City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 22, 2001

Kevin G. Patton, P.E.
BOHANNAN HUSTON
7500 Jefferson NE
Albuquerque, NM 87109

Re: Engineers Certification – Alameda Business Park (Overall Grading Plan) (C-16/D006) Submitted for Release of Financial Guaranty
Engineer's Stamp dated 2/19/1999
Engineering Certification Stamp dated 10/31/2000

Dear Mr. Patton:

Based upon the information provided in your submittal dated 11/2/2000, the Engineering Certification for the above referenced project is approved for Release of Financial Guaranty.

If I can be of further assistance, please contact me at 924-3986

Sincerely,

Bradley L. Bingham, PE
Hydrology Review Engineer

C: Arlene Portillo, PWD – #611581
file

C 161 D6

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
SANTA FE

THOMAS C. TURNEY
State Engineer

BATAAN MEMORIAL BUILDING, ROOM 101
POST OFFICE BOX 25102
SANTA FE, NEW MEXICO 87504-5102
(505) 827-6175
FAX: (505) 827-6188

July 19, 2000

Mr. James D. Hughes, P.E.
Mark Goodwin & Associates, P.A.
P.O. Box 90606
Albuquerque, New Mexico 87199

RE: Alameda Business Park Detention Pond and Lift Station - OSE File No. SP-04793 - Rio Grande Basin

Dear Mr. Hughes:

Enclosed is your copy of the approved Permit to Construct a Flood Control Dam (Detention Pond) with conditions of approval. Please submit the required mylar as-built drawings and the Proof of Completion of Works - Surface Waters to the State Engineer - Water Rights Division upon completion of the project. Forms for this filing are enclosed for your use. A filing fee of $25.00 is required as indicated on the attached copy of a receipt.

If your clients are aggrieved by the Conditions of Approval, you (or they) should so advise this office in writing before the expiration of thirty (30) days after receipt of this letter and request that the previous action of the State Engineer be set aside and that a date for hearing be set by the State Engineer.

If I can be of further assistance, please call me at (505) 827-6191.

Sincerely,

Jim L. Sizemore

Jim L. Sizemore, P.E.
Water Rights Division

cc: District I, Albuquerque (w/encls)

C16-6

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

March 9, 2000

Mr. George Holly
Wastewater Utility
City of Albuquerque
4201 Second Street SW
Albuquerque, NM 87105

Re: Alameda Business Park - Lift Station

Dear Mr. Holly:

Attached please find the corrected System Head Calculations and Pump Curve. Note that the 12" diameter was used in the calculations even though 10" was shown in the equation. So there is no change in the pump selection.

Please call with any further questions or concerns that might impact the wet well dimensions.

Sincerely,

MARK GOODWIN & ASSOCIATES, PA

James D. Hughes, PE
Senior Engineer

JDH/sw

xc: Susan Calongne

f:\\alameda bp\correct.shc

D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmg@swcp.com

PROJECT Alameda Business Park
SUBJECT Lift Station
BY _____ DATE _____
CHECKED _____ DATE _____
SHEET ____ OF ____

System Head Calculations

5054.6 Force Main Outlet Elev.
- 4996.0 Pump Elev.
58.6' Static Head

2119.92 LF — 12" Force Main PVC.
55.00 LF — 5 Bends, 45° 11 LF equivelant pipe length
60.00 LF — 4 Bends 90° 15 LF " " "
140.00 LF — 1 Check Valve 140 LF " " "
2375 LF - Total Equivelant Pipe Length

$h_f = 10.44 \times (2375')$
$C = 130$

$$\frac{Q^{1.85}}{C^{1.85}(12")^{4.8655}}$$

Q gpm	$(h_f)+(58.6')$ feet
250	59.0 ✓
500	60.0 ✓
1000	~~63.5~~ 64.6
1500	~~69.1~~ 71.4
2000	~~76.9~~ 80.46
3000	~~98.5~~ 104.89
4000	~~128.0~~ 137.42
5000	~~166.0~~ 177.70
4500	~~146.0~~ 156.61

Corrected 3-9-00 James D. Hughes

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 5, 1999

Kevin Patton, P.E.
Bohannan-Huston, Inc.
7500 Jefferson NE
Albuquerque, New Mexico 87109

RE: Drainage Report and Grading and Drainage Plan for Alameda Business Park (C16/D6) Submitted for Site Development Plan for Subdivision Approval, Preliminary and Final Plat Approval, and Grading and Paving Permit Release, Engineer's Stamp Dated 2/19/99.

Dear Mr. Patton:

Based on the information provided in the submittal of February 19, 1999, the above referenced plan is approved for Site Development Plan for Subdivision and Preliminary Plat action by the DRB.

After Preliminary Plat approval by the DRB, the Rough Grading Permit may be released. As you are aware, a top-soil disturbance permit is required prior to any grading on this site.

Prior to Final Plat sign-off, the Subdivision Improvements Agreement (SIA) must be in place. All public Infrastructure, including paving, will be approved with the DRC plans. Prior to DRC plan sign-off, please provide me with a typical cross-section for the private cross-Lot drainage swales. The Grading and Drainage Certification is required prior to release of the SIA.

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

Sincerely,

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

c: Michael Mechenbier, Owner
File

REVISED DRAINAGE REPORT
FOR THE
ALAMEDA BUSINESS PARK
(TRACT B-1-A-1)

FEBRUARY 17, 1999

PREPARED BY:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET N.E.
ALBUQUERQUE, NM 87109

PREPARED FOR:

MICHAEL MECHENBIER
4400 ALAMEDA BLVD. NE
ALBUQUERQUE, NM. 87113

PREPARED BY:

Carla Gomez 2/18/1999

Carla Gomez, E.I. Date

UNDER THE SUPERVISION OF:

KEVIN G. PATTON NEW MEXICO 13688 REGISTERED PROFESSIONAL ENGINEER 2/18/1999

Kevin Patton, P.E. Date

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I. PURPOSE

The purpose of this report is to provide site-specific drainage analysis for existing, interim and ultimate conditions for the commercial development of *The Alameda Business Park*. This plan is prepared and submitted to support rough grading, infrastructure design, the site development plan, and preliminary and final plat approvals.

This report will reference the following City of Albuquerque and the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) approved studies: 1) the *Drainage Master Plan for Vista Del Norte Subdivision*, dated March 18, 1998, prepared by Avid Engineering, Inc. and the amended portions added to that report, letter dated June 18, 1998.

The *Drainage Master Plan for Vista Del Norte Subdivision*, dated June 18, 1998, was prepared to serve as the Drainage Master Plan for the proposed development of the Vista Del Norte Subdivision located in the lower northeast heights and zoned SU-1 for mixed uses. The Vista Del Norte Subdivision is 408 acres in size and is bounded by Osuna Road and developed commercial properties on the south; developed residential and industrial properties on the west; Paseo Del Norte and Way-Cor Concrete Plant on the north; and the AMAFCA North Diversion Channel on the east. The *Drainage Master Plan for Vista Del Norte Subdivision* identifies the major infrastructure required to handle the 100-year storm runoff.

II. METHODOLOGIES

Please refer to the above referenced reports for the specific methodologies used in preparing those individual reports or plans.

Site conditions are analyzed for a 100-year, 6-hour storm events in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM), Volume 2, Design Criteria, Section 22.2, Hydrology for the City of Albuquerque, January 1993.

The site, as described in the 'Site Location and Characteristics' section below, is approximately 66.13 acres. A hydrologic computer program (AHYMO) and Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres were used.

III. SUMMARY OF THE RELATED PLATTING AND EASEMENTS

There is currently a slope easement located along the western boundary of the Alameda Business Park boundary. It is our desire to vacate this existing slope easement along the western boundary because it is no longer necessary. The enclosed grading plan proposes to slope up from Edith Boulevard at a 3:1 in order to tie to the proposed grades along the western boundary. The grade differential could have been accomplished by the slope proposed or by the construction of a series of retaining walls. Each lot within the proposed Alameda Business Park Development is required to submit a package to EPC which includes a grading and drainage plan. The development of those lots adjacent to Edith Boulevard may construct a series of retaining walls in order to take advantage of more developable area. Subsequently, the slope easement is not a necessity for the construction of public infrastructure. Therefore a request has been made for its vacation.

Tract A will contain the interim retention pond and permanent detention pond and pump station. This tract will be given to the City of Albuquerque so as to maintain and operate the pond and future pump station. The pump station will discharge storm water to the existing AMAFCA North Diversion Channel within the public right of way within the Alameda Business Park and the necessary public storm drain easements. The future Alameda Business Park Pump Station will receive storm water flow from the Vista Del Norte Pond via a 24" RCP located within the public rights of way of El Pueblo Road and Edith Boulevard.

IV. SITE LOCATION AND CHARACTERISTICS

For location of the site, please refer to the vicinity map on the grading and drainage plan enclosed with this report. The legal description for this site is currently Tract B-1-A-1, Lands of Springer Building Materials Corporation. This report will refer to this site as the Alameda Business Park.

The Alameda Business Park is located in the lower northeast heights of Albuquerque, on Zone Atlas page C-16. The project is bounded on the east by the AMAFCA Diversion Channel, on the south by the General Mills Property, on the north by Alameda Boulevard and on the west by Edith Boulevard. Access to the site, as supported by the recently submitted Traffic Impact Analysis, will be provided from the existing entrance stubbed from Alameda Boulevard. The site is currently zoned SU-2, IP-EP and is approximately 66.13 acres in size.

The site contains a fenced stockpile area and a fenced construction yard along its western boundary near Edith Boulevard. The construction yard contains a number of isolated buildings and trailers. The existing site is consistently higher (twenty feet or more) than Edith Boulevard and consistently lower (fifteen feet or more) than the AMAFCA Diversion Channel.

Vegetation on the site consists primarily of prairie grasses and a few juniper trees. Slopes in the project site range from 2% to 50%, with the majority of the project sloping from east to west at 2% to 15%. The Soil Conservation Service has classified the soils on this site as Embudo Tijeras complex, Embudo gravely fine sandy loam, and Tijeras gravely fine sandy loam, all of which correspond to a common hydrological soil group classification of B.

V. EXISTING HYDROLOGIC AND SITE DRAINAGE CONDITIONS

The existing site consists of six major on site drainage basins, labeled Basins A – F and seven off-site drainage basins, labeled Basins G - L. For additional assistance, please refer to the Existing Conditions Basin Map located in the Exhibit section of this report (see Exhibit 2).

