11-20-89
12.3.8 v.5

ASH GROVE CEMENT WEST, INC.

Drainage Analysis

To

Settling Pond

November 20, 1989

USEPA SF
1261540

AGC2H000620

Meriwether Leachman associates inc.
SURVEYORS 11800 N E 160th STREET | BOTHELL, WA 98011 | 206 488-4800

November 20, 1989

Ash Grove Cement West, Inc.
3801 East Marginal Way South
Seattle, WA 98134

Attn: Mr. Kenneth J. Rone, Jr.

Re: Drainage Analysis

Dear Mr. Rone:

As requested in your letter of November 6, 1989, I have done a computer analysis of the volume of surface runoff that would reach the settling pond during a 25 year/24 hour and 2 year/24 hour storm event. Enclosed is that analysis. In summary, the volumes that would reach the pond is as follows:

25 year - 98,238 CU-FT.
2 year - 53,232 CU-FT.

The analysis utilizes King County Hydrology Program Version 3.14. The hydrologic analysis selected is the Soil Conservation Service (SCS) Unit Hydrograph Method. The site drainage patterns is based upon information supplied by Ash Grove Cement which is included in the analysis.

The soil type is unclassified. In discussion with City of Seattle Engineering Department, I was informed that the site consists of fill material from the Denny regrade area. I have therefore classified this soil in Hydrologic Group D. This will give a worst case scenario. Ash Cement West identified four areas that drain into the pond. They are shown on pages 2 and 3 of the enclosed analysis. Page 2 identifies the area, type of ground cover, its Curve Number (CN), and the travel time to the pond. The travel time is based upon a surface runoff velocity of 1 foot per second and a subsurface velocity in pipe of 2 foot per second. Based upon this information, a hydrograph for each area was generated. Then all hydrographs were added together to produce one hydrography representing all four areas draining into the pond. This is reflected on pages 8 and 10 for the various storm events.

If we can be of any further assistance in this matter, please do not hesitate to contact me. Thank you.

