DEVELOPMENT & BUILDING SERVICE CENTER

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ATTENTION: Ting Pohl

505-924-3900

Records Withdrawal Form

Project No. J-14-D120 **Date:** 01-22-98

Project Title: Proposed U.S. District Courthouse

a. File b. Mylars c. Redlines/Comments

d. Other _____

Requested By: AAR-Larkin (Alb. Blue) **Phone No.:** 275-7500
Company

Anticipated Return Date: 01-23-98

Receipt Acknowledged

I here by accept full responsibility for the security of the above noted records/plans until return receipt acknowledgement is completed. Records/plans will be returned to the Development & Building Services Center on or before the indicated anticipated return date.

Delivery Picked Up By:

Name: ~~Jeanne Wolfenbarger~~ **Organization:** _____
Print

Signed: Ray Valdez **Date:** 1-22-98
Phone No. 821-1082

Office Use Only

Return Acknowledged

Received by: ~~Ray V~~ **Date:** 1-22-98
Print
Kyle Tsefrikian.

CITY OF
Albuquerque

April 9, 1997

Martin J. Chávez, Mayor

Mr. Sam Poole
Flatow Moore Shaffer McCabe, Inc..
809 Copper Avenue, NW
Albuquerque, New Mexico 87102

RE: NEW U.S. COURTHOUSE (4th ST. & LOMAS BLVD.) (J-14K/D-120)
ENGINEER'S STAMP DATED 4/23/96

Dear Mr. Poole:

The Drainage Report, dated April 22, 1996 and submitted to this office on 2/20/97, and the Grading and Drainage Plan, received separately on March 27, 1997, have been reviewed and are approved for Grading/Paving and Building Permit. The returns at Lomas and 3rd and at Lomas and 4th each should be able to drain north to the existing catch basins on the numbered streets. If 53.77/53.17 spot elevation is not in error (between 3rd and bus stop), this is a low point which should probably drain to the west to the new drop inlet. The 47.70 drain top elevation (southwest quadrant) should be 41.10 to match final grade. Indicate grate elevation for existing C.B. at east end of vacated Slate Avenue. In 3rd, 54.86/54.36 is low spot if it and next spot elevation to south are correct. Any changes should be reflected in the submittal for certification following construction. Should you have any questions, please call me at 768-2776.

John P. Murray, P.E.
PWD, Hydrology Division

c: Andrew Garcia
Steve Randall, Red Mountain Eng'rs.
Keith McCoy, Abide Int'l.
File

ORIGINAL
ANDREW
GARCIA

CITY OF
Albuquerque

April 9, 1997

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John P. Murray, P.E.
PWD, Hydrology Division

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Steve Randall, Red Mountain Eng'rs.
Keith McCoy, Abide Int'l.
✓File

April 22, 1996

Drainage Report for the City of Albuquerque

Proposed U.S. District Courthouse at Fourth N.W. and Lomas

Site Description

The proposed Courthouse is to be constructed on a site consisting of the present McClellan Park (2.033 acres), the adjacent Slate Street right-of-way (60' right-of-way with an average length of 301.34' equal to 0.415 acres) and the adjacent Moncor site, a gravel surfaced parking lot of 1.767 acres extent. The total area enclosed within the anticipated replat boundary is 4.235 acres.

The entire site is in FEMA (Federal Emergency Management Agency) Zone C (Reference 5) 'Areas of minimal flooding'. Flood Zone AO (DEPTH 1) is immediately adjacent to the site at the intersection of Marble and Third, indicating 'Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet'. This indicates a flood depth of one foot in the intersection for a 100-year storm, with the potentially flooded area extending away from the intersection to the north and east. A study involving the major storm drain near the site (Reference 2), a 54" line on Third, indicates insufficient capacity for a 100-year storm. Thus it appears likely that storm water will run in the streets at a significant depth in a 100- year event.

No on-site storm drains exist on the McClellan Park and Moncor plats, and these areas sheet flow without significant ponding to the surrounding streets. Slate Street between Third and Fourth Street N.W. (to be vacated and demolished) does not receive drainage from the surrounding streets. Curb inlets on the N.E., N.W. and S.W. corners of the Slate Street-Fourth Street intersection intercept flows on the west side of this section of Slate. Curb inlets at each corner of the Slate Street-Third Street intersection intercept flows on the east side of this section.

The curb inlets on the west side the Slate Street-Third Street intersection are to be removed as part of vacating the Slate Street right-of-way for the proposed Courthouse site. The removed curb inlets will be replaced by a single inlet at the new curb construction across vacated Slate Street right-of-way. This construction and associated hydrology considerations are by the City of Albuquerque, prior to development on the Courthouse site.

Pre-Development Site Runoff

AHYMO runoff from the composite site in its existing condition is estimated at 15.41 cubic feet per second (Appendix A).

Post-Development Site Runoff

The General Services Administration plans to provide underground parking at this site to help alleviate traffic congestion in downtown Albuquerque. Landscaping over the underground garage provides an opportunity for ponding, but ponding is unfeasible due to structural constraints on the underground parking structure. AHYMO runoff from the composite site after construction of the Courthouse facility is estimated at 18.8 cubic feet per second (Appendix B). The difference between post-development and pre-development runoff is 3.39 cubic feet per second.

The developed site is envisioned as having a loading dock and garage parking below street grade, with a drainage system sump and duplex pump installation to return storm water to the city stormwater sewer. The underground garage is covered and is expected to contribute a negligible volume of water to the sump. Precipitation falling on the garage access ramps is intercepted by trench drains at the bottom of the ramps.

The exposed area draining to the sump is 1.07 acres with an AHYMO peak flow of 4.80 cubic feet per second (Appendix C). The sump is to be pumped to the curb inlet at the N.W. corner of the Third Street-Lomas intersection through 44 feet of 12" ductile iron pipe. This existing curb inlet drains to the 54" line on Third Street via 45 feet of 18" pipe. The 54" line on Third intersects the Lomas Street 72" line, and continues to the Iron Street storm drain.

Drainage from 1.06 acres of roof surface, at 5.23 cubic feet per second (Appendix D), is anticipated to discharge through 70 feet of new 15" reinforced concrete pipe to a new manhole on the 54" storm drain in Third Street. This manhole should be constructed approximately 80 feet north of the most northern of two storm sewer manholes existing at the intersection of Third and Slate Streets (exact location on drawings).

The remaining peak flow discharge from the site is sheet flow at 8.79 cubic feet per second to the surrounding streets. Approximately 30% of this will flow to the Lomas Street inlet, 30% to Fourth Street inlets, 20% to Marble Street inlets, and 20% to Third Street inlets..

Curb Inlet Replacement on Lomas

A new drop-off bay along Lomas Street is envisioned for this site. This drop-off bay will will be constructed to City Standard Detail 2466 for a bus bay, with the exception of a planned 10' width, rather than 12' . Communication with Sun Tran indicates that no bus service will be provided to this drop-off bay, as its location cannot be reasonably incorporated into any routing through the downtown area.

The drop-off bay will be constructed with a valley gutter at the present curb-and-gutter flowline. The existing single Type C curb inlet will be replaced with a double Type D drop inlet at the valley gutter, with the grate elevation remaining unchanged. Grate capacity for the existing Type C curb inlet is identical to the proposed Type D drop inlet, from the Development Process Manual 22.3 D-6, and the added section of Type D inlet will accomodate the increased runoff from the site.

The existing curb inlet receives approximately 1.74 cubic feet per second peak flow from the site (Appendix E). After development, 3.04 cubic feet per second will be discharged from the site to this point (Appendix F).

Peak runoff presently flowing to this curb inlet is approximately 3.82 cubic feet per second, calculated for one half the Lomas right-of-way between the centerlines of Third and Fourth (Appendix G), and combined with the 1.74 cubic feet per second from the site. Grate capacity for a Type C inlet is 3.8 CFS (half of the graphed double Type C 7.6 CFS in 22.3 D-6, at slope = 0.002) when depth of flow reaches 0.62 feet above the grate. At the 5.12 CFS design flow the depth of flow required for a double Type C or Type D is 0.53 feet. Hence, headwater depth will be reduced and installation of a double Type D inlet will more than compensate for the increase in flow from the site, with regard to grate capacity.

