ENGINEERING, SURVEYING & LAND PLANNING

SAVOY, RUGGLES & BOHM, P.A.

DRAINAGE CALCULATIONS
SHELLY'S ORCHARD ADDITION

CITY OF WICHITA

MAY 24, 2001

MKEC ENGINEERING CONSULTANTS, INC.

May 29, 2001

Mr. Chris Carrier
City of Wichita
455 N. Main - 8th Floor
Wichita, KS 67202

RECEIVED
JUN 0 1 2001

Re: Prairie Woods Addition
Drainage

Dear Mr. Bohm:

Upon review of our Drainage Plan for the referenced addition located adjacent to Pawnee Prairie Park, the following information was used during the design and City approval of the pond located on park property.

The pond was not designed as a detention facility. There is some incidental detention, however, it was not a requirement. The larger storms will outflow from the pond across the top of the existing trail. An existing 12" pipe under the existing trail will control the smaller storms. The design also left in tact the existing drainage ways wher the storm outflows from the pond, whether it be along the existing swale or sheet flow across the top of the existing trail.

The concept for the construction of the pond was to eliminate the need to construct storm sewer pipe through the park property to the creek. This reduced substantially the amount of trees which would need to be removed and the potential damage caused by construction, to park property.

If additional storm water is directed into the pond, it will not effect our original design for detention. It will however, increase the frequency of outflow across the trail.

Please call if you have any questions.

Sincerely,

MKEC ENGINEERING CONSULTANTS, INC.

Gregory J. Allison, P.E.

GJA/wb

c: Chris Bohm

K:\WP\PROJECT\1997\97084\LETTERS\BOHM@SVB.WPD

924 NORTH MAIN
WICHITA, KANSAS 67203
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316-264-8008
FAX 264-4621
srb@srb1.com

SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

May 23, 2001

Mr. Chris Carrier, P.E.
Director, Storm Water Management
City of Wichita – 8th Floor
455 N. Main
Wichita, KS 67202

Re: Drainage calculations for Shelly's Orchard Addition

Dear Mr. Carrier,

Enclosed please find the supporting design calculations for Shelly's Orchard Addition that you requested in our meeting, Monday, May 21, 2001. Also enclosed is a contour map of the area now platted as Lindsay's Orchard addition, and Shelly's Orchard Addition.

The pre-developed and post-developed storm water runoff calculations have been performed on the areas platted as Lindsay's and Shelly's Orchard in an effort to determine the effect of development on the peak discharge and runoff volumes at a point located at the southeast corner of Shelly's Orchard Addition. The subdivision located south of Shelly's Orchard, Prairie Woods Addition, contributes some storm water runoff to this basin. The effect of this runoff is not included with these calculations in order to focus the analysis on changes to drainage patterns caused by the development of the two Orchard Additions.

A summary table of the results of the analysis may be found on the next page. Please refer to the supporting calculations for any detailed information you may wish to review.

Please review this information, and advise me if any additional analysis is required.

Thank you.

Sincerely,

Christopher M. Bohm, P.E.

Encl.

Summary of Drainage Calculations
Shelly's Orchard Addition, Wichita, Sedgwick County, Kansas
May 23, 2001

Peak Flows Using Rational Method

Return Period	Undeveloped Condition	Developed Condition
	(cfs)	(cfs)
2 Year	22.6	52.4
5 Year	31.4	67.7
10 Year	43.9	87.4
100 Year	89.4	149.3
	(A = 57.9 Acres)	(A = 29.7 Acres)

No volume calculations are performed with rational method.

Peak flows and Volumes using SCS Runoff Method (HEC-1)

Event	Peak Flow Undeveloped Condition (cfs)	Peak Flow Developed Condition (cfs)	Peak Flow Change (%)	Runoff Volume Undeveloped Condition (Acre-feet)	Runoff Volume Developed Condition (Acre-feet)	Runoff Volume Change (%)
5 year	50	80	+62	19	11	-59
10 year	66	104	+58	22	13	-59
25 year	88	126	+43	27	16	-59
50 year	111	146	+32	32	18	-56
100 year	119	154	+29	34	19	-56

May 29, 2001

Mr. Chris Carrier
City of Wichita
455 N. Main - 8th Floor
Wichita, KS 67202

RECEIVED
JUN 04 2001

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MKEC ENGINEERING CONSULTANTS, INC.

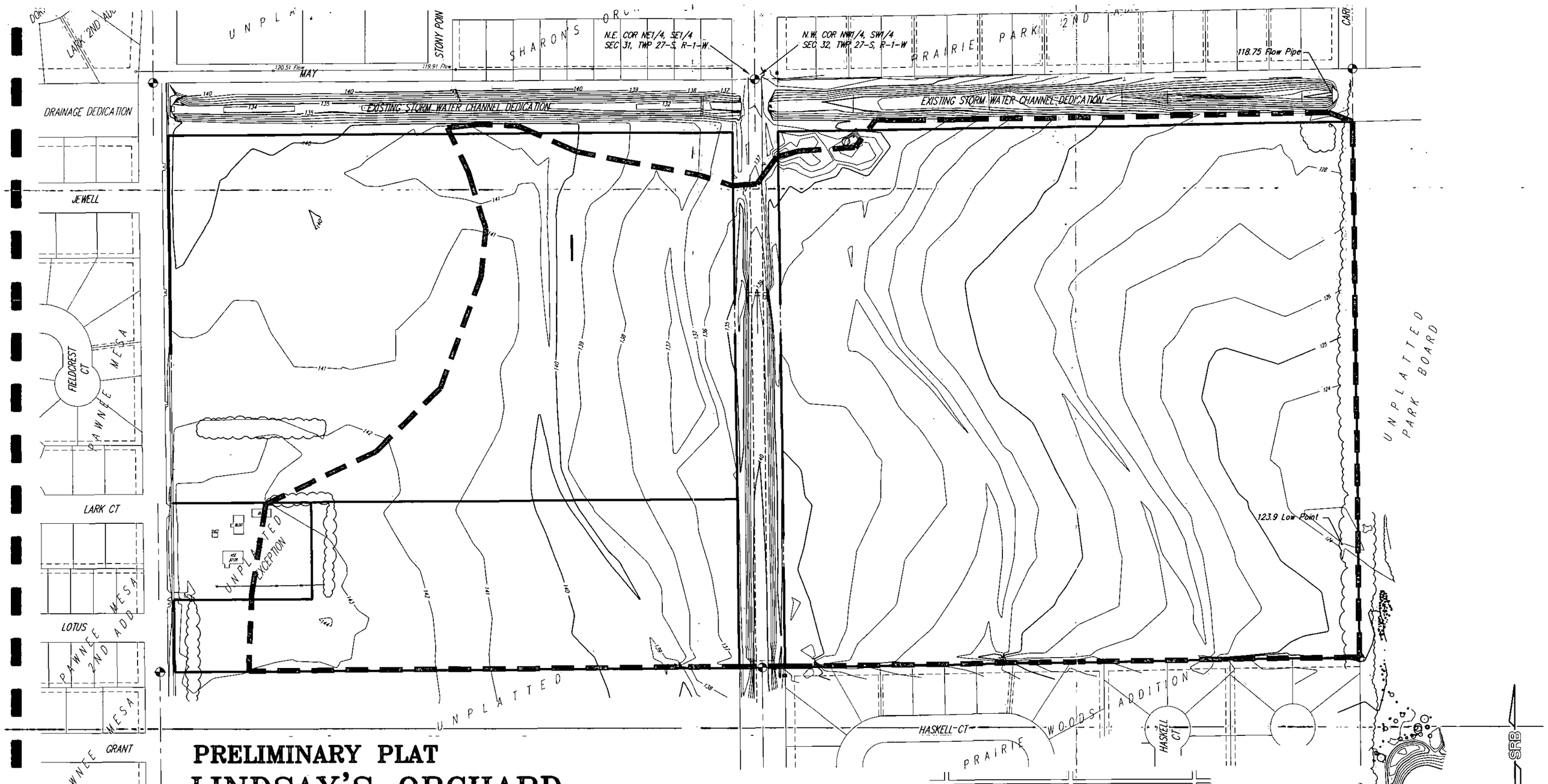
Greg Allison

Gregory J. Allison, P.E.

GJA/wb

c: Chris Bohm

K:\WP\PROJECT\1997\97084\LETTERS\BOHM@SVB.WPD



PRELIMINARY PLAT
LINDSAY'S ORCHARD
WICHITA, SEDGWICK COUNTY, KANSAS

OWNER:

RICK THOMPSON
250 N. GLENEAGLES CT.
WICHITA, KANSAS 67212

(316) 722-2122

LEGAL DESCRIPTION :

PART OF THE NE1/4 OF THE SE1/4 OF SEC 32, TWP 27-S, R-1-W OF THE 6TH P.M., SEDGWICK COUNTY, KANSAS AND
PART OF THE NW1/4 OF THE SW1/4 OF SEC 31, TWP 27-S, R-1-W OF THE 6TH P.M., SEDGWICK COUNTY, KANSAS.

NOTES:

1. *City of Wichita Benchmark disc @ Maize Road and May Street 31.5' S. and 38' E. of centerline both.*
   Elev. 137.67 (City Datum)
   Elev. 1325.07 (NGVD)
2. *Topography by Savoy, Ruggles, and Bohm, PA. 1996*
3. *Lot 1, Blk. 3 is currently under contract for proposed church.*

DWG FILE 00535P - R.C.

SRB 924 NORTH MAIN WICHITA, KANSAS 67203 316-264-8008 FAX 264-4621
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

Drainage Calculations

SAVOY, RUGGLES & BOHM, P.A.