Most of the existing onsite basins contain isolated depressions as a result of past mining excavations and construction activities. These existing ponding areas provide little storage of runoff due to small upland basin that would feed them. Therefore, the description of the following existing onsite basins have assumed no runoff storage or the effects associated the minor retention storage that may occur.

The majority of runoff from **Basin A (9.14 acres, Q_{100}=26.29 cfs)** currently drains via sheet flow and shallow concentrated flows (small existing natural arroyos) from the eastern boundary westward towards Basin C. The existing AMAFCA Diversion Channel along the eastern boundary of Basins A and E prevents flows from entering this site.

Basin B (4.90 acres, Q_{100}= 14.09 cfs) currently drains via sheet flow and shallow concentrated flows to Edith Boulevard (Basin J).

Basin C (14.93 acres, Q_{100}=42.94 cfs) along with flows from Basin A above and Basin E below, currently drain via sheet flow and shallow concentrated flows through Basin C to Edith Boulevard (Basin J).

Basin D (18.87 acres, Q_{100}=54.27 cfs) currently drains through an arroyo onto Edith Boulevard (Basins J and K).

Basin E (16.72 acres, Q_{100}=48.09 cfs) currently drains via sheet flow and shallow concentrated flows (small existing natural arroyos) from the eastern boundary westward towards Basin C.

Basin F (2.31 acres, Q_{100}=6.64 cfs) currently drains via sheet flow and shallow concentrated flows to Edith Boulevard (Basin I).

Basin G (0.24 acres, 0.69 cfs) is an off-site basin consisting of the eastern portion of Alameda Boulevard. The basin currently drains storm water runoff from the eastern portion of Alameda eastward via existing curb and gutter.

Basin H (1.20 acres, Q_{100}=3.45 cfs) is the remaining portion of Alameda Boulevard north and east of this site. Inlets downstream of the existing entrance stubbed into this site capture a portion of the runoff from Basin H and discharge it to a small existing pond that overflows across Edith and spills into a larger existing pond on the west side of Edith. The residual amount of runoff from the inlets continues westward down Alameda Boulevard.

Basin I (0.61 acres, Q_{100}=1.49 cfs) is an off-site basin within Edith Boulevard along the northwest area of our site. The runoff from this basin along with the flow from Basin F travels northward on Edith Boulevard away from this site. Runoff currently drains off the public right of way into a ponding area along the west side of Edith Boulevard.

Basin J (4.15 acres, Q_{100}=10.12 cfs) is one of two existing basins within Edith Boulevard that drains to a low point in the roadway. Basin K also contains a low point in the roadway that ponds storm water runoff. An existing irrigation channel along the western side of Edith Boulevard currently accepts any runoff from Basins J and K. Basin J currently accepts storm water runoff from Basins B, C, A, E and 1/8 of the flow from D **($Q_{100\ combined}$=175.24 cfs)** above.

Basin K (1.40 acres, Q_{100}=3.41 cfs) is the second of two basins in Edith Boulevard that contain a low point in the roadway. Storm water runoff from this basin ponds within the roadway before spilling over into the irrigation channel along its western boundary. Basin K also accepts 1/8 of the flows from Basin D above.

Basin L (0.35 acres, Q_{100}=0.85 cfs) is an off-site basin consisting of the southern half of a portion of Alameda Boulevard. This basin currently drains storm water runoff from the southern half of Alameda into Basin C via the existing curb and gutter from the stubbed entrance into this site.

A. FEMA Flood Plain

There are no FEMA Flood Plains within this site. There is however, an AMAFCA Diversion Channel adjacent to and along the eastern boundary of this site.

VI. PHASE 1 DEVELOPED HYDROLOGIC AND HYDRAULIC CONDITIONS

For additional assistance throughout this section, please refer to the Grading and Drainage Plan, the Proposed Conditions Basin Map enclosed within the Exhibit section of this report. Verification of basin flows, street, inlet and culvert capacities can be found in the Appendix of this report.

The initial development associated with the first phase of construction will grade and construct the infrastructure to serve the entire site. A temporary retention pond will be built on site along the western boundary, adjacent to Edith Boulevard. This temporary retention pond will exist for no more than two years prior to the construction of a permanent detention pond and pump station at the same location. The temporary retention pond has been sized (Volume = 12.15 acre-feet) for the 100 year 24 hour storm event during this two-year period.

State Engr. approval?

The Second Phase of construction will build the permanent detention pond and the pump station that will serve this and the Vista Del Norte Pond described in the Phase 2 section below. The permanent detention pond will be sized (Volume = 9.55 acre-feet) for the 100-year 6-hour storm event that serves this site and the section of Edith Boulevard along its western frontage. The pump station will be designed to pump a controlled flow rate from the Vista Del Norte Pond and the Alameda Business Park Pond to the AMAFCA Diversion Channel.

The proposed site will be divided into **nine** off-site basins, labeled Basins 21 – 23, 13 – 14, 24, and 27; and **twenty-four** on-site basins labeled Basins 1 – 6, 8, 10 – 12, 16 – 20, 28, and 31 – 33.

The site will remain consistent with its vertical relation ship to the AMAFCA North Diversion Channel and Edith Boulevard. As indicated on the grading and drainage plan, the site will slope down from the North Diversion Channel at a maximum slope of 3:1; with the maximum vertical drop of approximately 15 feet. The site will also slope down to Edith Boulevard with a maximum slope of 3:1; proposing a maximum vertical drop of approximately 24 feet. The slopes

along the North Diversion Channel and Edith Boulevard will be re-seeded as a part of the first phase and might be landscaped with the future development of each individual lot. Hay crimping the slope is recommended as a erosion control while the seeding has time to establish.

Basin 1 (5.02 acres, Q_{100}=21.77 cfs) contains two lots located at the northeast corner of this site. The basin runoff sheet flows into Alameda Park Drive directed southward. The public roadway directs flows from Basin 1 and **Basin 14 (0.39 acres, Q_{100}=1.36 cfs)** to the intersection of Alameda Park Drive with Paseo Alameda. Basin 14, an offsite basin, is the southern half of Alameda Drive that currently drains into this site via the existing entrance stubbed off of Alameda. This site finds no problem in accepting this small amount of runoff from Alameda. **Basin 27 (1.28 acres, Q_{100}=4.47 cfs)** is the northern half of Alameda Boulevard that continues its runoff westward away from this site. Inlets located in Alameda west of the site entrance pick up a portion of the flow and direct it northward via the existing storm drain and culverts. **Basin 24** (0.40 acres, 1.4 cfs) is the eastern portion of Alameda that continues its runoff eastward away from the site.

Basin 2 (13.00 acres, Q_{100}=56.38 cfs) contains six lots along the eastern boundary of the site. The runoff from this basin also sheet flows into Alameda Park Drive and is directed northward toward the intersection with Paseo Alameda. The flow is combined with Basins 1 and 14 above via the low point in Alameda Park Drive at the intersection with Paseo Alameda. The combined flow **(Q_{100}=79.51 cfs)** is then directed down Paseo Alameda where it is immediately intercepted by two double grate Type "A" inlets (one located on each side of the street). The inlets accept **12.7 cfs** each allowing **54.15 cfs** to pass by. A third double grate Type "C" inlet is located just downstream of the type A's mentioned above. This third inlet accepts **10 cfs** and allows **44.15 cfs** to pass by. A 24" RCP storm drain beneath Paseo Alameda directs the runoff (accepted from the inlets) toward the drainage pond within Tract A below.

Basin 17 (3.78 acres, Q_{100}=16.31 cfs) contains three lots which drain runoff toward an asphalt lined swale along the back edge of the lots. A private drainage easement encompasses the swale that directs runoff toward Paseo Alameda. Sidewalk culverts constructed within Paseo Alameda are designed to accept 10 year – 6 hr runoff. Larger events would travel over the sidewalk culverts into the roadway. The analysis and sizing of the asphalt-lined swale can be found in the appendix portion of this report. The design of the swales within this report is such

that the energy grade line is below the top of the swale. The runoff from Basin 17 is combined with the residual flow from the inlets mentioned in Basin 2 above. The combined flow **(Q_{100}=60.46 cfs)** continues down Paseo Alameda where it picks up a portion of runoff from Basin 3 and 12. This storm water **(Q_{100}=69.2 cfs)** is intercepted by one double grate Type "C" inlet located between lots 30 and 46. The inlet accepts **12 cfs** and allows **57.2 cfs** to pass by. The 30" RCP storm drain beneath Paseo Alameda directs the storm water toward the drainage pond in Tract A below.

4.34 cfs/ac

Basin 3 (5.51 acres, Q_{100}=23.90 cfs) contains five lots that drain the developed runoff from those lots to Paseo Alameda. **Basin 12 (3.52 acres, Q_{100}=15.27 cfs)** contains three lots that drain to Paseo Alameda. Portions of runoff from the lots within Basins 3 and 12 are combined with the residual storm water traveling down Paseo Alameda. A double grate Type "C" inlet located between lots 5 and 6 intercepts the runoff **(Q_{100}=61.34 cfs)** in Paseo Alameda. The inlet accepts **11 cfs** and allows **50.34 cfs** to pass by. The residual runoff from this inlet continues to receive runoff from the surrounding basins **(Q_{100}=54.79 cfs)** as it travels down the roadway. Two double grate Type "C" inlets, one located between lots 6 and 7 accepts **9.80 cfs** while the other between lots 46 and 45 accepts **9.50 cfs** and allows **39.73 cfs** to continue by. One final double grate Type "C" inlet intercepts runoff in Paseo Alameda before the roadway intersects with Calle Alameda. This inlet receives **8.6 cfs** as **35.49 cfs** continues through the intersection.

Basin 19 (1.16 acres, Q_{100}=5.03 cfs) contains two lots, 37 and 38, along Alameda Park Drive toward the southeastern area of the site. These lots drain into an asphalt-lined swale located toward the back of the lots. The back lot swale directs flows north to a asphalt-lined side yard swale between lots 40 and 41 in Basin 4, which intern discharges through sidewalk culverts into Calle Alameda. As mentioned above, the sidewalk culverts throughout this site are designed to pass the 10-year 6-hr storm event.

Basin 18 (2.19 acres, Q_{100}=9.50 cfs) is north of Basin 19 above and drains in a similar manner. Each of the four lots in Basin 18 drain toward a swale located in the rear of the lots. The asphalt-lined swale directs runoff to a sideyard swale between lots 43 and 44 in Basin 4, which intern discharges through sidewalk culverts into Calle Alameda.

