ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Genny Donart <gennyd@iacivil.com>

I need a drainage report/plan. Help?

3 messages

Genny Donart <gennyd@iacivil.com> Tue, Jan 12, 2016 at 10:07 AM
To: Monica Ortiz <MOrtiz@cabq.gov>, Rudy Rael <RRael@cabq.gov>

Good morning.
I need a copy of the Drainage Report for the Diversion storm drain along Lochside, between Oakland and Eagle Rock.

Apparently it was created by Mark Goodwin and Associates. Is that a pdf? Could I get a copy of it emailed to me??

Genny Donart, P.E.
Registered Engineer

Isaacson & Arfman, P.A.
Consulting Engineering Associates

128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8842
gennyd@iacivil.com

Ortiz, Monica <mortiz@cabq.gov> Tue, Jan 12, 2016 at 11:33 AM
To: Genny Donart <gennyd@iacivil.com>
Cc: "Rael, Rudy E." <RRael@cabq.gov>

Good morning Genny, we do not have anything scanned for that project. The file number is C18D066 Oakland Estates Subdivision.

Monica Ortiz

Planning Department – Transportation & Hydrology
Development & Building Services Division
600 2nd St. NW, Suite 201
Albuquerque, NM 87102

CITY OF ALBUQUERQUE

March 21, 2005

Mark Goodwin, PE
Mark Goodwin & Associates
P.O. Box 90606,
Albuquerque, NM 87199

Re: Eagle Rock Storm Drain Allocation Plan
Engineer's Stamp dated 12-14-04, (C18/D64)

Dear Mr. Goodwin,

Based upon the information provided in your submittal dated 12-14-04, the above referenced Allocation Plan is approved by the City Hydrologist. In order to enact this plan, it must be publicly approved by the Development Review Board and all affected property owners must be notified of the DRB meeting. You should get on the agenda at your earliest convenience.

If you have any questions, please contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE, CFM
City Hydrologist.

C: file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

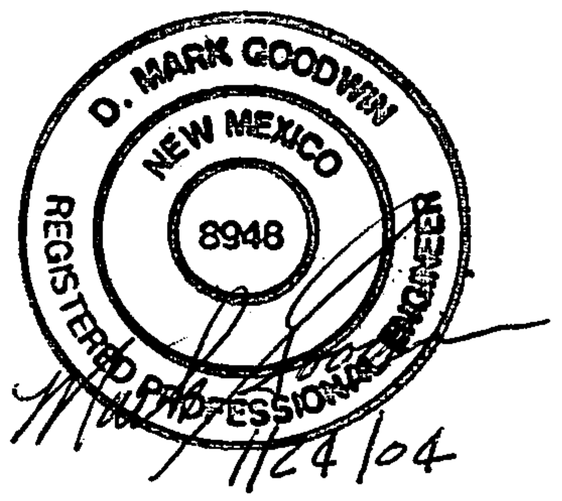
EAGLE ROCK STORM DRAIN

ALLOCATION PLAN

Proposed by:

Mark Goodwin & Associates
P.O. Box 90606
Albuquerque, NM 87199

January 2004



EAGLE ROCK AVENUE
STORM DRAINAGE INFRASTRUCTURE ALLOCATION PLAN

I. PURPOSE

*Under the guidelines established in the City of Albuquerque "Storm Drainage Infrastructure Allocation Procedure", this plan will assist in establishing the future developed drainage basin, and contributing sub-basins, that will deliver storm flows to Eagle Rock Avenue between San Pedro and Louisiana Boulevards (**Plate 1 - Basin Boundary Map).** This plan will quantify developed storm flows within the Eagle Rock Avenue Drainage Basin and design an adequately sized conveyance system to route the flows to a suitable downstream outfall point. Finally, this plan will equitably allocate all associated costs for the required system to properties within the basin that will benefit from the system.*

Reflected in this report are "main line" requirements with associated appurtenances to remove storm flows from the public roadways. No attempt has been made to predict future "secondary" system requirements that will route developed flows to the "main line" system. Any and all costs for individual 'secondary' systems will be the sole responsibility of each individual development within the drainage basin.

II. METHODOLOGY

*The proposed hydrological conditions presented in this report have been prepared utilizing the 100 year, 6 hour storm event in accordance with the revised City of Albuquerque Development Process Manual (DPM), dated January 1993 **(AHYMO - Appendix A)**. Future land use assumptions were made utilizing present zoning, and existing development trends within the basin limits. The new rational method hydrologic procedures identified within the revised DPM Section 22.2 were utilized to determine peak flow rates for design of the storm drainage improvements. . Manning's equation was used to assist in determining street and storm drain capacities. Storm sewer design was performed using current DPM methods for gravity flow systems (**Appendix B).***

*The estimated construction allocation costs calculated in this report include anticipated costs for engineering studies and design, surveying, planning, construction management, observation and administration, easements, and other incidental costs which may be incurred. Allocation costs were determined by proportioning the developed discharge of sub-basin properties to the total developed basin discharge. Since public right-of-way is not subject to a cost allocation, individual sub-basin allocation factors were adjusted accordingly to compensate for those areas (**Appendix C).***

III. BASIN BOUNDARY

A previous submittal to FEMA by AMAFCA was approved which removed all areas within the defined drainage basin from the 100-year floodplain.

In order to establish the developed Eagle Rock Drainage Basin limits a number of sources were utilized, including:

- *The Eagle Rock Subdivision Conceptual Drainage Master Plan prepared by Resource Technology, Inc. 1997.*
- *The Eagle Rock Subdivision Units 1-4 Drainage Reports by Mark Goodwin & Associates*
- *Topographical Mapping*
- *Meetings with City of Albuquerque Hydrology Division staff members.*

As a part of the required infrastructure improvements for the Eagle Rock Subdivision, Louisiana Boulevard has been constructed full width between Oakland Ave. and Modesto Ave. With that, any and all storm flows from the east that historically crossed Louisiana are now intercepted by the roadway and the storm drain system within it. Louisiana Blvd. thus serves as the easternmost, upstream boundary of the Eagle Rock Drainage Basin. With an existing 48"-54" storm drain already in place in San Pedro Blvd., and a parallel 60"-72" planned for the future that will intercept additional storm flows from the east, San Pedro Blvd. is at the western limits of the basin. To date, all development that has occurred between Eagle Rock Ave. and Modesto Ave. (Sub-basins D14, D15A, D15B & D16) have developed storm flows being conveyed south to Eagle Rock Avenue. It is assumed that as additional properties developed north of Eagle Rock Ave. this same drainage pattern will be followed. Thus, the northern limits of the Eagle Rock Drainage Basin has been identified as Modesto Avenue.