The existing curb inlet pipe capacity reaches 5.12 CFS (assuming inlet control on an 18" connection between the curb inlet and the 72" Lomas storm sewer) at a headwater depth of 16" (Appendix H). Thus the headwater depth remains below the grate elevation at this inlet (existing top elevation 53.35, invert 50.90) with the proposed increase in peak flow from the developed site.

Third & Lomas NW Curb Inlet - Capacity to Accept Sump Discharge

The existing curb inlet at the northwest corner of Third and Lomas drains 6600 square feet of the west side of Third Street in addition to 15,500 square feet of the present Courthouse site. This drain presently intercepts a peak flow of 2.11 CFS (Appendix L), and discharges to the existing 54" line in Third, immediately upstream of the cross-connection with the Lomas 72" line.

After development, a diminished contributing area from the Courthouse site will reduce peak surface flow entering this curb inlet to 0.87 CFS (Appendix M). The sump draining the proposed Courthouse site will discharge a peak influx of 4.80 CFS through 44 feet of 12" ductile iron to the back of this curb inlet, creating a total peak flow of 5.67 CFS. The increase in sustained peak flow through this inlet is (5.67 CFS - 2.11 CFS) equal to 3.56 CFS.

Pumps specified by Flatow Moore Schaffer and McCabe actually operate at 7.24 CFS (Appendix O), creating an intermittant peak flow of 8.11 CFS when added to 0.87 CFS surface flow. The headwater required to move 8.11 CFS through the 18" connection from the curb inlet to the 54" storm sewer in Third Street (Appendix H - assuming inlet control) is 22". With an existing invert of 51.92, and a grate elevation of 53.91, the required 22" head is less than the 24" available. Hence, this curb inlet has sufficient existing capacity to drain the proposed peak sump pumping.

Third Street 54" Line - Capacity to Accept Sump and Roof Discharge

Roof drainage from the proposed Courthouse construction is anticipated to discharge at 5.23 CFS through 70 feet of 15" reinforced concrete pipe to a proposed manhole constructed on the 54" storm sewer in Third Street. Combined with the increase of 3.56 CFS through the curb inlet

discussed above, and accounting for the change in sheet flow from the site (-6.69 CFS), peak flow to the Third Street 54" line will be increased by 3.34 CFS.

Prior to construction of the Lomas Street 72" line, projected flow in the Third Street drain south of Lomas was 110 CFS for a 10-year storm, in a report by AAR, Inc. (Reference 2), while capacity for this section was 90 CFS. This report analyzed the need for the new 72" line in Lomas, which has now been constructed. The new 72" line is intended to distribute flows more evenly to the Barelas, Alcalde, and Broadway pumping stations, but it will have the immediate effect of intercepting flow on the 54" Third Street line. The cross-connection will distribute part of this flow to the 72" Eighth Street line, which is less heavily loaded (110 CFS projected flow with 160 CFS capacity).

The increased flow from the site, though primarily discharged to the (previously) overloaded 54" Third Street line, will be redistributed immediately at the junction with the 72" Lomas Street line. Present capacity versus flow information does not appear to be available for the Third Street 54" line at this location.

The downtown basin which encompasses the site is characterized as developed (Reference 2), and a significant increase in peak discharge is not forseen. Development of the Courthouse site contributes a relatively insignificant increase of 3.4 cubic feet per second. It is not anticipated to be a precedent justifying substantial increases from other developments in the basin.

Sump Capacity

From Flatow Moore Shaffer and McCabe, the sump will be a duplex installation with two 3250 gallon-per-minute pumps (7.24 cubic feet per second), and 30,000 gallons of storage capacity.

Capacity of On-Site Area Drains

Drains around the building perimeter move storm water out of areas that are below street level. One consideration for sizing these drains is the potential for the sides of the building to intercept a slanting rain. The 24" square grates used on the site drain 5.6 CFS at 3" ponding depth (Appendix J). Maximum runoff to the drains based on the area of the side of the building is listed below. In all cases, the side of the building (leading to the drain) is larger than the horizontal drainage area intercepted by the drain.

Grate Elevation	Runoff (100-Year)	Grate Capacity (at 3" Ponding)	Pipe Capacity-Inlet Limited (at HW/D=1 Appendix H)
53.77 (two)	0.30 CFS	5.6 CFS	1.6 CFS
52.80	0.71 CFS	5.6 CFS	2.3 CFS
51.50	0.55 CFS	5.6 CFS	2.3 CFS
50.60	0.66 CFS	5.6 CFS	2.3 CFS
49.70	0.66 CFS	5.6 CFS	2.3 CFS

The trench drain at the loading dock is 20 feet long with a minimum 1-3/4" width grate. Peak flow is expected to be 2.84 CFS. Grate capacity is 3.6 CFS without ponding (Appendix K).

The trench drains at the bottom of the garage access ramps each intercept a peak flow of 0.33 CFS, (Appendix N). These drains are part of the covered underground garage floor drainage system designed by Flatow Moore Schaffer McCabe, and they discharge to the sump. Peak runoff from the garage access ramps is included in the sump discharge calculations and overall site runoff calculations.

Drains outside the garage exits intercept a peak 0.51 CFS, and have 5.6 CFS capacity.

Maximum flow expected in the 12" reinforced concrete pipe connecting area drains is 1.01 CFS, and the capacity at the designed 1.7% slope is 6.51 CFS. Maximum flow expected in the 18" reinforced concrete pipe connecting area drains to the sump is 4.80 CFS, and capacity at the planned 1.5% slope is 11.0 CFS. The pipes and drains are somewhat oversized to accomodate potential sediment and trash accumulation.

References

(1) Topographic Survey, Red Mountain Engineers, Albuquerque, New Mexico, Job #95803, 11/27/95.

(2) Lomas Boulevard Storm Drain Design Analysis Report, Andrews, Asbury & Robert Inc., Albuquerque, New Mexico, June, 1991.

(3) Development Process Manual, Municipal Development Department, Albuquerque, New Mexico, March 1982.

(4) Standard Specifications for Public Works Construction, Public Works Department, Albuquerque, New Mexico, 1986.

(5) FIRM Flood Insurance Rate Map - City of Albuquerque, New Mexico - Panel 28 of 50 - Community Panel Number 350002 0028 C, Federal Emergency Management Agency, October 14, 1983.

APPENDIX 'A'

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 02/06/1996
     START TIME (HR:MIN:SEC) = 07:31:55     USER NO.= RED_MTNM.194
     INPUT FILE = gsapre.dat

*          (GSA) OVERALL PEAK FLOW - PRE-DEVELOPMENT
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
RAINFALL          TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD      ID=1   HYD NO=101.0
              DA=0.00658 SQ MI
              PER A=35.0 PER B=0.0
              PER C=40.0 PER D=25.0
              TP=0.067 HR MASSRAIN=-1

     K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  12.921   CFS   UNIT VOLUME =  .4575      B =  526.28     P60 = 2.0000
     AREA =     .001645 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333


     K =  .066397HR   TP =  .067000HR   K/TP RATIO =  .991003    SHAPE CONSTANT, N =  3.562771
     UNIT PEAK =  23.930   CFS   UNIT VOLUME =  .6559      B =  324.88     P60 = 2.0000
     AREA =     .004935 SQ MI   IA =   .49000 INCHES   INF =  1.22200 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD         ID=1  CODE=1

                    PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =     1.09119 INCHES     =       .3829 ACRE-FEET
    PEAK DISCHARGE RATE =     15.41 CFS  AT   1.467 HOURS   BASIN AREA =   .0066 SQ. MI.

