	.00	.00	5952.30	152.00	5953.09	5953.10	5953.46	307.51	4.89	31.10	8.67
*	15.000	100.00	.00	.00	5948.00	570.00	5949.29	5949.60	5950.34	642.13	8.23	69.28	22.49
	15.000	100.00	.00	.00	5948.00	152.00	5948.74	5948.83	5949.14	556.77	5.08	29.92	6.44
*	14.000	100.00	.00	.00	5943.90	570.00	5945.45	5945.47	5946.07	267.90	6.33	90.04	34.82
*	14.000	100.00	.00	.00	5943.90	152.00	5944.74	5944.74	5945.00	324.29	4.13	36.81	8.44
*	13.000	100.00	.00	.00	5940.00	570.00	5941.21	5941.45	5942.00	543.29	7.12	80.04	24.45
	13.000	100.00	.00	.00	5940.00	152.00	5940.62	5940.69	5940.97	480.68	4.74	32.04	6.93
	12.000	100.00	.00	.00	5935.90	570.00	5937.01	5937.07	5937.49	358.14	5.58	102.24	30.12
	12.000	100.00	.00	.00	5935.90	152.00	5936.50	5936.51	5936.71	370.07	3.66	41.54	7.90
	11.000	100.00	.00	.00	5930.60	637.00	5932.37	5932.53	5933.01	534.23	6.44	98.85	27.56
	11.000	100.00	.00	.00	5930.60	157.00	5931.80	5931.88	5932.13	543.26	4.59	34.20	6.74
	10.350	65.00	.00	.00	5928.00	637.00	5929.60	5929.67	5930.08	367.89	5.56	114.56	33.21
*	10.350	65.00	.00	.00	5928.00	157.00	5929.07	5929.07	5929.28	380.73	3.61	43.52	8.05

100-YEAR SUMMARY OUTPUT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =02/23/1996
INPUT FILE = LAC100EX.DAT USER NO.= DAGGETTK.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S	PRIMROSE POINTE TRIBUTARY TO LA CUEVA ARROYO									PAGE = 1
*S	100-YR EXISTING CONDITIONS									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.900
COMPUTE NM HYD	LC-1.0	-	1	.15240	284.50	9.690	1.19213	1.499	2.917	PER IMP= 17.00
ROUTE MCUNGE	LC-1.0	1	2	.15240	281.68	9.677	1.19055	1.565	2.888	CCODE = .1
COMPUTE NM HYD	LC-2.0	-	3	.06820	192.47	7.376	2.02777	1.499	4.410	PER IMP= 57.00
ADD HYD	LC-2.1	2& 3	4	.22060	455.91	17.052	1.44938	1.532	3.229	
*S DIVIDE THE HYDROGRAPH FROM BASINS LC-1 & LC-2 INTO 48% AND 52% HYDROGRAPHS										
DIVIDE HYD	PIPE.1	4	5	.10589	218.84	8.185	1.44938	1.532	3.229	
	CHANL.1	AND	6	.11471	237.07	8.867	1.44938	1.532	3.229	
*S ********** WASH LOAD AT TRAMWAY BLVD POINT 'G' **********										
SED WASH LOAD	LC-2.1	4								WASH CONC.(PPM-w) = 30305
*S ********** SEDIMENT TRANSPORT AT TRAMWAY BLVD (POINT 'G') **********										
SEDIMENT TRANSP	CHANL.1	6	SED ID = 1		PEAK CONC.(PPM-w) =	83737	TOTAL SED.(TONS) =	858.32		
ROUTE MCUNGE	CHANL.1	6	7	.11471	235.30	8.864	1.44880	1.532	3.205	CCODE = .2
ROUTE MCUNGE	PIPE.1	5	8	.10589	217.85	8.186	1.44944	1.532	3.215	CCODE = .2
ADD HYD	TRAM.1	7& 8	9	.22060	453.15	17.049	1.44910	1.532	3.210	
COMPUTE NM HYD	SLC-A.0	-	10	.01860	52.48	2.012	2.02777	1.499	4.409	PER IMP= 57.00
*S DIVIDE THE HYDROGRAPH FROM BASIN SLC-A INTO 42% AND 58% HYDROGRAPHS										
DIVIDE HYD	SLC-A.S	10	11	.01079	30.44	1.167	2.02776	1.499	4.409	
	SLC-A.N	AND	12	.00781	22.04	.845	2.02776	1.499	4.409	
*S** COMBINE 58% OF SLC-A AND TOTAL OF LC-1 AND LC-2										
*S** TOTAL OFFSITE FLOW ENTERING PRIMEROSE POINTE AT TENNYSON ST & CEDAR HILL RD										
ADD HYD	LACA.1	9&11	13	.23139	482.41	18.216	1.47608	1.532	3.258	
ROUTE MCUNGE	LACA.1	13	14	.23139	465.59	18.169	1.47230	1.598	3.144	CCODE = .1
*S ****** SEDIMENT TRANSPORT JUST ABOVE CONFLUENCE POINT F (SECNO 26.00) *****										
SEDIMENT TRANSP	LACA.1	14	SED ID = 2		PEAK CONC.(PPM-w) =	53811	TOTAL SED.(TONS) =	1254.95		
COMPUTE NM HYD	LC2A.0	-	15	.01762	46.59	1.747	1.85857	1.499	4.131	PER IMP= 48.00
*S** COMBINE 42% OF SLC-A AND LC-2A										
*S** TOTAL OFFSITE FLOW ENTERING PRIMEROSE POINTE NEAR OAKLAND & TENNYSON INT.										
ADD HYD	LACA.N	12&15	16	.02543	68.63	2.591	1.91052	1.499	4.217	
ROUTE MCUNGE	LACA.N	16	17	.02543	67.97	2.596	1.91359	1.532	4.176	CCODE = .2
COMPUTE NM HYD	LC-3.1	-	18	.03312	53.64	1.628	.92168	1.499	2.531	PER IMP= .00
ADD HYD	LC-3.1A	17&18	19	.05855	121.08	4.224	1.35251	1.532	3.231	
*S ****** WASH LOAD FOR BRANCH FLOWS AT CONFLUENCE POINT F (SECTION A-A) *****										
SED WASH LOAD	LC-3.1A	19								WASH CONC.(PPM-w) = 29472
*S * SEDIMENT TRANSPORT FOR BRANCH FLOWS AT CONFLUENCE POINT F (SECTION A-A) *										
SEDIMENT TRANSP	LC-3.1A	19	SED ID = 3		PEAK CONC.(PPM-w) =	65092	TOTAL SED.(TONS) =	313.42		
*S **********										
*S ********** TOTAL EXISTING FLOW AT CONFLUENCE POINT F **********										
*S **********										
ADD HYD	LACA.2	14&19	20	.28994	569.73	22.393	1.44811	1.598	3.070	
*S ********** WASH LOAD AT CONFLUENCE POINT F (SECNO 25.00) **********										
SED WASH LOAD	LACA.2	20								WASH CONC.(PPM-w) = 30659
*S ********** SEDIMENT TRANSPORT AT CONFLUENCE POINT F (SECNO 25.00) **********										
SEDIMENT TRANSP	LACA.2	20	SED ID = 4		PEAK CONC.(PPM-w) =	103297	TOTAL SED.(TONS) =	2793.88		
*S ********** SEDIMENT TRANSPORT AT SECNO 22.00 **********										
SEDIMENT TRANSP	LACA.2	20	SED ID = 5		PEAK CONC.(PPM-w) =	53144	TOTAL SED.(TONS) =	1478.08		