*From Louisiana Blvd. For a distance of approximately 1600', the southern limits of the defined basin has been establish midway between Oakland Ave. and Alameda Blvd. (**Plate 1**). From that point, to San Pedro Blvd. the remainder of the basin's southern boundary has been identified as being midway between Eagle Rock Ave. and Oakland Ave. The southern basin boundary was established as such to reduce future needs in both Oakland Ave. and in San Pedro Blvd., south of Eagle Rock Avenue.*

IV. EXISTING FLOW PATTERNS

*Current flow conditions within the Eagle Rock Drainage Basin are as follows (**Refer to Plate 1**):*

Sub-basin(s)

D-10:	*Undeveloped presently with site generated runoff impacting Oakland Avenue and adjacent property to the west.*
D-12:	*Undeveloped presently with site generated runoff impacting Eagle Rock Avenue and adjacent property to the west.*
D-13 & D-14:	*Developed Eagle Rock Subdivision, Units 3 & 4. Site generated storm flows are presently retained on-site in ponds located within sub-basins 13A, 13B, 14A & 14B.*
D-15A & D15B:	*Runoff from the developed portions of D15A & D15B free discharge into the Eagle Rock Avenue ROW, while undeveloped flows from these sub-basins primarily impact sub-basin D15 to the west.*
D-15:	*Undeveloped presently with storm flows entering Modesto Avenue to the north, the Convenience Center detention basin to the west, and Eagle Rock Avenue to the south.*
D-16:	*C.O.A. owned and developed as refuse convenience center. Offsite flows from the east are collected within a detention pond along the east property line, and site generated flows are detained in an additional pond located near the center of the site. Separate 18" & 24" outfall lines drain the ponds to a 24" storm drain line in Eagle Rock Avenue which routes the flow to an existing trunk line in San Pedro Blvd.*
D-17:	*Currently developed as an auto salvage yard with storm flows surface flowing to San Pedro Blvd.*

IV. DEVELOPED CONDITIONS

*With the previous assumptions made in regards to developed basin boundaries, future land use and densities within the Eagle Rock Drainage Basin, the conveyance system designed in this plan will allow for free discharge of storm waters from all properties within the defined basin limits. As reflected on the Drainage Facility map **(Plate 2),** storm waters from a portion of Oakland Ave., as well as developed flows from sub-basin D10, will be routed via a 24"-42"storm drain to Eagle Rock Avenue. In Eagle Rock Avenue, a 30"-54" storm drain will collect developed runoff from both sides of the roadway and route the storm waters to San Pedro Blvd.. In San Pedro, a new cross-connect junction box/manhole will be required to help regulate the amount of storm flows being diverted to the I-25 crossings at Wildflower and the South La Cueva respectively. To complete the Wildflower Crossing diversion, approximately 350' of 60" storm drain is shown in this plan extending from San Pedro west where it will tie to a 60" proposed as a part of the Premier Auto development on Eagle Rock Ave.*