  FINISH

    NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 07:32:02
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```
   AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
      RUN DATE (MON/DAY/YR) = 02/06/1996
      START TIME (HR:MIN:SEC) = 13:51:03     USER NO.= RED_MTNM.194
      INPUT FILE = gsatotal.dat

*          (GSA) OVERALL PEAK FLOW - POST-DEVELOPMENT
*         USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*        AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START            RAINFALL BEGINS AT 0.0  HRS
RAINFALL           TYPE=1 RAIN QUARTER=0
                   ONE=2.00 SIX=2.30
                   RAIN DAY=2.70 DT=0.133333 HR

            COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
            DT =   .133333 HOURS      END TIME =    5.999986 HOURS
              .0000  .0052  .0110  .0173  .0243  .0324  .0417
              .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
             1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
             2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
             2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
             2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
             2.2876 2.2919 2.2960 2.3000

   COMPUTE NM HYD      ID=1   HYD NO=101.0
                   DA=0.00658 SQ MI
                   PER A=0.0 PER B=26.3
                   PER C=0.0 PER D=73.7
                   TP=0.067 HR MASSRAIN=-1

      K=  .036515HR   TP=  .067000HR   K/TP RATIO=  .545000    SHAPE CONSTANT, N=  7.106420
      UNIT PEAK=  38.092   CFS  UNIT VOLUME=  .4577     B=  526.28     P60=2.0000
      AREA=     .004849 SQ MI   IA=   .10000 INCHES   INF=   .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT=
.133333


      K=  .066330HR   TP=  .067000HR   K/TP RATIO=  .990000    SHAPE CONSTANT, N=  3.566429
      UNIT PEAK=  8.3982   CFS  UNIT VOLUME=  .6553     B=  325.15     P60=2.0000
      AREA=     .001731 SQ MI   IA=   .50000 INCHES   INF=  1.25000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT=
.133333

PRINT HYD          ID=1  CODE=1

                     PARTIAL HYDROGRAPH   101.00


   RUNOFF VOLUME=    1.72083 INCHES    =       .6039 ACRE-FEET
   PEAK DISCHARGE RATE=     18.80 CFS  AT   1.467 HOURS   BASIN AREA=   .0066 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 13:51:10
```

APPENDIX 'C'

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 02/06/1996
     START TIME (HR:MIN:SEC) = 13:56:50     USER NO.= RED_MTNM.194
     INPUT FILE = gsasump.dat

*          U.S. DISTRICT COURT (GSA) SUMP PEAK FLOW
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
RAINFALL          TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD      ID=1   HYD NO=101.0
                DA=0.001680 SQ MI
                PER A=0.0 PER B=26.9
                PER C=0.0 PER D=73.1
                TP=0.067 HR MASSRAIN=-1

     K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  9.6464   CFS   UNIT VOLUME =   .4571      B =  526.28     P60 = 2.0000
     AREA =     .001228 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333


     K =  .066330HR   TP =  .067000HR   K/TP RATIO =  .990000    SHAPE CONSTANT, N =  3.566429
     UNIT PEAK =  2.1931   CFS   UNIT VOLUME =   .6530      B =  325.15     P60 = 2.0000
     AREA =     .000452 SQ MI   IA =   .50000 INCHES   INF =  1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD         ID=1  CODE=1

                    PARTIAL HYDROGRAPH   101.00


    RUNOFF VOLUME =     1.71290 INCHES    =       .1535 ACRE-FEET
    PEAK DISCHARGE RATE =      4.80 CFS  AT   1.467 HOURS   BASIN AREA =   .0017 SQ. MI.

  FINISH

    NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 13:56:57
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APPENDIX 'D'

```
 AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
    RUN DATE (MON/DAY/YR) = 01/18/1996
    START TIME (HR:MIN:SEC) = 11:38:33    USER NO.= RED_MTNM.194
    INPUT FILE = gsaroof.dat

*          U.S. DISTRICT COURT (GSA) ROOF PEAK FLOW
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
  RAINFALL        TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS     END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD     ID=1   HYD NO=101.0
                  DA=0.001664 SQ MI
                  PER A=0.0 PER B=0.0
                  PER C=0.0 PER D=100.0
                  TP=0.067 HR MASSRAIN=-1

     K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  13.070   CFS  UNIT VOLUME =  .4575     B =  526.28     P60 = 2.0000
     AREA =     .001664 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD       ID=1  CODE=1

                    PARTIAL HYDROGRAPH  101.00


     RUNOFF VOLUME =    2.06827 INCHES    =       .1836 ACRE-FEET
     PEAK DISCHARGE RATE =      5.23 CFS  AT   1.467 HOURS   BASIN AREA =   .0017 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH       END TIME (HR:MIN:SEC) = 11:38:40
```

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/08/1996
     START TIME (HR:MIN:SEC) = 15:59:07     USER NO.= RED_MTNM.194
     INPUT FILE = 174.dat

*              SAMPLE INPUT FOR AHYMO
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
RAINFALL          TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD      ID=1   HYD NO=101.0
                DA=0.000552 SQ MI
                PER A=0.0 PER B=0.0
                PER C=0.0 PER D=100.0
                TP=0.067 HR MASSRAIN=-1

     K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  4.3359   CFS   UNIT VOLUME =   .4571      B =  526.28     P60 = 2.0000
     AREA =     .000552 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD         ID=1  CODE=1

                      PARTIAL HYDROGRAPH   101.00


     RUNOFF VOLUME =    2.06827 INCHES    =       .0609 ACRE-FEET
     PEAK DISCHARGE RATE =      1.74 CFS  AT   1.467 HOURS   BASIN AREA =   .0006 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 15:59:14
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```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 03/08/1996
     START TIME (HR:MIN:SEC) = 16:06:14     USER NO.= RED_MTNM.194
     INPUT FILE = sample.dat

*              SAMPLE INPUT FOR AHYMO
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
RAINFALL          TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD      ID=1   HYD NO=101.0
                DA=0.000965 SQ MI
                PER A=0.0 PER B=0.0
                PER C=0.0 PER D=100.0
                TP=0.067 HR MASSRAIN=-1

     K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  7.5799   CFS   UNIT VOLUME =   .4571      B =  526.28     P60 = 2.0000
     AREA =     .000965 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD         ID=1  CODE=1

                      PARTIAL HYDROGRAPH   101.00


     RUNOFF VOLUME =    2.06827 INCHES    =       .1064 ACRE-FEET
     PEAK DISCHARGE RATE =      3.04 CFS  AT   1.467 HOURS   BASIN AREA =   .0010 SQ. MI.

  FINISH

     NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 16:06:21
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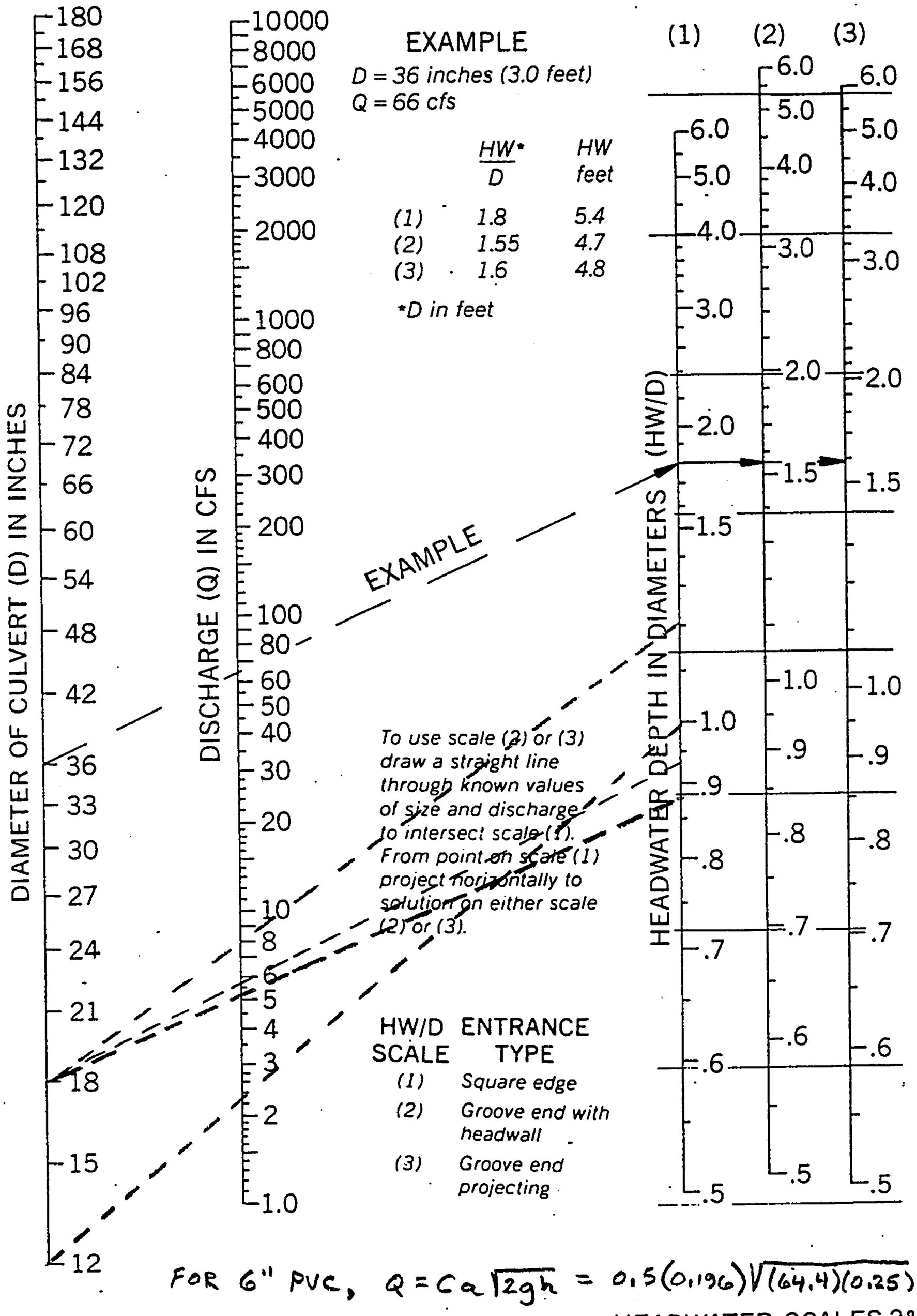
APPENDIX 'G'

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 02/07/1996
     START TIME (HR:MIN:SEC) = 15:14:51     USER NO.= RED_MTNM.194
     INPUT FILE = gsalomas.dat

*              GSA LOMAS STREET CURB INLET
*         USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*        AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START            RAINFALL BEGINS AT 0.0  HRS
   RAINFALL          TYPE=1 RAIN QUARTER=0
                     ONE=2.00 SIX=2.30
                     RAIN DAY=2.70 DT=0.133333 HR

              COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
              DT =   .133333 HOURS      END TIME =    5.999986 HOURS
                .0000  .0052  .0110  .0173  .0243  .0324  .0417
                .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
               1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
               2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
               2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
               2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
               2.2876 2.2919 2.2960 2.3000

   COMPUTE NM HYD       ID=1   HYD NO=101.0
                        DA=0.0006617 SQ MI
                        PER A=0.0 PER B=0.0
                        PER C=0.0 PER D=100.0
                        TP=0.067 HR MASSRAIN=-1

      K=  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
      UNIT PEAK =  5.1976   CFS  UNIT VOLUME =   .4571      B =  526.28     P60 = 2.0000
      AREA =     .000662 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

   PRINT HYD          ID=1  CODE=1

                        PARTIAL HYDROGRAPH  101.00


      RUNOFF VOLUME =    2.06827 INCHES    =       .0730 ACRE-FEET
      PEAK DISCHARGE RATE =      2.08 CFS  AT   1.467 HOURS   BASIN AREA =   .0007 SQ. MI.


FINISH

   NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 15:14:58
```