Basin 20 (2.32 acres, Q_{100}=10.06 cfs) contains three lots and drains in the same manner as Basins 18 and 19 above. Two of the three lots, lots 31 and 32, within this basin drain to the

4.34 cfs/ac

rear of the lot, at which point a swale directs runoff to Calle Alameda via a sideyard swale along Lot 44. The flow discharges into Calle Alameda through sidewalk culverts.

Basin 4 (3.91 acres, Q_{100}=16.96 cfs) is comprised of five lots and Calle Alameda. Runoff from each lot within this basin sheet flows into Calle Alameda. A portion of the storm water from Basin 4 combined with the runoff from Basin 19 above**(Q_{100}=26.22 cfs)** is intercepted in Calle Alameda by one double grate Type "A" inlet located between lots 42 and 43. The inlet accepts **6.60 cfs** and allows **19.62 cfs** to pass by. The double grate Type "A" inlet located between lots 48 and 47 accepts **6.0 cfs** from Calle Alameda and forces **13.62 cfs** to continue down. A double grate Type "C" inlet located next to the knuckle PC, down stream of lot 44, will receive flow from the residual from the inlets mentioned above as well as the runoff from Basin 18 and 20. This inlet accepts **6.60 cfs** from Calle Alameda and permits **29.06 cfs** to continue down. The residual from this inlet is then intercepted down stream by two double grate Type "C" inlets (one located on each side of the street). Each inlet accepts **5.7 cfs** allowing **17.66 cfs** to pass by. The storm drain beneath Calle Alameda directs the storm water from the inlets above toward the drainage pond in Tract A below.

Basin 11 (3.40 acres, Q_{100}=14.75 cfs) contains four lots and a portion of Vista Alameda. Basin 11 is located at the southeast corner of the site. The runoff from this basin sheet flows to Vista Alameda. There is a retaining wall with a maximum height of 4' that extends along the south end of Lots 16 – 21. There is a small area along the southern boundary of Basin 11, along Lots 13 – 16, that slopes upward toward the property boundary in order to tie to natural grade. This sloped area ties to existing grade at the southern boundary at a 3:1 maximum and is contained within a maximum 11-foot wide strip.

Basin 33 is a maximum 9' wide pond 0.5' deep that is located on the north side of the retaining wall along Lots 17 – 19. The slopes of the pond slope at 2:1 from the north edge of the pond and slope at 3:1 from the south edge of the pond at the top of the retaining wall. This area will pond drain .38 cfs that will drain onto the southern property (General Mills).

Basin 10 (3.90 acres, Q_{100}=16.91 cfs) contains six lots along the southern portion of this site. The runoff from this basin sheet flows to Vista Alameda.

Basin 5 (3.04 acres, Q_{100}=13.18 cfs) contains four lots and is located along Calle Alameda. The runoff from this basin drains toward the rear on the lot where flow is caught in the

typical asphalt lined swale. The runoff within this back yard swale is directed to a sideyard swale between lot 57 and 58 in Basin 8. Runoff from this swale is directed to Paseo Alameda through sidewalk culverts.

The runoff from **Basin 6 (6.19 acres, Q_{100}=26.85 cfs)** combined with the runoff from Basins 10 and 11 (from Vista Alameda) will drain to Paseo Alameda northward. This runoff will drain to a low point in Paseo Alameda, at which point the flow is combined with residual runoff heading south from the intersection from Calle Alameda and Basin 8.

Basin 8 (2.60 acres, Q_{100}=11.28 cfs) contains three lots that sheet flow to Paseo Alameda. Basin 8 contains a side yard swale between lots 57 and 58 that accepts and transports runoff from Basin 5 above. The runoff from this swale discharges through sidewalk culverts to Paseo Alameda. The flow in Paseo Alameda is then directed south to the low point in the roadway.

This combined flow from above in Paseo Alameda **(Q_{100}=115.69 cfs)** located in the sump condition will be captured by three double grate, double wing Type "A" inlets. The flow from these inlets is transported to the storm drain under Paseo Alameda. The storm drain then ushers the storm water to the adjacent temporary retention pond below. The temporary retention pond is located within Tract A, which is adjacent to the low point found in Paseo Alameda. Upon the construction of the pump station (within two years) the temporary retention pond becomes a permanent detention pond, owned and maintained by the City of Albuquerque.

Basin 13 (0.10 acres, Q_{100}=0.35 cfs) and **Basin 28 (0.46 acres, Q_{100}=0.88 cfs)** are tie back slope areas that drain to **Basin 21 (0.61 acres, Q_{100}=2.65 cfs)** in Edith Boulevard. The combined runoff from these basins will continue to flow north in Edith Boulevard as it always has.

Basin 16 (1.60 acres, Q_{100}=3.07 cfs) and **Basin 31 (0.33 acres, Q_{100}=0.63 cfs)** are portions of the tie back sloped area along the western boundary of the site that drains to **Basin 22 (3.62 acres, Q_{100}=15.7 cfs)** within Edith Boulevard. The combined storm water within Edith currently drains to a low point in the roadway spilling over into the irrigation channel along the western right of way. The runoff will continue to drain in this fashion until Edith is built into a four-lane divided road with curb and gutter. Upon the development of the four-lane roadway, two single grate double wing Type "A" inlets will be located on the east side of the road at the sump in the road. A single grate double wing Type "A" inlet will be located on the west side of the road at the

sump in the road. Storm water will then be direct from inlet into a storm drain under Edith, which will be directed to the detention pond within Tract A.

Basin 32 (0.88 acres, Q_{100}=1.69 cfs) is the remaining portion of tieback sloped areas along the western boundary of the Alameda Business Park. Basin 32 drains to **Basin 23 (1.05 acres, Q_{100}=4.55 cfs)** within Edith Boulevard. The combined flow (**Q_{100}=6.24 cfs)** from Basins 32 and 23 will drain to a low point within Basin 23 until the development of the future four-lane roadway. After the development of the future four-lane roadway, a portion of the runoff from these basins will be captured by two single grate Type "A" inlets in Edith Boulevard at the south end of the site (two inlets on each side of the roadway). The runoff caught in the inlets will then be directed into the Edith Storm Drain that was built between the Vista Del Norte and Alameda Business Park Ponds.

Basin 7 (3.08 acres, Q_{100}=13.36 cfs) is the area of Tract A that contains the temporary retention pond as a part of Phase 1. The temporary retention pond volume (100 year 24 hour storm event) required for the fully developed condition of the Alameda Business Park along with the future development of Edith Boulevard is **12.15 acre-feet**.

Basin 7 (Tract A) will also contain the future pump station and detention pond as a part of Phase 2. The next section below describes in more detail the relationship between the pump station and the permanent detention ponds in Vista Del Norte and the Alameda Business Park.

VII. PHASE 2 DEVELOPED HYDROLOGICAL AND HYDRAULIC CONDITIONS (CONTRIBUTION FROM VISTA DEL NORTE)

For additional assistance throughout this section, please refer to the Edith Boulevard Storm Drain Plan and Profile Sheet and the Vista Del Norte Drainage Plan and Interim Grading Plan enclosed within the Exhibit section of this report.

The North Basin on the Vista Del Norte Drainage Plan will drain storm water runoff to its North Detention Pond. As shown on the Vista Del Norte Drainage Plan, the volume required for the proposed detention pond on the **Vista Del Norte Drainage Plan** is 21.92 acre-feet. Our analysis has determined that the runoff volume required is **20.94 acre-feet**.

In order to drain the site within in a 96 hour period a controlled flow rate of 4.15 cfs will discharge from the Vista Del Norte Pond into a 24" RCP storm drain directed toward the Alameda Business Park Pond. The public storm drain will be located within the El Pueblo Road right of way from the Vista Del Norte Pond to Edith Boulevard. The storm drain will continue up Edith Boulevard until it discharges into the Alameda Business Park Pond. The public storm drain within Edith Boulevard will pick up a small amount of storm water captured by a couple of future inlets within the future development of Edith.

The only inlets contributing to the storm drain between the Alameda Business Park and Vista Del Norte ponds is that portion of Edith Boulevard along the southwestern area of the Alameda Business Park. The remaining portion of Edith Boulevard along the Alameda Business Park Site will be serviced by a separate public storm drain system discharging into the Alameda Business Park Pond.

As mentioned above, Edith Boulevard is currently a two-lane roadway with no curb and gutter and contains two low points along the Alameda Business Parks western boundary. This report has analyzed the future development of Edith Boulevard based upon a four-lane divided roadway with a continuous southward slope from the southern high point. The future development of Edith will have a 2% crown in the road and will require two single Type "A" inlets on the east side and one on the west side (with wings on both sides) be constructed at the first low point mentioned above. Also, a Type "A" double inlet and a Type "A" single inlet at the south end of the site will be located on the east and west sides of the road, respectively. A single Type "A" double grate double wing inlet will accept approximately 50 cfs.

The storm water runoff from Edith Boulevard and the Vista Del Norte enter the Alameda Business Park Pond and are combined with the flow from our site. The combined runoff from the **Alameda Business Park Pond** is then **discharge**d at a controlled rate of **6.75 cfs** into the **Pump Stations wet well**. A volume of **9.55 acre-feet** and controlled discharge of **6.75 cfs** are needed to drain the Alameda Business Park Pond within the required 96-hour period. The pump station, located adjacent to the Alameda Business Park Pond, will pump the controlled discharge from the

wet well to the AMAFCA North Diversion Channel (above the water surface elevation in the channel) through the public roadways and easements within the site. The pump station will be designed to meet the City of Albuquerque Standard Specifications. Currently, meetings have been scheduled with City personal to discuss the design of the proposed pump station. A number of existing safety factors is available should any problems occur. For example, the pump station will be designed with a back up system; for any reason that the back up system failed the Alameda Business Park Pond would drain to Edith Boulevard which would carry it southward and possible end up in the irrigation ditch adjacent to its west right-of-way.

The concept of draining the Vista Del Norte and Alameda Business Park Ponds with one pump station is a great benefit to the City and the Developers. This idea will reduce the Cities responsibility of owning and operation more than one pump station.