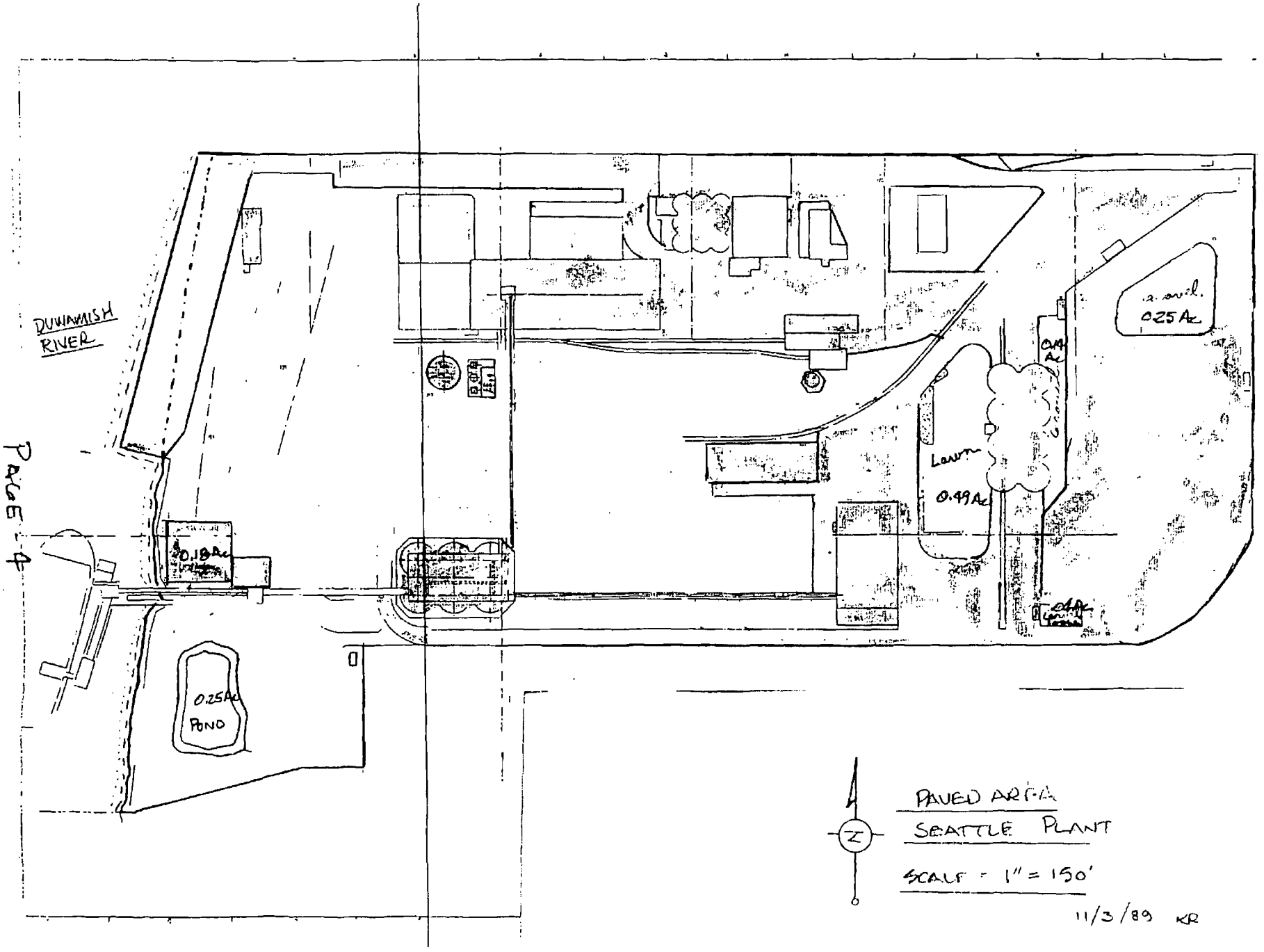
Yours truly,

MERIWETHER LEACHMAN ASSOCIATES, INC.

Joel S. Timmerman

JOEL S. TIMMERMAN