FIGURE 33

HEADWATER DEPTH FOR CIRCULAR CONCRETE PIPE CULVERTS WITH INLET CONTROL



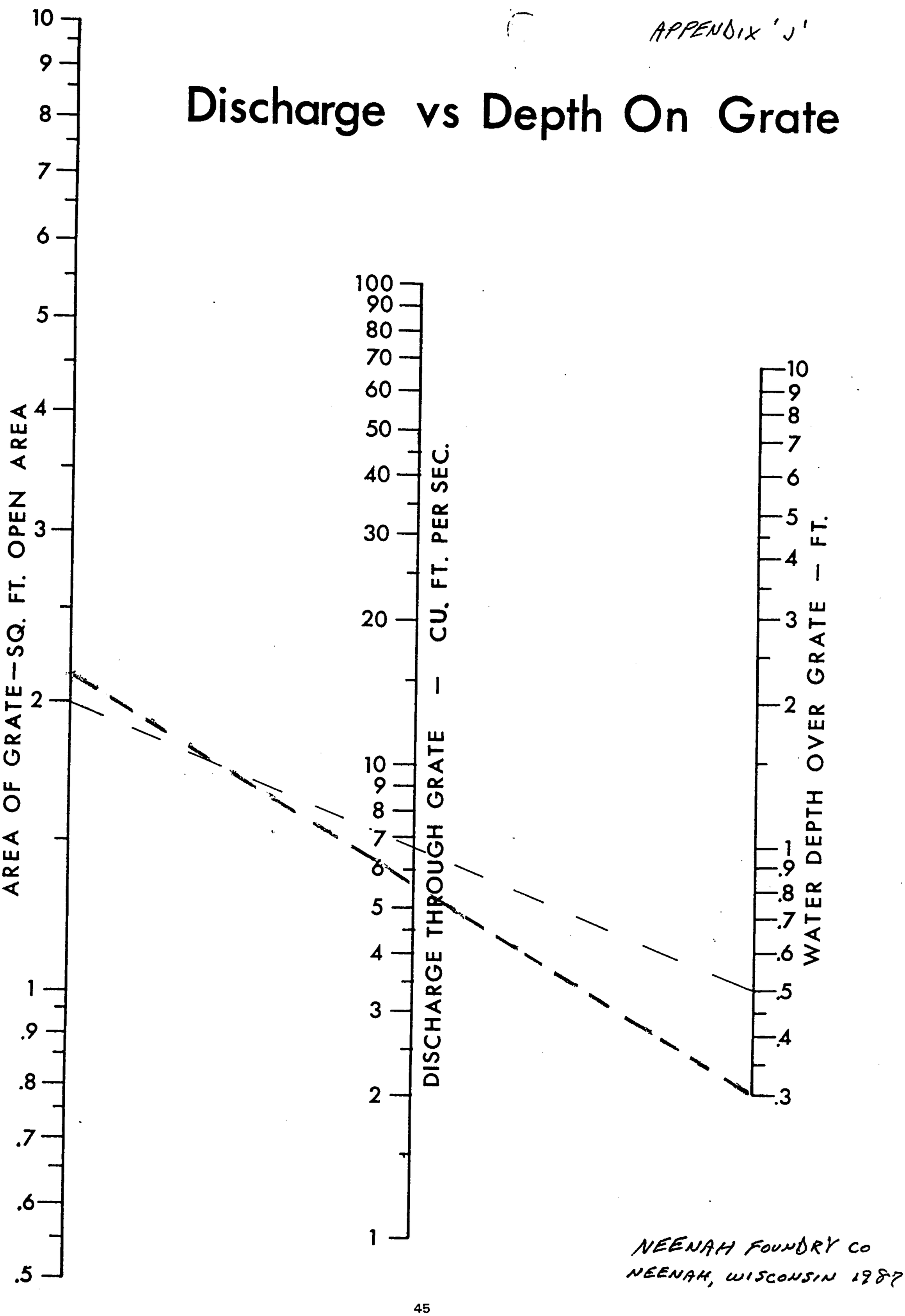
FOR 6" PVC, $Q = C_a\sqrt{2gh} = 0.5(0.196)\sqrt{(64.4)(0.25)} = 1.58$ CFS

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER SCALES 2&3
REVISED MAY 1964

APPENDIX 'J'