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S ********** SEDIMENT TRANSPORT AT SECNO 19.00 **********										
SEDIMENT TRANSP	LACA.2	20		SED ID = 6		PEAK CONC.(PPM-w) =	105959	TOTAL SED.(TONS) =	2682.44	
*S ********** SEDIMENT TRANSPORT AT SECNO 16.00 **********										
SEDIMENT TRANSP	LACA.2	20		SED ID = 1		PEAK CONC.(PPM-w) =	47709	TOTAL SED.(TONS) =	1375.57	
*S ********** SEDIMENT TRANSPORT AT SECNO 14.00 **********										
SEDIMENT TRANSP	LACA.2	20		SED ID = 2		PEAK CONC.(PPM-w) =	69348	TOTAL SED.(TONS) =	1788.71	
*S ********** SEDIMENT TRANSPORT AT SECNO 12.00 **********										
SEDIMENT TRANSP	LACA.2	20		SED ID = 3		PEAK CONC.(PPM-w) =	71150	TOTAL SED.(TONS) =	1807.79	
ROUTE MCUNGE	LACA.2	20	21	.28994	554.90	22.353	1.44556	1.665	2.990	CCODE = .1
COMPUTE NM HYD	LC3A.0	-	22	.01610	32.63	1.097	1.27784	1.499	3.167	PER IMP= 17.00
*S DIVIDE THE HYDROGRAPH FROM BASIN LC-3A INTO 67% AND 33% HYDROGRAPHS										
DIVIDE HYD	LC-3A.S	22	23	.00531	10.77	.362	1.27782	1.499	3.167	
	LC-3A.N	AND	24	.01079	21.86	.735	1.27782	1.499	3.167	
ROUTE MCUNGE	LC-3A.S	23	25	.00531	10.15	.352	1.24118	1.698	2.985	CCODE = .2
COMPUTE NM HYD	LC-3.2	-	26	.07290	118.68	3.583	.92168	1.499	2.544	PER IMP= .00
COMPUTE NM HYD	OUT.2	-	27	.00416	8.45	.284	1.27784	1.499	3.172	PER IMP= 17.00
ADD HYD	LC-3.2A	26&27	28	.07706	127.13	3.867	.94090	1.499	2.578	
ADD HYD	LC-3.2B	25&28	29	.08237	127.71	4.219	.96027	1.499	2.423	
*S ********** WASH LOAD FOR BRANCH FLOWS AT LOWELL ST (SECTION B-B) **********										
SED WASH LOAD	LC-3.2B	29						WASH CONC.(PPM-w) =	37916	
*S ***** SEDIMENT TRANSPORT FOR BRANCH FLOWS AT LOWELL ST (SECTION B-B) ******										
SEDIMENT TRANSP	LC-3.2B	29		SED ID = 4		PEAK CONC.(PPM-w) =	52677	TOTAL SED.(TONS) =	291.05	
*S **********										
*S * TOTAL FLOW EXITING PRIMEROSE POINTE AT LOWELL ST (DISCHARGE POINTE 'C') *										
*S **********										
ADD HYD	LACA.3	21&29	30	.37231	636.91	26.572	1.33819	1.665	2.673	
*S ********** WASH LOAD AT LOWELL ST (POINT 'C') **********										
SED WASH LOAD	LACA.3	30						WASH CONC.(PPM-w) =	32709	
*S ********** SEDIMENT TRANSPORT AT LOWELL ST (POINT 'C') **********										
*S (SECNO 10.35)										
SEDIMENT TRANSP	LACA.3	30		SED ID = 5		PEAK CONC.(PPM-w) =	48405	TOTAL SED.(TONS) =	1655.45	
*S ********** SEDIMENT TRANSPORT AT LOWELL ST (POINT 'C') **********										
*S (SECNO 9.80)										
SEDIMENT TRANSP	LACA.3	30		SED ID = 6		PEAK CONC.(PPM-w) =	78484	TOTAL SED.(TONS) =	2420.08	
ROUTE MCUNGE	LC-3A.N	24	31	.01079	21.07	.733	1.27414	1.565	3.052	CCODE = .1
COMPUTE NM HYD	OFF2A.0	-	32	.03160	64.02	2.154	1.27784	1.499	3.166	PER IMP= 17.00
ADD HYD	OFF2A.1	31&32	33	.04239	81.53	2.887	1.27688	1.532	3.006	
ROUTE MCUNGE	OFF2A.1	33	34	.04239	80.18	2.883	1.27548	1.565	2.956	CCODE = .1
COMPUTE NM HYD	OFF-2.0	-	35	.01350	21.04	.652	.90562	1.499	2.435	PER IMP= 3.00
*S TOTAL EXISTING FLOW EXITING SITE AT DISCHARGE POINT 'D'										
ADD HYD	OFF-2.1	34&35	36	.05589	100.74	3.535	1.18613	1.532	2.817	
FINISH										

COMMUNITY SCIENCES CORPORATION - CORRALES, NEW MEXICO - (505) 897-0000

JAMES L. CONDIT, NEW MEXICO, 11668, REGISTERED PROFESSIONAL, 1-27-99

Is this ESB what was previously approved?
Are these ESB limits on the plans?

E POINTE PRUDENT LINE STUDY
E 2 - LA CUEVA ARROYO
& PROFILE

NO.	DATE	
1	08-21-98	EXPAN
2	09-30-98	CLARI
3		
4		

SCALE: 1"=60'
DESIGNED: BOM
DRAWN: DLW
JOB NO.: 207-07-039

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1328 Corrales, N.M. 87048

SHEET 1 OF 1

207039/PLATE2.DWG

APPENDIX D

FROM THE DRAINAGE REPORT FOR PRIMROSE POINTE, UNIT 3 & 4:

AHYMO 2-, 10-, AND 100 YEAR POST-DEVELOPMENT SUMMARY OUTPUT

HEC-12 INLET CAPACITY CALCULATIONS FOR INLETS #1 AND #18

```
[ 1 ] INLET NUMBER 1
[ 2 ] COMBINATION GRATE & CURB INLET IN A SUMP
[ 3 ] STATION
[ 4 ] PEAK DISCHARGE FOR FIRST SIDE IS  18.51  (cfs)
      PEAK DISCHARGE FOR OTHER SIDE IS  0  (cfs)
      TOTAL PEAK DISCHARGE IS  18.51  (cfs)
[ 7 ] APPROACH GUTTER ' N 'VALUE  .017
[ 8 ] GUTTER LONGITUDINAL SLOPE  .005  (ft/ft)
[ 9 ] PAVEMENT CROSS SLOPE  .02  (ft/ft)
[10 ] WIDTH OF GUTTER IS  2  (ft)
[11 ] GUTTER CROSS SLOPE IS  .0625  (ft/ft)
[12 ] WIDTH OF LOCAL DEPRESSION IS  2  (ft.)
[13 ] AMOUNT OF LOCAL DEPRESSION IS  2.75  (in.)

==========================================================================
INLET NUMBER 1              LENGTH   7.5        STATION

  TOTAL PEAK DISCHARGE = 18.51 (cfs)

GUTTER SLOPE = 0.0050 FT/FT        PAVEMENT CROSS SLOPE =  0.0200 FT/FT


    SPREAD AT A SLOPE OF .005 (ft./ft.) IS 18.97 (ft.)

  XXXXXXXXXX COMBINATION GRATE CURB INLET IN A SUMP XXXXXXXXXX
   DEPTH OF WATER (ft) =   0.69          SPREAD (ft)  = 34.36
PERIMETER OF GRATE = 10.83 (ft.)          AREA =  8.20 (sq.ft.)
LENGTH OF INLET =  7.5 (ft.)              H = 0.500 (ft.)
       [ 1 ] INLET NUMBER 2
       [ 2 ] COMBINATION GRATE & CURB INLET ON A CONTINUOUS GRADE
       [ 3 ] STATION
       [ 4 ] PEAK DISCHARGE IS  8.72  (cfs)
       [ 7 ] APPROACH GUTTER ' N 'VALUE  .017
       [ 8 ] GUTTER LONGITUDINAL SLOPE  .01  (ft/ft)
       [ 9 ] PAVEMENT CROSS SLOPE  .02  (ft/ft)
       [10 ] WIDTH OF GUTTER IS  2  (ft)
       [11 ] GUTTER CROSS SLOPE IS  .0625  (ft/ft)
       [12 ] WIDTH OF LOCAL DEPRESSION IS  2  (ft.)
       [13 ] AMOUNT OF LOCAL DEPRESSION IS  2.75  (in.)
       [14 ] WIDTH OF GRATE IS  2  (ft.)
       [15 ] LENGTH OF GRATE IS  3.33  (ft.)

==========================================================================
INLET NUMBER 2              LENGTH   7.5        STATION

  TOTAL PEAK DISCHARGE =  8.72 (cfs)

GUTTER SLOPE = 0.0100 FT/FT        PAVEMENT CROSS SLOPE =  0.0200 FT/FT

SPREAD      W     W/T     SW       SW/SX      Eo      a      S'W     SE
 16.17     2.0    0.12   0.0625    3.1       0.34    3.8    0.157  0.074

  XXXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXXX
 SLOT INTERCEPTS  2.92 CFS          GRATE INTERCEPTS  3.93 CFS
   CFS INTERCEPTED=  6.84               CFS CARRYOVER=  1.88
```

[1] INLET NUMBER 17
[2] COMBINATION GRATE & CURB INLET ON A CONTINUOUS GRADE
[3] STATION
[4] PEAK DISCHARGE IS 9.85 (cfs)
[7] APPROACH GUTTER ' N 'VALUE .017
[8] GUTTER LONGITUDINAL SLOPE .005 (ft/ft)
[9] PAVEMENT CROSS SLOPE .02 (ft/ft)
[10] WIDTH OF GUTTER IS 2 (ft)
[11] GUTTER CROSS SLOPE IS .0625 (ft/ft)
[12] WIDTH OF LOCAL DEPRESSION IS 2 (ft.)
[13] AMOUNT OF LOCAL DEPRESSION IS 2.75 (in.)
[14] WIDTH OF GRATE IS 2 (ft.)
[15] LENGTH OF GRATE IS 6.66 (ft.)

==========

INLET NUMBER 17 LENGTH 10.8 STATION

TOTAL PEAK DISCHARGE = 9.85 (cfs)

GUTTER SLOPE = 0.0050 FT/FT . PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
19.44	2.0	0.10	0.0625	3.1	0.29	3.8	0.157	0.065

XXXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXXX
SLOT INTERCEPTS 3.54 CFS GRATE INTERCEPTS 5.24 CFS
CFS INTERCEPTED= 8.78 CFS CARRYOVER= 1.07

==========

INLET NUMBER 18 LENGTH 0.0 STATION WELL

TOTAL PEAK DISCHARGE = 10.78 (cfs)

XXXXXXXXXX GRATE INLET IN A TRAPEZOIDAL CHANNEL XXXXXXXXXX
DEPTH OF WATER (ft) = 0.61 PERIMETER OF GRATE (ft) = 7.50 AREA (sq ft) = 4.10