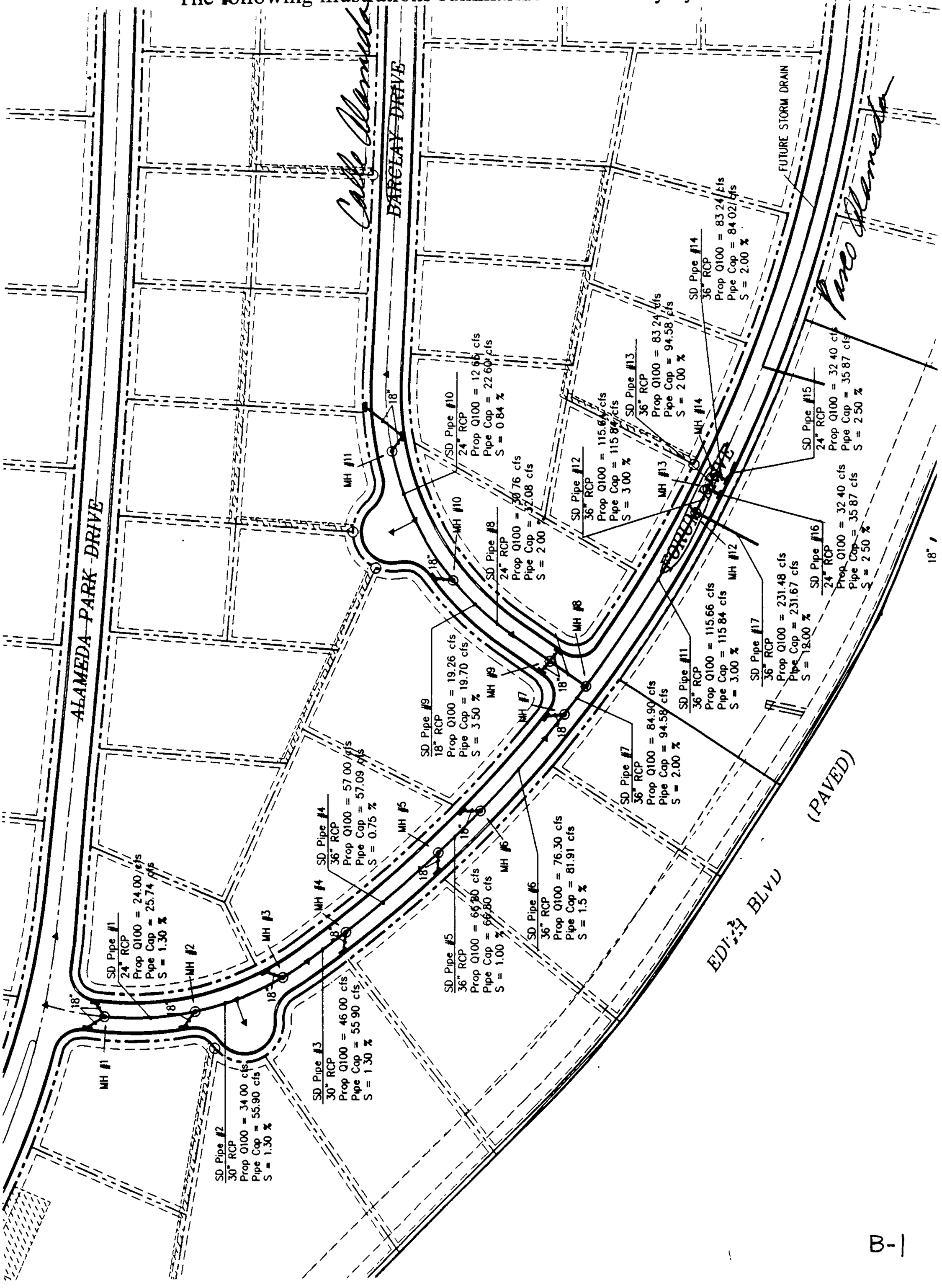
The construction of the public storm drain in Edith Boulevard will be associated with the development of the Vista Del Norte North Detention Pond and or the upgrade of Edith Boulevard. The Alameda Business Park will construct the Pump Station within two years of the completion of the public onsite infrastructure.

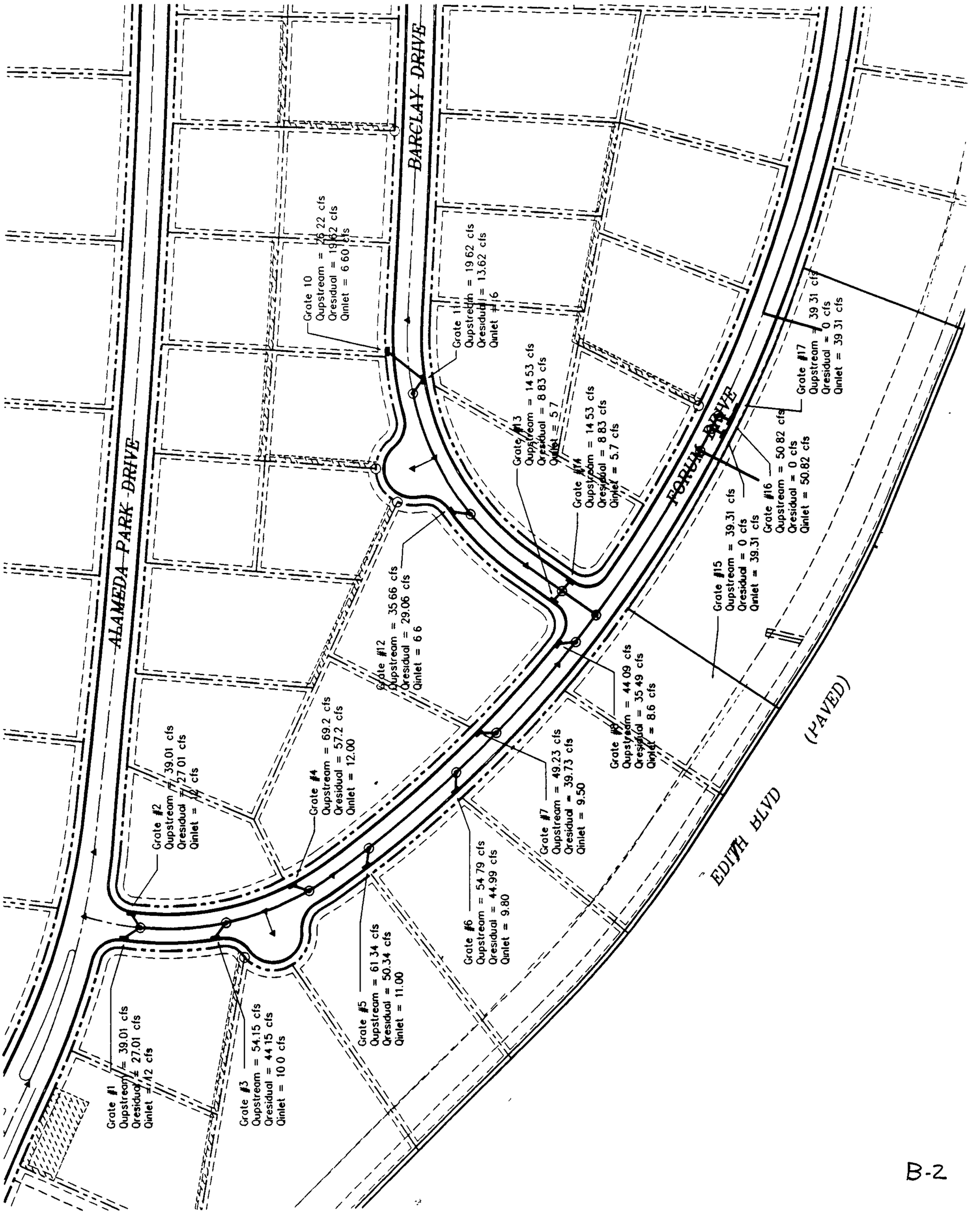
VIII. CONCLUSION

This report has presented a comprehensive drainage management plan for the proposed developments. The plan provides safe and adequate drainage protection for the both the Vista Del Norte North Basin as well as the Alameda Business Park (including Edith Boulevard along its frontage).

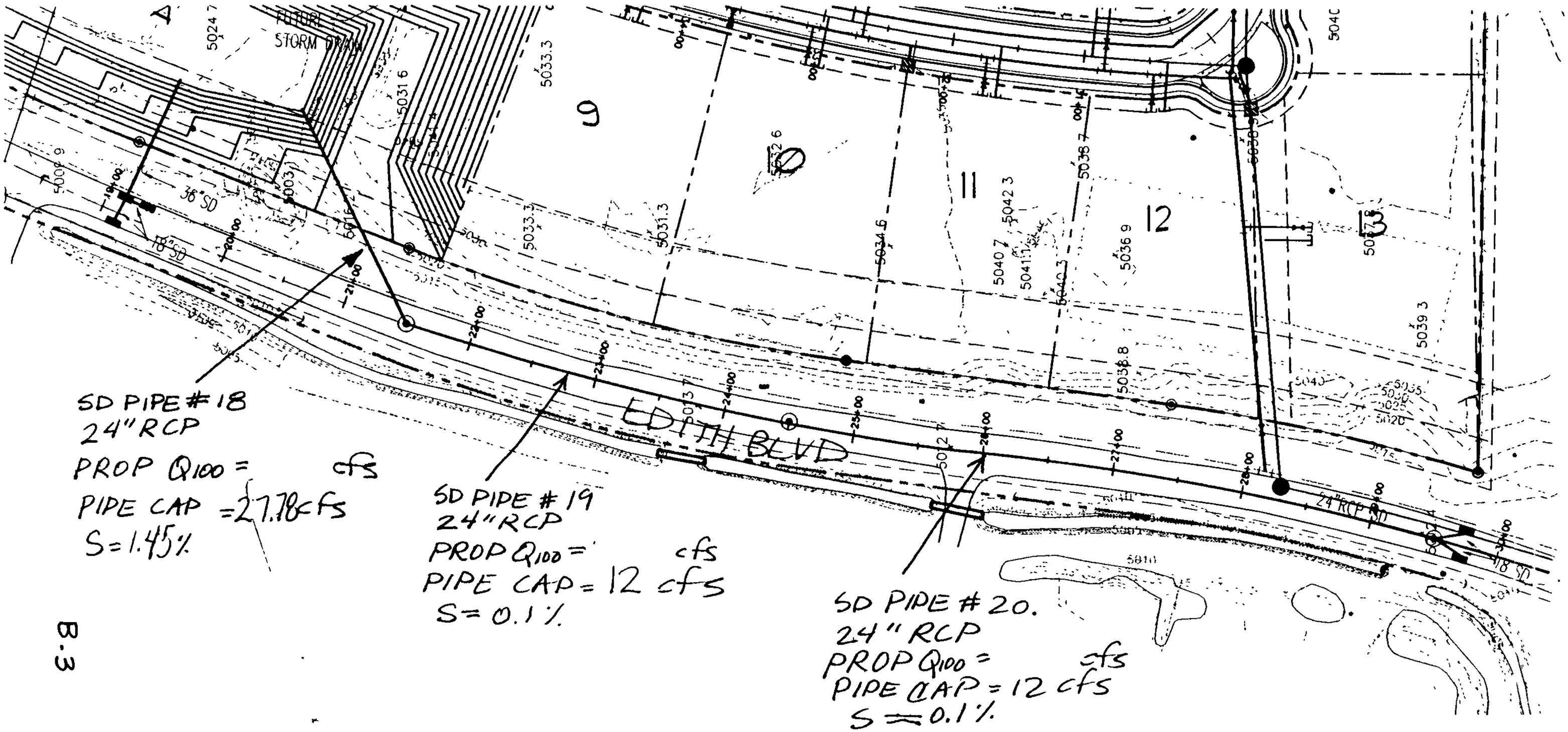
Therefore, it is recommended that this plan be approved for rough grading, site development plan, preliminary and final platting approval and actions.