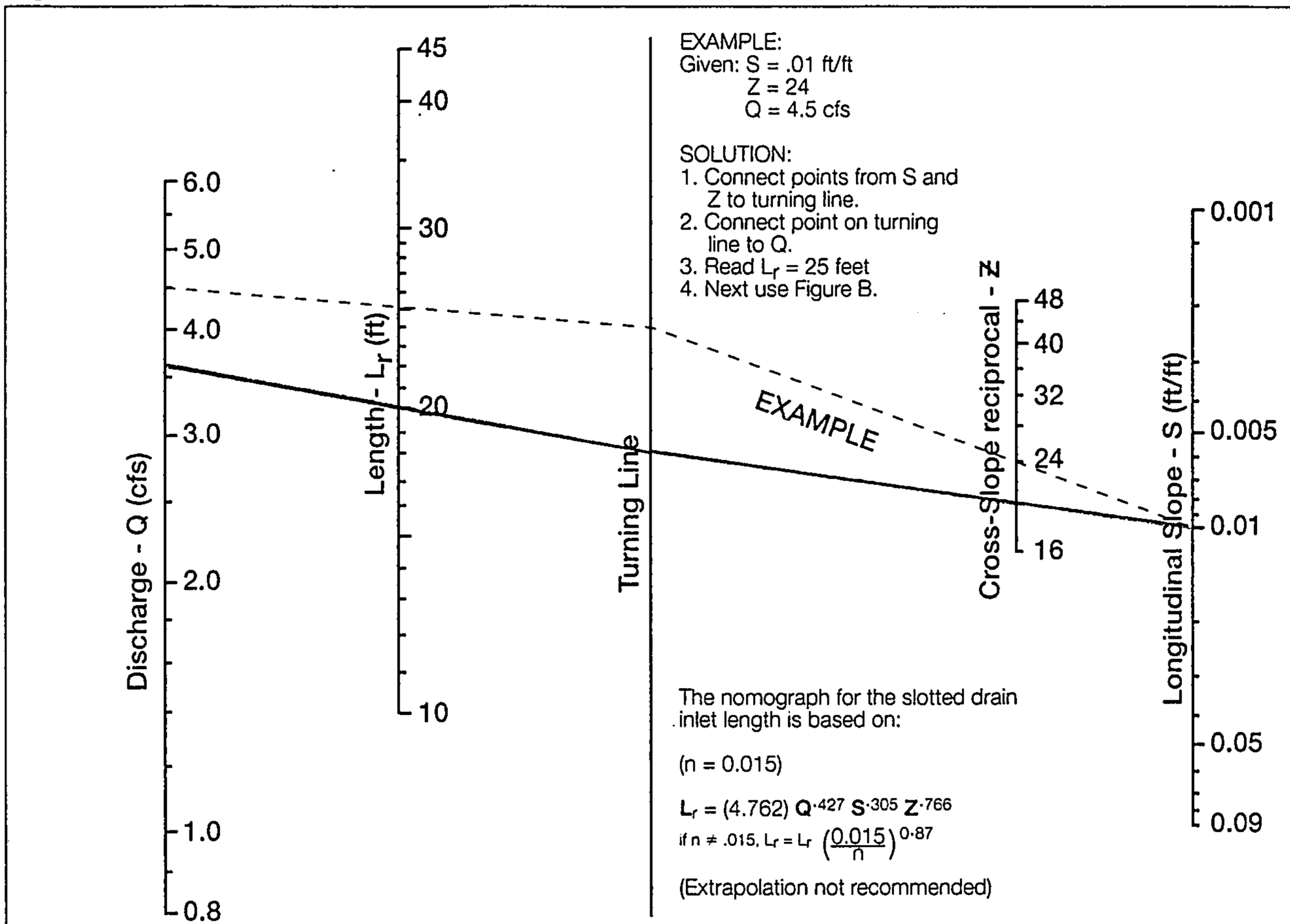
Discharge vs Depth On Grate



NEENAH FOUNDRY CO
NEENAH, WISCONSIN 1987

APPENDIX 'K'

Figure A: **NOMOGRAPH—SLOTTED DRAIN ON GRADE IN CURB AND GUTTER**



EXAMPLE:
Given: S = .01 ft/ft
Z = 24
Q = 4.5 cfs

SOLUTION:
1. Connect points from S and Z to turning line.
2. Connect point on turning line to Q.
3. Read L_r = 25 feet
4. Next use Figure B.

The nomograph for the slotted drain inlet length is based on:

(n = 0.015)

$L_r = (4.762)\ Q^{.427}\ S^{-.305}\ Z^{.766}$

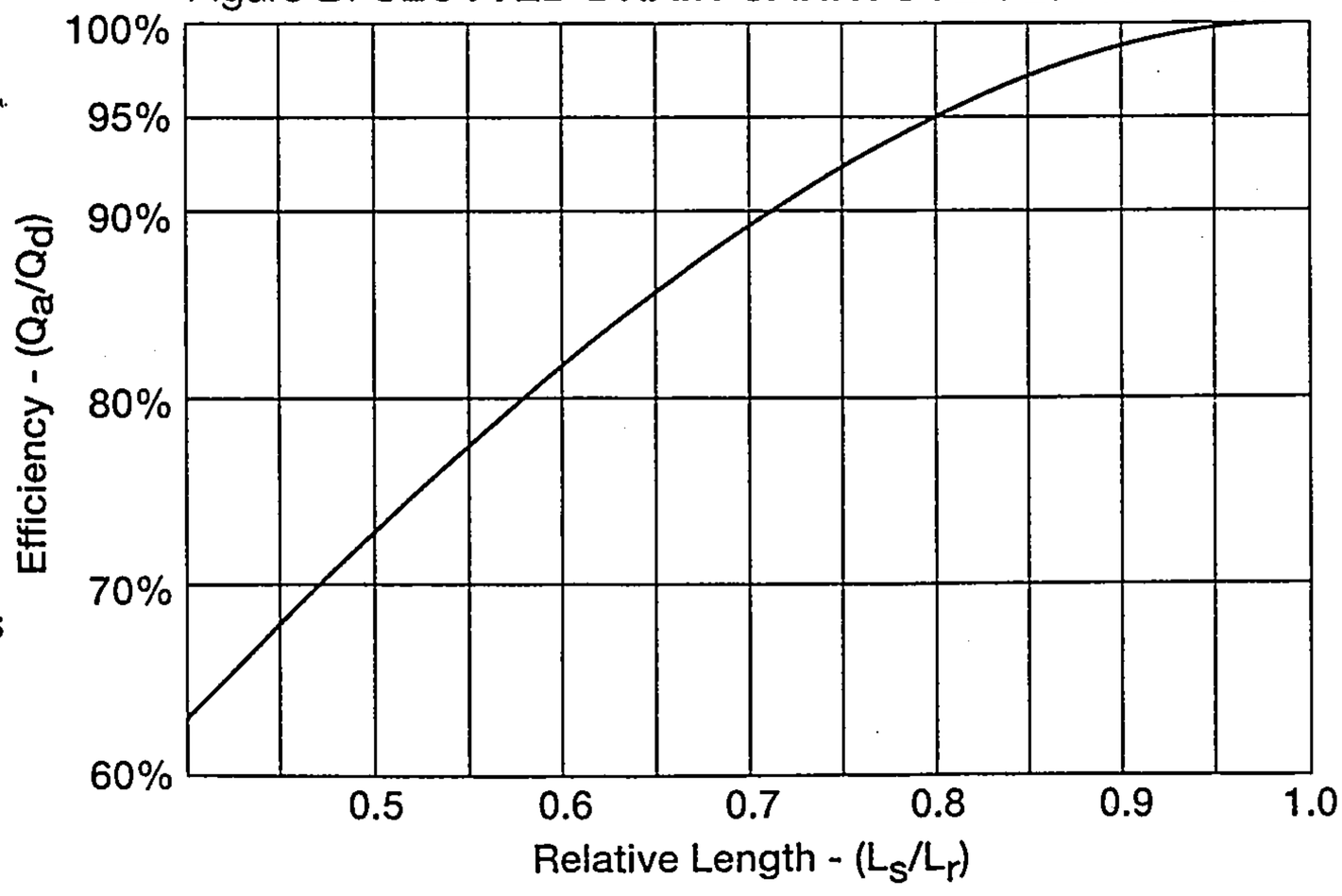
if $n \neq .015$, $L_r = L_r \left(\frac{0.015}{n}\right)^{0.87}$

(Extrapolation not recommended)

Definitions

S — Longitudinal gutter or channel slope, ft/ft
S_x — Transverse slope, ft/ft
$\cancel{Z}$ — Transverse slope reciprocal $\left(\frac{1}{S_x}\right)$, ft/ft
d — Depth of flow over the slot, ft
L — Length of slot, ft
L_r — Length of slot required for total interception, ft
L_s — A selected length of slot, ft
Q — Discharge into inlet, cfs
Q_d — Total discharge at an inlet, cfs
Q_a — An allowed discharge, cfs
C — Runoff coefficient
I — Rainfall intensity, ft/sec
A — Area drained

Figure B: **SLOTTED DRAIN CARRYOVER EFFICIENCY**



Example: Solution from Figure A is L_r = 25 feet. If a standard 20-foot length is used, relative length ratio L_s/L_r = 20 ft/25 ft = 0.8. From Figure B with a relative length ratio of 0.8, the efficiency is 95%. Ninety-five percent of the flow is intercepted by the 20-foot length, and 5% runs down the gutter to be intercepted by the next slot.