2-YEAR POST-DEVELOPMENT SUMMARY OUTPUT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/07/1996
INPUT FILE = U3&4-2.DAT USER NO.= DAGGETTK.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S	PRIMROSE POINTE UNITS 3 AND 4 DRAINAGE PLAN									
*S	2-YR DEVELOPED CONDITIONS									
START										
RAINFALL TYPE= 1										TIME= .00 RAIN6= 1.260
*S	**********									
*S	BASINS A1, A2, A3, A4, AND C CORRESPOND TO PREVIOUSLY DESIGNATED									
*S	BASINS 101, 102, AND 103. BASIN D IS AN ADDITIONAL BASIN WITH									
*S	PARTIAL FLOW INTO THE NORTH DOMINGO BACA ARROYO.									
*S BASIN A1										
COMPUTE NM HYD	1.00	-	1	.10469	64.94	1.499	.26856	1.499	.969	PER IMP= .00
ROUTE MCUNGE	2.00	1	2	.10469	58.34	1.499	.26857	1.765	.871	CCODE = .1
*S BASIN A2										
COMPUTE NM HYD	3.00	-	3	.09531	32.48	.779	.15317	1.532	.533	PER IMP= .00
*S COMBINE R-A1 AND A2										
ADD HYD	4.00	2& 3	4	.20000	65.77	2.278	.21357	1.765	.514	
*S BASIN D										
COMPUTE NM HYD	5.00	-	5	.32030	100.99	4.019	.23524	1.598	.493	PER IMP= .00
*S DIVIDE THE HYDROGRAPH FROM BASIN D INTO 20% AND 80% HYDROGRAPHS										
DIVIDE HYD	15.00	5	15	.06406	20.20	.804	.23524	1.598	.493	
	16.00	AND	16	.25624	80.80	3.215	.23524	1.598	.493	
*S COMBINE 20% OF D AND TOTAL OF R-A1, AND A2 (SUBTOTAL AT A2)										
ADD HYD	6.00	4&15	6	.26406	78.53	3.082	.21883	1.765	.465	
*S BASIN C										
COMPUTE NM HYD	7.00	-	7	.42969	102.20	6.155	.26856	1.698	.372	PER IMP= .00
*S COMBINE C AND TOTAL OF R-A1, A2, AND 25% OF D (TOTAL AT A2)										
ADD HYD	8.00	6& 7	8	.69375	179.43	9.236	.24963	1.732	.404	
ROUTE MCUNGE	9.00	8	9	.69375	172.18	8.964	.24227	1.998	.388	CCODE = .1
*S BASIN A3										
COMPUTE NM HYD	10.00	-	10	.18594	65.73	2.358	.23783	1.499	.552	PER IMP= 17.00
*S COMBINE R-TOTAL AT A2 AND A3 (TOTAL AT TRAMWAY LANE)										
ADD HYD	11.00	9&10	11	.87969	185.33	11.322	.24133	1.998	.329	
SEDIMENT TRANSP	11.00	11		SED ID = 1		PEAK CONC.(PPM-w) =	39512	TOTAL SED.(TONS) =		531.98
ROUTE MCUNGE	12.00	11	12	.87969	184.75	11.316	.24120	2.031	.328	CCODE = .1
*S BASIN A4										
COMPUTE NM HYD	13.00	-	13	.03125	34.06	1.225	.73499	1.499	1.703	PER IMP= 65.00
*S COMBINE R-TOTAL AT A3 AND A4 (TOTAL AT TRAMWAY BLVD)										
ADD HYD	14.00	12&13	14	.91094	191.54	12.541	.25813	2.031	.329	
ROUTE MCUNGE	17.00	14	17	.91094	190.87	12.538	.25807	2.031	.327	CCODE = .1
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE CONCRETE CHANNEL										
ROUTE MCUNGE	NDB.0	17	18	.91094	190.35	12.534	.25799	2.065	.326	CCODE = .1
COMPUTE NM HYD	100.10	-	19	.00140	1.01	.032	.43157	1.499	1.123	PER IMP= 30.00
COMPUTE NM HYD	OUT1.1	-	20	.00531	2.00	.068	.23994	1.499	.588	PER IMP= 17.00
ADD HYD	100.12	19&20	21	.00671	3.00	.100	.27983	1.499	.699	
ADD HYD	NDB.0A	18&21	22	.91765	190.81	12.634	.25815	2.065	.325	
SEDIMENT TRANSP	NDB.0A	22		SED ID = 2		PEAK CONC.(PPM-w) =	62568	TOTAL SED.(TONS) =		897.17
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE TO POND NDB1										
ROUTE MCUNGE	NDB.1	22	23	.91765	188.95	12.602	.25749	2.131	.322	CCODE = .1
COMPUTE NM HYD	183.00	-	24	.01150	11.28	.403	.65706	1.499	1.533	PER IMP= 57.00
COMPUTE NM HYD	110.10	-	25	.02590	18.50	.596	.43157	1.499	1.116	PER IMP= 30.00
COMPUTE NM HYD	110.20	-	26	.00250	2.14	.071	.53068	1.499	1.340	PER IMP= 40.00
ADD HYD	110.21	24&26	27	.01400	13.43	.474	.63445	1.499	1.499	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	110.22	25&27	28	.03990	31.92	1.070	.50275	1.499	1.250	
COMPUTE NM HYD	110.30	-	29	.00140	.59	.014	.18188	1.532	.659	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB1										
ADD HYD	110.00	28&29	30	.04130	32.51	1.083	.49187	1.499	1.230	
*S ROUTE HYDOGRAPH THRU POND NDB1										
ROUTE RESERVOIR	NDB1.0	30	31	.04130	11.47	.952	.43212	1.732	.434	AC-FT= .598
ADD HYD	NDB.1A	23&31	32	.95895	195.31	13.554	.26501	2.131	.318	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB1 TO POND NDB2										
ROUTE MCUNGE	NDB.2	32	33	.95895	194.94	13.557	.26507	2.131	.318	CCODE = .2
COMPUTE NM HYD	120.10	-	34	.00850	6.07	.196	.43157	1.499	1.117	PER IMP= 30.00
COMPUTE NM HYD	120.20	-	35	.00070	.30	.007	.18188	1.532	.662	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB2										
ADD HYD	120.00	34&35	36	.00920	6.37	.202	.41253	1.499	1.082	
*S ROUTE HYDOGRAPH THRU POND NDB2										
ROUTE RESERVOIR	NDB2.0	36	37	.00920	.13	.155	.31513	2.597	.022	AC-FT= .180
ADD HYD	NDB.2A	33&37	38	.96815	195.04	13.711	.26555	2.131	.315	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB2 TO LOWELL ST										
ROUTE MCUNGE	NDB.3	38	39	.96815	194.77	13.694	.26521	2.164	.314	CCODE = .1
COMPUTE NM HYD	100.00	-	40	.01928	5.33	.174	.16933	1.499	.432	PER IMP= 10.00
ADD HYD	NDB.3A	39&40	41	.98743	195.23	13.868	.26334	2.164	.309	
SEDIMENT TRANSP	NDB.3A	41	SED ID = 3		PEAK CONC.(PPM-w) =	63204	TOTAL SED.(TONS) =	974.15		
*S										
*S********** UNITS 3 AND 4 **********										
*S********** DEVELOPED FLOW TO POND NDB4 **********										
*S										
COMPUTE NM HYD	OUT.1	-	42	.00402	1.51	.051	.23994	1.499	.588	PER IMP= 17.00
COMPUTE NM HYD	140.11	-	43	.01090	7.79	.251	.43157	1.499	1.116	PER IMP= 30.00
ADD HYD	140.10	42&43	44	.01492	9.30	.302	.37990	1.499	.974	
COMPUTE NM HYD	140.12	-	45	.00934	6.67	.215	.43157	1.499	1.117	PER IMP= 30.00
ADD HYD	140.10	44&45	46	.02426	15.98	.517	.39978	1.499	1.029	
COMPUTE NM HYD	OUT.2	-	47	.00139	.53	.018	.23994	1.499	.592	PER IMP= 17.00
ADD HYD	140.10	46&47	48	.02565	16.50	.535	.39111	1.499	1.005	
COMPUTE NM HYD	140.13	-	49	.01107	7.91	.255	.43157	1.499	1.116	PER IMP= 30.00
ADD HYD	140.10	48&49	50	.03672	24.41	.790	.40330	1.499	1.039	
COMPUTE NM HYD	140.14	-	51	.00736	5.26	.169	.43157	1.499	1.117	PER IMP= 30.00
COMPUTE NM HYD	140.15	-	52	.00693	4.95	.160	.43157	1.499	1.117	PER IMP= 30.00
ADD HYD	140.10	51&52	53	.01429	10.21	.329	.43153	1.499	1.117	
ADD HYD	140.10	50&53	54	.05101	34.63	1.119	.41121	1.499	1.061	
COMPUTE NM HYD	140.16	-	55	.00577	4.13	.133	.43157	1.499	1.117	PER IMP= 30.00
ADD HYD	140.10	54&55	56	.05678	38.75	1.251	.41327	1.499	1.066	
COMPUTE NM HYD	140.17	-	57	.00415	2.97	.096	.43157	1.499	1.118	PER IMP= 30.00
ADD HYD	140.10	56&57	58	.06093	41.72	1.347	.41451	1.499	1.070	
COMPUTE NM HYD	140.18	-	59	.00783	5.60	.180	.43157	1.499	1.117	PER IMP= 30.00
ADD HYD	140.10	58&59	60	.06876	47.32	1.527	.41645	1.499	1.075	
COMPUTE NM HYD	140.00	-	61	.00578	.70	.018	.05866	1.532	.188	PER IMP= .00
ADD HYD	140.10	60&61	62	.07454	47.97	1.545	.38870	1.499	1.006	
ROUTE RESERVOIR	NDB4.0	62	63	.07454	.27	.242	.06077	3.230	.006	AC-FT= 1.457
COMPUTE NM HYD	140.20	-	64	.00430	2.95	.093	.40660	1.499	1.072	PER IMP= 27.00
ADD HYD	140.13	63&64	65	.07884	2.98	.335	.07963	1.499	.059	
*S ********** TOTAL NORTH DOMINGO BACA FLOW AT LOWELL STREET **********										
ADD HYD	NDB.4	41&65	66	1.06627	195.60	14.203	.24976	2.164	.287	
SEDIMENT TRANSP	NDB.4	66	SED ID = 4		PEAK CONC.(PPM-w) =	32332	TOTAL SED.(TONS) =	596.76		
FINISH										