Drainage Calculations

2/9
CW3
5/23

	Dist.	Type	Slope	V (f/s)	Time (min)
1	400'	Sheet flow	0.50%	0.20	33
2	730'	Grass Waterway	0.70%	0.91	13.3
3	530'	Ditch Flow	0.50%	2.0	4.4
4	1440'	Grass Waterway	1.0%	1.4	17.1

Total T_c = 67.8 min

Use 67 minutes for analysis:

For type B soil (wheat field)
Use Average of 1 Ac Lot C coefficient and Urban lawn area coeff.

	1A lot	Urban Lawn	$\overline{\Delta}$	i ("/hr)
C_2	0.33	0.16	0.25	1.56
C_5	0.35	0.18	0.27	2.01
C_{10}	0.40	0.24	0.32	2.37
C_{100}	0.51	0.37	0.44	3.51

Rational Method: $Q = ciA$
Where area = 57.9 Ac

Q_2 = 22.6 cfs
Q_5 = 31.4 cfs
Q_{10} = 43.9 cfs
Q_{100} = 89.4 cfs

Developed Condition:

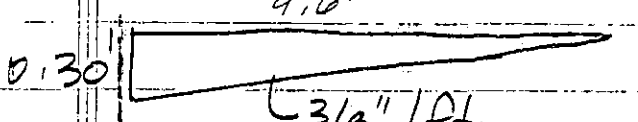
Lindsay's Orchard, for all practical purposes, no longer drains across Shelly's Orchard. Both Maize Road Ditches will re-direct water north to drainage channel.

Drainage from Shelly's Orchard to SE Corner (developed condition). = 29.7 Ac (Use 30 Ac for analysis).

Tc: Longest Path On-Site = 2160 feet.

60' urban lawn to T.C.
1350 Curb Flow to Sump
Balance = SWS Pipe flow.

Curb Flow Rate @ 0.50'
Use 0.30 feet depth



$A = 1/2(9.6')(0.3') = 1.44\ ft^2$
$WP = 9.9$ feet
$n = 0.014$ (Conc: Asph.)
$S = 0.005$

$$V = \frac{1.49}{n}(A/WP)^{0.67} S^{1/2}$$

$$V = \frac{1.49}{0.014}\left(\frac{1.44}{9.9}\right)^{0.67}(0.005)^{1/2} = 2.07\ f/sec.$$

CMB
5/23/01

From Preliminary Plat Survey,
Shelly's Orchard ; Lindsay's Orchard :

Of the area that was platted, 57.9 Acres drains to South East Corner of Shelly's Orchard Addition.

Water from West property crosses Maize Road @ ℄ Plats (N & S) via 2-30" RCPs, and @ south end of both plats, via 3-30" RCP's.

From SCS Soil Survey, Sedgwick County, KS.

±70% F_b	B	Hydrologic Soil Group
10% F_a	B	
20% B_a	C	

Use Type B for Analysis.

Tc : Longest flowlength = 3100 feet
Using Velocity method (City of Wichita).

First 400' sheet flow @ 0.50%
730 feet to Ditch, 0.50% Grassed waterway
530 feet Ditch Flow
Balance = Grassed waterway

4/9
CWB
5/23/01

Composite Tc:

	Dist	Type	Slope	V (fps)	Time (min)
1	60'	Urban lawn	0.50	0.20	5.0
2	1350'	Street Fl.	0.50	2.07	10.9
3	750'	Pipe flow	var.	3.0	4.2

Total Time 20.1 min

Use 20 minutes

Lot Size: Between 1/3 & 1/4

$C_2 = 0.53$ $i_2 = 3.33$ in/hr
$C_5 = 0.57$ $i_5 = 4.00$ in/hr
$C_{10} = 0.64$ $i_{10} = 4.60$ in/hr
$C_{100} = 0.77$ $i_{100} = 6.53$ "/hr

$Q_2 = (29.7 Ac)(0.53)(3.33) = 52.4$ cfs
$Q_5 = 67.7$ cfs
$Q_{10} = 87.4$ cfs
$Q_{100} = 149.3$ cfs

Runoff volume:

To compare volumes, use input data generated from rational method calculations and input into HEC-1 storm model.

For Sedgwick County, 100-yr.-24 hour storm = 7.8" with SCS type 2 distribution. Instead of runoff coefficients, use SCS Curve Numbers for calculation. From U.S. Soil Conservation Service, select CN's for developed & undeveloped condition.

Type B soil, contoured; terraced small grain crops (pre-developed condition), CN = 70 (good condition).

For herd surface roads; CN = 84. To be conservative, use CN = 90 for developed subdivision.

SCS lag time = 0.6 * T_c (time of concentration)
Pre-developed, T_c = 67 min, so SCS lag
= 0.6(67 min)(1 hr/60 m) = 0.67 hours

Post developed T_c = 20 min
SCS lag = 0.6(20 m)(1 hr/60 m) = 0.20 hours

6/9
CMB
5/23/01

Input to HEC-1

Predeveloped condition
A= 57.9 = 57.9/640 = 0.0905 sq. miles
CN = 70
SCS Lag = 0.67 hours
↳ To HEC-1 (shellye.hc1)

Results: Q_{100} = 119 cfs
Initial Abstraction = 0.86 inches
Therefore: Rainfall = 7.8" − 0.86 inches
= 6.94" runoff
Volume of runoff = (6.94")(1 foot/12")(57.9 Ac)
= 33.5 Ac. feet

Post developed condition:
A = 29.7 Acres = 29.7/640 = 0.0464 sq. miles
CN = 90
SCS Lag = 0.20 hours
↳ To HEC-1 (shellyd.hc1)

Results: Q_{100} = 154 cfs
Initial Abstraction = 0.22"
Therefore: Rainfall = 7.8" − 0.22" = 7.58"
Volume of runoff = (7.58")(1 foot/12")(29.7 Ac)
= 18.8 Ac-feet

7/9
CMB
5/23/01

Compare rational method & HEC-1

100 year peak increase:

Rational: Pre = 69.4 cfs Post = 149.3
= 67% Peak flow increase

HEC-1: Pre = 119 cfs Post = 154 cfs
29% Peak flow increase

Volume of flow, 100 year storm:

Pre: 33.5 Ac-feet Post = 18.8 Ac-feet
56% reduction in volume of runoff.

Check 5 yr, 10 yr, 25 yr, 50 yr & 100 yr

Event	(cfs) Undev. Q	(cfs) Dev Q	% change	(in) Rainfall Event	(in) Undev IA	(in) Dev IA	(Ac-ft) Undev Vol	(Ac-ft) Dev. Vol.	% change
5yr	-50	80	+62	4.8	0.86	0.22	19	11.3	-59
10yr	66	104	+58	5.5	0.86	0.22	22	13	-59
25yr	88	126	+43	6.48	0.86	0.22	27	16	-59
50yr	111	146	+32	7.44	0.86	0.22	32	18	-56
100yr	119	154	+29	7.8	0.86	0.22	34	19	-56

8/9
CMB
5/23/01

Water Surface Elevation In Pond.
Pond is not designed for detention,
So look @ outlet weir (horse trail) as
control, steady state flow.

From Prairie Woods Drainage Plan,
Q_{100} to Pond = 74.8 cfs (T_c = 25.9 min)

Shelly's Orchard Q_{100} = 149.3 cfs (T_c = 20 min)
Composite Basin flow
Routed flow (through storm-CAD) including
system time of concentrations = 118 cfs

Using these flows, $Q_{max\text{-}100\text{-}pond}$ =
118 + 74.8 = 192.8 (adjusted)
or 149.3 + 74.8 = 224.1 (composite).

Using 224 cfs for analysis, look @ weir
flow:
Elevation of horse path = 121.5 (City)
Minimum flow width @ this elevation = 220'

Check weir flow; $Q = CLH^{1.5}$; where C = 2.0
$\therefore$ $224.1 = (2.0)(220')(H)^{1.5}$
$H^{1.5} = 0.509$
$H = 0.64$ feet

9/9
CM3
5/23/01

So, max elevation of pond = 121.5 + 0.64
= 122.14

Static Pool of existing pond = 119.8

Max Ponding Depth = 122.14 - 119.8 = 2.34 feet.

The existing pond can also spill through a low area north and east of the pond center, however, this outlet is ignored in this calculation. Pipe outlet capacity is ignored.

Check velocity across path

$Q = V \cdot A$

$224.1 = V * (220' * 0.64')$

$V = 1.6$ feet/second in the 100 year storm

100 yr-24 hr. Storm

Pre-Development

SAVOY, RUGGLES & BOHM, P.A.