SOURCE: CONTECH

```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 02/09/1996
     START TIME (HR:MIN:SEC) = 14:24:45     USER NO.= RED_MTNM.194
     INPUT FILE = 3RD&LOM.PRE

*        GSA THIRD & LOMAS CURB DRAIN - PRE-DEVELOPMENT
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START            RAINFALL BEGINS AT 0.0  HRS
RAINFALL           TYPE=1 RAIN QUARTER=0
                   ONE=2.00 SIX=2.30
                   RAIN DAY=2.70 DT=0.133333 HR

              COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
              DT =   .133333 HOURS      END TIME =    5.999986 HOURS
                .0000  .0052  .0110  .0173  .0243  .0324  .0417
                .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
               1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
               2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
               2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
               2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
               2.2876 2.2919 2.2960 2.3000

   COMPUTE NM HYD      ID=1   HYD NO=101.0
                  DA=0.000797 SQ MI
                  PER A=0.0 PER B=0.0
                  PER C=70.2 PER D=29.8
                  TP=0.067 HR MASSRAIN=-1

      K=  .036515HR   TP=  .067000HR   K/TP RATIO=  .545000    SHAPE CONSTANT, N=  7.106420
      UNIT PEAK=  1.8656   CFS  UNIT VOLUME=   .4555     B=  526.28     P60=2.0000
      AREA=     .000238 SQ MI   IA=   .10000 INCHES   INF=   .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT=
.133333


      K=  .053948HR   TP=  .067000HR   K/TP RATIO=  .805200    SHAPE CONSTANT, N=  4.445615
      UNIT PEAK=  3.2055   CFS  UNIT VOLUME=   .6035     B=  383.86     P60=2.0000
      AREA=     .000559 SQ MI   IA=   .35000 INCHES   INF=   .83000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT=
.133333

PRINT HYD          ID=1  CODE=1

                        PARTIAL HYDROGRAPH  101.00


   RUNOFF VOLUME=     1.38283 INCHES     =       .0588 ACRE-FEET
   PEAK DISCHARGE RATE=       2.11 CFS  AT   1.467 HOURS   BASIN AREA=   .0008 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 14:24:52
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```
  AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 02/09/1996
     START TIME (HR:MIN:SEC) = 14:31:51     USER NO.= RED_MTNM.194
     INPUT FILE = 3RD&LOM.PST

*       GSA THIRD & LOMAS CURB INLET - POST DEVELOPMENT
*        USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*       AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START           RAINFALL BEGINS AT 0.0  HRS
RAINFALL          TYPE=1 RAIN QUARTER=0
                  ONE=2.00 SIX=2.30
                  RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS      END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD      ID=1   HYD NO=101.0
                DA=0.000276 SQ MI
                PER A=0.0 PER B=0.0
                PER C=0.0 PER D=100.0
                TP=0.067 HR MASSRAIN=-1

     K=  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
     UNIT PEAK =  2.1679   CFS  UNIT VOLUME =   .4555      B =  526.28     P60 = 2.0000
     AREA =     .000276 SQ MI   IA =   .10000 INCHES   INF =   .04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD         ID=1  CODE=1

                      PARTIAL HYDROGRAPH   101.00


     RUNOFF VOLUME =    2.06827 INCHES    =       .0304 ACRE-FEET
     PEAK DISCHARGE RATE =       .87 CFS  AT   1.467 HOURS   BASIN AREA =   .0003 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH        END TIME (HR:MIN:SEC) = 14:31:58
```