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

JST/mr
Enc.



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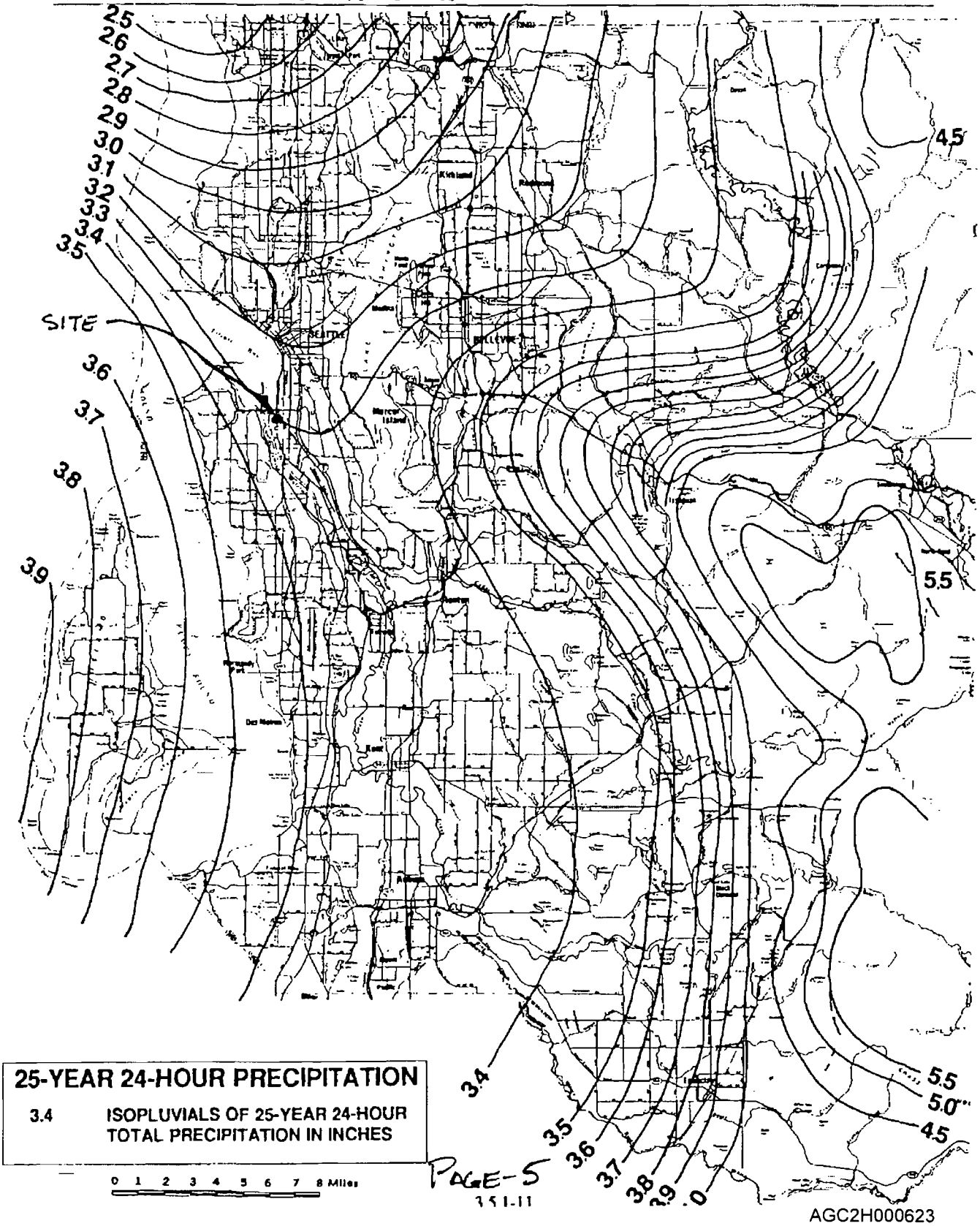
AGC2H000622