The following illustrations summarize the roadway hydraulics



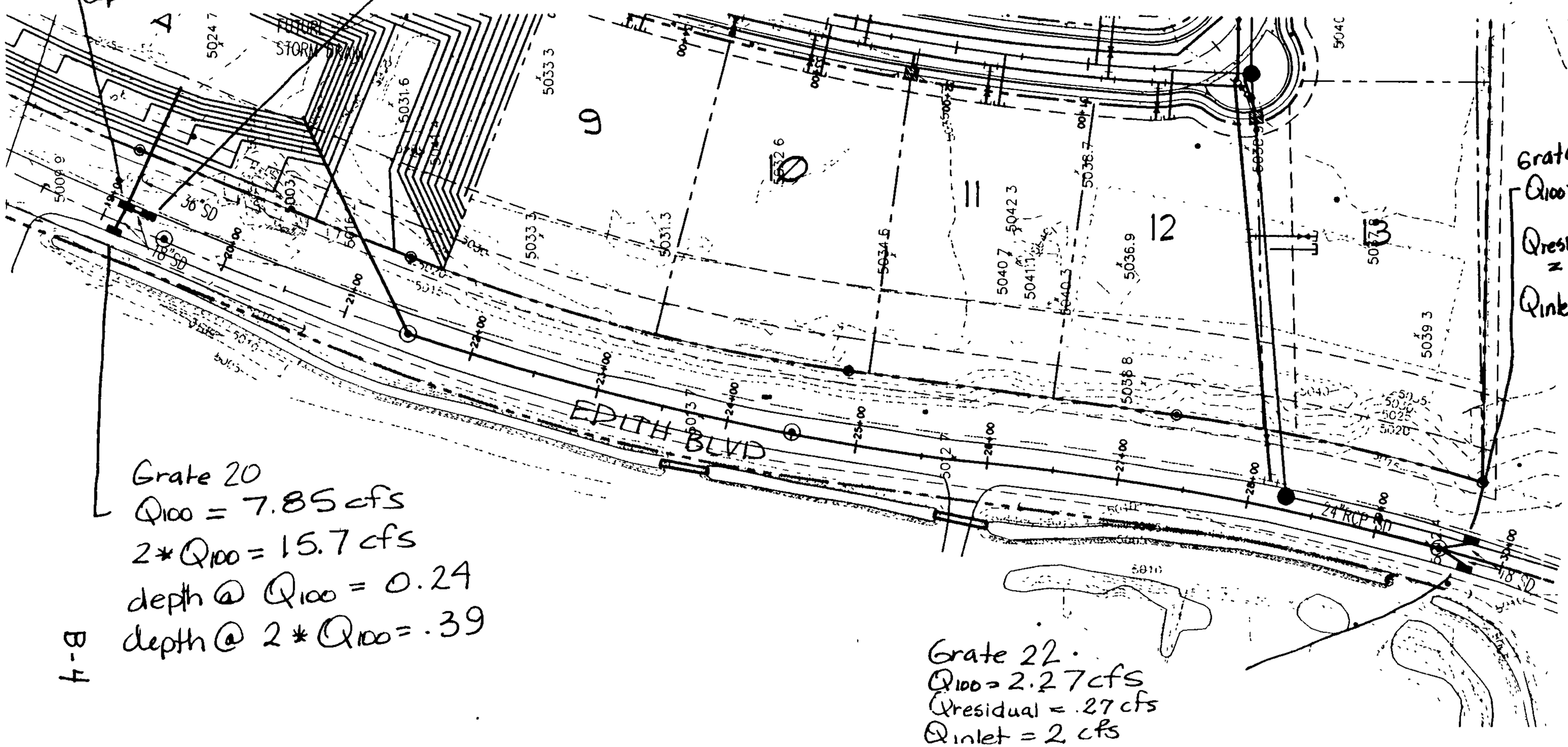

ALAMEDA PARK DRIVE
BARCLAY DRIVE
FORUM DRIVE
EDITH BLVD
(PAVED)
Grate 10
Qupstream = 76 22 cfs
Qresidual = 19 62 cfs
Qinlet = 6 60 cfs
Grate 11
Qupstream = 19 62 cfs
Qresidual = 13.62 cfs
Qinlet #16
Grate #13
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5 7
Grate #14
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5.7 cfs
Grate #15
Qupstream = 39.31 cfs
Qresidual = 0 cfs
Qinlet = 39.31 cfs
Grate #16
Qupstream = 50 82 cfs
Qresidual = 0 cfs
Qinlet = 50.82 cfs
Grate #17
Qupstream = 39 31 cfs
Qresidual = 0 cfs
Qinlet = 39 31 cfs
Grate #12
Qupstream = 3
Qresidual = 29.
Qinlet = 6 6
Grate #2
Qupstream = 39.01 cfs
Qresidual = 27 01 cfs
Qinlet = 12 cfs
Grate #4
Qupstream = 69.2 cfs
Qresidual = 57.2 cfs
Qinlet = 12.00
Grate #1
Qupstream = 39.01 cfs
Qresidual = 27.01 cfs
Qinlet = 12 cfs
Grate #3
Qupstream = 54.15 cfs
Qresidual = 44 15 cfs
Qinlet = 10 0 cfs
Grate #5
Qupstream = 61 34 cfs
Qresidual = 50.34 cfs
Qinlet = 11.00
Grate #6
Qupstream = 54 79 cfs
Qresidual = 44.99 cfs
Qinlet = 9.80
Grate #7
Qupstream = 49.23 cfs
Qresidual = 39.73 cfs
Qinlet = 9.50
Grate #8
Qupstream = 44 09 cfs
Qresidual = 35 49 cfs
Qinlet = 8.6 cfs

B-2


FUTURE
STORM DRAIN
36" SD
18" SD
24" RCP SD
18" SD
EDITH BLVD
11
12
13
SD PIPE #18
24" RCP
PROP Q100 = cfs
PIPE CAP = 27.78 cfs
S = 1.45%
SD PIPE # 19
24" RCP
PROP Q100 = cfs
PIPE CAP = 12 cfs
S = 0.1%
SD PIPE # 20.
24" RCP
PROP Q100 = cfs
PIPE CAP = 12 cfs
S = 0.1%

Grate 18
Q_{100} = 5.78 cfs
$2 * Q_{100}$ = 11.55 cfs
depth @ Q_{100} = 0.2
depth @ $2 * Q_{100}$ = .31

Grate 19
Q_{100} = 5.78 cfs
$2 * Q_{100}$ = 11.55 cfs
depth @ Q_{100} = 0.2
depth @ $Q_{100} * 2$ = .31



Grate 20
Q_{100} = 7.85 cfs
$2 * Q_{100}$ = 15.7 cfs
depth @ Q_{100} = 0.24
depth @ $2 * Q_{100}$ = .39

Grate 22
Q_{100} = 2.27 cfs
Qresidual = .27 cfs
Qinlet = 2 cfs

ORIFICE ANALYSIS OF A PIPE IN AN INLET

ORIFICE:

18" RCP Q=CA(2GH)^.5

C=0.6 Diameter (inches) = **18**

DEPTH OF INLET **4.00**

AREA (SF) = 1.77

WS ELEVATION (ft)	HEIGHT ABOVE ABOVE C.L. OF PIPE (ft)	Q (CFS) ORIFICE / DOUBLE GRATE	COMMENTS
0.00	0.00	0.00	
1.70	0.20	3.80	
1.90	0.40	5.38	
2.10	0.60	6.59	
2.30	0.80	7.61	
2.50	1.00	8.50	
2.70	1.20	9.32	
2.90	1.40	10.06	
3.10	1.60	10.76	
3.30	1.80	11.41	
3.50	2.00	12.03	
3.70	2.20	12.61	
3.90	2.40	13.18	
4.10	2.60	13.71	*Flows are less than 12 cfs

*Note: Inlets 1-14 on Forum Drive and Barclay will have an inlet depth of at least 4 feet. The flows into these inlets with acception to the inlets into the pond are less than 13 cfs capable of handling orifice capacity.