APPENDIX 'N'

```
 AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
    RUN DATE (MON/DAY/YR) = 02/19/1996
    START TIME (HR:MIN:SEC) = 11:19:46    USER NO.= RED_MTNM.194
    INPUT FILE = GSARAMP.DAT

*            GARAGE ACCESS RAMP PEAK RUNOFF
*       USING MODIFIED METHODS FOR D.P.M. CHAPTER 22
*      AND THE INITIAL ABSTRACTION - INFILTRATION METHOD
*
START          RAINFALL BEGINS AT 0.0  HRS
RAINFALL         TYPE=1 RAIN QUARTER=0
                 ONE=2.00 SIX=2.30
                 RAIN DAY=2.70 DT=0.133333 HR

          COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40
HR.
          DT =   .133333 HOURS     END TIME =    5.999986 HOURS
            .0000  .0052  .0110  .0173  .0243  .0324  .0417
            .0528  .0708  .1679  .6008 1.3315 1.5942 1.7860
           1.9372 2.0593 2.0816 2.0999 2.1157 2.1295 2.1418
           2.1531 2.1634 2.1730 2.1819 2.1902 2.1981 2.2056
           2.2127 2.2194 2.2259 2.2321 2.2380 2.2438 2.2493
           2.2546 2.2598 2.2647 2.2696 2.2743 2.2789 2.2833
           2.2876 2.2919 2.2960 2.3000

  COMPUTE NM HYD     ID=1  HYD NO=101.0
                 DA=0.000102 SQ MI
                 PER A=0.0 PER B=0.0
                 PER C=0.0 PER D=100.0
                 TP=0.067 HR MASSRAIN=-1

    K =  .036515HR   TP =  .067000HR   K/TP RATIO =  .545000    SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =  .80120   CFS  UNIT VOLUME =  .4503     B =  526.28     P60 = 2.0000
    AREA =     .000102 SQ MI   IA =  .10000 INCHES   INF =  .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
.133333

  PRINT HYD        ID=1  CODE=1

                     PARTIAL HYDROGRAPH  101.00


    RUNOFF VOLUME =    2.06827 INCHES    =       .0113 ACRE-FEET
    PEAK DISCHARGE RATE =       .33 CFS  AT   1.467 HOURS   BASIN AREA =   .0001 SQ. MI.

FINISH

   NORMAL PROGRAM FINISH       END TIME (HR:MIN:SEC) = 11:19:53
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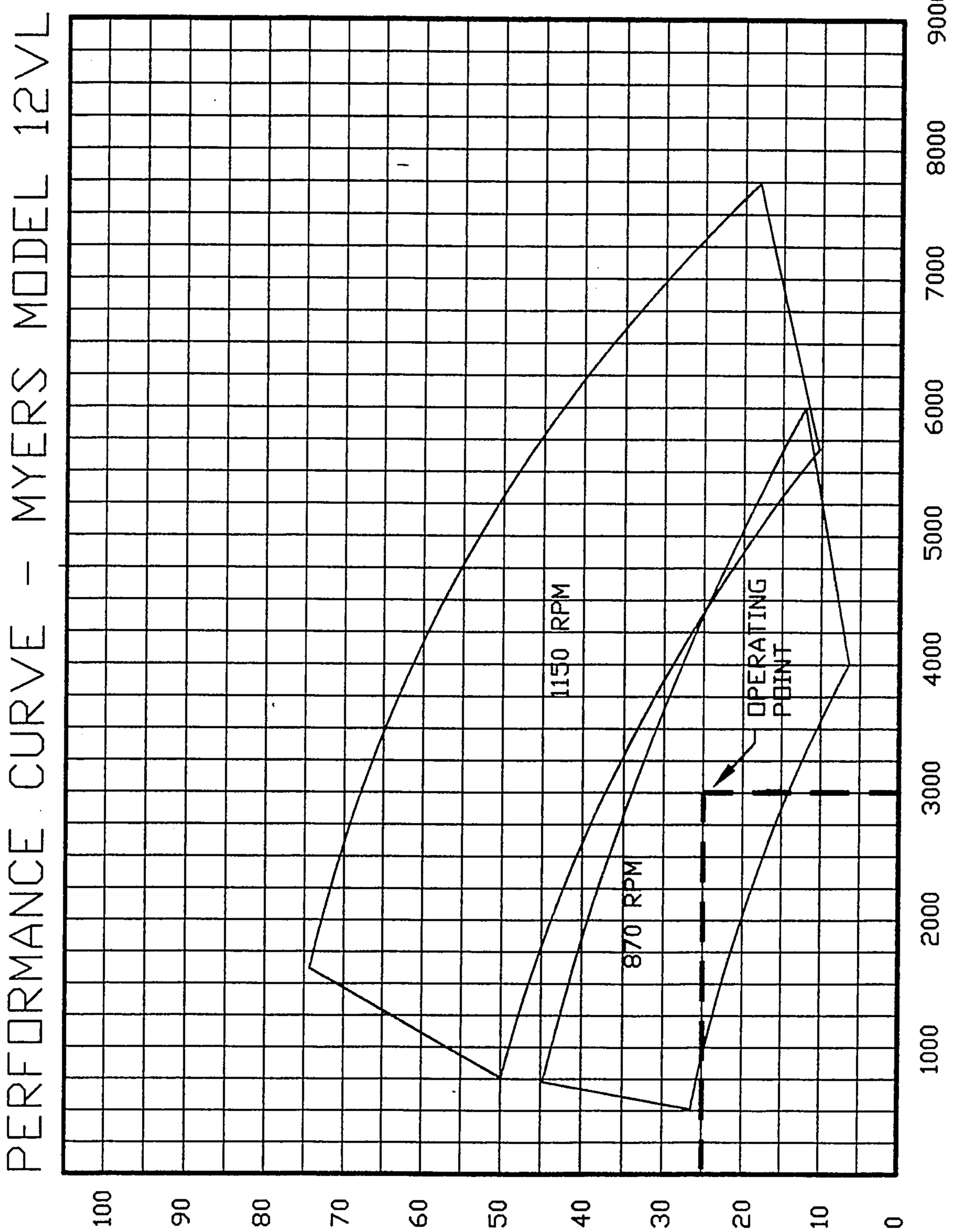
AFTER DATA FROM:
F.E.MYERS, A PENTAIR COMPANY
1101 MYERS PARKWAY
ASHLAND, OHIO 44805-1969 419/269-1144



Red Mountain Engineers, Inc.

Engineers • Surveyors

LETTER OF TRANSMITTAL

Date: 3 4/27/97

Firm: CITY HYDROLOGY
400 MARQUETTE NW
ALBUQUERQUE, NM

Project No: FEDERAL COURTHOUSE
Project:

Attention: [redacted] JOHN MURRAY - 3rd FLOOR - HYDROLOGY OFFICE

We Transmit For Your:

- ☐ For Your Review and Comment
- ☐ Make Corrections Noted
- ☐ No Exceptions Taken
- ☐ As Requested
- ☐ For Approval
- ☑ For Your Use
- ☐ Resubmit

The Following Document (s):

- ☑ Drawings
- ☐ Shop Drawing Submittals
- ☐ Specifications
- ☐ Change Order
- ☐ Correspondence
- ☐ _____

Copies	Date	Description
1		GRADING & DRAINAGE

REMARKS:

Copy (s) To: _____

By: STEVE RANDALL

☒ **Santa Fe** Phone: (505) 473-7373 Fax: (505) 473-4865
1216 Parkway Drive, Santa Fe, NM 87505

☐ **Albuquerque** Phone: (505) 889-3004 Fax: (505) 889-2797
4600-C Montgomery Blvd. NE, Suite 101, Albuquerque, NM 87109

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS

Drainage Analysis for

Bernalillo County Courthouse

and

District Attorney Building

COMPLETE PROFESSIONAL SERVICES

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Bernalillo County Courthouse ZONE ATLAS/DRNG. FILE #: ~~J-15~~ J-14/D120

DRB #: 97-318 EPC #: WORK ORDER #3:

LEGAL DESCRIPTION: Block 19, Perfecto Armijo & Bros. Addition and Block J, Mandell Addition

CITY ADDRESS:

ENGINEERING FIRM: Andrews, Asbury & Robert, Inc. CONTACT: Jeanne Wolfenbarger

ADDRESS: 149 Jackson St. N.E., Albuquerque, NM 87108 PHONE: 265-6631

OWNER: Bernalillo County CONTACT:

ADDRESS: PHONE:

ARCHITECT: FMSM Architects CONTACT: Joe Boehning

ADDRESS: 809 Copper N.W. PHONE: 766-6610

SURVEYOR: Andrews, Asbury & Robert, Inc. CONTACT: Mr. Gayle D. Jewell, P.S.

ADDRESS: 149 Jackson St. N.E., Albuquerque, NM 87108 PHONE: 265-6631

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

____ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

____

PRE-DESIGN MEETING:

X YES

____ NO

X COPY PROVIDED

RECEIVED
OCT 14 1997
HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

X PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

X S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

____ OTHER ____ (SPECIFY)

DATE SUBMITTED: October 10, 1997

BY: Jeanne Wolfenbarger

d:\projects\BC-782\Drainage.Frm

DRAINAGE ANALYSIS

for

BERNALILLO COUNTY COURTHOUSE AND DISTRICT ATTORNEY BUILDING

Albuquerque, New Mexico

October 13, 1997

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
No. 9688
JOHN A. ANDREWS

Prepared by
Andrews, Asbury, & Robert, Inc.
Consulting Engineers
149 Jackson Street, N.E.
Albuquerque, New Mexico 87108

TABLE OF CONTENTS

I. INTRODUCTION

It is proposed to construct a new Bernalillo County Courthouse and District Attorney Building in downtown Albuquerque on land that is currently developed and is primarily used for parking. The purpose of this report is to analyze the drainage for this new development and to propose a grading and drainage plan based on that analysis.

The entire on-site area is bounded by Lomas Boulevard on the north, Fruit Avenue on the south, Fourth Street on the east, and Sixth Street on the west (See Vicinity Map, Map No.1). Fifth Street will separate the Bernalillo County Courthouse site on the east side from the District Attorney Building site on the west side. As shown by FIRM on Panel 35001C0334 D, neither of the two sites is located within the floodplain.

Drainage for the proposed development is analyzed for existing and developed conditions. Existing land usage and drainage conditions was determined from site visits and topographic site information. Proposed drainage areas are shown on Map No. 2.

The drainage analysis was based on Section 22.2 of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993. The drainage calculations and basin areas may be found in Tables 1 through 4.

ZONE ATLAS MAP J-14

SCALE: 1"=750'

COUNTY OF BERNALILLO, NEW MEXICO

BERNALILLO COUNTY COURTHOUSE

VICINITY MAP

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
ALBUQUERQUE NEW MEXICO

FILE No.	DRAWN	CHECKED	DATE	
97-782	TL	JW	OCT. 1997	MAP 1

II. EXISTING SITE CONDITIONS

The existing site is completely developed. Gravel and paved parking lots cover the majority of the site, and two commercial buildings are located on the far east side. Because of the proposed new County Courthouse and District Attorney Building, the existing buildings and parking lots on-site are currently undergoing demolition.

The existing on-site area is divided into Basins A and B where Basin A covers the site for the Bernalillo County Courthouse and Basin B covers the site for the District Attorney Building. (See map number 2.) Generally, on-site runoff is directed to all surrounding streets by sheet flow at very minimal slopes. 4th, 5th, and 6th Street convey on-site runoff to the south where the runoff is then collected by existing inlets along Fruit Avenue at each of the north-south street intersections. As shown on the grading and drainage plan, the inlets discharge to separate storm drains located under 4th, 5th, and 6th Street. Existing on-site drainage calculations may be found in Tables 1 and 2.

On-site runoff that discharges to Lomas Boulevard is collected by a series of inlets that are located along the south side of Lomas Boulevard. These inlets discharge to an existing 72" storm drain under Lomas Boulevard which has recently been built in accordance with the Albuquerque Master Drainage Study. An existing 24" storm drain under Lomas Boulevard is directly tied to the 72" storm drain.

All runoff is generated on-site. Streets surrounding the site have curb and gutter on each side, preventing any off-site street runoff from entering the on-site area.

III. PROPOSED SITE CONDITIONS

A. Bernalillo County Courthouse