FIGURE 3.5.1F 25-YEAR 24-HOUR ISOPLUVIALS



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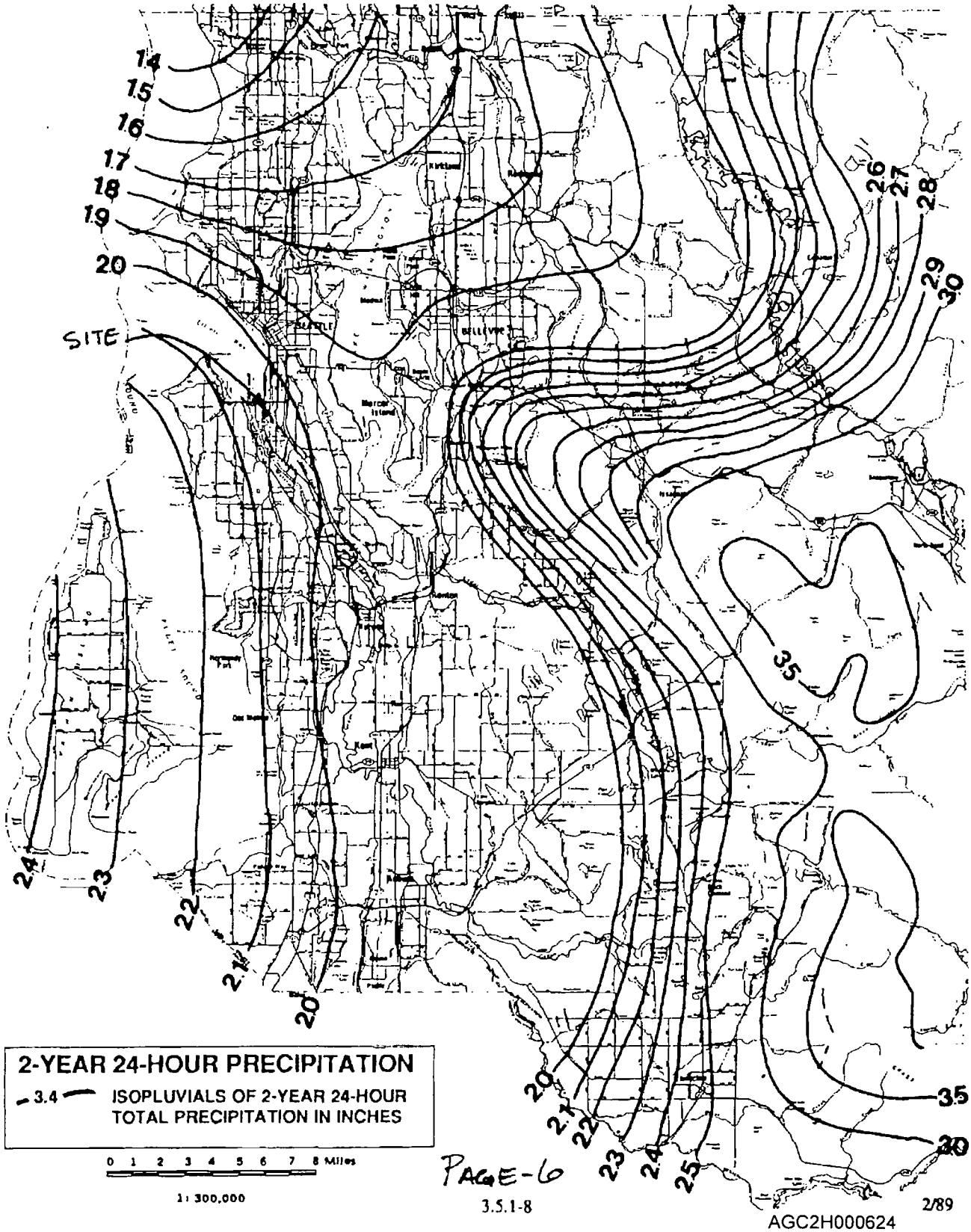
AGC2H000623