PIPE ANALYSIS AT AN INLET

ORIFICE:

36" RCP Q=CA(2GH)^.5

C=0.6

DEPTH OF INLET 4.00

AREA (SF) = 7.07

WS ELEVATION	HEIGHT ABOVE ABOVE C.L. OF PIPE	Q (CFS) ORIFICE / DOUBLE GRATE	COMMENTS
0.00	0.00	0.00	
3.00	1.50	41.66	
3.20	1.70	44.35	
3.40	1.90	46.89	
3.60	2.10	49.30	
3.80	2.30	51.59	
4.00	2.50	53.79	
4.20	2.70	55.90	
4.40	2.90	57.93	
4.60	3.10	59.89	
4.80	3.30	61.80	
5.00	3.50	63.64	
5.20	3.70	65.43	
5.40	3.90	67.18	
5.60	4.10	68.88	
5.80	4.30	70.54	
6.00	4.50	72.16	
6.20	4.70	73.75	
6.40	4.90	75.30	
6.60	5.10	76.82	
6.80	5.30	78.31	
7.00	5.50	79.78	
7.20	5.70	81.22	
7.40	5.90	82.63	
7.60	6.10	84.02	
7.80	6.30	85.38	
8.00	6.50	86.73	
8.20	6.70	88.05	
8.40	6.90	89.36	
8.60	7.10	90.64	Inlet 17 + 16 = 90.13 cfs
8.80	7.30	91.91	

PIPE ANALYSIS AT AN INLET

ORIFICE:

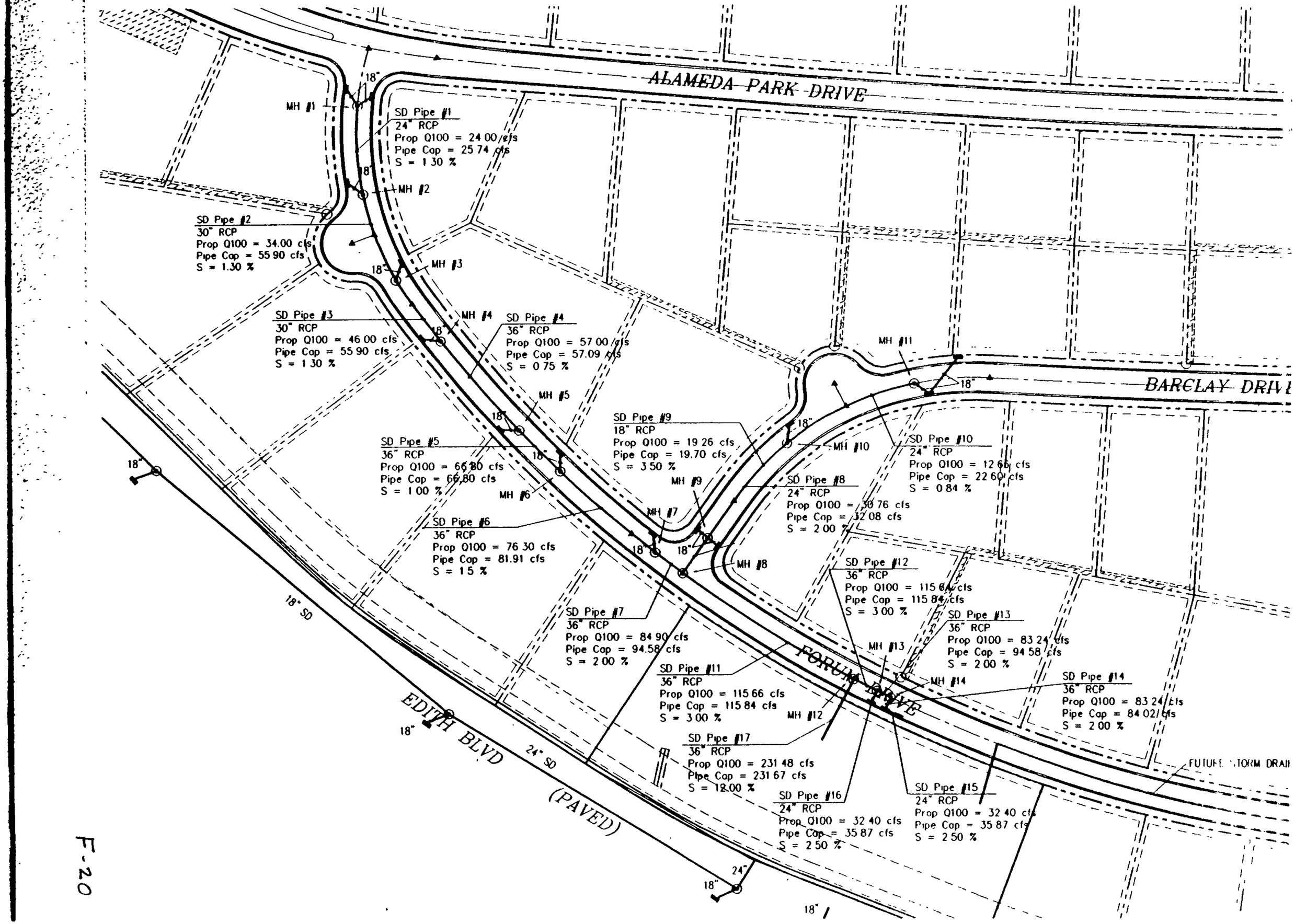
24" RCP Q=CA(2GH)^.5

C=0.6

DEPTH OF INLET 5.00

AREA (SF) = 3.14

WS ELEVATION	HEIGHT ABOVE ABOVE C.L. OF PIPE	Q (CFS) ORIFICE / DOUBLE GRATE	COMMENTS
0.00	0.00	0.00	
2.00	1.00	15.12	
2.20	1.20	16.56	
2.40	1.40	17.89	
2.60	1.60	19.12	
2.80	1.80	20.28	
3.00	2.00	21.38	
3.20	2.20	22.43	
3.40	2.40	23.42	
3.60	2.60	24.38	
3.80	2.80	25.30	
4.00	3.00	26.19	
4.20	3.20	27.05	
4.40	3.40	27.88	
4.60	3.60	28.69	
4.80	3.80	29.47	
5.00	4.00	30.24	
5.20	4.20	30.98	
5.40	4.40	31.71	
5.60	4.60	32.43	
5.80	4.80	33.12	
6.00	5.00	33.81	
6.20	5.20	34.48	
6.40	5.40	35.13	
6.60	5.60	35.78	
6.80	5.80	36.41	
7.00	6.00	37.03	
7.20	6.20	37.65	
7.40	6.40	38.25	
7.60	6.60	38.84	
7.80	6.80	39.43	Inlet 15 & 17 take 39.3 cfs


ALAMEDA PARK DRIVE
BARCLAY DRIVE
FORUM DRIVE
EDITH BLVD (PAVED)
18" SD
24" SD
FUTURE STORM DRAIN
MH #1
MH #2
MH #3
MH #4
MH #5
MH #6
MH #7
MH #8
MH #9
MH #10
MH #11
MH #12
MH #13
MH #14
SD Pipe #1
24" RCP
Prop Q100 = 24.00 cfs
Pipe Cap = 25.74 cfs
S = 1.30 %
SD Pipe #2
30" RCP
Prop Q100 = 34.00 cfs
Pipe Cap = 55.90 cfs
S = 1.30 %
SD Pipe #3
30" RCP
Prop Q100 = 46.00 cfs
Pipe Cap = 55.90 cfs
S = 1.30 %
SD Pipe #4
36" RCP
Prop Q100 = 57.00 cfs
Pipe Cap = 57.09 cfs
S = 0.75 %
SD Pipe #5
36" RCP
Prop Q100 = 66.80 cfs
Pipe Cap = 66.80 cfs
S = 1.00 %
SD Pipe #6
36" RCP
Prop Q100 = 76.30 cfs
Pipe Cap = 81.91 cfs
S = 1.5 %
SD Pipe #7
36" RCP
Prop Q100 = 84.90 cfs
Pipe Cap = 94.58 cfs
S = 2.00 %
SD Pipe #8
24" RCP
Prop Q100 = 30.76 cfs
Pipe Cap = 32.08 cfs
S = 2.00 %
SD Pipe #9
18" RCP
Prop Q100 = 19.26 cfs
Pipe Cap = 19.70 cfs
S = 3.50 %
SD Pipe #10
24" RCP
Prop Q100 = 12.66 cfs
Pipe Cap = 22.60 cfs
S = 0.84 %
SD Pipe #11
36" RCP
Prop Q100 = 115.66 cfs
Pipe Cap = 115.84 cfs
S = 3.00 %
SD Pipe #12
36" RCP
Prop Q100 = 115.66 cfs
Pipe Cap = 115.84 cfs
S = 3.00 %
SD Pipe #13
36" RCP
Prop Q100 = 83.24 cfs
Pipe Cap = 94.58 cfs
S = 2.00 %
SD Pipe #14
36" RCP
Prop Q100 = 83.24 cfs
Pipe Cap = 84.02 cfs
S = 2.00 %
SD Pipe #15
24" RCP
Prop Q100 = 32.40 cfs
Pipe Cap = 35.87 cfs
S = 2.50 %
SD Pipe #16
24" RCP
Prop Q100 = 32.40 cfs
Pipe Cap = 35.87 cfs
S = 2.50 %
SD Pipe #17
36" RCP
Prop Q100 = 231.48 cfs
Pipe Cap = 231.67 cfs
S = 18.00 %

ALAMEDA PARK DRIVE

Grate #1
Qupstream = 39.01 cfs
Qresidual = 27.01 cfs
Qinlet = 12 cfs

Grate #2
Qupstream = 39 01 cfs
Qresidual = 27 01 cfs
Qinlet = 12 cfs

Grate #3
Qupstream = 54.15 cfs
Qresidual = 44 15 cfs
Qinlet = 10 0 cfs

Grate #4
Qupstream = 69 2 cfs
Qresidual = 57 2 cfs
Qinlet = 12 00

Grate #5
Qupstream = 61 34 cfs
Qresidual = 50.34 cfs
Qinlet = 11.00

Grate #12
Qupstream = 35 66 cfs
Qresidual = 29 06 cfs
Qinlet = 6 6

Grate 10
Qupstream = 26 22 cfs
Qresidual = 19 62 cfs
Qinlet = 6 60 cfs

BARCLAY DRIVE

Grate 11
Qupstream = 19 62 cfs
Qresidual = 13 62 cfs
Qinlet = 6

Grate #6
Qupstream = 54 79 cfs
Qresidual = 44 99 cfs
Qinlet = 9 80

Grate #7
Qupstream = 49 23 cfs
Qresidual = 39.73 cfs
Qinlet = 9 50

Grate #13
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5 7

Grate #14
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5 7 cfs

Grate #9
Qupstream = 44 09 cfs
Qresidual = 35.49 cfs
Qinlet = 8 6 cfs

FORUM DRIVE

Grate #15
Qupstream = 39 31 cfs
Qresidual = 0 cfs
Qinlet = 39.31 cfs

Grate #16
Qupstream = 50 82 cfs
Qresidual = 0 cfs
Qinlet = 50 82 cfs

Grate #17
Qupstream = 39 31 cfs
Qresidual = 0 cfs
Qinlet = 39 31 cfs

EDITH BLVD (PAVED)

ORIFICE ANALYSIS OF A PIPE IN AN INLET

ORIFICE:

18" RCP Q=CA(2GH)^.5

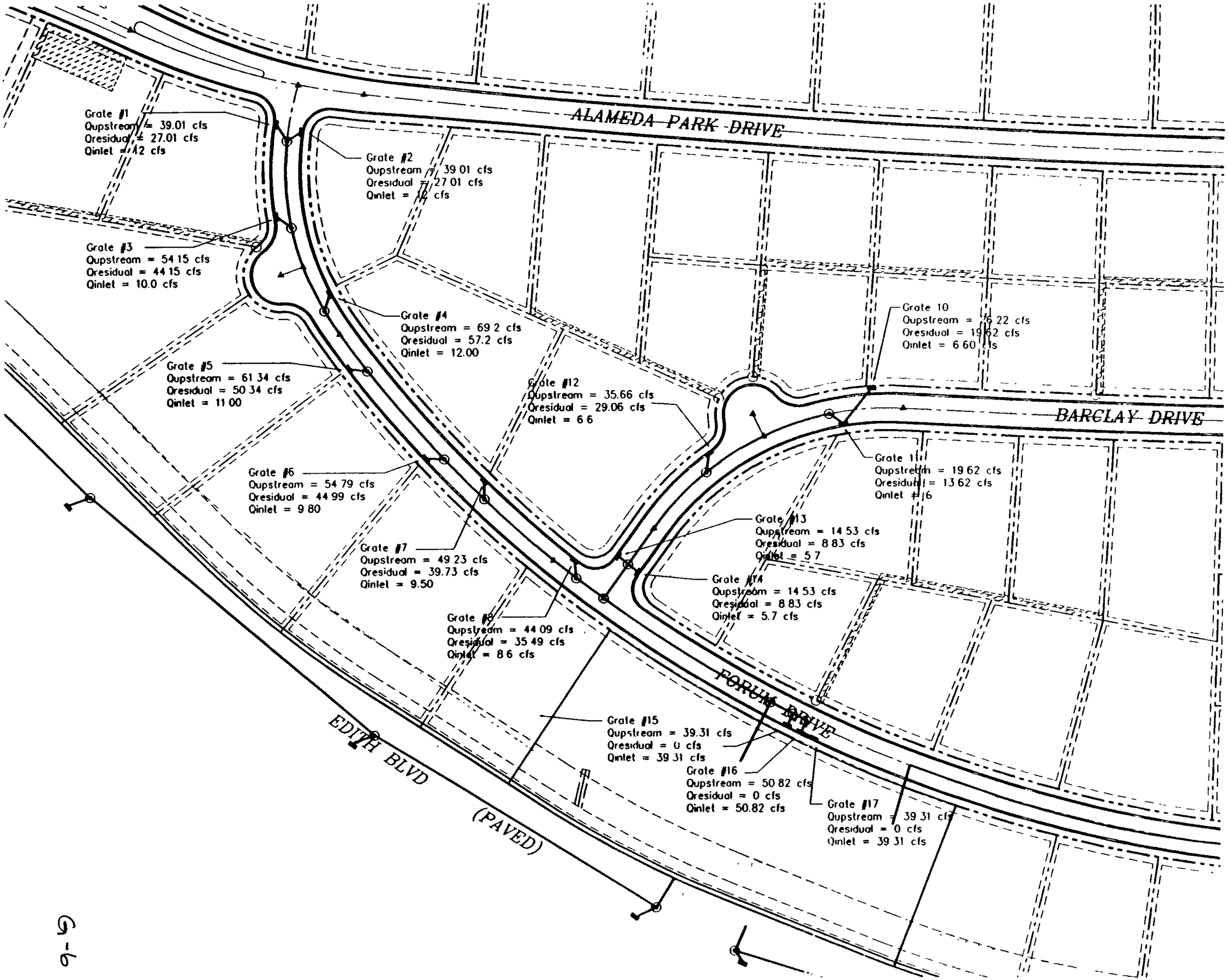
C=0.6 Diameter (inches) = **18**

DEPTH OF INLET **4.00**

AREA (SF) = 1.77

WS ELEVATION (ft)	HEIGHT ABOVE ABOVE C.L. OF PIPE (ft)	Q (CFS) ORIFICE / DOUBLE GRATE	COMMENTS
0.00	0.00	0.00	
1.70	0.20	3.80	
1.90	0.40	5.38	
2.10	0.60	6.59	
2.30	0.80	7.61	
2.50	1.00	8.50	
2.70	1.20	9.32	
2.90	1.40	10.06	
3.10	1.60	10.76	
3.30	1.80	11.41	
3.50	2.00	12.03	
3.70	2.20	12.61	
3.90	2.40	13.18	
4.10	2.60	13.71	*Flows are less than 12 cfs

*Note: Inlets 1-14 on Forum Drive and Barclay will have an inlet depth of at least 4 feet. The flows into these inlets with acception to the inlets into the pond are less than 13 cfs capable of handling orifice capacity.


ALAMEDA PARK DRIVE
BARCLAY DRIVE
FORUM DRIVE
EDITH BLVD
(PAVED)
Grate #1
Qupstream = 39.01 cfs
Qresidual = 27.01 cfs
Qinlet = 12 cfs
Grate #2
Qupstream = 39 01 cfs
Qresidual = 27 01 cfs
Qinlet = 12 cfs
Grate #3
Qupstream = 54 15 cfs
Qresidual = 44 15 cfs
Qinlet = 10.0 cfs
Grate #4
Qupstream = 69 2 cfs
Qresidual = 57.2 cfs
Qinlet = 12.00
Grate #5
Qupstream = 61 34 cfs
Qresidual = 50 34 cfs
Qinlet = 11 00
Grate #6
Qupstream = 54 79 cfs
Qresidual = 44 99 cfs
Qinlet = 9 80
Grate #7
Qupstream = 49 23 cfs
Qresidual = 39.73 cfs
Qinlet = 9.50
Grate #8
Qupstream = 44 09 cfs
Qresidual = 35 49 cfs
Qinlet = 8 6 cfs
Grate #12
Qupstream = 35.66 cfs
Qresidual = 29.06 cfs
Qinlet = 6 6
Grate 10
Qupstream = 6 22 cfs
Qresidual = 19 62 cfs
Qinlet = 6 60 cfs
Grate 11
Qupstream = 19 62 cfs
Qresidual = 13 62 cfs
Qinlet = 6
Grate #13
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5 7
Grate #14
Qupstream = 14 53 cfs
Qresidual = 8 83 cfs
Qinlet = 5.7 cfs
Grate #15
Qupstream = 39.31 cfs
Qresidual = 0 cfs
Qinlet = 39 31 cfs
Grate #16
Qupstream = 50 82 cfs
Qresidual = 0 cfs
Qinlet = 50.82 cfs
Grate #17
Qupstream = 39 31 cfs
Qresidual = 0 cfs
Qinlet = 39 31 cfs

ALAMEDA PARK DRIVE

BARCLAY DRIVE

FORUM GROVE

EDITH BLVD (PAVED)

18" SD

24" SD

FUTURE STORM DRAIN

MH #1

MH #2

MH #3

MH #4

MH #5

MH #6

MH #7

MH #8

MH #9

MH #10

MH #11

MH #12

MH #13

MH #14

SD Pipe #1
24" RCP
Prop Q100 = 24.00 cfs
Pipe Cap = 25.74 cfs
S = 1.30 %

SD Pipe #2
30" RCP
Prop Q100 = 34.00 cfs
Pipe Cap = 55.90 cfs
S = 1.30 %

SD Pipe #3
30" RCP
Prop Q100 = 46.00 cfs
Pipe Cap = 55.90 cfs
S = 1.30 %

SD Pipe #4
36" RCP
Prop Q100 = 57.00 cfs
Pipe Cap = 57.09 cfs
S = 0.75 %

SD Pipe #5
36" RCP
Prop Q100 = 66.80 cfs
Pipe Cap = 66.80 cfs
S = 1.00 %

SD Pipe #6
36" RCP
Prop Q100 = 76.30 cfs
Pipe Cap = 81.91 cfs
S = 1.5 %

SD Pipe #7
36" RCP
Prop Q100 = 84.90 cfs
Pipe Cap = 94.58 cfs
S = 2.00 %

SD Pipe #8
24" RCP
Prop Q100 = 30.76 cfs
Pipe Cap = 32.08 cfs
S = 2.00 %

SD Pipe #9
18" RCP
Prop Q100 = 19.26 cfs
Pipe Cap = 19.70 cfs
S = 3.50 %

SD Pipe #10
24" RCP
Prop Q100 = 12.66 cfs
Pipe Cap = 22.60 cfs
S = 0.84 %

SD Pipe #11
36" RCP
Prop Q100 = 115.66 cfs
Pipe Cap = 115.84 cfs
S = 3.00 %

SD Pipe #12
36" RCP
Prop Q100 = 115.66 cfs
Pipe Cap = 115.84 cfs
S = 3.00 %

SD Pipe #13
36" RCP
Prop Q100 = 83.24 cfs
Pipe Cap = 94.58 cfs
S = 2.00 %

SD Pipe #14
36" RCP
Prop Q100 = 83.24 cfs
Pipe Cap = 84.02 cfs
S = 2.00 %

SD Pipe #15
24" RCP
Prop Q100 = 32.40 cfs
Pipe Cap = 35.87 cfs
S = 2.50 %

SD Pipe #16
24" RCP
Prop Q100 = 32.40 cfs
Pipe Cap = 35.87 cfs
S = 2.50 %

SD Pipe #17
36" RCP
Prop Q100 = 231.48 cfs
Pipe Cap = 231.67 cfs
S = 18.00 %

ANALYSIS OF AN INLET IN A SUMP CONDITION - **EDITH BLVD EASTSIDE & WESTSIDE**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet

WEIR: Q=C*L*H^1.5

Wing opening
C= 3.0
L= 4.0 ft
Q=3.0(4.0')H**1.5= 12.0H**1.5

Grate opeining
C=3.0
L(double grate)=[2(2.67')+2(1.8')]=8.94 ft
Q=3.0(8.94)H^1.5=26.82*H^1.5

ORIFICE: Q=C*A*(2*G*H)**0.5

Grate opening
C=0.6
A(double grate)=8.19 sf
Q=4.194*(64.4*H)^0.5

Wing opening
C=0.6
A=2.0 sf
Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	Eastside:
	0.30	0.30	1.97	4.41	21.60	8.35	2 inlets @ 100 yr, Inlet 18,19 = 5.8 cfs each
	0.40	0.40	3.04	6.78	24.94	12.86	2 inlets @ 2*100 yr, Inlet 18,19 = 11.55 cfs each
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	Westside:
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	1 inlet @ 100 yr, Inlet 20 = 7.85 cfs each
	0.80	0.80	8.59	19.19	35.27	36.36	1 inlets @ 2*100 yr, Inlet 20 = 15.7 cfs each
	0.90	0.90	10.25	22.90	37.41	43.39	
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	