100 yr-24 hr. Storm Pre-Development

```
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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY  1991               *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  05/23/2001  TIME  13:10:25 *
*                                      *
****************************************

****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*        609 SECOND STREET             *
*     DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104              *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX       X
X     X  X        X     X     XX
X     X  X        X            X
XXXXXXX  XXXX     X     XXXXX  X
X     X  X        X            X
X     X  X        X     X      X
X     X  XXXXXXX   XXXXX      XXX
```

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:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::               by                    :::
:::      Haestad Methods, Inc.          :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT　　PAGE 1

```
LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

*** FREE ***
   1      ID   SHELLY'S ORCHARD EXISTING CONDITION HEC RUN
   2      IT      5                     289
   3      IN     30
   4      IO      4

   5      KK   UNDEV
   6      PC      0    0.04    0.08     .12     .17     .22     .27     .32     .37     .43
   7      PC    .49     .56     .62     .69     .77     .85     .94    1.04    1.15    1.27
   8      PC   1.41    1.59    1.83    2.21    5.17    5.73    6.11    6.23    6.40    6.54
   9      PC   6.65    6.76    6.86    6.95    7.02    7.09    7.16    7.23    7.29    7.36
  10      PC   7.43    7.49    7.54    7.59    7.63    7.68    7.72    7.76    7.80
  11      BA 0.0505
  12      UD   0.67
  13      LS      0      70
  14      ZZ
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HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLYE.HC1


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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              MAY  1991               *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  05/23/2001  TIME  13:10:25 *
*                                      *
****************************************

****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*        609 SECOND STREET             *
*     DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104              *
*                                      *
****************************************
```


```
                    SHELLY'S ORCHARD EXISTING CONDITION HEC RUN

 4 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          4  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                   NMIN           5  MINUTES IN COMPUTATION INTERVAL
                   IDATE     1    0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE     2    0  ENDING DATE
                  NDTIME       0000  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.08 HOURS
                   TOTAL TIME BASE   24.00 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

               **************
               *            *
  5 KK         *   UNDEV    *
               *            *
               **************

  3 IN       TIME DATA FOR INPUT TIME SERIES
                   JXMIN         30  TIME INTERVAL IN MINUTES
                   JXDATE    1    0  STARTING DATE
                   JXTIME         0  STARTING TIME

          SUBBASIN RUNOFF DATA
```

```
13 BA          SUBBASIN CHARACTERISTICS
                    TAREA          0.09  SUBBASIN AREA

               PRECIPITATION DATA

 6 PB               STORM          7.80  BASIN TOTAL PRECIPITATION

 6 PI            INCREMENTAL PRECIPITATION PATTERN
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
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0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.02	0.02	0.02
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0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
0.04	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.49	0.49
0.49	0.49	0.49	0.49	0.09	0.09	0.09	0.09	0.09	0.09
0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.04	0.03	0.03
0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		

```
13 LS          SCS LOSS RATE
                    STRTL          0.66  INITIAL ABSTRACTION
                    CRVNBR        70.00  CURVE NUMBER
                    RTIMP          0.00  PERCENT IMPERVIOUS AREA

12 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG           0.67  LAG
```

***

UNIT HYDROGRAPH
42 END-OF-PERIOD ORDINATES

3.	8.	15.	26.	39.	51.	58.	61.	61.	58.
53.	46.	40.	32.	26.	21.	17.	15.	12.	10.
8.	7.	6.	5.	4.	3.	3.	2.	2.	2.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.								

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	UNDEV	115.	12.50	34.	10.	10.	0.09		

*** NORMAL END OF HEC-1 ***

100yr. - 24hr. Storm

Post Development

SAVOY, RUGGLES & BOHM, P.A.

100 yr - 24 hr. Storm Post Development

MKEC ENGINEERING CONSULTANTS, INC.

May 29, 2001

Mr. Chris Bohm
Savoy Ruggles and Bohm, PA
924 N. Main Street
Wichita, KS 67203

Re: Prairie Woods Addition
Drainage

Dear Mr. Bohm:

Upon review of our Drainage Plan for the referenced addition located adjacent to Pawnee Prairie Park, the following information was used during the design and City approval of the pond located on park property.

The pond was not designed as a detention facility. There is some incidental detention, however, it was not a requirement. The larger storms will outflow from the pond across the top of the existing trail. An existing 12" pipe under the existing trail will control the smaller storms. The design also left in tact the existing drainage ways when the storm outflows from the pond, whether it be along the existing swale or sheet flow across the top of the existing trail.

The concept for the construction of the pond was to eliminate the need to construct storm sewer pipe through the park property to the creek. This reduced substantially the amount of trees which would need to be removed and the potential damage caused by construction, to park property.

If additional storm water is directed into the pond, it will not effect our original design for detention. It will however, increase the frequency of outflow across the trail.

Please call if you have any questions.

Sincerely,

MKEC ENGINEERING CONSULTANTS, INC.

Gregory J. Allison, P.E.

GJA/wb

K:\WP\PROJECT\1997\97084\LETTERS\bohm@svb.wpd

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
* RUN DATE  05/23/2001  TIME  13:17:33  *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*     DAVIS, CALIFORNIA 95616           *
*          (916) 756-1104               *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

```
::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::
:::                                    :::
:::  Full Microcomputer Implementation :::
:::               by                   :::
:::       Haestad Methods, Inc.        :::
:::                                    :::
::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
                                     HEC-1 INPUT                                    PAGE  1

     LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

*** FREE ***
        1      ID    SHELLY'S ORCHARD DEVELOPED CONDITION HEC RUN
        2      IT      5                     289
        3      IN     30
        4      IO      4

        5      KK DEVELOP
        6      PC      0    0.04    0.09     .12     .17     .22     .27     .32     .37     .42
        7      PC    .49     .56     .62     .69     .77     .85     .94    1.04    1.15    1.27
        8      PC   1.41    1.59    1.83    2.22    5.37    5.73    6.11    6.23    6.40    6.54
        9      PC   6.65    6.76    6.86    6.95    7.02    7.09    7.16    7.23    7.29    7.36
       10      PC   7.43    7.49    7.54    7.59    7.63    7.68    7.72    7.76    7.80
       11      BA 0.0464
       12      UD   0.20
       13      LS      0      90
       14      ZZ
```

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLYD.HC1


```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
* RUN DATE  05/23/2001  TIME  13:17:33  *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*     DAVIS, CALIFORNIA 95616           *
*          (916) 756-1104               *
*                                       *
*****************************************
```



```
                    SHELLY'S ORCHARD DEVELOPED CONDITION HEC RUN

   4 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          4  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT        HYDROGRAPH TIME DATA
                    NMIN           5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME       0000  ENDING TIME
                    ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL    0.08 HOURS
                    TOTAL TIME BASE   24.00 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              ***************
              *             *
   5 KK       *   DEVELOP   *
              *             *
              ***************

   3 IN        TIME DATA FOR INPUT TIME SERIES
                    JXMIN         30  TIME INTERVAL IN MINUTES
                    JXDATE     1   0  STARTING DATE
                    JXTIME         0  STARTING TIME

          SUBBASIN RUNOFF DATA
```

```
11 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.05  SUBBASIN AREA

               PRECIPITATION DATA

 6 PE                STORM        7.80  BASIN TOTAL PRECIPITATION

 6 PI            INCREMENTAL PRECIPITATION PATTERN
```

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04
0.04	0.04	0.06	0.06	0.06	0.06	0.06	0.06	0.49	0.45
0.45	0.49	0.45	0.45	0.09	0.09	0.09	0.09	0.09	0.05
0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.04	0.03	0.03
0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		

```
13 LS          SCS LOSS RATE
                     STRTL        0.22  INITIAL ABSTRACTION
                    CRVNBR       90.00  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

12 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        0.20  LAG

                                     ***

                              UNIT HYDROGRAPH
                          14 END-OF-PERIOD ORDINATES
          23.       75.       92.       74.       42.       24.       13.        8.        4.        3.
           1.        1.        0.        0.

                              RUNOFF SUMMARY
                        FLOW IN CUBIC FEET PER SECOND
                      TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD        BASIN     MAXIMUM     TIME OF
       OPERATION            STATION    FLOW     PEAK                                            AREA      STAGE     MAX STAGE
   6-HOUR       24-HOUR      72-HOUR

      HYDROGRAPH AT                           DEVELOP       154.    12.00            25.          6.          6.        0.05


*** NORMAL END OF HEC-1 ***
```

5yr. 24hr STORM

PRE & POST DEVELOPMENT

SAVOY, RUGGLES & BOHM, P.A.

5yr-24hr. Storm Pre & Post Development

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
* RUN DATE  05/23/2001  TIME  13:33:07  *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*     DAVIS, CALIFORNIA 95616           *
*         (916) 756-1104                *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::         Haestad Methods, Inc.       :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
                                   HEC-1 INPUT                                          PAGE  1

 LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

*** FREE ***
    1          ID   Shelly's Orchard, 5 year, 24 hour storm, both existing and developed.
    2          IT      5                      289
    3          IN     30
    4          IO      4

    5          KK   UNDEV
    6          BA  0.0905
    7          PC       0    0.02    0.05    0.08    0.11    0.14    0.17    0.20    0.23    0.27
    8          PC    0.30    0.34    0.38    0.43    0.47    0.52    0.58    0.64    0.72    0.78
    9          PC    0.87    0.98    1.13    1.36    3.18    3.53    3.71    3.84    3.94    4.02
   10          PC    4.09    4.16    4.22    4.28    4.32    4.36    4.41    4.45    4.49    4.53
   11          PC    4.57    4.61    4.64    4.67    4.70    4.72    4.75    4.78    4.80
   12          UD    0.67
   13          LS       0      70

   14          KK   DEVEL
   15          BA  0.0464
   16          UD    0.20
   17          LS       0      90
   18          ZZ
```