10-YEAR POST-DEVELOPMENT SUMMARY OUTPUT

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/07/1996
INPUT FILE = U3&4-10.DAT USER NO.= DAGGETTK.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										PAGE = 1
*S	PRIMROSE POINTE UNITS 3 AND 4 DRAINAGE PLAN									
*S	10-YR DEVELOPED CONDITIONS									
START										
RAINFALL TYPE= 1										TIME= .00
*S	**********									RAIN6= 1.930
*S	BASINS A1, A2, A3, A4, AND C CORRESPOND TO PREVIOUSLY DESIGNATED									
*S	BASINS 101, 102, AND 103. BASIN D IS AN ADDITIONAL BASIN WITH									
*S	PARTIAL FLOW INTO THE NORTH DOMINGO BACA ARROYO.									
*S BASIN A1										
COMPUTE NM HYD		1.00	- 1	.10469	159.14	4.305	.77113	1.499	2.375	PER IMP= .00
ROUTE MCUNGE		2.00	1 2	.10469	151.48	4.154	.74402	1.632	2.261	CCODE = .1
*S BASIN A2										
COMPUTE NM HYD		3.00	- 3	.09531	108.37	2.841	.55898	1.532	1.776	PER IMP= .00
*S COMBINE R-A1 AND A2										
ADD HYD		4.00	2& 3 4	.20000	223.89	6.996	.65583	1.598	1.749	
*S BASIN D										
COMPUTE NM HYD		5.00	- 5	.32030	324.54	12.143	.71087	1.598	1.583	PER IMP= .00
*S DIVIDE THE HYDROGRAPH FROM BASIN D INTO 20% AND 80% HYDROGRAPHS										
DIVIDE HYD		15.00	5 15	.06406	64.91	2.429	.71086	1.598	1.583	
		16.00	AND 16	.25624	259.63	9.715	.71086	1.598	1.583	
*S COMBINE 20% OF D AND TOTAL OF R-A1, AND A2 (SUBTOTAL AT A2)										
ADD HYD		6.00	4&15 6	.26406	288.79	9.424	.66918	1.598	1.709	
*S BASIN C										
COMPUTE NM HYD		7.00	- 7	.42969	327.41	17.672	.77113	1.732	1.191	PER IMP= .00
*S COMBINE C AND TOTAL OF R-A1, A2, AND 25% OF D (TOTAL AT A2)										
ADD HYD		8.00	6& 7 8	.69375	575.40	27.096	.73233	1.665	1.296	
ROUTE MCUNGE		9.00	8 9	.69375	555.11	26.949	.72835	1.832	1.250	CCODE = .1
*S BASIN A3										
COMPUTE NM HYD		10.00	- 10	.18594	207.54	6.314	.63666	1.499	1.744	PER IMP= 17.00
*S COMBINE R-TOTAL AT A2 AND A3 (TOTAL AT TRAMWAY LANE)										
ADD HYD		11.00	9&10 11	.87969	602.60	33.263	.70897	1.832	1.070	
SEDIMENT TRANSP		11.00	11	SED ID = 1		PEAK CONC.(PPM-w) =	68444	TOTAL SED.(TONS) =	2459.04	
ROUTE MCUNGE		12.00	11 12	.87969	600.08	33.256	.70882	1.865	1.066	CCODE = .1
*S BASIN A4										
COMPUTE NM HYD		13.00	- 13	.03125	64.38	2.233	1.33951	1.499	3.219	PER IMP= 65.00
*S COMBINE R-TOTAL AT A3 AND A4 (TOTAL AT TRAMWAY BLVD)										
ADD HYD		14.00	12&13 14	.91094	618.07	35.488	.73046	1.865	1.060	
ROUTE MCUNGE		17.00	14 17	.91094	612.55	35.484	.73037	1.865	1.051	CCODE = .1
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE CONCRETE CHANNEL										
ROUTE MCUNGE	NDB.0	17	18	.91094	612.01	35.479	.73027	1.898	1.050	CCODE = .1
COMPUTE NM HYD	100.10	-	19	.00140	2.25	.070	.93823	1.499	2.507	PER IMP= 30.00
COMPUTE NM HYD	OUT1.1	-	20	.00531	5.90	.182	.64095	1.499	1.735	PER IMP= 17.00
ADD HYD	100.12	19&20	21	.00671	8.14	.252	.70288	1.499	1.896	
ADD HYD	NDB.0A	18&21	22	.91765	613.57	35.730	.73007	1.898	1.045	
SEDIMENT TRANSP	NDB.0A	22	SED ID = 2		PEAK CONC.(PPM-w) =	652885	TOTAL SED.(TONS) =	36298.11		
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE TO POND NDB1										
ROUTE MCUNGE	NDB.1	22	23	.91765	612.30	35.718	.72982	1.931	1.043	CCODE = .2
COMPUTE NM HYD	183.00	-	24	.01150	22.12	.756	1.23198	1.499	3.005	PER IMP= 57.00
COMPUTE NM HYD	110.10	-	25	.02590	41.32	1.296	.93823	1.499	2.492	PER IMP= 30.00
COMPUTE NM HYD	110.20	-	26	.00250	4.45	.143	1.07602	1.499	2.780	PER IMP= 40.00
ADD HYD	110.21	24&26	27	.01400	26.56	.899	1.20409	1.499	2.965	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	110.22	25&27	28	.03990	67.88	2.195	1.03151	1.499	2.658	
COMPUTE NM HYD	110.30	-	29	.00140	1.74	.046	.61341	1.532	1.937	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB1										
ADD HYD	110.00	28&29	30	.04130	69.61	2.241	1.01733	1.499	2.634	
*S ROUTE HYDOGRAPH THRU POND NDB1										
ROUTE RESERVOIR	NDB1.0	30	31	.04130	26.27	2.102	.95435	1.732	.994	AC-FT= 1.071
ADD HYD	NDB.1A	23&31	32	.95895	636.60	37.820	.73949	1.931	1.037	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB1 TO POND NDB2										
ROUTE MCUNGE	NDB.2	32	33	.95895	634.89	37.809	.73926	1.931	1.034	CCODE = .1
COMPUTE NM HYD	120.10	-	34	.00850	13.57	.425	.93823	1.499	2.494	PER IMP= 30.00
COMPUTE NM HYD	120.20	-	35	.00070	.87	.023	.61341	1.532	1.944	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB2										
ADD HYD	120.00	34&35	36	.00920	14.44	.448	.91347	1.499	2.452	
*S ROUTE HYDOGRAPH THRU POND NDB2										
ROUTE RESERVOIR	NDB2.0	36	37	.00920	7.28	.397	.80931	1.665	1.236	AC-FT= .228
ADD HYD	NDB.2A	33&37	38	.96815	638.38	38.206	.73992	1.931	1.030	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB2 TO LOWELL ST										
ROUTE MCUNGE	NDB.3	38	39	.96815	638.39	38.187	.73956	1.965	1.030	CCODE = .2
COMPUTE NM HYD	100.00	-	40	.01928	18.87	.556	.54114	1.532	1.530	PER IMP= 10.00
ADD HYD	NDB.3A	39&40	41	.98743	640.98	38.743	.73568	1.965	1.014	
SEDIMENT TRANSP	NDB.3A	41	SED ID = 3		PEAK CONC.(PPM-w) =	652885	TOTAL SED.(TONS) =	44651.82		
*S										
*S********** UNITS 3 AND 4 **********										
*S********** DEVELOPED FLOW TO POND NDB4 **********										
*S										
COMPUTE NM HYD	OUT.1	-	42	.00402	4.47	.137	.64095	1.499	1.736	PER IMP= 17.00
COMPUTE NM HYD	140.11	-	43	.01090	17.40	.545	.93823	1.499	2.494	PER IMP= 30.00
ADD HYD	140.10	42&43	44	.01492	21.86	.683	.85809	1.499	2.290	
COMPUTE NM HYD	140.12	-	45	.00934	14.91	.467	.93823	1.499	2.494	PER IMP= 30.00
ADD HYD	140.10	44&45	46	.02426	36.77	1.150	.88893	1.499	2.368	
COMPUTE NM HYD	OUT.2	-	47	.00139	1.55	.048	.64095	1.499	1.746	PER IMP= 17.00
ADD HYD	140.10	46&47	48	.02565	38.32	1.198	.87548	1.499	2.334	
COMPUTE NM HYD	140.13	-	49	.01107	17.67	.554	.93823	1.499	2.493	PER IMP= 30.00
ADD HYD	140.10	48&49	50	.03672	55.99	1.752	.89439	1.499	2.382	
COMPUTE NM HYD	140.14	-	51	.00736	11.75	.368	.93823	1.499	2.495	PER IMP= 30.00
COMPUTE NM HYD	140.15	-	52	.00693	11.06	.347	.93823	1.499	2.495	PER IMP= 30.00
ADD HYD	140.10	51&52	53	.01429	22.81	.715	.93819	1.499	2.495	
ADD HYD	140.10	50&53	54	.05101	78.80	2.467	.90666	1.499	2.414	
COMPUTE NM HYD	140.16	-	55	.00577	9.21	.289	.93823	1.499	2.495	PER IMP= 30.00
ADD HYD	140.10	54&55	56	.05678	88.02	2.755	.90986	1.499	2.422	
COMPUTE NM HYD	140.17	-	57	.00415	6.63	.208	.93823	1.499	2.497	PER IMP= 30.00
ADD HYD	140.10	56&57	58	.06093	94.65	2.963	.91179	1.499	2.427	
COMPUTE NM HYD	140.18	-	59	.00783	12.50	.392	.93823	1.499	2.494	PER IMP= 30.00
ADD HYD	140.10	58&59	60	.06876	107.15	3.355	.91480	1.499	2.435	
COMPUTE NM HYD	140.00	-	61	.00578	4.38	.117	.37989	1.532	1.185	PER IMP= .00
ADD HYD	140.10	60&61	62	.07454	111.42	3.472	.87332	1.499	2.336	
ROUTE RESERVOIR	NDB4.0	62	63	.07454	1.22	1.517	.38169	2.831	.025	AC-FT= 3.251
COMPUTE NM HYD	140.20	-	64	.00430	6.72	.208	.90574	1.499	2.440	PER IMP= 27.00
ADD HYD	140.13	63&64	65	.07884	6.78	1.725	.41027	1.499	.134	
*S ********** TOTAL NORTH DOMINGO BACA FLOW AT LOWELL STREET **********										
ADD HYD	NDB.4	41&65	66	1.06627	643.20	40.468	.71162	1.965	.943	
SEDIMENT TRANSP	NDB.4	66	SED ID = 4		PEAK CONC.(PPM-w) =	39651	TOTAL SED.(TONS) =	1938.99		
FINISH										