NOTE: The total runoff intercepted by the inlet at the low point in Edith Blvd:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)]

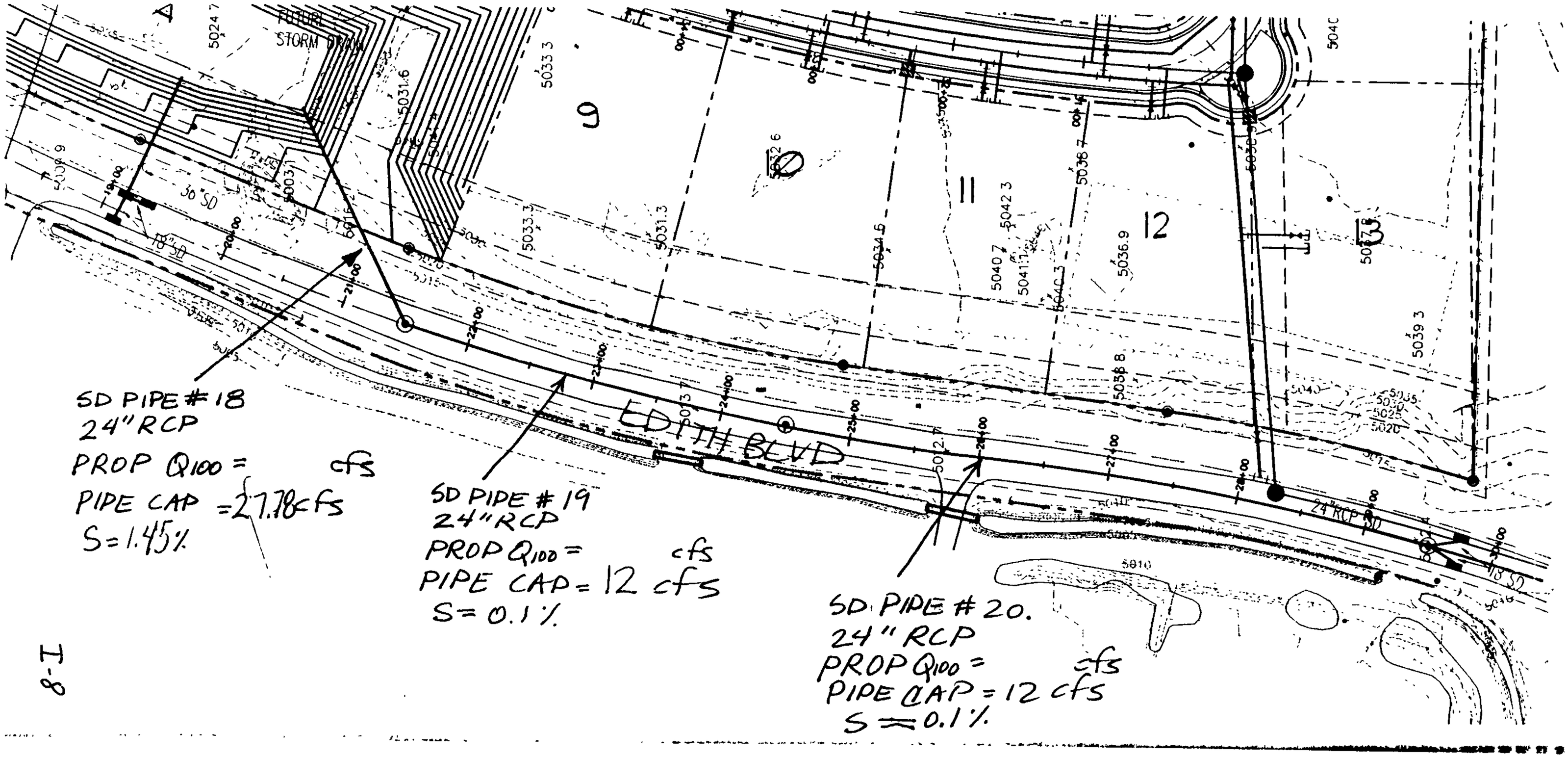
THE 100 YR STORM EVENT = the values above at the sump conditior

Inlets 18 and 19 will be located on the side of Edith Blvd at the low point in the street.

Inlet 20 will be located on the West side of Edith Blvd at the low point in the street.


Grate 18
Q_{100} = 5.78 cfs
2 * Q_{100} = 11.55 cfs
depth @ Q_{100} = 0.2
depth @ 2 * Q_{100} = .31
Grate 19
Q_{100} = 5.78 cfs
2 * Q_{100} = 11.55 cfs
depth @ Q_{100} = 0.2
depth @ Q_{100} * 2 = .31
Grate 20
Q_{100} = 7.85 cfs
2 * Q_{100} = 15.7 cfs
depth @ Q_{100} = 0.24
depth @ 2 * Q_{100} = .39
Grate 21
Q_{100} = 3.9 cfs
$Q_{residual}$ = 1.67 cfs
Q_{inlet} =
Grate 22
Q_{100} = 2.27 cfs
$Q_{residual}$ = .27 cfs
Q_{inlet} = 2 cfs
FUTURE STORM DRAIN
36" SD
18" SD
24" RCP SD
EDITH BLVD
9
10
11
12
13

I-7



SD PIPE #18
24" RCP
PROP Q100 = cfs
PIPE CAP = 27.78 cfs
S = 1.45%

SD PIPE #19
24" RCP
PROP Q100 = cfs
PIPE CAP = 12 cfs
S = 0.1%

SD PIPE # 20.
24" RCP
PROP Q100 = cfs
PIPE CAP = 12 cfs
S = 0.1%

8-I

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =12/10/1998
INPUT FILE = P:\98144\HYDRO\STUDY\MMALLPD.HYM USER NO.= BOHN_HNM.STE

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 PROJECT TITLE: SPRINGER BLDG. LANDS, MIKE MECHENBIER SITE
S JOB NO.: 98 144A2 07
S DATE: DECEMBER 10, 1998
S
S FILE NAME: MMALLPD.HYM
S FILE LOCATION: 98144\HYDRO\STUDY\
S
S COMMENTS:
S
S 100-YEAR, 24-HOUR STORM
S
S FINAL DRAINAGE SOLUTION:
S RON BROWN'S SITE (VISTA DEL NORTE) WILL ROUTE RUNOFF THROUGH
S AN ON-SITE DETENTION POND. OUTFLOW WILL BE ROUTED TO EDITH
S BLVD AND INTO THE MECHENBIER POND. THE WET WELL WILL ACCEPT
S RUNOFF FROM THE MECHENBIER SITE (SPRINGER BUILDING LANDS)
S DETENTION POND. THE FULLY DEVELOPED EDITH BLVD. (ALAMEDA TO
S SOUTH EDGE OF MECHENBIER PROPERTY) WILL FLOW TO THIS POND.
S
S WATER FROM THE WET WELL WILL BE PUMPED TO THE NORTH
S DIVERSION CHANNEL.
S
S THIS MODEL WILL DETERMINE THE POND VOLUMES REQ'D WITH
S DIFFERENT OUTFLOW TO THE PUMP STATION.
S
S

START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.650
SEDIMENT BULK										PK BF =	1.02
S	RON BROWN'S VISTA DEL NORTE INUSTRIAL SITE - DEVELOPED										
S	"NORTH BASIN" WHICH CURRENTLY IS PLANNED TO DRAIN TO POND										
S	AND PUMP STATION										
S	HYDROGRAPH DEVELOPED FROM INFO ON THE PRELIM. BULK LAND PLAT										
S	PREPARED BY AVID										
COMPUTE NM HYD	BROWN	-	1	.25000	332.11	25.657	1.92431	1.760	2.076	PER IMP=	64.00
S	ROUTE THROUGH DUMMY DETENTION POND - ASSUME MIN 3.1 CFS										
S	OUTFLOW TO DRAIN W/IN 96 HOURS										
*S**** DUMMY POND = RECTANGULAR BASIN, 10' DEEP X 2.9 AC											
*S**** 7" ORIFICE, C=0.6, ORIFICE INVERT IS 3.5 FT BELOW THE ~~POND~~ BOTTOM ****											
ROUTE RESERVOIR	BROWNRT1	1	2	.25000	4.15	25.659	1.92443	4.960	.026	AC-FT=	20.939

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	ROUTE OUTFLOW THROUGH PIPE ALONG LOS ANGELES TO PASEO DEL									
S	NORTE, DOWN EDITH BLVD INTO THE MECHENBIER POND									
S	ASSUME PIPE IS 24" RCP									
ROUTE MCUNGE	BROWNRT2	2	3	.25000	4.15	25.659	1.92444	5.120	.026	CCODE = .2
ROUTE MCUNGE	BROWNRT3	3	4	.25000	4.15	25.659	1.92439	5.120	.026	CCODE = .2
ROUTE MCUNGE	INFLOW1	4	5	.25000	4.15	25.657	1.92426	5.280	.026	CCODE = .2
S	MIKE MECHENBIER SITE UNDER PROPOSED CONDITIONS (LIGHT									
S	INDUSTRIAL)									
COMPUTE NM HYD	MECH	-	1	.10300	184.04	11.082	2.01740	1.600	2.792	PER IMP= 70.00
S	EDITH BOULEVARD DEVELOPED CONDITIONS									
COMPUTE NM HYD	EDITH	-	2	.00850	22.57	.908	2.00230	1.440	4.150	PER IMP= 72.00
S	ADD EDITH TO MECH									
ADD HYD	MECHEDTH	1& 2	3	.11150	195.30	11.990	2.01624	1.600	2.737	
S	ADD BROWNRT4 AND MECHEDTH									
S	TOTAL INFLOW INTO MECH DET POND									
ADD HYD	ALLFLOW	5& 3	4	.36150	196.54	37.647	1.95263	1.600	.850	
S	ROUTE FLOW THROUGH MECH DET POND W/ 6-7 CFS OUTFLOW INTO WET									
S	WELL									
*S****	DUMMY POND = RECTANGULAR BASIN, 10' DEEP X 1.2 AC									
*S****	9" ORIFICE, C=0.6, ORIFICE INVERT IS 2.5 FT BELOW THE POND BOTTOM ****									
ROUTE RESERVOIR	MECHRT1	4	2	.36150	6.75	37.647	1.95265	3.680	.029	AC-FT= 9.547
FINISH										