V. SUMMARY

Upon adoption by the City of Albuquerque, this plan will assist in ensuring an equitable cost distribution for the necessary drainage improvements within the Eagle Rock Avenue Drainage Basin, and at the same time provide a 'Master Drainage Plan' to assist in the future development of the basin.

```
START                   TIME=0.0
*****                   EAGLE ROCK DRAINAGE BASIN
*****                   CALCULATE & ROUTE SUB-BASINS TO EAGLE ROCK
*****                   USE 100 YEAR 24 HOUR STORM EVENT
*****                   FILE:   EAGLERK.DAT   12/05/03 JSD

RAINFALL                TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=2.10 RAIN SIX=2.45
                        RAIN DAY=2.85 DT=0.05
*********************************************
*****FIRST CALCULATE INDIVIDUAL BASINS*****
*********************************************
*****
*****SUB-BASIN D10 (8.98 ACRES)
*****
COMPUTE NM HYD          ID=1 HYD NO=100.D10 AREA=.01403SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333HR MASS RAINFALL=-1
PRINT HYD               ID=1 CODE=1
*****
*****SUB-BASIN D11 (2.20 ACRES)-OAKLAND AVE.
*****
COMPUTE NM HYD          ID=2 HYD NO=100.D11 AREA=.003438SQ MI
                        PER A=0 PER B=30 PER C=0 PER D=70
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=2 CODE=1
*****
*****SUB-BASIN D12 (10.66 ACRES)
*****
COMPUTE NM HYD          ID=3 HYD NO=100.D12 AREA=.016656 SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=3 CODE=1
*****
*****SUB-BASIN D13 (5.98 ACRES)
*****
COMPUTE NM HYD          ID=4 HYD NO=100.D13 AREA=.0093502 SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=4 CODE=1
*****
*****SUB-BASIN D13A (0.2882 ACRES)
*****
COMPUTE NM HYD          ID=5 HYD NO=100.D13A AREA=.00045 SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=5 CODE=1
*****
*****SUB-BASIN D13B (0.124 ACRES)
*****
COMPUTE NM HYD          ID=6 HYD NO=100.D13B AREA=.000194 SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=6 CODE=1
*****
*****SUB-BASIN D14 (5.98 ACRES)
*****
COMPUTE NM HYD          ID=7 HYD NO=100.D14 AREA=.0093502 SQ MI
                        PER A=0 PER B=15 PER C=25 PER D=60
                        TP=.1333 MASS RAINFALL=-1
PRINT HYD               ID=7 CODE=1
*****
*****SUB-BASIN D14A (0.2882 ACRES)
```

```
*****
COMPUTE NM HYD       ID=8 HYD NO=100.D14A AREA=.00045 SQ MI
                     PER A=0 PER B=15 PER C=25 PER D=60
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=8 CODE=1
*****
*****SUB-BASIN D14B (0.124 ACRES)
*****
COMPUTE NM HYD       ID=9 HYD NO=100.D14B AREA=.000194 SQ MI
                     PER A=0 PER B=15 PER C=25 PER D=60
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=9 CODE=1
*****
*****SUB-BASIN D15 (7.184 ACRES)
*****
COMPUTE NM HYD       ID=10 HYD NO=100.D15 AREA=.011225 SQ MI
                     PER A=0 PER B=10 PER C=5 PER D=85
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=10 CODE=1
*****
*****SUB-BASIN D15A (1.80 ACRES)
*****
COMPUTE NM HYD       ID=11 HYD NO=100.D15A AREA=.0028225 SQ MI
                     PER A=0 PER B=10 PER C=5 PER D=85
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=11 CODE=1
*****
*****SUB-BASIN D15B (1.80 ACRES)
*****
COMPUTE NM HYD       ID=12 HYD NO=100.D15B AREA=.0028225 SQ MI
                     PER A=0 PER B=10 PER C=5 PER D=85
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=12 CODE=1
*****
*****SUB-BASIN D16 (7.18 ACRES)
*****
COMPUTE NM HYD       ID=13 HYD NO=100.D16 AREA=.011219 SQ MI
                     PER A=0 PER B=15 PER C=55 PER D=30
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=13 CODE=1
*****
*****SUB-BASIN D17 (5.39 ACRES)
*****
COMPUTE NM HYD       ID=14 HYD NO=100.D17 AREA=.008415 SQ MI
                     PER A=0 PER B=10 PER C=5 PER D=85
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=14 CODE=1
*****
*****SUB-BASIN D18 (.87 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=15 HYD NO=100.D18 AREA=.001359 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=15 CODE=1
*****
*****SUB-BASIN D19 (0.234 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=16 HYD NO=100.D19 AREA=.000366 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=16 CODE=1
*****
*****SUB-BASIN D20 (.234 ACRES) EAGLE ROCK AVE.
```

```
*****
COMPUTE NM HYD       ID=17 HYD NO=100.D20 AREA=.000366 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=17 CODE=1
*****
*****SUB-BASIN D21 (.702 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=18 HYD NO=100.D21 AREA=.001097 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=18 CODE=1
*****
*****SUB-BASIN D22 (.234 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=19 HYD NO=100.D22 AREA=.000366 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=19 CODE=1
*****
*****SUB-BASIN D23 (.702 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=20 HYD NO=100.D23 AREA=.001097 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=20 CODE=1
*****
*****SUB-BASIN D24 (.702 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD       ID=21 HYD NO=100.D24 AREA=.001097 SQ MI
                     PER A=0 PER B=30 PER C=0 PER D=70
                     TP=.1333 MASS RAINFALL=-1
PRINT HYD            ID=21 CODE=1
**********************************************
*****ROUTE SUB-BASINS TO EAGLE ROCK AVENUE*****
**********************************************
*****
*****ROUTE D10 THRU D11
*****
ADD HYD              ID=22 HYD NO=101.1 ID=1 ID=2
PRINT HYD            ID=22 CODE=1
*****
*****ROUTE D10 & D11 THRU D12
*****
ADD HYD              ID=23 HYD NO=101.2 ID=22 ID=3
PRINT HYD            ID=23 CODE=1
*****
*****ROUTE D13B THRU D13
*****
ADD HYD              ID=24 HYD NO=101.3 ID=6 ID=4
PRINT HYD            ID=24 CODE=1
*****
*****ROUTE D13A THRU D13
*****
ADD HYD              ID=25 HYD NO=101.4 ID=5 ID=24
PRINT HYD            ID=25 CODE=1
*****
*****ROUTE COMBINED D13A, D13B & D13 TO EAGLE ROCK AVE @ D18
*****
ADD HYD              ID=26 HYD NO=101.5 ID=25 ID=15
PRINT HYD            ID=26 CODE=1
*****
*****ROUTE D14B THRU D14
```

```
*****
ADD HYD              ID=27 HYD NO=101.6 ID=9 ID=7
PRINT HYD            ID=27 CODE=1
*****
*****ROUTE D14A THRU D14
*****
ADD HYD              ID=28 HYD NO=101.7 ID=8 ID=27
PRINT HYD            ID=28 CODE=1
*****
*****ROUTE COMBINED D14A, D14B & D14 TO EAGLE ROCK AVE @ D18
*****
ADD HYD              ID=29 HYD NO=101.8 ID=28 ID=26
PRINT HYD            ID=29 CODE=1
*****
*****ROUTE EAGLE ROCK D18 THRU EAGLE ROCK D19
*****
ADD HYD              ID=30 HYD NO=101.9 ID=29 ID=16
PRINT HYD            ID=30 CODE=1
*****
*****ROUTE D15A TO EAGLE ROCK AVE @ D19
*****
ADD HYD              ID=31 HYD NO=101.10 ID=11 ID=30
PRINT HYD            ID=31 CODE=1
*****
*****ROUTE EAGLE ROCK D19 THRU EAGLE ROCK D20
*****
ADD HYD              ID=32 HYD NO=101.11 ID=31 ID=17
PRINT HYD            ID=32 CODE=1
*****
*****ROUTE D15B TO EAGLE ROCK AVE @ D20
*****
ADD HYD              ID=33 HYD NO=101.12 ID=12 ID=32
PRINT HYD            ID=33 CODE=1
*****
*****ROUTE EAGLE ROCK D20 THRU EAGLE ROCK D21
*****
ADD HYD              ID=34 HYD NO=101.13 ID=33 ID=18
PRINT HYD            ID=34 CODE=1
*****
*****ROUTE D15 TO EAGLE ROCK AVE @ D21
*****
ADD HYD              ID=35 HYD NO=101.14 ID=10 ID=34
PRINT HYD            ID=35 CODE=1
*****
*****ROUTE EAGLE ROCK D21 THRU EAGLE ROCK D22
*****
ADD HYD              ID=36 HYD NO=101.15 ID=35 ID=19
PRINT HYD            ID=36 CODE=1
*****
*****ROUTE COMBINED D10, D11 & D12 TO EAGLE ROCK AVE @ D22
*****
ADD HYD              ID=37 HYD NO=101.16 ID=23 ID=36
PRINT HYD            ID=37 CODE=1
*****
*****ROUTE EAGLE ROCK D22 THRU EAGLE ROCK D23
*****
ADD HYD              ID=38 HYD NO=101.17 ID=37 ID=20
PRINT HYD            ID=38 CODE=1
*****
*****ROUTE D16 TO EAGLE ROCK AVE @ D23
*****
ADD HYD              ID=39 HYD NO=101.18 ID=13 ID=38
PRINT HYD            ID=39 CODE=1
```

```
*****
*****ROUTE EAGLE ROCK D23 THRU EAGLE ROCK D24
*****
ADD HYD              ID=40 HYD NO=101.19 ID=39 ID=21
PRINT HYD            ID=40 CODE=1
*****
*****ROUTE D17 TO EAGLE ROCK AVE @ D24
*****
ADD HYD              ID=41 HYD NO=101.20 ID=14 ID=40
PRINT HYD            ID=41 CODE=1
FINISH
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          AHYMO PROGRAM (AHYMO_97) -                              - Version:
1997.02d
               RUN DATE (MON/DAY/YR) = 01/14/2004
               START TIME (HR:MIN:SEC) = 08:35:36     USER NO.= AHYMO-I-
9702dGoodwinM-AH
               INPUT FILE = C:\PROGRA~1\AHYMO_97\EAGLERK3.DAT

     START                          TIME=0.0
     *****                          EAGLE ROCK DRAINAGE BASIN
     *****                          CALCULATE & ROUTE SUB-BASINS TO EAGLE
ROCK
     *****                          USE 100 YEAR 24 HOUR STORM EVENT
     *****                          FILE:   EAGLERK.DAT   12/05/03 JSD

     RAINFALL                  TYPE=2 RAIN QUARTER=0.0 IN
                                    RAIN ONE=2.10 RAIN SIX=2.45
                                    RAIN DAY=2.85 DT=0.05

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ATLAS 2 - PEAK AT 1.40 HR.
                    DT =     .050000 HOURS        END TIME =     24.000000
HOURS
                       .0000   .0025   .0050   .0076   .0104   .0132
.0161
                       .0191   .0223   .0256   .0290   .0326   .0364
.0403
                       .0445   .0490   .0537   .0587   .0641   .0700
.0763
                       .0851   .0949   .1233   .1903   .3054   .4835
.7400
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1.8436
                      1.9111  1.9730  2.0301  2.0827  2.1313  2.1763
2.1861
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2.2764
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2.3062
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2.3528
                      2.3557  2.3586  2.3614  2.3641  2.3668  2.3695
2.3721
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2.3895
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2.4054
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2.4201
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2.4337
                      2.4356  2.4374  2.4393  2.4411  2.4429  2.4447
2.4465
                      2.4483  2.4500  2.4517  2.4534  2.4552  2.4569
2.4586
                      2.4603  2.4620  2.4636  2.4653  2.4670  2.4686
2.4703
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2.4818	2.4720	2.4736	2.4752	2.4769	2.4785	2.4801
2.4929	2.4834	2.4850	2.4866	2.4882	2.4898	2.4914
2.5039	2.4945	2.4961	2.4976	2.4992	2.5008	2.5023
2.5145	2.5054	2.5069	2.5085	2.5100	2.5115	2.5130
2.5250	2.5160	2.5175	2.5190	2.5205	2.5220	2.5235
2.5352	2.5264	2.5279	2.5294	2.5308	2.5323	2.5337
2.5452	2.5366	2.5381	2.5395	2.5409	2.5423	2.5438
2.5550	2.5466	2.5480	2.5494	2.5508	2.5522	2.5536
2.5646	2.5564	2.5577	2.5591	2.5605	2.5618	2.5632
2.5740	2.5659	2.5673	2.5686	2.5700	2.5713	2.5726
2.5832	2.5753	2.5766	2.5780	2.5793	2.5806	2.5819
2.5923	2.5845	2.5858	2.5871	2.5884	2.5897	2.5910
2.6011	2.5935	2.5948	2.5961	2.5974	2.5986	2.5999
2.6099	2.6024	2.6037	2.6049	2.6062	2.6074	2.6086
2.6185	2.6111	2.6123	2.6136	2.6148	2.6160	2.6172
2.6269	2.6197	2.6209	2.6221	2.6233	2.6245	2.6257
2.6352	2.6281	2.6293	2.6304	2.6316	2.6328	2.6340
2.6433	2.6363	2.6375	2.6387	2.6398	2.6410	2.6422
2.6513	2.6445	2.6456	2.6468	2.6479	2.6490	2.6502
2.6592	2.6525	2.6536	2.6547	2.6558	2.6570	2.6581
2.6670	2.6603	2.6614	2.6625	2.6636	2.6648	2.6659
2.6746	2.6681	2.6692	2.6702	2.6713	2.6724	2.6735
2.6821	2.6757	2.6768	2.6778	2.6789	2.6800	2.6811
2.6895	2.6832	2.6842	2.6853	2.6864	2.6874	2.6885
2.6968	2.6906	2.6916	2.6927	2.6937	2.6948	2.6958
2.7040	2.6979	2.6989	2.6999	2.7009	2.7020	2.7030
2.7111	2.7050	2.7061	2.7071	2.7081	2.7091	2.7101
2.7181	2.7121	2.7131	2.7141	2.7151	2.7161	2.7171
2.7250	2.7191	2.7201	2.7211	2.7221	2.7230	2.7240
2.7318	2.7260	2.7270	2.7279	2.7289	2.7299	2.7308
	2.7328	2.7337	2.7347	2.7356	2.7366	2.7376

2.7385 2.7395 2.7404 2.7414 2.7423 2.7432 2.7442
2.7451 2.7461 2.7470 2.7479 2.7489 2.7498 2.7507
2.7517 2.7526 2.7535 2.7544 2.7554 2.7563 2.7572
2.7581 2.7590 2.7599 2.7609 2.7618 2.7627 2.7636
2.7645 2.7654 2.7663 2.7672 2.7681 2.7690 2.7699
2.7708 2.7717 2.7726 2.7734 2.7743 2.7752 2.7761
2.7770 2.7779 2.7787 2.7796 2.7805 2.7814 2.7823
2.7831 2.7840 2.7849 2.7857 2.7866 2.7875 2.7883
2.7892 2.7901 2.7909 2.7918 2.7926 2.7935 2.7943
2.7952 2.7960 2.7969 2.7977 2.7986 2.7994 2.8003
2.8011 2.8019 2.8028 2.8036 2.8045 2.8053 2.8061
2.8070 2.8078 2.8086 2.8094 2.8103 2.8111 2.8119
2.8127 2.8136 2.8144 2.8152 2.8160 2.8168 2.8177
2.8185 2.8193 2.8201 2.8209 2.8217 2.8225 2.8233
2.8241 2.8249 2.8257 2.8265 2.8273 2.8281 2.8289
2.8297 2.8305 2.8313 2.8321 2.8329 2.8337 2.8345
2.8353 2.8361 2.8368 2.8376 2.8384 2.8392 2.8400
2.8407 2.8415 2.8423 2.8431 2.8438 2.8446 2.8454
2.8462 2.8469 2.8477 2.8485 2.8492 2.8500