100-YEAR POST DEVELOPMENT SUMMARY OUTPUT

AHYMO SUMMARY TABLE (AHYM0194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =05/07/1996
INPUT FILE = U3&4-100.DAT USER NO.= DAGGETTK.S94

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S	PRIMROSE POINTE UNITS 3 AND 4 DRAINAGE PLAN									
*S	100-YR DEVELOPED CONDITIONS									
START										
RAINFALL TYPE= 1										TIME= .00
*S	**********									RAIN6= 2.900
*S	BASINS A1, A2, A3, A4, AND C CORRESPOND TO PREVIOUSLY DESIGNATED									
*S	BASINS 101, 102, AND 103. BASIN D IS AN ADDITIONAL BASIN WITH									
*S	PARTIAL FLOW INTO THE NORTH DOMINGO BACA ARROYO.									
*S BASIN A1										
COMPUTE NM HYD		1.00	- 1	.10469	253.83	8.183	1.46562	1.499	3.788	PER IMP= .00
ROUTE MCUNGE		2.00	1 2	.10469	242.63	8.046	1.44111	1.632	3.621	CCODE = .1
*S BASIN A2										
COMPUTE NM HYD		3.00	- 3	.09531	195.84	6.031	1.18652	1.499	3.210	PER IMP= .00
*S COMBINE R-A1 AND A2										
ADD HYD		4.00	2& 3 4	.20000	383.20	14.078	1.31978	1.598	2.994	
*S BASIN D										
COMPUTE NM HYD		5.00	- 5	.32030	591.61	23.733	1.38931	1.598	2.886	PER IMP= .00
*S DIVIDE THE HYDROGRAPH FROM BASIN D INTO 20% AND 80% HYDROGRAPHS										
DIVIDE HYD		15.00	5 15	.06406	118.32	4.747	1.38931	1.598	2.886	
		16.00	AND 16	.25624	473.29	18.986	1.38931	1.598	2.886	
*S COMBINE 20% OF D AND TOTAL OF R-A1, AND A2 (SUBTOTAL AT A2)										
ADD HYD		6.00	4&15 6	.26406	501.52	18.824	1.33665	1.598	2.968	
*S BASIN C										
COMPUTE NM HYD		7.00	- 7	.42969	605.50	33.587	1.46562	1.732	2.202	PER IMP= .00
*S COMBINE C AND TOTAL OF R-A1, A2, AND 25% OF D (TOTAL AT A2)										
ADD HYD		8.00	6& 7 8	.69375	1038.35	52.412	1.41653	1.632	2.339	
ROUTE MCUNGE		9.00	8 9	.69375	1036.07	52.548	1.42021	1.698	2.333	CCODE = .2
*S BASIN A3										
COMPUTE NM HYD		10.00	- 10	.18594	390.73	12.611	1.27170	1.499	3.283	PER IMP= 17.00
*S COMBINE R-TOTAL AT A2 AND A3 (TOTAL AT TRAMWAY LANE)										
ADD HYD		11.00	9&10 11	.87969	1213.11	65.159	1.38882	1.698	2.155	
SEDIMENT TRANSP		11.00	11	SED ID = 1		PEAK CONC.(PPM-w) =	95522	TOTAL SED.(TONS) =	6685.09	
ROUTE MCUNGE		12.00	11 12	.87969	1196.29	65.147	1.38856	1.732	2.125	CCODE = .1
*S BASIN A4										
COMPUTE NM HYD		13.00	- 13	.03125	93.41	3.647	2.18833	1.499	4.670	PER IMP= 65.00
*S COMBINE R-TOTAL AT A3 AND A4 (TOTAL AT TRAMWAY BLVD)										
ADD HYD		14.00	12&13 14	.91094	1236.05	68.794	1.41600	1.698	2.120	
ROUTE MCUNGE		17.00	14 17	.91094	1235.45	68.790	1.41592	1.732	2.119	CCODE = .1
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE CONCRETE CHANNEL										
ROUTE MCUNGE		NDB.0	17 18	.91094	1234.53	68.779	1.41568	1.732	2.118	CCODE = .2
COMPUTE NM HYD		100.10	- 19	.00140	3.54	.125	1.67589	1.499	3.949	PER IMP= 30.00
COMPUTE NM HYD		OUT1.1	- 20	.00531	10.78	.362	1.27784	1.499	3.171	PER IMP= 17.00
ADD HYD		100.12	19&20 21	.00671	14.31	.487	1.36082	1.499	3.333	
ADD HYD		NDB.0A	18&21 22	.91765	1240.41	69.266	1.41528	1.732	2.112	
SEDIMENT TRANSP		NDB.0A	22	SED ID = 2		PEAK CONC.(PPM-w) =	652885	TOTAL SED.(TONS) =	60866.45	
*S ROUTE NDB-1, NDB-2, & NDB-3 THROUGH PRIMROSE POINTE TO POND NDB1										
ROUTE MCUNGE		NDB.1	22 23	.91765	1227.95	69.226	1.41448	1.798	2.091	CCODE = .1
COMPUTE NM HYD		183.00	- 24	.01150	32.82	1.258	2.05053	1.499	4.459	PER IMP= 57.00
COMPUTE NM HYD		110.10	- 25	.02590	65.09	2.315	1.67590	1.499	3.927	PER IMP= 30.00
COMPUTE NM HYD		110.20	- 26	.00250	6.74	.247	1.85256	1.499	4.213	PER IMP= 40.00
ADD HYD		110.21	24&26 27	.01400	39.56	1.505	2.01515	1.499	4.415	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	110.22	25&27	28	.03990	104.65	3.820	1.79492	1.499	4.098	