The new Bernalillo County Courthouse Building is proposed to be built between Fourth and Fifth Street, and most of the surrounding area will be paved with concrete. A proposed underground parking garage for this building will be accessed off of the existing Fruit Avenue. It is noted that Fruit Avenue is planned for vacation in the near future in order that this street can be used as a private access to the building.

To minimize sheet flow to the street, all roof runoff from the Bernalillo County Courthouse will be discharged through an underground roof/storm drain which will be connected to a proposed inlet on the south side of Lomas Boulevard just west of Fourth Street. As shown on Map 2, the inlet will discharge to a 24" storm drain. The Courthouse Building area is designated as Basin B1.

Basin B2 only includes the entrance to an underground parking garage for the County Courthouse which is located to the south of the building off of Fruit Avenue. Runoff from Basin B2 will be collected by a trench grate at the bottom of the drive and discharged to the County Courthouse roof drain system by a pumping system.

Basin B3 will surface discharge to surrounding streets. Similar to existing conditions, the runoff from this basin will be collected by inlets on the streets surrounding the site.

Basin B4 only includes the existing Fruit Avenue which is planned for vacation. Runoff from this street will drain west and be collected by inlets on 5th Street and 6th Street, the same as under existing conditions. Refer to Tables 3 and 4 for proposed drainage calculations.

B. District Attorney Building

The District Attorney Building and parking lot are proposed to be built between 5th Street and 6th Street. Areas surrounding the building and parking lot will be mostly landscaped.

The drainage concept used for the District Attorney Building will be similar to the concept used for the Bernalillo County Courthouse. The drainage from the District Attorney Building, which is designated as Basin A1, will be collected by an underground storm drain system and drained to the back of the inlet on the southeast corner of Lomas Boulevard and 6th Street. The landscaped area around the building, which is designated as Basin A4, will surface discharge to surrounding streets.

The parking lot for the District Attorney's Office is separated into Basins A2 and A3. Basin A2 will drain to the south side of the parking lot, where the runoff will be collected by proposed inlets and discharged to the back of the new existing inlet on the northwest corner of 5th Street and Fruit Avenue. Basin A3 will drain to the north side of the parking lot where the runoff is collected by proposed inlets and discharged to the back of the inlet on the northeast corner of 5th Street and Lomas Boulevard.

IV. CONCLUSION

Drainage under developed conditions will remain basically the same as under existing conditions as shown by comparing total 100-year runoff flows between Tables 1 and 3. The combination of the existing 24" storm drain and 72" storm drain in Lomas Boulevard provide ample capacity to carry the runoff that is discharging from the proposed buildings. Surface runoff from on-site is minimized, and therefore will have little impact on downstream conditions.

How do you know, did you do a capacity / Basin analysis?

100-YEAR PEAK DISCHARGE FOR EXISTING CONDITIONS
(Section 22.2 of the DPM)
TABLE 1

Basin	Land Treatment Area (acres)					Land Treatment Peak Discharge (cfs/acre)				Total Area (acres)	Peak Discharge (cfs)
	A	B	C	D		A	B	C	D		
A		0.13		2.22		1.56	2.28	3.14	4.70	2.35	10.73
B		0.11		2.26		1.56	2.28	3.14	4.70	2.37	10.87
TOTAL										4.72	21.60

There is landscaping in existing condition?

100-YEAR PEAK RUNOFF FOR EXISTING CONDITIONS
(Section 22.2 of the DPM)
TABLE 2

Basin	Land Treatment Area (Acres)					Land Treatment Excess Precipitation (in)				Total Area (acres)	Excess Precipitation (inches)	Runoff Volume V360(acre-ft)
	A	B	C	D		A	B	C	D			
A		0.13		2.22		0.53	0.78	1.13	2.12	2.35	2.05	0.40
B		0.11		2.26		0.53	0.78	1.13	2.12	2.37	2.06	0.41
TOTAL										4.72		0.81

100-YEAR PEAK DISCHARGE FOR PROPOSED CONDITIONS
(Section 22.2 of the DPM)
TABLE 3

Basin	Land Treatment Area (acres)					Land Treatment Peak Discharge (cfs/acre)				Total Area (acres)	Peak Discharge (cfs)
	A	B	C	D		A	B	C	D		
A1				0.52		1.56	2.28	3.14	4.70	0.52	2.43
A2		0.04		0.74		1.56	2.28	3.14	4.70	0.78	3.57
A3		0.58		0.21		1.56	2.28	3.14	4.70	0.79	2.31
A4		0.19		0.07		1.56	2.28	3.14	4.70	0.26	0.76
Subtotal											9.07
B1				1.17		1.56	2.28	3.14	4.70	1.17	5.50
B2				0.03		1.56	2.28	3.14	4.70	0.03	0.14
B3				0.93		1.56	2.28	3.14	4.70	0.93	4.37
B4				0.24		1.56	2.28	3.14	4.70	0.24	1.13
Subtotal											11.14
TOTAL										4.72	20.21

100-YEAR PEAK RUNOFF FOR PROPOSED CONDITIONS
(Section 22.2 of the DPM)
TABLE 4

Basin	Land Treatment Area (Acres)					Land Treatment Excess Precipitation (in)				Total Area (acres)	Excess Precipitation (inches)	Runoff Volume V360(acre-ft)
	A	B	C	D		A	B	C	D			
A1				0.52		0.53	0.78	1.13	2.12	0.52	2.12	0.09
A2		0.04		0.74		0.53	0.78	1.13	2.12	0.78	2.05	0.13
A3		0.58		0.21		0.53	0.78	1.13	2.12	0.79	1.14	0.07
A4		0.19		0.07		0.53	0.78	1.13	2.12	0.26	1.14	0.02
Subtotal												**0.32**
B1				1.17		0.53	0.78	1.13	2.12	1.17	2.12	0.21
B2				0.03		0.53	0.78	1.13	2.12	0.03	2.12	0.01
B3				0.93		0.53	0.78	1.13	2.12	0.93	2.12	0.16
B4				0.24		0.53	0.78	1.13	2.12	0.24	2.12	0.04
Subtotal												**0.42**
TOTAL										**4.72**		**0.74**

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
DEVELOPMENT SERVICE / HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NO. J14 DATE: 10-2-97
PLANNING DIVISION NO'S: EPC: _____ DRB: 97-318
SUBJECT: County Courthouse and District Attorneys Office
STREET ADDRESS (IF KNOWN): _____
SUBDIVISIONNAME: _____

APPROVAL REQUESTED:

✓ PRELIMINARY PLAT	✓ FINAL PLAT
✓ SITE PLAN FOR BP	____ SITE PLAN FOR SUB
____ GRADING PERMIT	____ PAVING PERMIT
____ BUILDING PERMIT	____ FOUNDATION PERMIT
____ SECTOR PLAN	____ OTHER: _____

	WHO	REPRESENTING
ATTENDANCE:	John Andrews	AAR
	Jeanne Wolfenbarger	AAR
	Fred J. Aguirre	City

FINDINGS:

- An approved drainage plan is required for site plan and/or subdivision (i.e. violation of Fruit St).
- The drainage concept will be to drain directly to the storm drain on the back of catch basins.

THE UNDERSIGNED AGREES THAT THE ABOVE FINDINGS ARE SUMMERIZED ACCURATELY AND ARE SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THEY ARE NOT REASONABLE OR THAT THEY ARE BASED ON INACCURATE INFORMATION.

SIGNED: _____ SIGNED: _____
TITLE : _____ TITLE : _____
DATE : 10/2/97 DATE : _____

CITY OF
Albuquerque

November 6, 1997

Martin J. Chávez, Mayor

Jeanne Wolfenbarger
Andrews, Asbury & Robert
149 Jackson St. NE
Albuquerque, NM 87109

RE: BERNALILLO COUNTY COURTHOUSE (J14-D120). DRAINAGE REPORT AND CONCEPTUAL GRADING AND DRAINAGE PLAN FOR PRELIMINARY PLAT AND SITE DEVELOPMENT PLAN FOR BUILDING PERMIT. ENGINEER'S STAMP DATED 10-13-97.

Dear Ms. Wolfenbarger:

Based on the information provided on your October 14, 1997 submittal, the above reference project is approved for Site Development Plan for Building Permit only. City Hydrology has the following comments prior Preliminary Plat approval:

1. A conceptual plan is not adequate for Preliminary Plat approval. Preliminary Plat requires a detailed grading and drainage plan with associated hydrology calculations.

2. Provide inlet and storm drain capacity calculations.

3. Show the storm drain pipe that takes the roof flow to the inlet.

4. Label proposed and existing inlets and manholes on the legend. I am having a difficult time determining what you are installing, and what is existing.

5. If Fruit Avenue is to be vacated, you will be required to install driveways (cannot use existing curb returns) and a one foot water block. No public storm water may enter the vacated Fruit Avenue.

6. How do you know that there is capacity in the existing storm drain for historical flows. Allowable discharge is not necessaraly the same as historical discharge. Did you analyze the existing storm drain systems?

7. This project will require a Work Order Permit.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File