```
*******************************************
*****FIRST CALCULATE INDIVIDUAL BASINS*****
*******************************************
*****
*****SUB-BASIN D10 (8.98 ACRES)
*****
COMPUTE NM HYD          ID=1 HYD NO=100.D10 AREA=.01403SQ MI
                             PER A=0 PER B=15 PER C=25 PER D=60
                             TP=.1333HR MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   33.235    CFS   UNIT VOLUME =    .9988        B =
526.28      P60 = 2.1000
          AREA =       .008418 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR    TP =    .133300HR    K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
```

```
          UNIT PEAK =   15.003    CFS   UNIT VOLUME =    1.000        B =
356.36      P60 = 2.1000
          AREA =       .005612 SQ MI    IA =    .40625 INCHES    INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                ID=1 CODE=1

                                                HYDROGRAPH FROM AREA
100.D10

          RUNOFF VOLUME =     1.99521 INCHES     =       1.4929 ACRE-FEET
          PEAK DISCHARGE RATE =      36.63 CFS  AT   1.500 HOURS   BASIN
AREA =    .0140 SQ. MI.

     *****
     *****SUB-BASIN D11 (2.20 ACRES)-OAKLAND AVE.
     *****
     COMPUTE NM HYD           ID=2 HYD NO=100.D11 AREA=.003438SQ MI
                                   PER A=0 PER B=30 PER C=0 PER D=70
                                   TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   9.5014    CFS   UNIT VOLUME =    .9981        B =
526.28      P60 = 2.1000
          AREA =       .002407 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .133173HR    TP =    .133300HR    K/TP RATIO =    .999050
SHAPE CONSTANT, N =  3.533693
          UNIT PEAK =   2.4975    CFS   UNIT VOLUME =    .9954        B =
322.78      P60 = 2.1000
          AREA =       .001031 SQ MI    IA =    .50000 INCHES    INF =
1.25000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                ID=2 CODE=1

                                                HYDROGRAPH FROM AREA
100.D11

          RUNOFF VOLUME =     2.08769 INCHES     =        .3828 ACRE-FEET
          PEAK DISCHARGE RATE =       9.07 CFS  AT   1.500 HOURS   BASIN
AREA =    .0034 SQ. MI.


     *****
     *****SUB-BASIN D12 (10.66 ACRES)
     *****
     COMPUTE NM HYD           ID=3 HYD NO=100.D12 AREA=.016656 SQ MI
```

```
                                   PER A=0 PER B=15 PER C=25 PER D=60
                                   TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   39.455    CFS   UNIT VOLUME =    .9989       B =
526.28      P60 = 2.1000
          AREA =       .009994 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR    TP =    .133300HR    K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =   17.811    CFS   UNIT VOLUME =    1.001       B =
356.36      P60 = 2.1000
          AREA =       .006662 SQ MI    IA =    .40625 INCHES    INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                ID=3 CODE=1

                                                HYDROGRAPH FROM AREA
100.D12


          RUNOFF VOLUME =     1.99521 INCHES     =       1.7724 ACRE-FEET
          PEAK DISCHARGE RATE =      43.48 CFS  AT   1.500 HOURS   BASIN
AREA =    .0167 SQ. MI.


     *****
     *****SUB-BASIN D13 (5.98 ACRES)
     *****
     COMPUTE NM HYD           ID=4 HYD NO=100.D13 AREA=.0093502 SQ MI
                                   PER A=0 PER B=15 PER C=25 PER D=60
                                   TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   22.149    CFS   UNIT VOLUME =    .9986       B =
526.28      P60 = 2.1000
          AREA =       .005610 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR    TP =    .133300HR    K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =   9.9987    CFS   UNIT VOLUME =    1.000       B =
356.36      P60 = 2.1000
          AREA =       .003740 SQ MI    IA =    .40625 INCHES    INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                ID=4 CODE=1
```

HYDROGRAPH FROM AREA
100.D13

RUNOFF VOLUME = 1.99521 INCHES = .9950 ACRE-FEET
PEAK DISCHARGE RATE = 24.42 CFS AT 1.500 HOURS BASIN
AREA = .0094 SQ. MI.

*****
*****SUB-BASIN D13A (0.2882 ACRES)
*****
COMPUTE NM HYD ID=5 HYD NO=100.D13A AREA=.00045 SQ MI
PER A=0 PER B=15 PER C=25 PER D=60
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.0660 CFS UNIT VOLUME = .9891 B =
526.28 P60 = 2.1000
AREA = .000270 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

K = .117728HR TP = .133300HR K/TP RATIO = .883183
SHAPE CONSTANT, N = 4.017935
UNIT PEAK = .48121 CFS UNIT VOLUME = .9747 B =
356.36 P60 = 2.1000
AREA = .000180 SQ MI IA = .40625 INCHES INF =
.98750 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

PRINT HYD ID=5 CODE=1

HYDROGRAPH FROM AREA
100.D13A

RUNOFF VOLUME = 1.99521 INCHES = .0479 ACRE-FEET
PEAK DISCHARGE RATE = 1.19 CFS AT 1.500 HOURS BASIN
AREA = .0005 SQ. MI.

*****
*****SUB-BASIN D13B (0.124 ACRES)
*****
COMPUTE NM HYD ID=6 HYD NO=100.D13B AREA=.000194 SQ MI
PER A=0 PER B=15 PER C=25 PER D=60
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = .45955 CFS UNIT VOLUME = .9739 B =
526.28 P60 = 2.1000
AREA = .000116 SQ MI IA = .10000 INCHES INF =