COMPUTE NM HYD	110.30	-	29	.00140	3.00	.094	1.26171	1.499	3.352	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB1										
ADD HYD	110.00	28&29	30	.04130	107.65	3.914	1.77685	1.499	4.073	
*S ROUTE HYDOGRAPH THRU POND NDB1										
ROUTE RESERVOIR	NDB1.0	30	31	.04130	35.92	3.762	1.70803	1.798	1.359	AC-FT= 1.865
ADD HYD	NDB.1A	23&31	32	.95895	1263.87	72.989	1.42712	1.798	2.059	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB1 TO POND NDB2										
ROUTE MCUNGE	NDB.2	32	33	.95895	1258.86	72.951	1.42639	1.798	2.051	CCODE = .1
COMPUTE NM HYD	120.10	-	34	.00850	21.37	.760	1.67590	1.499	3.929	PER IMP= 30.00
COMPUTE NM HYD	120.20	-	35	.00070	1.51	.047	1.26171	1.499	3.365	PER IMP= .00
*S TOTAL INFLOW INTO POND NDB2										
ADD HYD	120.00	34&35	36	.00920	22.88	.807	1.64434	1.499	3.886	
*S ROUTE HYDOGRAPH THRU POND NDB2										
ROUTE RESERVOIR	NDB2.0	36	37	.00920	15.14	.741	1.50954	1.632	2.572	AC-FT= .294
ADD HYD	NDB.2A	33&37	38	.96815	1269.68	73.692	1.42718	1.798	2.049	
*S ROUTE NDB-1, NDB-2, & NDB-3 FROM POND NDB2 TO LOWELL ST										
ROUTE MCUNGE	NDB.3	38	39	.96815	1268.57	73.710	1.42754	1.832	2.047	CCODE = .2
COMPUTE NM HYD	100.00	-	40	.01928	36.37	1.180	1.14725	1.499	2.947	PER IMP= 10.00
ADD HYD	NDB.3A	39&40	41	.98743	1277.44	74.890	1.42206	1.832	2.021	
SEDIMENT TRANSP	NDB.3A	41	SED ID = 3		PEAK CONC.(PPM-w) =	652885	TOTAL SED.(TONS) =	64962.71		
*S										
*S********** UNITS 3 AND 4 **********										
*S********** DEVELOPED FLOW TO POND NDB4 **********										
*S										
COMPUTE NM HYD	OUT.1	-	42	.00402	8.16	.274	1.27784	1.499	3.173	PER IMP= 17.00
COMPUTE NM HYD	140.11	-	43	.01090	27.40	.974	1.67589	1.499	3.928	PER IMP= 30.00
ADD HYD	140.10	42&43	44	.01492	35.57	1.248	1.56861	1.499	3.725	
COMPUTE NM HYD	140.12	-	45	.00934	23.48	.835	1.67589	1.499	3.929	PER IMP= 30.00
ADD HYD	140.10	44&45	46	.02426	59.05	2.083	1.60990	1.499	3.803	
COMPUTE NM HYD	OUT.2	-	47	.00139	2.84	.095	1.27784	1.499	3.188	PER IMP= 17.00
ADD HYD	140.10	46&47	48	.02565	61.89	2.178	1.59190	1.499	3.770	
COMPUTE NM HYD	140.13	-	49	.01107	27.83	.989	1.67590	1.499	3.928	PER IMP= 30.00
ADD HYD	140.10	48&49	50	.03672	89.72	3.167	1.61721	1.499	3.818	
COMPUTE NM HYD	140.14	-	51	.00736	18.51	.658	1.67589	1.499	3.930	PER IMP= 30.00
COMPUTE NM HYD	140.15	-	52	.00693	17.43	.619	1.67589	1.499	3.930	PER IMP= 30.00
ADD HYD	140.10	51&52	53	.01429	35.94	1.277	1.67586	1.499	3.930	
ADD HYD	140.10	50&53	54	.05101	125.66	4.444	1.63364	1.499	3.849	
COMPUTE NM HYD	140.16	-	55	.00577	14.52	.516	1.67589	1.499	3.931	PER IMP= 30.00
ADD HYD	140.10	54&55	56	.05678	140.17	4.960	1.63793	1.499	3.857	
COMPUTE NM HYD	140.17	-	57	.00415	10.45	.371	1.67589	1.499	3.933	PER IMP= 30.00
ADD HYD	140.10	56&57	58	.06093	150.62	5.331	1.64051	1.499	3.863	
COMPUTE NM HYD	140.18	-	59	.00783	19.69	.700	1.67589	1.499	3.930	PER IMP= 30.00
ADD HYD	140.10	58&59	60	.06876	170.31	6.031	1.64454	1.499	3.870	
COMPUTE NM HYD	140.00	-	61	.00578	9.48	.288	.93294	1.499	2.562	PER IMP= .00
ADD HYD	140.10	60&61	62	.07454	179.79	6.318	1.58936	1.499	3.769	
ROUTE RESERVOIR	NDB4.0	62	63	.07454	1.53	2.265	.56971	3.197	.032	AC-FT= 5.895
COMPUTE NM HYD	140.20	-	64	.00430	10.66	.375	1.63448	1.499	3.874	PER IMP= 27.00
ADD HYD	140.13	63&64	65	.07884	11.37	2.640	.62778	1.499	.225	
*S ********** TOTAL NORTH DOMINGO BACA FLOW AT LOWELL STREET **********										
ADD HYD	NDB.4	41&65	66	1.06627	1282.02	77.530	1.36333	1.832	1.879	
SEDIMENT TRANSP	NDB.4	66	SED ID = 4		PEAK CONC.(PPM-w) =	57644	TOTAL SED.(TONS) =	4770.85		
FINISH										