FIGURE 3.5.1C 2-YEAR 24-HOUR ISOPLUVIALS



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-----------------------------------------------------------------
******************* S.C.S. TYPE-1A DISTRIBUTION ****************
******** 25-YEAR  24-HOUR STORM  ****  3.30" TOTAL PRECIP. *********

-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  1
2.05,92,6

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      2.0          92.0          6.0

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
     1.38           7.67          18199

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:AREA25-1

-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  2
 49,90,6.4

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
       .5          90.0          6.4

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
      .30           7.83           4022

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:AREA25-2
-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  3
 .64,98,12.8

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      2.6          98.0         12.8

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
     1.95           7.83          29361

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:AREA25-3

-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  4
 4.13,96,17

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      4.1          96.0         17.0

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
     2.71           7.83          42594

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
C:AREA25-4
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DATA PRINT-OUT:

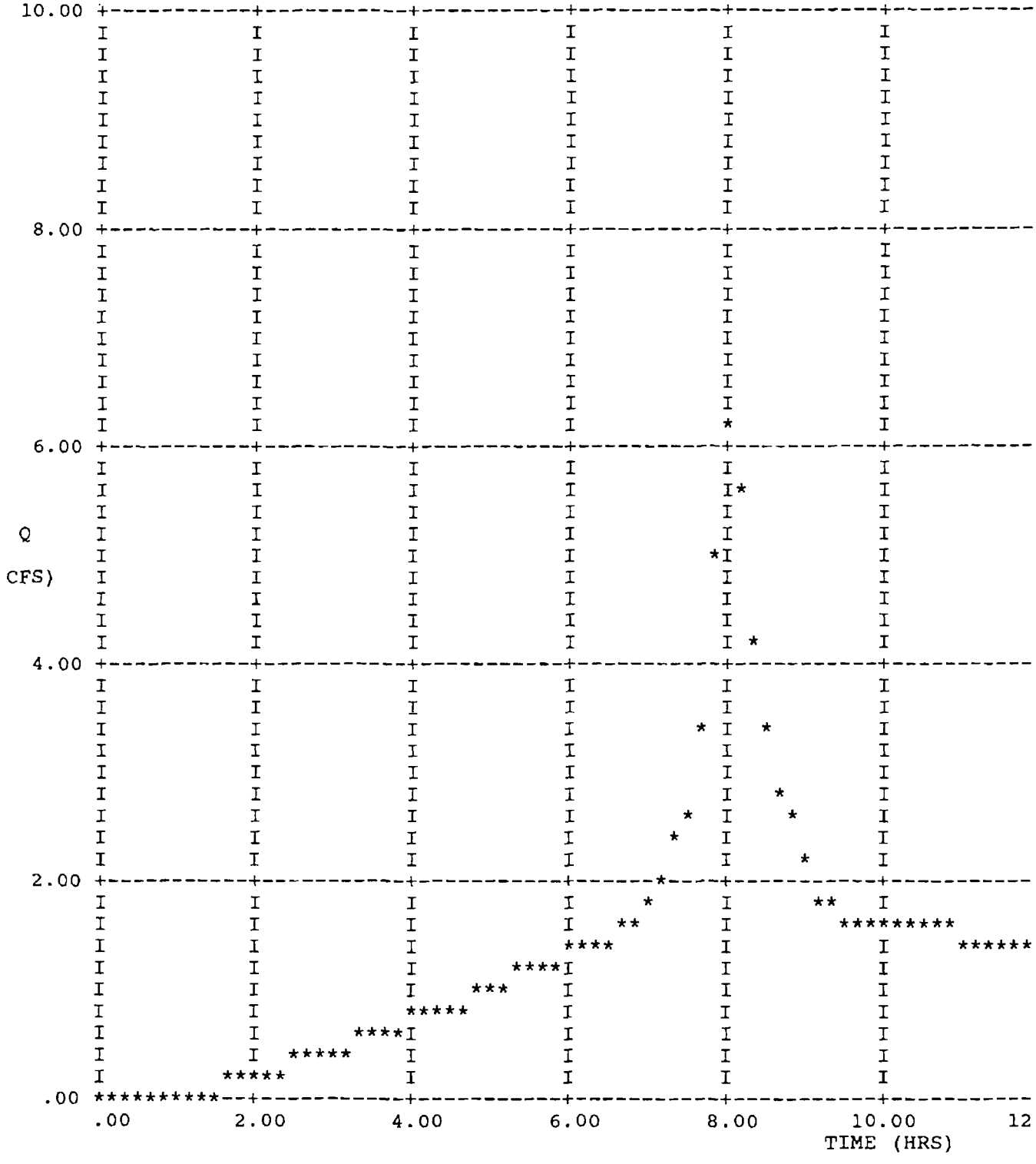
HYDROGRAPH S: PEAK-Q= 3.71 CFS T-PEAK= 8.00 HRS TT= 0MINUTES
HYDROGRAPH 4: PEAK-Q= 2.58 CFS T-PEAK= 8.17HRS TT= 17 MINUTES

HYDROGRAPH SUM: PEAK-Q= 6.19 CFS T-PEAK= 8.00 HRS

HYDROGRAPH PLOT

TOTAL VOLUME: 98238CU-FT

* = STORM-25



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AGC2H000626

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-----------------------------------------------------------------
******************* S.C.S. TYPE-1A DISTRIBUTION *****************
********  2-YEAR  24-HOUR STORM  ****  2.05" TOTAL PRECIP. *********

-----------------------------------------------------------------
NTER: A,CN,TC FOR BASIN NO.  1
.05,92,6.0

ATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      2.0          92.0           6.0

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
      .69           7.83           9539

NTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
AREA2-1
-----------------------------------------------------------------
NTER: A,CN,TC FOR BASIN NO.  2
.49,90,6.4

ATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
       .5          90.0           6.4

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
      .14           7.83           2021

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
AREA2-2
-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  3
.64,98,12.8

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      2.6          98.0          12.8

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
     1.18           7.83          17459

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
AREA2-3
-----------------------------------------------------------------
ENTER: A,CN,TC FOR BASIN NO.  4
.13,96,17.0

DATA PRINT-OUT:

  AREA(ACRES)     CN-VALUE     TC(MINUTES)
      4.1          96.0          17.0

  PEAK-Q(CFS)    T-PEAK(HRS)    VOL(CU-FT)
     1.56           7.83          24269

ENTER [d:][path]filename[.ext] FOR STORAGE OF COMPUTED HYDROGRAPH:
AREA2-4
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DAE-9