```
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR     TP =    .133300HR     K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =    .20746     CFS    UNIT VOLUME =     .9391        B =
356.36       P60 = 2.1000
          AREA =       .000078 SQ MI     IA =     .40625 INCHES     INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                 ID=6 CODE=1

                                                    HYDROGRAPH FROM AREA
100.D13B

          RUNOFF VOLUME =      1.99521 INCHES      =          .0206 ACRE-FEET
          PEAK DISCHARGE RATE =          .53 CFS  AT    1.500 HOURS    BASIN
AREA =    .0002 SQ. MI.


     *****
     *****SUB-BASIN D14 (5.98 ACRES)
     *****
     COMPUTE NM HYD            ID=7 HYD NO=100.D14 AREA=.0093502 SQ MI
                                    PER A=0 PER B=15 PER C=25 PER D=60
                                    TP=.1333 MASS RAINFALL=-1

          K =    .072649HR     TP =    .133300HR     K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =    22.149     CFS    UNIT VOLUME =     .9986        B =
526.28       P60 = 2.1000
          AREA =       .005610 SQ MI     IA =     .10000 INCHES     INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR     TP =    .133300HR     K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =    9.9987     CFS    UNIT VOLUME =     1.000        B =
356.36       P60 = 2.1000
          AREA =       .003740 SQ MI     IA =     .40625 INCHES     INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                 ID=7 CODE=1

                                                    HYDROGRAPH FROM AREA
100.D14


          RUNOFF VOLUME =      1.99521 INCHES      =          .9950 ACRE-FEET
          PEAK DISCHARGE RATE =        24.42 CFS  AT    1.500 HOURS    BASIN
AREA =    .0094 SQ. MI.
```

```
     *****
     *****SUB-BASIN D14A (0.2882 ACRES)
     *****
     COMPUTE NM HYD          ID=8 HYD NO=100.D14A AREA=.00045 SQ MI
                                  PER A=0 PER B=15 PER C=25 PER D=60
                                  TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   1.0660    CFS   UNIT VOLUME =    .9891       B =
526.28      P60 = 2.1000
          AREA =       .000270 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

          K =    .117728HR    TP =    .133300HR    K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =   .48121    CFS   UNIT VOLUME =    .9747       B =
356.36      P60 = 2.1000
          AREA =       .000180 SQ MI    IA =    .40625 INCHES    INF =
.98750 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD               ID=8 CODE=1

                                                HYDROGRAPH FROM AREA
100.D14A


          RUNOFF VOLUME =     1.99521 INCHES     =         .0479 ACRE-FEET
          PEAK DISCHARGE RATE =       1.19 CFS  AT   1.500 HOURS   BASIN
AREA =    .0005 SQ. MI.


     *****
     *****SUB-BASIN D14B (0.124 ACRES)
     *****
     COMPUTE NM HYD          ID=9 HYD NO=100.D14B AREA=.000194 SQ MI
                                  PER A=0 PER B=15 PER C=25 PER D=60
                                  TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   .45955    CFS   UNIT VOLUME =    .9739       B =
526.28      P60 = 2.1000
          AREA =       .000116 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .117728HR    TP =    .133300HR    K/TP RATIO =    .883183
SHAPE CONSTANT, N =  4.017935
          UNIT PEAK =   .20746    CFS   UNIT VOLUME =    .9391       B =
```

356.36 P60 = 2.1000
AREA = .000078 SQ MI IA = .40625 INCHES INF = .98750 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=9 CODE=1

HYDROGRAPH FROM AREA 100.D14B

RUNOFF VOLUME = 1.99521 INCHES = .0206 ACRE-FEET
PEAK DISCHARGE RATE = .53 CFS AT 1.500 HOURS BASIN AREA = .0002 SQ. MI.

*****
*****SUB-BASIN D15 (7.184 ACRES)
*****
COMPUTE NM HYD ID=10 HYD NO=100.D15 AREA=.011225 SQ MI
PER A=0 PER B=10 PER C=5 PER D=85
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 37.669 CFS UNIT VOLUME = .9989 B = 526.28 P60 = 2.1000
AREA = .009541 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124936HR TP = .133300HR K/TP RATIO = .937254
SHAPE CONSTANT, N = 3.773204
UNIT PEAK = 4.2915 CFS UNIT VOLUME = .9985 B = 339.75 P60 = 2.1000
AREA = .001684 SQ MI IA = .45000 INCHES INF = 1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=10 CODE=1

HYDROGRAPH FROM AREA 100.D15

RUNOFF VOLUME = 2.36832 INCHES = 1.4178 ACRE-FEET
PEAK DISCHARGE RATE = 32.43 CFS AT 1.500 HOURS BASIN AREA = .0112 SQ. MI.

*****
*****SUB-BASIN D15A (1.80 ACRES)
*****
COMPUTE NM HYD ID=11 HYD NO=100.D15A AREA=.0028225 SQ MI
PER A=0 PER B=10 PER C=5 PER D=85

TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.4719 CFS UNIT VOLUME = .9981 B =
526.28 P60 = 2.1000
AREA = .002399 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

K = .124936HR TP = .133300HR K/TP RATIO = .937254
SHAPE CONSTANT, N = 3.773204
UNIT PEAK = 1.0791 CFS UNIT VOLUME = .9891 B =
339.75 P60 = 2.1000
AREA = .000423 SQ MI IA = .45000 INCHES INF =
1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

PRINT HYD ID=11 CODE=1

HYDROGRAPH FROM AREA
100.D15A

RUNOFF VOLUME = 2.36832 INCHES = .3565 ACRE-FEET
PEAK DISCHARGE RATE = 8.17 CFS AT 1.500 HOURS BASIN
AREA = .0028 SQ. MI.

*****
*****SUB-BASIN D15B (1.80 ACRES)
*****
COMPUTE NM HYD ID=12 HYD NO=100.D15B AREA=.0028225 SQ MI
PER A=0 PER B=10 PER C=5 PER D=85
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 9.4719 CFS UNIT VOLUME = .9981 B =
526.28 P60 = 2.1000
AREA = .002399 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

K = .124936HR TP = .133300HR K/TP RATIO = .937254
SHAPE CONSTANT, N = 3.773204
UNIT PEAK = 1.0791 CFS UNIT VOLUME = .9891 B =
339.75 P60 = 2.1000
AREA = .000423 SQ MI IA = .45000 INCHES INF =
1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

PRINT HYD ID=12 CODE=1

HYDROGRAPH FROM AREA
100.D15B

RUNOFF VOLUME = 2.36832 INCHES = .3565 ACRE-FEET
PEAK DISCHARGE RATE = 8.17 CFS AT 1.500 HOURS BASIN AREA = .0028 SQ. MI.

*****
*****SUB-BASIN D16 (7.18 ACRES)
*****
COMPUTE NM HYD ID=13 HYD NO=100.D16 AREA=.011219 SQ MI
PER A=0 PER B=15 PER C=55 PER D=30
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 13.288 CFS UNIT VOLUME = .9983 B = 526.28 P60 = 2.1000
AREA = .003366 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .113757HR TP = .133300HR K/TP RATIO = .853388
SHAPE CONSTANT, N = 4.169695
UNIT PEAK = 21.582 CFS UNIT VOLUME = 1.001 B = 366.33 P60 = 2.1000
AREA = .007853 SQ MI IA = .38214 INCHES INF = .92000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=13 CODE=1

HYDROGRAPH FROM AREA
100.D16

RUNOFF VOLUME = 1.57258 INCHES = .9409 ACRE-FEET
PEAK DISCHARGE RATE = 25.93 CFS AT 1.500 HOURS BASIN AREA = .0112 SQ. MI.

*****
*****SUB-BASIN D17 (5.39 ACRES)
*****
COMPUTE NM HYD ID=14 HYD NO=100.D17 AREA=.008415 SQ MI
PER A=0 PER B=10 PER C=5 PER D=85
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 28.239 CFS UNIT VOLUME = .9987 B = 526.28 P60 = 2.1000
AREA = .007153 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .124936HR TP = .133300HR K/TP RATIO = .937254 SHAPE CONSTANT, N = 3.773204
UNIT PEAK = 3.2172 CFS UNIT VOLUME = .9971 B = 339.75 P60 = 2.1000
AREA = .001262 SQ MI IA = .45000 INCHES INF = 1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=14 CODE=1

HYDROGRAPH FROM AREA 100.D17

RUNOFF VOLUME = 2.36832 INCHES = 1.0629 ACRE-FEET
PEAK DISCHARGE RATE = 24.32 CFS AT 1.500 HOURS BASIN AREA = .0084 SQ. MI.

*****
*****SUB-BASIN D18 (.87 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD ID=15 HYD NO=100.D18 AREA=.001359 SQ MI
PER A=0 PER B=30 PER C=0 PER D=70
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000 SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.7558 CFS UNIT VOLUME = .9966 B = 526.28 P60 = 2.1000
AREA = .000951 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133173HR TP = .133300HR K/TP RATIO = .999050 SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .98723 CFS UNIT VOLUME = .9875 B = 322.78 P60 = 2.1000
AREA = .000408 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=15 CODE=1

HYDROGRAPH FROM AREA 100.D18

RUNOFF VOLUME = 2.08769 INCHES = .1513 ACRE-FEET
PEAK DISCHARGE RATE = 3.59 CFS AT 1.500 HOURS BASIN AREA = .0014 SQ. MI.