County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

June 21, 1996

Roger A. Paul, P.E.
Hydrology Review Section
County Public Works Department
2400 Broadway SE
Albuquerque, New Mexico 87102

RE: DRAINAGE REPORT FOR PRIMROSE POINTE, UNIT 3 (C22/D23)(PWD 95-128) SUBMITTED FOR PRELIMINARY PLAT APPROVAL, ENGINEER'S STAMP DATED MAY 1996.

Dear Mr. Paul:

Since Primrose Pointe is a County subdivision, the County remains the lead agency for approval. Based on the information provided in the submittal of May 21, 1996, it appears that the above referenced plan has adequately addressed all issues concerning the floodplain.

It is my understanding that the Letter of Map Revision (LOMR) for the portion of the North Domingo Baca Arroyo through the site has been requested as part of the study that RTI conducted for FEMA. Therefore, Community Sciences is not responsible for the submittal for the CLOMR for this arroyo. Community Sciences will be responsible for submitting the As-Built plans to FEMA after the channel construction is complete.

As you are aware there is a branch of the North Domingo Baca Arroyo which crosses the southeastern portion of Primrose Pointe Unit 1 (see attached exhibit). Community Sciences is responsible for obtaining the LOMR for the realignment of this floodplain. Until the LOMR is obtained for this floodplain, the Certificates of Occupancy for **each lot** affected by this floodplain will be withheld.

I assume that the development proposed for Units 3 and 4 are not within the erosion setback limit of the LaCueva tributary, since this was not shown on the plans. Any development north of these units must address the LaCueva floodplain.

If you should have any questions regarding these comments please call me at 768-2666.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: (with attachment)
Kent M. Whitman, P.E., Community Sciences Corp.
Kurt Browning, AMAFCA
File

County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

April 1, 1999

James L. Condit, P.E.
Community Sciences Corporation
Post Office Box 1328
Corrales, New Mexico 87048

RE: Drainage Report and Grading and Drainage Plan for Primrose Pointe, Unit 4 (C22/D23)(PWDN 990019) Submitted for Preliminary Plat Approval, Engineer's Stamp Dated 3/25/99 on Plans, Report Dated 1/28/99.

Dear Mr. Condit:

Based on the information provided in the submittals of February 1, 1999 and March 25, 1999, the above referenced plan is approved for Preliminary Plat action.

The Final Plat must provide the floodplain easement as shown on this approved plan.

Since the Lots are being platted outside the erosion setback limit of the arroyo, none of the private Lots will be encumbered by the FEMA floodplain. This information must be disclosed to the future property owners.

If you have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Brad Catanach, P.E., Bernalillo County Public Works Division
Lisa Ann Manwill, P.E., Albuquerque Metropolitan Arroyo Flood Control Authority
File

County of Bernalillo

State of New Mexico

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

February 17, 1999

Brad Catanach, P.E.
Drainage Engineer
Bernalillo County Public Works Division
2400 Broadway SE
Albuquerque, New Mexico 87102

RE: Drainage Report and Grading and Drainage Plan for Primrose Pointe, Unit 4 (C22/D23)(PWDN 990019) Submitted for Preliminary Plat Approval, Engineer's Stamp Dated 1/27/99 on Plans, Report Dated 1/28/99.

Dear Brad:

Since Primrose Pointe is a County subdivision, the County remains the lead agency for review and approval. With respect to the information provided with the above referenced submittal, I have the following comments concerning the floodplain and proposed slopes:

1. The plan must show the limits of the erosion setback (ESB) that we previously approved. It is unclear from this plan whether the proposed Lots encroach in the ESB. The plan must also show the limits of the existing FEMA floodplain and the AMAFCA easement.

2. Several of the details on Sheet 3 use 1:1 side slopes. I doubt that the soils can maintain 1:1 side slopes without some sort of treatment to keep them stable. Perhaps retaining walls should be considered.

If you have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: James L. Condit, P.E., Community Sciences Corporation
Lisa Ann Manwill, P.E., Albuquerque Metropolitan Arroyo Flood Control Authority
File

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA, N.W.
ALBUQUERQUE, NEW MEXICO 87102
ADMINISTRATION (505) 768-4000
COMMISSION (505) 768-4217
FAX (505) 768-4329

August 8, 1995

Roger A. Paul, P.E.
Hydrology Review Section
County Public Works Department
2400 Broadway SE
Albuquerque, New Mexico 87102

RE: DRAINAGE REPORT FOR PRIMROSE POINTE, UNIT 3 (C22/D23)(PWD 95-128) SUBMITTED FOR PRELIMINARY PLAT APPROVAL, ENGINEER'S STAMP DATED JUNE, 1995.

Dear Mr. Paul:

Since Primrose Pointe is a County subdivision, the County remains the lead review agency for comments. Therefore, my comments are as follows:

1. Based on the information provided in the above referenced submittal of July 19, 1995, the plan is approved with respect to floodplain issues.

2. The engineer should be aware that a Letter of Map Revision is required from FEMA for the channelization of the North Domingo Baca Arroyo. The engineer has not yet submitted a request for the Conditional Letter of Map Revision. This should be done as soon as possible. The application forms are available at my office and the request must be submitted to my office prior to my forwarding the request to FEMA.

If I can be of further assistance, please feel free to call me at 768-2666.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Chris Rivera, City Hydrology
Kent M. Whitman, Community Sciences Corp.
Kurt Browning, AMAFCA
File