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLY5.HC1


```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*           VERSION 4.0.1E              *
*                                       *
* RUN DATE  05/23/2001  TIME  13:33:07  *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*     DAVIS, CALIFORNIA 95616           *
*         (916) 756-1104                *
*                                       *
*****************************************
```



```
                 Shelly's Orchard, 5 year, 24 hour storm, both existing and developed.

  4 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          4  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                     NMIN          5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME       0000  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL    0.08 HOURS
                   TOTAL TIME BASE   24.00 HOURS

       ENGLISH UNITS
            DRAINAGE AREA          SQUARE MILES
            PRECIPITATION DEPTH    INCHES
            LENGTH, ELEVATION      FEET
            FLOW                   CUBIC FEET PER SECOND
            STORAGE VOLUME         ACRE-FEET
            SURFACE AREA           ACRES
            TEMPERATURE            DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

                  ***************
                  *             *
  5 KK            *   UNDEV     *
                  *             *
                  ***************

  1 IN        TIME DATA FOR INPUT TIME SERIES
```

```
            JXMIN          30  TIME INTERVAL IN MINUTES
            JXDATE     1    0  STARTING DATE
            JXTIME          0  STARTING TIME

         SUBBASIN RUNOFF DATA

  6 BA     SUBBASIN CHARACTERISTICS
            TAREA         0.09  SUBBASIN AREA

           PRECIPITATION DATA

  6 PB      STORM         4.80  BASIN TOTAL PRECIPITATION

  6 PI      INCREMENTAL PRECIPITATION PATTERN
            0.00    0.00    0.00    0.00    0.00    0.00    0.01    0.01    0.00    0.01
            0.00    0.00    0.00    0.00    0.00    0.01    0.01    0.00    0.01    0.00
            0.01    0.01    0.01    0.00    0.01    0.00    0.01    0.00    0.01    0.00
            0.00    0.01    0.00    0.00    0.01    0.00    0.00    0.01    0.00    0.00
            0.01    0.00    0.00    0.01    0.00    0.00    0.01    0.00    0.01    0.01
            0.01    0.01    0.01    0.01    0.00    0.00    0.01    0.00    0.00    0.00
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.02
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.02
            0.01    0.01    0.01    0.02    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.02    0.01    0.01    0.02    0.01
            0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.03    0.02
            0.02    0.02    0.04    0.04    0.04    0.04    0.04    0.04    0.30    0.30
            0.30    0.30    0.30    0.20    0.06    0.06    0.06    0.06    0.06    0.06
            0.03    0.03    0.03    0.03    0.03    0.03    0.02    0.02    0.02    0.02
            0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.01    0.02
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.01    0.01
            0.00    0.01    0.01    0.01    0.01    0.00    0.01    0.01    0.01    0.00
            0.01    0.01    0.00    0.01    0.00    0.00    0.00    0.00    0.00    0.00
            0.01    0.01    0.01    0.00    0.01    0.01    0.01    0.01    0.01    0.00
            0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00

 12 LS     SCS LOSS RATE
            STRTL         0.86  INITIAL ABSTRACTION
            CRVNBR  .    70.00  CURVE NUMBER
            RTIMP         0.00  PERCENT IMPERVIOUS AREA

 12 UD     SCS DIMENSIONLESS UNITGRAPH
            TLAG          0.67  LAG

                                          ***

                                   UNIT HYDROGRAPH
                              42 END-OF-PERIOD ORDINATES
      3.       8.      15.      26.      39.      51.      58.      61.      61.      56.
     53.      48.      40.      32.      26.      21.      17.      15.      12.      10.
      8.       7.       6.       5.       4.       3.       3.       2.       2.       2.
      1.       1.       1.       1.       1.       1.       0.       0.       0.       0.
      0.       0.

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        ***************
        *             *
 14 KK  *    DEVEL    *
        *             *
        ***************

         SUBBASIN RUNOFF DATA

 15 BA     SUBBASIN CHARACTERISTICS
            TAREA         0.05  SUBBASIN AREA

           PRECIPITATION DATA

  6 PB      STORM         4.80  BASIN TOTAL PRECIPITATION

  6 PI      INCREMENTAL PRECIPITATION PATTERN
            0.00    0.00    0.00    0.00    0.00    0.00    0.01    0.01    0.00    0.01
            0.00    0.00    0.00    0.00    0.00    0.01    0.01    0.00    0.01    0.00
            0.01    0.01    0.01    0.00    0.01    0.00    0.01    0.00    0.01    0.00
            0.00    0.01    0.00    0.00    0.01    0.00    0.00    0.01    0.00    0.00
            0.01    0.00    0.00    0.01    0.00    0.00    0.01    0.00    0.01    0.01
            0.01    0.01    0.01    0.01    0.00    0.00    0.01    0.00    0.00    0.00,
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.02    0.01    0.01    0.02    0.01
            0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.03    0.02
            0.02    0.02    0.04    0.04    0.04    0.04    0.04    0.04    0.30    0.30
            0.30    0.30    0.30    0.20    0.06    0.06    0.06    0.06    0.06    0.06
            0.03    0.03    0.03    0.03    0.03    0.03    0.02    0.02    0.02    0.02
            0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.02    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.01
            0.01    0.01    0.01    0.01    0.01    0.01    0.01    0.00    0.01    0.01
            0.00    0.01    0.01    0.01    0.01    0.00    0.01    0.01    0.01    0.00
            0.01    0.01    0.00    0.01    0.00    0.00    0.00    0.00    0.00    0.00
            0.01    0.01    0.01    0.00    0.01    0.01    0.01    0.01    0.01    0.00
            0.01    0.01    0.00    0.00    0.00    0.00    0.00    0.00

 17 LS     SCS LOSS RATE
            STRTL         0.22  INITIAL ABSTRACTION
            CRVNBR       90.00  CURVE NUMBER
            RTIMP         0.00  PERCENT IMPERVIOUS AREA

 16 UD     SCS DIMENSIONLESS UNITGRAPH
            TLAG          0.20  LAG

                                          ***

                                   UNIT HYDROGRAPH
                              14 END-OF-PERIOD ORDINATES
     23.      75.      92.      74.      41.      24.      13.       8.       4.       3.
      1.       2.       0.       0.

                                    RUNOFF SUMMARY
                              FLOW IN CUBIC FEET PER SECOND
                            TIME IN HOURS,  AREA IN SQUARE MILES

                               PEAK    TIME OF      AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
           OPERATION     STATION       FLOW    PEAK                                      AREA      STAGE       MAX STAGE
                                                  6-HOUR      24-HOUR      72-HOUR
```

HYDROGRAPH AT	UNDEV	50.	12.58	15.	5.	5.	0.05
HYDROGRAPH AT	DEVEL	88.	12.00	14.	5.	5.	0.05

*** NORMAL END OF HEC-1 ***

10yr. - 24hr. Storm

Pre & Post Development

10 yr - 24 hr Storm Pre ; Post Development

```
*****************************************                 *****************************************
*                                       *                 *                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *                 *  U.S. ARMY CORPS OF ENGINEERS         *
*           MAY  1991                   *                 *  HYDROLOGIC ENGINEERING CENTER        *
*       VERSION 4.0.1E                  *                 *  609 SECOND STREET                    *
*                                       *                 *  DAVIS, CALIFORNIA 95616              *
*  RUN DATE  05/23/2001  TIME  13:45:36 *                 *  (916) 756-1104                       *
*                                       *                 *                                       *
*****************************************                 *****************************************
```

```
X       X  XXXXXXX   XXXXX            X
X       X  X        X     X          XX
X       X  X        X                 X
XXXXXXX    XXXX     X         XXXXX   X
X       X  X        X                 X
X       X  X        X     X           X
X       X  XXXXXXX   XXXXX           XXX
```

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
                                        HEC-1 INPUT                                              PAGE  1

      LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

*** FREE ***
         1      ID   SHELLY'S ORCHARD PRE AND POST, 10 year, 24 hour storm.
         2      IT       5                      289
         3      IN      30
         4      IO       4

         5      KK   UNDEV
         6      BA  0.0905
         7      PC       0    0.03    0.06    0.09    0.12    0.16    0.19    0.23    0.26    0.31
         8      PC    0.35    0.39    0.44    0.49    0.54    0.60    0.66    0.73    0.81    0.90
         9      PC    1.00    1.13    1.30    1.56    3.66    4.06    4.26    4.41    4.53    4.63
        10      PC    4.71    4.79    4.86    4.92    4.97    5.02    5.07    5.12    5.16    5.21
        11      PC    5.26    5.30    5.34    5.37    5.40    5.43    5.46    5.49    5.52
        12      UD    0.67
        13      LS       0      70

        14      KK    DEVL
        15      BA  0.0464
        16      UD    0.20
        17      LS       0      90
        18      ZZ
```

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLY10.HC1


```
*****************************************                 *****************************************
*                                       *                 *                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *                 *  U.S. ARMY CORPS OF ENGINEERS         *
*           MAY  1991                   *                 *  HYDROLOGIC ENGINEERING CENTER        *
*       VERSION 4.0.1E                  *                 *  609 SECOND STREET                    *
*                                       *                 *  DAVIS, CALIFORNIA 95616              *
*  RUN DATE  05/23/2001  TIME  13:45:36 *                 *  (916) 756-1104                       *
*                                       *                 *                                       *
*****************************************                 *****************************************
```


```
                 SHELLY'S ORCHARD PRE AND POST, 10 year, 24 hour storm.