```
     *****
     *****SUB-BASIN D19 (0.234 ACRES) EAGLE ROCK AVE.
     *****
     COMPUTE NM HYD          ID=16 HYD NO=100.D19 AREA=.000366 SQ MI
                                  PER A=0 PER B=30 PER C=0 PER D=70
                                  TP=.1333 MASS RAINFALL=-1

          K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   1.0115    CFS   UNIT VOLUME =    .9891       B =
526.28      P60 = 2.1000
          AREA =      .000256 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =   .050000

          K =   .133173HR    TP =   .133300HR    K/TP RATIO =   .999050
SHAPE CONSTANT, N =  3.533693
          UNIT PEAK =   .26588    CFS   UNIT VOLUME =    .9540       B =
322.78      P60 = 2.1000
          AREA =      .000110 SQ MI    IA =    .50000 INCHES    INF =
1.25000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =   .050000

     PRINT HYD               ID=16 CODE=1

                                                HYDROGRAPH FROM AREA
100.D19


          RUNOFF VOLUME =     2.08768 INCHES     =        .0408 ACRE-FEET
          PEAK DISCHARGE RATE =        .98 CFS  AT   1.500 HOURS   BASIN
AREA =    .0004 SQ. MI.


     *****
     *****SUB-BASIN D20 (.234 ACRES) EAGLE ROCK AVE.
     *****
     COMPUTE NM HYD          ID=17 HYD NO=100.D20 AREA=.000366 SQ MI
                                  PER A=0 PER B=30 PER C=0 PER D=70
                                  TP=.1333 MASS RAINFALL=-1

          K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =   1.0115    CFS   UNIT VOLUME =    .9891       B =
526.28      P60 = 2.1000
          AREA =      .000256 SQ MI    IA =    .10000 INCHES    INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =   .050000

          K =   .133173HR    TP =   .133300HR    K/TP RATIO =   .999050
SHAPE CONSTANT, N =  3.533693
          UNIT PEAK =   .26588    CFS   UNIT VOLUME =    .9540       B =
322.78      P60 = 2.1000
```

```
          AREA =       .000110 SQ MI    IA =     .50000 INCHES     INF =
1.25000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                 ID=17 CODE=1

                                                HYDROGRAPH FROM AREA
100.D20

          RUNOFF VOLUME =      2.08768 INCHES      =          .0408 ACRE-FEET
          PEAK DISCHARGE RATE =         .98 CFS  AT    1.500 HOURS   BASIN
AREA =    .0004 SQ. MI.

     *****
     *****SUB-BASIN D21  (.702 ACRES) EAGLE ROCK AVE.
     *****
     COMPUTE NM HYD            ID=18 HYD NO=100.D21 AREA=.001097 SQ MI
                                    PER A=0 PER B=30 PER C=0 PER D=70
                                    TP=.1333 MASS RAINFALL=-1

          K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000
SHAPE CONSTANT, N =  7.106420
          UNIT PEAK =    3.0317    CFS   UNIT VOLUME =     .9959        B =
526.28       P60 = 2.1000
          AREA =       .000768 SQ MI    IA =     .10000 INCHES     INF =
.04000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000


          K =    .133173HR    TP =    .133300HR    K/TP RATIO =    .999050
SHAPE CONSTANT, N =  3.533693
          UNIT PEAK =    .79690    CFS   UNIT VOLUME =     .9837        B =
322.78       P60 = 2.1000
          AREA =       .000329 SQ MI    IA =     .50000 INCHES     INF =
1.25000 INCHES PER HOUR
          RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT =    .050000

     PRINT HYD                 ID=18 CODE=1

                                                HYDROGRAPH FROM AREA
100.D21

          RUNOFF VOLUME =      2.08768 INCHES      =          .1221 ACRE-FEET
          PEAK DISCHARGE RATE =        2.90 CFS  AT    1.500 HOURS   BASIN
AREA =    .0011 SQ. MI.