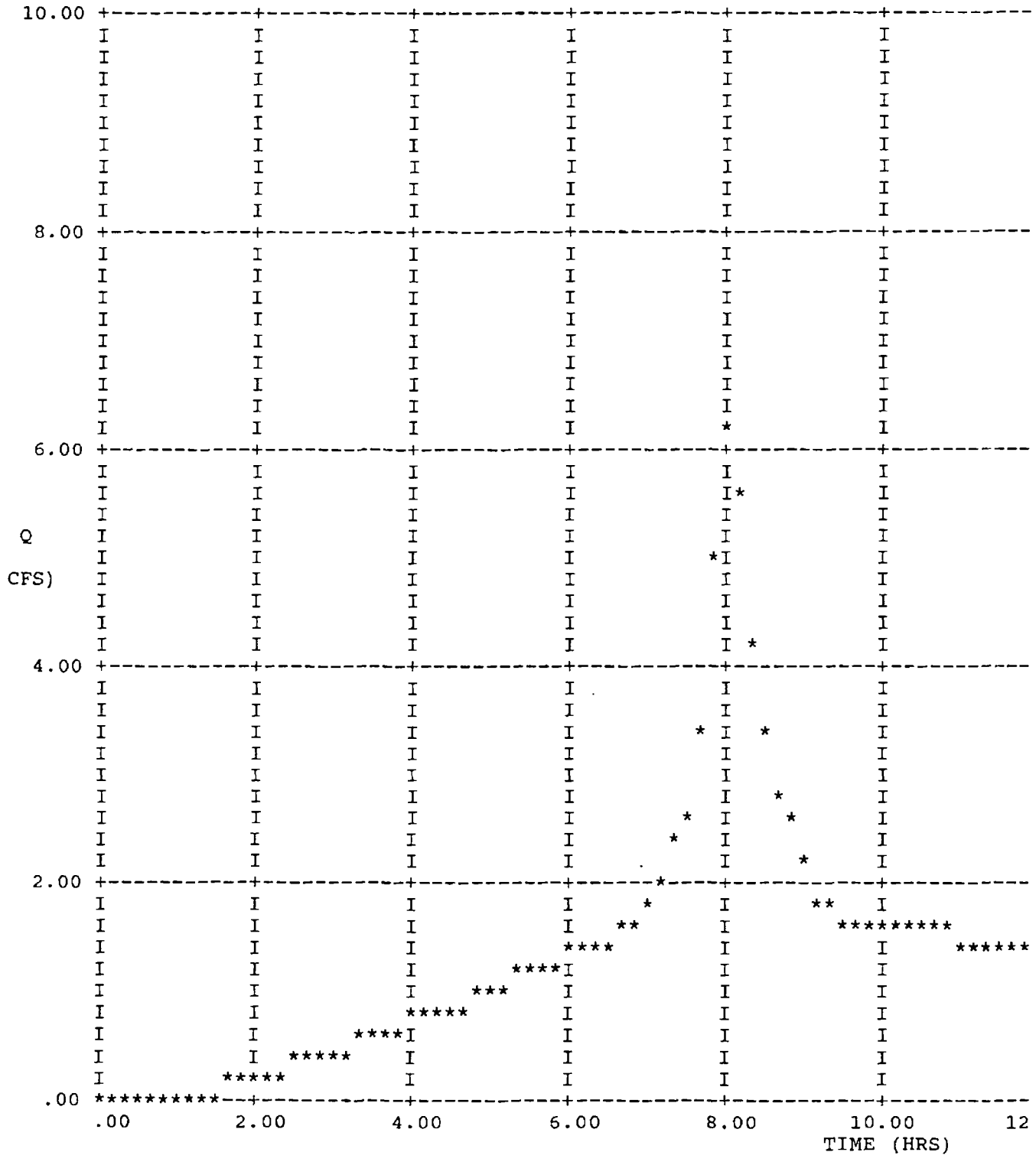
HYDROGRAPH S: PEAK-Q= 1.85 CFS T-PEAK= 8.00 HRS TT= 0MINUTES
HYDROGRAPH 4: PEAK-Q= 1.48 CFS T-PEAK= 8.17HRS TT= 17 MINUTES

(YDROGRAPH SUM: PEAK-Q= 3.27 CFS T-PEAK= 8.00 HRS

HYDROGRAPH PLOT

TOTAL VOLUME: 53232CU-FT

* = STROM-2



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