   4 IO       OUTPUT CONTROL VARIABLES
                   IPRNT          4  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1   0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2   0  ENDING DATE
                  NDTIME       0000  ENDING TIME
                   ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL    0.08 HOURS
                   TOTAL TIME BASE  24.00 HOURS

      ENGLISH UNITS
           DRAINAGE AREA           SQUARE MILES
           PRECIPITATION DEPTH     INCHES
           LENGTH, ELEVATION       FEET
           FLOW                    CUBIC FEET PER SECOND
           STORAGE VOLUME          ACRE-FEET
           SURFACE AREA            ACRES
           TEMPERATURE             DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

               ***************
               *             *
   5 KK        *    UNDEV    *
               *             *
               ***************

   3 IN       TIME DATA FOR INPUT TIME SERIES
```

```
        JXMIN          30  TIME INTERVAL IN MINUTES
        JXDATE     1    0  STARTING DATE
        JXTIME          0  STARTING TIME

    SUBBASIN RUNOFF DATA

6 BA    SUBBASIN CHARACTERISTICS
        TAREA        0.09  SUBBASIN AREA

        PRECIPITATION DATA

6 PB    STORM        5.52  BASIN TOTAL PRECIPITATION

6 PI    INCREMENTAL PRECIPITATION PATTERN
```

0.01	0.01	0.00	0.01	0.00	0.00	[illegible]	0.00	0.00	0.01
0.00	0.00	0.00	0.01	0.01	0.01	[illegible]	0.01	0.01	0.00
0.01	0.00	0.01	0.00	0.01	0.01	[illegible]	0.01	0.01	0.01
0.00	0.01	0.00	0.00	0.01	0.00	[illegible]	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.01	0.00	[illegible]	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.02	0.01	0.01	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	[illegible]	0.03	0.03	0.03
0.03	0.03	0.04	0.04	0.04	0.04	[illegible]	0.04	0.35	0.35
0.35	0.35	0.35	0.35	0.07	0.07	[illegible]	0.07	0.07	0.07
0.03	0.03	0.03	0.03	0.03	0.03	[illegible]	0.02	0.03	0.03
0.02	0.03	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.02	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.00	0.01	0.01	0.01	0.00	[illegible]	0.01	0.00	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.00	0.01	0.01
0.00	0.01	0.01	0.01	0.01	0.00	[illegible]	0.01		

```
13 LS   SCS LOSS RATE
        STRTL        0.86  INITIAL ABSTRACTION
        CRVNBR      70.00  CURVE NUMBER
        RTIMP        0.00  PERCENT IMPERVIOUS AREA

12 UD   SCS DIMENSIONLESS UNITGRAPH
        TLAG         0.67  LAG

                              ***

                        UNIT HYDROGRAPH
                   42 END-OF-PERIOD ORDINATES
```

3.	8.	15.	26.	39.	51.	58.	61.	61.	56.
53.	48.	40.	32.	26.	21.	17.	15.	12.	10.
8.	7.	6.	5.	4.	3.	3.	2.	2.	2.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.								

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

        **************
        *            *
14 KK   *    DEVL    *
        *            *
        **************

    SUBBASIN RUNOFF DATA

15 BA   SUBBASIN CHARACTERISTICS
        TAREA        0.05  SUBBASIN AREA

        PRECIPITATION DATA

6 PB    STORM        5.52  BASIN TOTAL PRECIPITATION

6 PI    INCREMENTAL PRECIPITATION PATTERN
```

0.01	0.01	0.00	0.01	0.00	0.00	[illegible]	0.00	0.00	0.01
0.00	0.00	0.00	0.01	0.01	0.01	[illegible]	0.01	0.01	0.00
0.01	0.00	0.01	0.00	0.01	0.01	[illegible]	0.01	0.01	0.01
0.00	0.01	0.00	0.00	0.01	0.00	[illegible]	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.01	0.00	[illegible]	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.02	0.01	0.01	0.01	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.35	0.35
0.35	0.35	0.35	0.35	0.07	0.07	0.07	0.07	0.07	0.07
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03
0.02	0.03	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.00	0.01	0.01	0.01	0.00	[illegible]	0.01	0.00	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.00	0.01	0.01
0.00	0.01	0.01	0.01	0.01	0.00	[illegible]	0.01		

```
17 LS   SCS LOSS RATE
        STRTL        0.22  INITIAL ABSTRACTION
        CRVNBR      90.00  CURVE NUMBER
        RTIMP        0.00  PERCENT IMPERVIOUS AREA

16 UD   SCS DIMENSIONLESS UNITGRAPH
        TLAG         0.20  LAG

                              ***

                        UNIT HYDROGRAPH
                   14 END-OF-PERIOD ORDINATES
```

23.	75.	92.	74.	41.	24.	13.	8.	4.	3.
1.	1.	0.	0.						

```
                              RUNOFF SUMMARY
                      FLOW IN CUBIC FEET PER SECOND
                   TIME IN HOURS,  AREA IN SQUARE MILES

                         PEAK   TIME OF    AVERAGE FLOW FOR MAXIMUM PERIOD    BASIN   MAXIMUM   TIME OF
     OPERATION   STATION  FLOW    PEAK                                           AREA    STAGE   MAX STAGE
                                             6-HOUR    24-HOUR    72-HOUR
```

HYDROGRAPH AT	UNDEV	66.	12.50	19.	6.	6.	0.09
HYDROGRAPH AT	DEVL	104.	12.00	17.	5.	5.	0.05

*** NORMAL END OF HEC-1 ***

25 yr. - 24 hr. Storm

Pre & Post Development

SAVOY, RUGGLES & BOHM, P.A.

25 yr - 24 hr storm Pre & Post Development

Carrier, Christopher

From: Carrier, Christopher
Sent: Wednesday, May 30, 2001 11:16 AM
To: 'Chris Bohm'
Subject: RE: Shelly's Orchard Drainage - Pawnee Prairie Park
Park

Okay - I give up. Points well made. I got the letter from MKEC. It's okay. Let's see where this all goes.

-----Original Message-----
From: Chris Bohm [mailto:cbohm@srb1.com]
Sent: Wednesday, May 30, 2001 8:22 AM
To: Carrier, Christopher
Subject: Re: Shelly's Orchard Drainage - Pawnee Prairie Park

Chris,

Thanks. Greg Allison contacted me today, and the letter from MKEC will be mailed today to your attention. I understand the role you play in the resolution of this issue, and appreciate the work you have and will do to that end.

Mathematically, I agree that water from the site could be piped to the Lark Ditch. However, on a practical level, I have to disagree. If the homeowner on the corner is concerned about the water level in the channel during a storm, it must reach at least a 127.0 (City Datum) elevation at the inflow into the CMP.

This water surface in a large rainfall event would require a minimum top of curb elevation of 128.0 (one foot above the channel 100 yr. surface) at the lowest portion of the Shelly's Orchard Plat, the elevation of which is about a 124.0 City Datum. We would have to design the SWS to handle the 100 year flow concurrently with the 100 year water surface in the channel, which would require at least an additional foot of head to charge the system. Without considering street grades grading away from the lowest elevation on site, this would result in at least 5 feet of fill just to meet the 100 year storm requirement at the sump. Since the majority of the site grades to the low by the Park in the existing condition, it is not justifiable to force so much fill over the site in an attempt to prevent runoff to the Park area that, in the natural condition, accepts drainage from the site.

Sorry to seem so militant in my text, but please consider my position on draining to the Lark Ditch. I can't see this as a practical solution. Please keep me advised of any additional information that you may need.

Thanks,

Chris
----- Original Message -----

From: Carrier, Christopher
To: 'Chris Bohm'
Sent: Tuesday, May 29, 2001 11:37 AM
Subject: RE: Shelly's Orchard Drainage - Pawnee Prairie Park

I understand where you're comming from. I looked over your report, but still don't have anything from MKEC. I see their role as critical - ie - can the lake handle the additional runoff? All I can do is report to Kupper. Then, If he decides to still oppose it, not much more I can do. I will say this - and will tell Doug - you could get all the water into the Lark Ditch. I know you have to buck grade for 5 ft. or so, but it could be done. If he continues to object, you may have to go that way. I'll stay in touch.

-----Original Message-----
From: Chris Bohm [mailto:cbohm@srb1.com]
Sent: Tuesday, May 29, 2001 9:09 AM
To: Chris Carrier
Subject: Shelly's Orchard Drainage - Pawnee Prairie Park

Chris,

Hate to bother you with this, but I would like to keep this Shelly's Orchard project on the front burner. Two reasons for this are the sanitary sewer serving the addition, which in under construction as we speak, and the water mains serving the area which successfully bid last Friday. The owner intends to begin building homes in the addition as soon as possible.

Needless to say, the street plans (which include the storm water sewer in need of an easement) need to be finaled and bid. As I understand it, once you provide your input to the Park Department they will determine if they are willing to pursue providing an easement. If this is the case, Park Department Staff would meet with me to walk some of the alternate pipe routes to the pond, looking for a route that would minimize the number of trees removed. An easement would then be prepared and presented to the proper body for signature.

If you are interested in looking at the area, please let me know. I would be happy to show you our approach to reaching the pond.

Thanks for your help.

Christopher M. Bohm, P.E.
316-264-8008 Office
316-258-3237 Cell
316-264-4621 Fax
cbohm@srb1.com
www.srb1.com

Carrier, Christopher

From: Carrier, Christopher
Sent: Tuesday, May 29, 2001 11:38 AM
To: 'Chris Bohm'
Subject: RE: Shelly's Orchard Drainage - Pawnee Prairie Park
Park

I understand where you're comming from. I looked over your report, but still don't have anything from MKEC. I see their role as critical - ie - can the lake handle the additional runoff? All I can do is report to Kupper. Then, If he decides to still oppose it, not much more I can do. I will say this - and will tell Doug - you could get all the water into the Lark Ditch. I know you have to buck grade for 5 ft. or so, but it could be done. If he continues to object, you may have to go that way. I'll stay in touch.

-----Original Message-----
From: Chris Bohm [mailto:cbohm@srb1.com]
Sent: Tuesday, May 29, 2001 9:09 AM
To: Chris Carrier
Subject: Shelly's Orchard Drainage - Pawnee Prairie Park

Chris,

Hate to bother you with this, but I would like to keep this Shelly's Orchard project on the front burner. Two reasons for this are the sanitary sewer serving the addition, which in under construction as we speak, and the water mains serving the area which successfully bid last Friday. The owner intends to begin building homes in the addition as soon as possible.

Needless to say, the street plans (which include the storm water sewer in need of an easement) need to be finaled and bid. As I understand it, once you provide your input to the Park Department they will determine if they are willing to pursue providing an easement. If this is the case, Park Department Staff would meet with me to walk some of the alternate pipe routes to the pond, looking for a route that would minimize the number of trees removed. An easement would then be prepared and presented to the proper body for signature.

If you are interested in looking at the area, please let me know. I would be happy to show you our approach to reaching the pond.

Thanks for your help.