     *****
     *****SUB-BASIN D22  (.234 ACRES) EAGLE ROCK AVE.
     *****
     COMPUTE NM HYD            ID=19 HYD NO=100.D22 AREA=.000366 SQ MI
                                    PER A=0 PER B=30 PER C=0 PER D=70
                                    TP=.1333 MASS RAINFALL=-1
```

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 1.0115 CFS UNIT VOLUME = .9891 B =
526.28 P60 = 2.1000
AREA = .000256 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

K = .133173HR TP = .133300HR K/TP RATIO = .999050
SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .26588 CFS UNIT VOLUME = .9540 B =
322.78 P60 = 2.1000
AREA = .000110 SQ MI IA = .50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

PRINT HYD ID=19 CODE=1

HYDROGRAPH FROM AREA
100.D22

RUNOFF VOLUME = 2.08768 INCHES = .0408 ACRE-FEET
PEAK DISCHARGE RATE = .98 CFS AT 1.500 HOURS BASIN
AREA = .0004 SQ. MI.

*****
*****SUB-BASIN D23 (.702 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD ID=20 HYD NO=100.D23 AREA=.001097 SQ MI
PER A=0 PER B=30 PER C=0 PER D=70
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.0317 CFS UNIT VOLUME = .9959 B =
526.28 P60 = 2.1000
AREA = .000768 SQ MI IA = .10000 INCHES INF =
.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

K = .133173HR TP = .133300HR K/TP RATIO = .999050
SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .79690 CFS UNIT VOLUME = .9837 B =
322.78 P60 = 2.1000
AREA = .000329 SQ MI IA = .50000 INCHES INF =
1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER
METHOD - DT = .050000

PRINT HYD ID=20 CODE=1

HYDROGRAPH FROM AREA

100.D23

RUNOFF VOLUME = 2.08768 INCHES = .1221 ACRE-FEET
PEAK DISCHARGE RATE = 2.90 CFS AT 1.500 HOURS BASIN AREA = .0011 SQ. MI.

*****
*****SUB-BASIN D24 (.702 ACRES) EAGLE ROCK AVE.
*****
COMPUTE NM HYD ID=21 HYD NO=100.D24 AREA=.001097 SQ MI
PER A=0 PER B=30 PER C=0 PER D=70
TP=.1333 MASS RAINFALL=-1

K = .072649HR TP = .133300HR K/TP RATIO = .545000
SHAPE CONSTANT, N = 7.106420
UNIT PEAK = 3.0317 CFS UNIT VOLUME = .9959 B = 526.28 P60 = 2.1000
AREA = .000768 SQ MI IA = .10000 INCHES INF = .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

K = .133173HR TP = .133300HR K/TP RATIO = .999050
SHAPE CONSTANT, N = 3.533693
UNIT PEAK = .79690 CFS UNIT VOLUME = .9837 B = 322.78 P60 = 2.1000
AREA = .000329 SQ MI IA = .50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = .050000

PRINT HYD ID=21 CODE=1

HYDROGRAPH FROM AREA 100.D24

RUNOFF VOLUME = 2.08768 INCHES = .1221 ACRE-FEET
PEAK DISCHARGE RATE = 2.90 CFS AT 1.500 HOURS BASIN AREA = .0011 SQ. MI.

****
*****ROUTE SUB-BASINS TO EAGLE ROCK AVENUE*****
****
*****
*****ROUTE D10 THRU D11
*****
ADD HYD ID=22 HYD NO=101.1 ID=1 ID=2
PRINT HYD ID=22 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = 2.01338 INCHES = 1.8757 ACRE-FEET
PEAK DISCHARGE RATE = 45.70 CFS AT 1.500 HOURS BASIN

AREA = .0175 SQ. MI.

*****
*****ROUTE D10 & D11 THRU D12
*****
ADD HYD ID=23 HYD NO=101.2 ID=22 ID=3
PRINT HYD ID=23 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 2.00450 INCHES = 3.6481 ACRE-FEET
PEAK DISCHARGE RATE = 89.18 CFS AT 1.500 HOURS BASIN AREA = .0341 SQ. MI.

*****
*****ROUTE D13B THRU D13
*****
ADD HYD ID=24 HYD NO=101.3 ID=6 ID=4
PRINT HYD ID=24 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.99516 INCHES = 1.0156 ACRE-FEET
PEAK DISCHARGE RATE = 24.94 CFS AT 1.500 HOURS BASIN AREA = .0095 SQ. MI.

*****
*****ROUTE D13A THRU D13
*****
ADD HYD ID=25 HYD NO=101.4 ID=5 ID=24
PRINT HYD ID=25 CODE=1

PARTIAL HYDROGRAPH 101.40

RUNOFF VOLUME = 1.99515 INCHES = 1.0635 ACRE-FEET
PEAK DISCHARGE RATE = 26.14 CFS AT 1.500 HOURS BASIN AREA = .0100 SQ. MI.

*****
*****ROUTE COMBINED D13A, D13B & D13 TO EAGLE ROCK AVE @ D18
*****
ADD HYD ID=26 HYD NO=101.5 ID=25 ID=15
PRINT HYD ID=26 CODE=1

PARTIAL HYDROGRAPH 101.50

RUNOFF VOLUME = 2.00620 INCHES = 1.2148 ACRE-FEET
PEAK DISCHARGE RATE = 29.73 CFS AT 1.500 HOURS BASIN AREA = .0114 SQ. MI.

```
*****
*****ROUTE D14B THRU D14
*****
ADD HYD                          ID=27 HYD NO=101.6 ID=9 ID=7
PRINT HYD                   ID=27 CODE=1

                                        PARTIAL HYDROGRAPH   101.60


      RUNOFF VOLUME =     1.99516 INCHES     =       1.0156 ACRE-FEET
      PEAK DISCHARGE RATE =      24.94 CFS  AT   1.500 HOURS   BASIN
AREA =   .0095 SQ. MI.
```

```
*****
*****ROUTE D14A THRU D14
*****
ADD HYD                          ID=28 HYD NO=101.7 ID=8 ID=27
PRINT HYD                   ID=28 CODE=1

                                        PARTIAL HYDROGRAPH   101.70


      RUNOFF VOLUME =     1.99515 INCHES     =       1.0635 ACRE-FEET
      PEAK DISCHARGE RATE =      26.14 CFS  AT   1.500 HOURS   BASIN
AREA =   .0100 SQ. MI.
```

```
*****
*****ROUTE COMBINED D14A, D14B & D14 TO EAGLE ROCK AVE @ D18
*****
ADD HYD                          ID=29 HYD NO=101.8 ID=28 ID=26
PRINT HYD                   ID=29 CODE=1

                                        PARTIAL HYDROGRAPH   101.80


      RUNOFF VOLUME =     2.00102 INCHES     =       2.2782 ACRE-FEET
      PEAK DISCHARGE RATE =      55.87 CFS  AT   1.500 HOURS   BASIN
AREA =   .0213 SQ. MI.
```

```
*****
*****ROUTE EAGLE ROCK D18 THRU EAGLE ROCK D19
*****
ADD HYD                          ID=30 HYD NO=101.9 ID=29 ID=16
PRINT HYD                   ID=30 CODE=1

                                        PARTIAL HYDROGRAPH   101.90


      RUNOFF VOLUME =     2.00248 INCHES     =       2.3190 ACRE-FEET
      PEAK DISCHARGE RATE =      56.85 CFS  AT   1.500 HOURS   BASIN
AREA =   .0217 SQ. MI.
```

```
*****
*****ROUTE D15A TO EAGLE ROCK AVE @ D19
*****
ADD HYD                          ID=31 HYD NO=101.10 ID=11 ID=30
PRINT HYD                  ID=31 CODE=1

                                        PARTIAL HYDROGRAPH   101.10


     RUNOFF VOLUME =     2.04455 INCHES     =       2.6754 ACRE-FEET
     PEAK DISCHARGE RATE =      65.02 CFS  AT   1.500 HOURS   BASIN
AREA =    .0245 SQ. MI.


*****
*****ROUTE EAGLE ROCK D19 THRU EAGLE ROCK D20
*****
ADD HYD                          ID=32 HYD NO=101.11 ID=31 ID=17
PRINT HYD                  ID=32 CODE=1

                                        PARTIAL HYDROGRAPH   101.11


     RUNOFF VOLUME =     2.04518 INCHES     =       2.7162 ACRE-FEET
     PEAK DISCHARGE RATE =      66.00 CFS  AT   1.500 HOURS   BASIN
AREA =    .0249 SQ. MI.


*****
*****ROUTE D15B TO EAGLE ROCK AVE @ D20
*****
ADD HYD                          ID=33 HYD NO=101.12 ID=12 ID=32
PRINT HYD                  ID=33 CODE=1

                                        PARTIAL HYDROGRAPH   101.12


     RUNOFF VOLUME =     2.07806 INCHES     =       3.0727 ACRE-FEET
     PEAK DISCHARGE RATE =      74.16 CFS  AT   1.500 HOURS   BASIN
AREA =    .0277 SQ. MI.


*****
*****ROUTE EAGLE ROCK D20 THRU EAGLE ROCK D21
*****
ADD HYD                          ID=34 HYD NO=101.13 ID=33 ID=18
PRINT HYD                  ID=34 CODE=1

                                        PARTIAL HYDROGRAPH   101.13


     RUNOFF VOLUME =     2.07842 INCHES     =       3.1948 ACRE-FEET
     PEAK DISCHARGE RATE =      77.07 CFS  AT   1.500 HOURS   BASIN
AREA =    .0288 SQ. MI.
```

```
     *****
     *****ROUTE D15 TO EAGLE ROCK AVE @ D21
     *****
     ADD HYD                         ID=35 HYD NO=101.14 ID=10 ID=34
     PRINT HYD                  ID=35 CODE=1

                                          PARTIAL HYDROGRAPH   101.14


          RUNOFF VOLUME =     2.15967 INCHES     =       4.6126 ACRE-FEET
          PEAK DISCHARGE RATE =     109.50 CFS  AT   1.500 HOURS   BASIN
AREA =    .0400 SQ. MI.


     *****
     *****ROUTE EAGLE ROCK D21 THRU EAGLE ROCK D22
     *****
     ADD HYD                          ID=36 HYD NO=101.15 ID=35 ID=19
     PRINT HYD                  ID=36 CODE=1

                                          PARTIAL HYDROGRAPH   101.15


          RUNOFF VOLUME =     2.15901 INCHES     =       4.6534 ACRE-FEET
          PEAK DISCHARGE RATE =     110.48 CFS  AT   1.500 HOURS   BASIN
AREA =    .0404 SQ. MI.


     *****
     *****ROUTE COMBINED D10, D11 & D12 TO EAGLE ROCK AVE @ D22
     *****
     ADD HYD                         ID=37 HYD NO=101.16 ID=23 ID=36
     PRINT HYD                  ID=37 CODE=1

                                          PARTIAL HYDROGRAPH   101.16


          RUNOFF VOLUME =     2.08828 INCHES     =       8.3014 ACRE-FEET
          PEAK DISCHARGE RATE =     199.67 CFS  AT   1.500 HOURS   BASIN
AREA =    .0745 SQ. MI.


     *****
     *****ROUTE EAGLE ROCK D22 THRU EAGLE ROCK D23
     *****
     ADD HYD                         ID=38 HYD NO=101.17 ID=37 ID=20
     PRINT HYD                  ID=38 CODE=1

                                          PARTIAL HYDROGRAPH   101.17


          RUNOFF VOLUME =     2.08826 INCHES     =       8.4235 ACRE-FEET
          PEAK DISCHARGE RATE =     202.57 CFS  AT   1.500 HOURS   BASIN
AREA =    .0756 SQ. MI.
```

```
     *****
     *****ROUTE D16 TO EAGLE ROCK AVE @ D23
     *****
     ADD HYD                         ID=39 HYD NO=101.18 ID=13 ID=38
     PRINT HYD                  ID=39 CODE=1

                                          PARTIAL HYDROGRAPH   101.18


         RUNOFF VOLUME =     2.02165 INCHES     =       9.3645 ACRE-FEET
         PEAK DISCHARGE RATE =     228.50 CFS  AT   1.500 HOURS   BASIN
AREA =   .0869 SQ. MI.


     *****
     *****ROUTE EAGLE ROCK D23 THRU EAGLE ROCK D24
     *****
     ADD HYD                         ID=40 HYD NO=101.19 ID=39 ID=21
     PRINT HYD                  ID=40 CODE=1

                                          PARTIAL HYDROGRAPH   101.19


         RUNOFF VOLUME =     2.02247 INCHES     =       9.4866 ACRE-FEET
         PEAK DISCHARGE RATE =     231.41 CFS  AT   1.500 HOURS   BASIN
AREA =   .0879 SQ. MI.


     *****
     *****ROUTE D17 TO EAGLE ROCK AVE @ D24
     *****
     ADD HYD                         ID=41 HYD NO=101.20 ID=14 ID=40
     PRINT HYD                  ID=41 CODE=1

                                          PARTIAL HYDROGRAPH   101.20


         RUNOFF VOLUME =     2.05266 INCHES     =      10.5495 ACRE-FEET
         PEAK DISCHARGE RATE =     255.73 CFS  AT   1.500 HOURS   BASIN
AREA =   .0964 SQ. MI.


     FINISH

         NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 08:35:36
```

EAGLE ROCK DRAINAGE ALLOCATION

INFRASTRUCTURE DESIGN CALCULATIONS

$$Q = \frac{1.486}{n}(A)(R)^{2/3}(S)^{1/2}$$

LOCATION	SLOPE (%)	CATCH POINTS	FLOW (cfs)	PIPE SIZE (inches)	CAPACITIY (cfs)	FLOW DEPTH (ft)	FLOW VELOCITY (fps)
Oakland Avenue	3.0	①	23.0	24	39	1.4	7.5
		②	45.7	30	71	2.1	9.4
Oakland to Eagle Rock	1.0	③	67.5	36	67	Press.	9.6
		④	89.2	42	100	3.2	9.5
Eagle Rock D18-D20	2.8	⑤	74.2	30	69	Press.	15.4
Eagle Rock D20-D21	2.8	⑥	109.5	36	111	2.9	15.0
Eagle Rock D21-D22	2.8	⑦	199.7	48	241	3.3	16.0
Eagle Rock D22-D23	2.8	⑧	228.5	48	241	3.8	18.5
Eagle Rock D23-D24	2.8	⑨	256.3	54	330	3.5	16.2

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PROJECT EAGLE ROCK ANNEXATION
SUBJECT St. Cap.
BY JTO DATE 1-22-04
CHECKED _____ DATE _____
SHEET ____ OF ____

Street Capacities

1. Oakland Ave.

60' ROW, 42' F-F, Std. Curb, S = 3.0% n = .017

A = 2[.125(2)/2 + .54(2) + 19(.38)/2 + .16(19)] = 14.09

R = 14.09/43.34 = .325

V = 1.49 (.325)$^{.67}$(.03)$^{1/2}$/.017 = 7.15 FPS

Q = VA = 7.15(14.09) = 100.74

d + V^2/29 = .67 + 51.12/64.4 = 1.46

d = .5 : A = 12.18, WP = 43, R = .283

V = 1.49 (.283)$^{.67}$(.03)$^{1/2}$/.017 = 6.52

Q = 6.52(12.18) = 79.41

.5 + 6.52^2/64.4 = 1.16

d = .42 : A = 8.82 WP = 42.84, R = .206

V = 1.49(.206)$^{.67}$(.03)$^{1/2}$/.017 = 5.27

Q = 5.27(8.82) = 46.48

.42 + 5.27^2/64.4 = .85 ≤ .85 ✓

2. Eagle Rock Ave.

Same section as Oakland, similar slope (2.81%)