Christopher M. Bohm, P.E.
316-264-8008 Office
316-258-3237 Cell
316-264-4621 Fax
cbohm@srb1.com
www.srb1.com

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLY25.HC1

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  05/23/2001  TIME  13:53:29 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*        609 SECOND STREET             *
*     DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104              *
*                                      *
****************************************
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```
X     X  XXXXXXX   XXXXX         X
X     X  X        X     X       XX
X     X  X        X              X
XXXXXXX  XXXX     X       XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX        XXX
```

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:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT PAGE 1

```
 LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

*** FREE ***
   1       ID   SHELLY'S ORCHARD PRE AND POST, 25 year, 24 hour storm.
   2       IT      5                      289
   3       IN     30
   4       IO      4

   5       KK   UNDEV
   6       BA  0.0905
   7       PC      0    0.03    0.07    0.10    0.14    0.18    0.23    0.27    0.31    0.36
   8       PC   0.41    0.46    0.52    0.58    0.64    0.70    0.78    0.86    0.95    1.06
   9       PC   1.17    1.32    1.52    1.83    4.30    4.76    5.01    5.18    5.32    5.43
  10       PC   5.53    5.62    5.70    5.77    5.83    5.89    5.95    6.01    6.06    6.12
  11       PC   6.17    6.22    6.26    6.30    6.34    6.38    6.41    6.45    6.49
  12       UD   0.67
  13       LS      0      70

  14       KK    DEVL
  15       BA  0.0464
  16       UD    0.20
  17       LS      0      90
  18       ZZ
```

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLY25.HC1

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                *
*           VERSION 4.0.1E             *
*                                      *
*  RUN DATE  05/23/2001  TIME  13:53:29 *
*                                      *
****************************************
```

```
****************************************
*                                      *
*   U.S. ARMY CORPS OF ENGINEERS       *
*   HYDROLOGIC ENGINEERING CENTER      *
*        609 SECOND STREET             *
*     DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104              *
*                                      *
****************************************
```

```
                SHELLY'S ORCHARD PRE AND POST, 25 year, 24 hour storm.

  4 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          4  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1   0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2   0  ENDING DATE
                  NDTIME       0000  ENDING TIME
                   ICENT         19  CENTURY MARK

               COMPUTATION INTERVAL     0.08 HOURS
                    TOTAL TIME BASE    24.00 HOURS

        ENGLISH UNITS
              DRAINAGE AREA           SQUARE MILES
              PRECIPITATION DEPTH     INCHES
              LENGTH, ELEVATION       FEET
              FLOW                    CUBIC FEET PER SECOND
              STORAGE VOLUME          ACRE-FEET
              SURFACE AREA            ACRES
              TEMPERATURE             DEGREES FAHRENHEIT

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

              ***************
              *             *
   5 KK       *    UNDEV    *
              *             *
              ***************

   3 IN       TIME DATA FOR INPUT TIME SERIES
```

JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 1 0 STARTING DATE
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

6 BA SUBBASIN CHARACTERISTICS
TAREA 0.09 SUBBASIN AREA

PRECIPITATION DATA

6 PB STORM 6.48 BASIN TOTAL PRECIPITATION

6 PI INCREMENTAL PRECIPITATION PATTERN

0.01	0.01	0.00	0.01	0.00	0.00	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.01	[illegible]	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.03	0.02	0.02	0.03	0.02	[illegible]	0.03	0.03	0.03
0.03	0.03	0.05	0.05	0.05	0.05	[illegible]	0.05	0.41	0.41
0.41	0.41	0.41	0.41	0.08	0.08	[illegible]	0.08	0.08	0.08
0.04	0.04	0.04	0.04	0.04	0.04	[illegible]	0.03	0.03	0.03
0.03	0.03	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.01	0.01	0.02	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.00	0.01	0.01	0.00	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.00	[illegible]	0.01		

13 LS SCS LOSS RATE
STRTL 0.66 INITIAL ABSTRACTION
CRVNBR 70.00 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.67 LAG

***

UNIT HYDROGRAPH
42 END-OF-PERIOD ORDINATES

3.	8.	15.	26.	39.	51.	58.	61.	61.	58.
53.	46.	40.	32.	26.	21.	17.	15.	12.	10.
9.	7.	6.	5.	4.	3.	3.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.								

*** ***

```
*************
*           *
14 KK    *   DEVL    *
*           *
*************
```

SUBBASIN RUNOFF DATA

15 BA SUBBASIN CHARACTERISTICS
TAREA 0.05 SUBBASIN AREA

PRECIPITATION DATA

6 PB STORM 6.48 BASIN TOTAL PRECIPITATION

6 PI INCREMENTAL PRECIPITATION PATTERN

0.01	0.01	0.00	0.01	0.00	0.00	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.00	0.01	0.01	[illegible]	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.02	0.01	[illegible]	0.01	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.03	0.02	0.02	0.03	0.02	[illegible]	0.03	0.03	0.03
0.03	0.03	0.05	0.05	0.05	0.05	[illegible]	0.05	0.41	0.41
0.41	0.41	0.41	0.41	0.08	0.08	[illegible]	0.08	0.08	0.08
0.04	0.04	0.04	0.04	0.04	0.04	[illegible]	0.03	0.03	0.03
0.03	0.03	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	[illegible]	0.02	0.02	0.02
0.01	0.01	0.02	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	[illegible]	0.01	0.01	0.01
0.01	0.00	0.01	0.01	0.00	0.01	[illegible]	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.00	[illegible]	0.01		

17 LS SCS LOSS RATE
STRTL 0.22 INITIAL ABSTRACTION
CRVNBR 90.00 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

16 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.20 LAG

***

UNIT HYDROGRAPH
14 END-OF-PERIOD ORDINATES

23.	75.	92.	74.	41.	24.	13.	8.	4.	2.
1.	1.	0.	0.						

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			

HYDROGRAPH AT	UNDEV	88.	12.50	25.	8.	8.	0.09
HYDROGRAPH AT	DEVL	126.	12.00	21.	7.	7.	0.05

*** NORMAL END OF HEC-1 ***

50yr. - 24hr. Storm

Pre & Post Development

SHEET 13

SAVOY, RUGGLES & BOHM, P.A.

50 yr - 24 hour storm Pre & Post Developed

HEC1 S/N: 1343000364 HMVersion: 6.33 Data File: SHELLY50.HC1

```
*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)*
*         MAY 1991                  *
*       VERSION 4.0.1E              *
*                                   *
* RUN DATE 05/23/2001 TIME 14:03:45 *
*                                   *
*************************************
```


U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 756-1104


```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
```

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 23 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT PAGE 1

```
        LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*** FREE ***
             1        ID   SHELLYS ORCHARD PRE AND POST, 50 year, 24 hour storm.
             2        IT       5                    288
             3        IN      30
             4        IO       4

             5        KK   UNIEV
             6        BA  0.0505
             7        PC       0    0.04    0.08    0.12    0.16    0.21    0.26    0.31    0.42    0.47
             8        PC    0.53    0.60    0.66    0.73    0.81    0.88    0.94    1.00    1.03    1.05
             9        PC    1.52    1.75    2.11    4.93    5.47    5.74    5.84    6.10    6.23    6.34
            10        PC    6.45    6.55    6.63    6.70    6.77    6.83    6.89    6.96    7.02    7.08
            11        PC    7.14    7.19    7.24    7.28    7.32    7.36    7.40    7.44
            12        UI    0.67
            13        LS       0      70

            14        KK   DEVEL
            15        BA  0.0466
            16        UD    0.20
            17        LS       0      90
            18        ZZ
```



```
*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)*
*         MAY 1991                  *
*       VERSION 4.0.1E              *
*                                   *
* RUN DATE 05/23/2001 TIME 14:03:45 *
*                                   *
*************************************
```

U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 756-1104

SHELLYS ORCHARD PRE AND POST, 50 year, 24 hour storm.

```
  4 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          4  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

 IT           HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME          0000  STARTING TIME
                     NQ           288  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     2   0  ENDING DATE
                     NDTIME         0000  ENDING TIME
                     ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE   24.00 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT
```

*** *** *** *** *** *** ***

```
  5 KK          UNIEV
```

```
  8 IN          TIME DATA FOR INPUT TIME SERIES
```

JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 1 0 STARTING DATE
JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

6 BA SUBBASIN CHARACTERISTICS
TAREA 0.09 SUBBASIN AREA

PRECIPITATION DATA

6 PB STORM 7.44 BASIN TOTAL PRECIPITATION

6 PI INCREMENTAL PRECIPITATION PATTERN

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06
0.06	0.06	0.47	0.47	0.47	0.47	0.47	0.47	0.09	0.09
0.09	0.09	0.09	0.09	0.05	0.05	0.05	0.04	0.05	0.05
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01								

13 LS SCS LOSS RATE
STRTL 0.56 INITIAL ABSTRACTION
CRVNBR 70.00 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.67 LAG

***

UNIT HYDROGRAPH
42 END-OF-PERIOD ORDINATES

3.	8.	15.	26.	39.	51.	58.	61.	61.	55.
53.	46.	40.	32.	26.	22.	17.	15.	12.	10.
8.	7.	6.	5.	4.	3.	3.	2.	2.	2.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.								

*** ***

****
14 KK * DEVEL *
****

SUBBASIN RUNOFF DATA

15 BA SUBBASIN CHARACTERISTICS
TAREA 0.05 SUBBASIN AREA

PRECIPITATION DATA

6 PB STORM 7.44 BASIN TOTAL PRECIPITATION

6 PI INCREMENTAL PRECIPITATION PATTERN

0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06
0.06	0.06	0.47	0.47	0.47	0.47	0.47	0.47	0.09	0.09
0.09	0.09	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.05
0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
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0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
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0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
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0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
0.01	0.01								

17 LS SCS LOSS RATE
STRTL 0.22 INITIAL ABSTRACTION
CRVNBR 90.00 CURVE NUMBER
RTIMP 0.00 PERCENT IMPERVIOUS AREA

16 UD SCS DIMENSIONLESS UNITGRAPH
TLAG 0.20 LAG

***

UNIT HYDROGRAPH
14 END-OF-PERIOD ORDINATES

23.	75.	92.	74.	41.	24.	13.	8.	4.	3.
1.	1.	0.	0.00						

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			

HYDROGRAPH AT	UNDEV	111.	12.00	21.	10.	10.	0.09
HYDROGRAPH AT	DEVEL	146.	11.50	24.	8.	8.	0.05

*** NORMAL END OF HEC-1 ***

924 NORTH MAIN
WICHITA, KANSAS 67203
www.srb1.com

316-264-8008
FAX 264-4621
srb@srb1.com

SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

June 22, 2001

Vicky Huang, P.E.
Subdivison Engineer
City of Wichita
455 N. Main, 7th Floor
Wichita, KS 67201

Re: 2nd Review of Shelly's Orchard Addition Phase 2 Street Improvements

Dear Vicky,

Please find attached the revised preliminary plans for the above referenced improvements. As requested by the Parks Department, a water quality treatment pond has been added to the project. The pond has been located in a manner to minimize the amount of trees that will be disturbed and provide a tree buffer between the pond and the adjacent horse trail. Unfortunately, due to site constraints, the pond's capacity for water quality containment is limited to ¼" of runoff.

Once the plan has been approved, a drainage easement will be written to encompass the route of the pipe and pond area. Mr. Kupper has agreed to execute such an easement upon acceptance of the plan. We will present the easement for signature at the same time the final plans are submitted.

Please review the attached plans and advise as necessary. If possible, we would like to submit final plans for this project on Tuesday, July 3rd. Feel free to contact me at (316) 264-8008 or at cbohm@srb1.com with any questions or comments. If I am not available, feel free to discuss this project with Ken Lee as well.

Thank you,

Christopher M. Bohm, P.E.

Encl.

cc: Chris Carrier, City of Wichita
Doug Kupper, City of Wichita

STREET IMPROVEMENTS
SHELLY'S ORCHARD ADDITION
CITY OF WICHITA, KANSAS
MICHAEL E. LINDEBAK, P.E. - CITY ENGINEER
PROJECT NO. 472-83326
OCA NO.

LOTUS: FROM THE W.L. OF SHELLY'S ORCHARD ADDITION TO S.L. OF LYDIA
LOTUS COURT: FROM THE S.L. OF LOTUS TO AND INCLUDING CUL DE SAC
LYDIA CIRCLE: FROM W.L. OF LOTUS TO AND INCLUDING CUL DE SAC
LYDIA: FROM E.L. OF LYDIA TO E.L. LOT 21, BLOCK 2

GENERAL NOTES

Contractor will be required to provide a minimum advance notice of twenty-four (24) hours to utility companies prior to starting any excavation as follows:

Kansas One-Call	687-2470

The Contractor must notify the following in case of an emergency:

Cox Communications	262-0661
Kansas Gas Service	383-8600
K.G.E. Electric	383-8600
Peoples Natural Gas Company	1-800-303-0357
Southwestern Bell Telephone Company	1-800-286-8313
City of Wichita Water Department	262-6000
City of Wichita Sewer Maintenance	262-6000

Utility service lines, poles, valve boxes, meters, and et cetera are to be adjusted as necessary by others prior to construction unless the plans specifically call for their adjustment by the Contractor or unless the plans specifically identify a utility to be adjusted by its owner during construction. Existing utilities and their location, as shown on the plans, represent the best information obtainable for design. The Contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.

A saw cut of at least one-half the depth of existing surface courses or one-fourth the depth of existing total pavement thickness shall be provided at locations where proposed construction abuts an existing surface course or pavement for which partial removal of that surface or pavement is required, except when such saw cuts are within three (3) feet of an existing joint the limits of removal shall be extended to the existing joint. Such saw cuts will not be paid for directly and this cost shall be considered as subsidiary to the removal of the surface or pavement.

Rubble from the removal of miscellaneous structures and excess excavation which is to be wasted shall be disposed of on sites to be provided by the Contractor. These sites shall be approved by the Engineer as to suitability, appearance and site location. Locations that, in the opinion of the Engineer, will leave an unsightly appearance will not be approved.

All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands is subject to U.S. Corps permitting regulations. Any material buried or stockpiled beyond approved of Engineers construction limits would require additional archeological investigations unless buried in a previously approved borrow location.

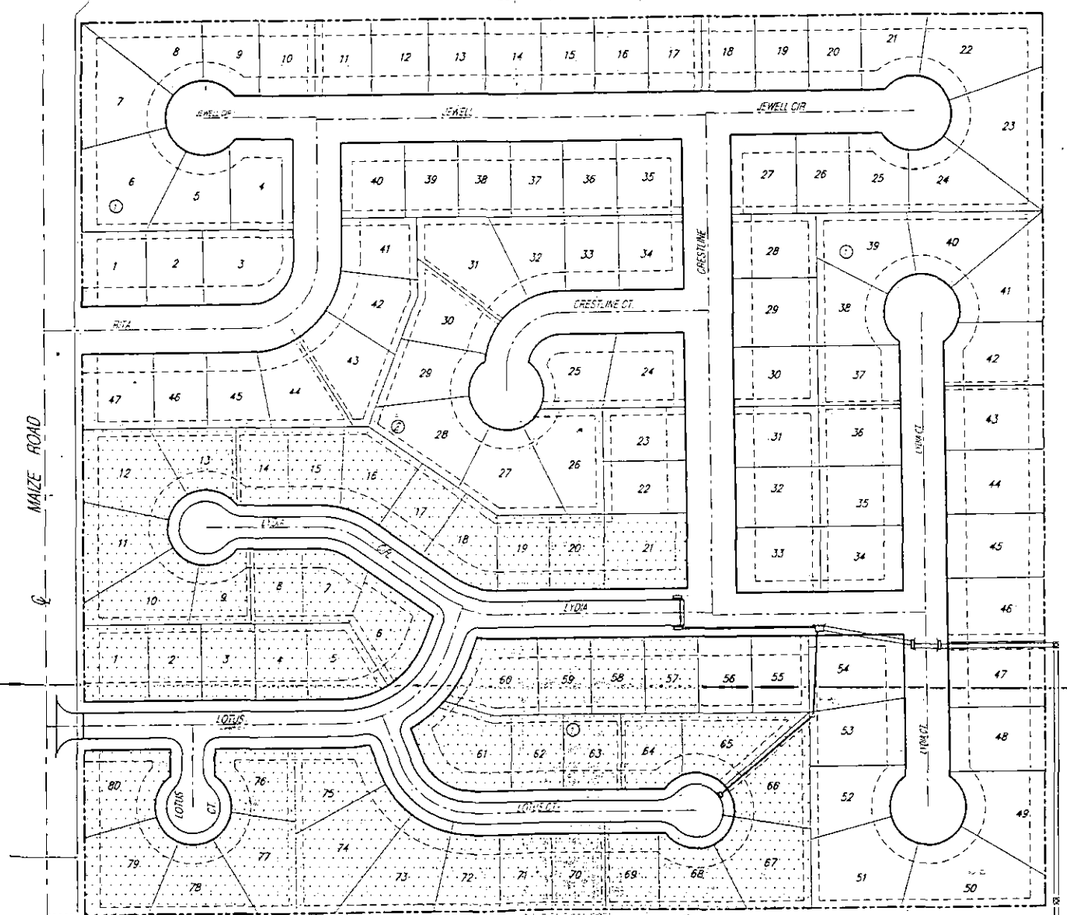
The Engineer shall take field ties to all quarter section corners. The Contractor shall set a City survey monument in the required location where such quarter section corners fall within the limits of pavement construction. Survey monuments will be furnished by the City. The Engineer will accurately located and install the iron at the quarter section corner. This work will not be paid for directly, but shall be considered subsidiary to the other pay items of work in the contract.

Trees and shrubs in public right-of-way which are in direct conflict with proposed new construction shall be removed by the Contractor with the Engineer's approval. Trees and shrubs which are not in direct conflict with proposed new construction shall be saved and protected from damage.

The Contractor shall be responsible for preserving property irons. The Contractor will be required to re-establish any property irons which are damaged or destroyed by his construction operations. Such irons shall be re-established by a licensed land surveyor in accordance with state laws.

Contractor will be required to provide a minimum advance notice of twenty-four (24) hours to utility companies prior to starting any excavation as follows:

EXISTING DRAINAGE DEDICATION FILM 414, PAGE 845



PROJECT SUMMARY

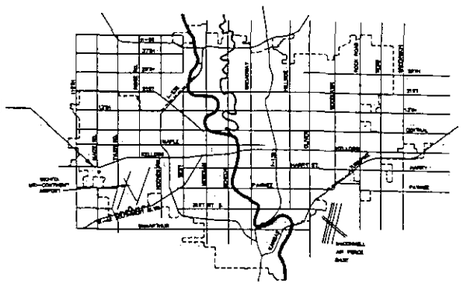
Project Length: 1983.16 l.f.
Dirt Work:
Cut: 3870.1 cu. yds.
Fill: Compacted: 1416.50 cu. yds.
Loose: 1082.82 cu. yds.
Excess: Cut-Fill.= 1370.78 cu. yds.

Bench Marks

CITY OF WICHITA DISC @ MAIZE ROAD AND MAY STREET 31.5' S. AND 38.0' E. OF THE CENTERLINE OF BOTH.
ELEV. = 137.67 (CITY DATUM)

INDEX

PROJECT LOCATION



SRB

Scale: 1" = 100'

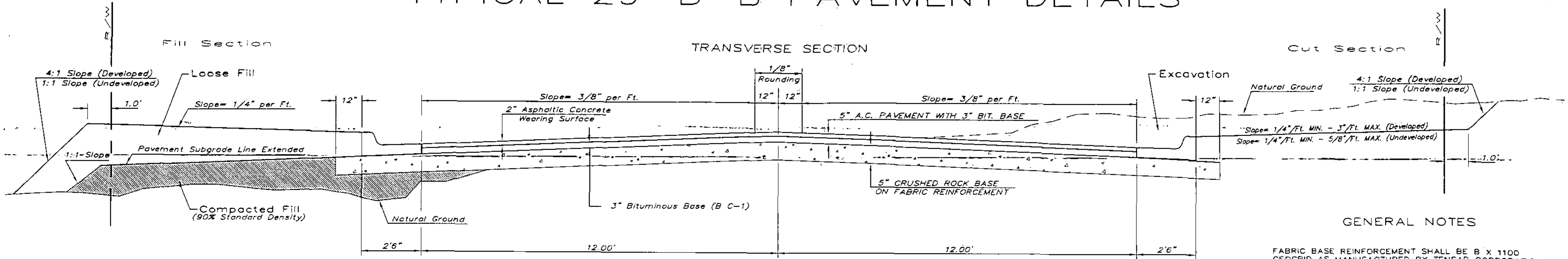
VICINITY MAP

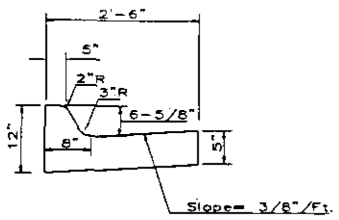
PRELIMINARY
NOT FOR CONSTRUCTION
6-25-01

BENEFIT DISTRICT

SRB
924 NORTH MAIN
WICHITA, KANSAS 67203
316-264-6208
FAX 264-4621
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

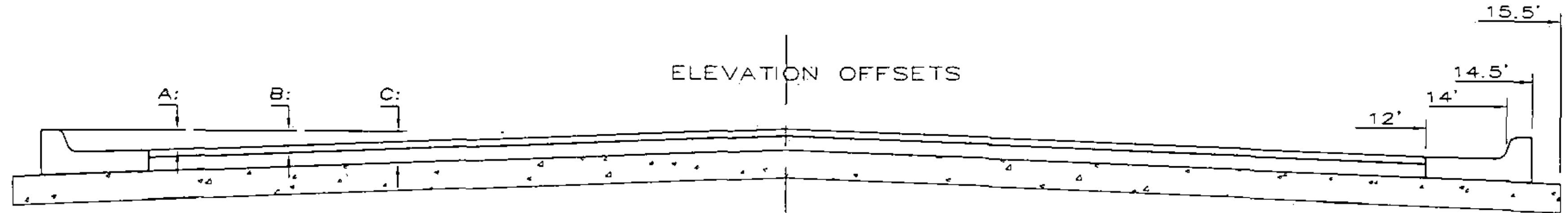
TYPICAL 29' B-B PAVEMENT DETAILS





COMBINED CURB & GUTTER

ELEVATION OFFSETS



	DISTANCE FROM CENTERLINE (LT. & RT.)										
	0'	2'	4'	6'	7'	8'	10'	12'	14'	14.5'	15.5'
A: Top of Curbs to Top of Surface Lift	0.13	0.18	0.24	0.30	0.33	0.36	0.43	0.49	—	—	—
B: Top of Curbs to Top of Upper Base Lift	0.30	0.35	0.41	0.47	0.50	0.53	0.60	0.66	—	—	—
C: Top of Curbs to Top of C. R. Subgrade	0.47	0.52	0.60	0.68	0.71	0.75	0.83	0.90	0.98	1.00	1.02

CRUSHED ROCK GRADATION REQUIREMENTS
Percent of Aggregate Retained

	% Retained
2-1/2"	0
3/4"	20 to 60
#4	50 to 80
#40	80 to 94
#200	90 to 98

Rock quality shall conform to the requirements specified by the KDOT 1990 Edition Standard Specification Subsection 1102 for durability Class I.

GENERAL NOTES

FABRIC BASE REINFORCEMENT SHALL BE B X 1100 GEOGRID AS MANUFACTURED BY TENSAR CORPORATION OR APPROVED EQUAL. FABRIC BASE REINFORCEMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. CRUSHED ROCK SHALL BE UNIFORMLY GRADED FROM 1-1/2" MAXIMUM SIZE TO NOT MORE THAN 10% PASSING A NO. 200 SIEVE. ROCK QUALITY SHALL BE THE SAME AS SPECIFIED FOR COARSE AGGREGATE FOR CONCRETE MIXES.

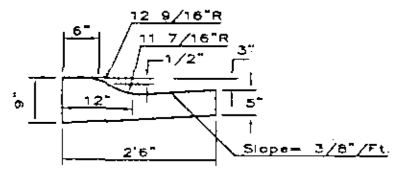
ROCK BASE IS TO BE COMPACTED AND SMOOTHED WITH A STEEL FACED ROLLER PROIR TO PLACEMENT OF ASPHALT. TACK COAT WILL NOT BE APPLIED TO ROCK BASE.

A TACK COAT OF EMULSIFIED ASPHALT (SC-1H OR CSS-1H) SHALL BE APPLIED AT AN APPROXIMATE RATE OF 0.05 GALLONS PER SQUARE YARD BETWEEN EACH LIFT OF ASPHALTIC MATERIAL.

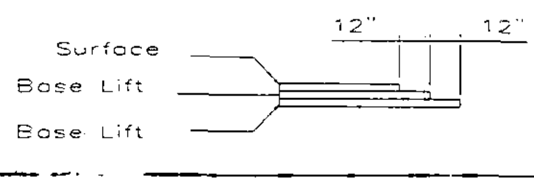
BITUMINOUS BASE AND ASPHALTIC CONCRETE WEARING SURFACE SHALL BE PLACED WITH A LAYDOWN MACHINE HAVING AUTOMATIC CONTROLS FOR LINE AND GRADE.

CONSTRUCTION JOINTS IN EACH LIFT SHALL BE STAGGERED A MINIMUM DISTANCE OF ONE (1) FOOT FROM JOINTS IN PRECEDING LIFTS AND PLACED SO THAT A JOINT WILL BE CONSTRUCTED ON THE CENTERLINE OF THE TOP LIFT.

THE ASPHALTIC CONCRETE PAVEMENT BETWEEN THE COMBINED CURB AND GUTTER SHALL BE PAID AS SQUARE YARDS OF 5" ASPHALTIC CONCRETE (3" BITUMINOUS BASE.)



COMBINED ROLL TYPE CURB & GUTTER



TRANSVERSE CONSTRUCTION JOINTS

Transverse construction joints shall be constructed in flexible base pavements at locations where pavement joins existing flexible base pavement as shown by the detail. All costs associated with the construction of the transverse joint shall be included in the bid price for Square Yards 5" ASPHALTIC CONCRETE (3" BITUMINOUS BASE).

** UNDERDRAIN AGGREGATE*
Percent of Aggregate Retained

1"	0
3/4"	0 to 10
3/8"	45 to 80
#4	90 to 100
#8	95 to 100

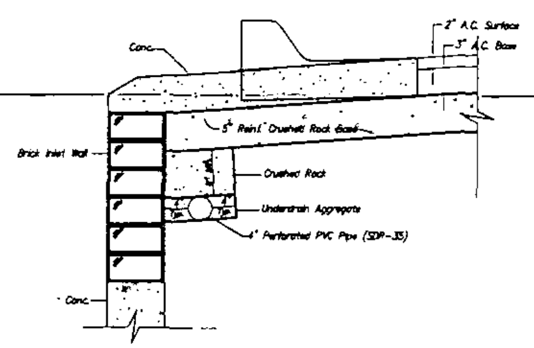
Rock Quality Shall Conform To The Requirements Specified By K.D.O.T. 1990 Edition Standard Specification Subsection 1102 For Durability Class I.

NOTES: The 4" PVC Perforated Pipe shall be installed by the paving contractor at all sump locations.

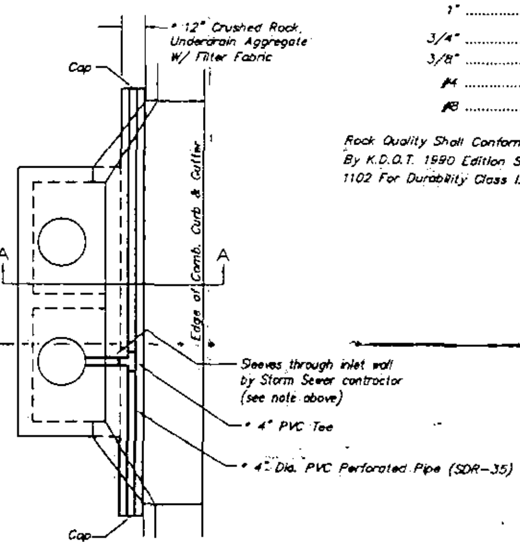
The Storm Sewer contractor shall install sleeves through inlet wall.

Cost of Underdrain System to be incidental to the Reinforced Crushed Rock Subgrade.

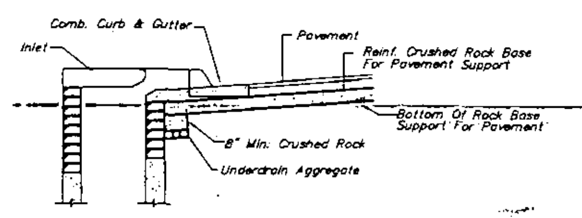
Inlet Type May Vary From That Shown.



TRENCH DRAIN DETAIL FOR RES. STREETS
NOT TO SCALE



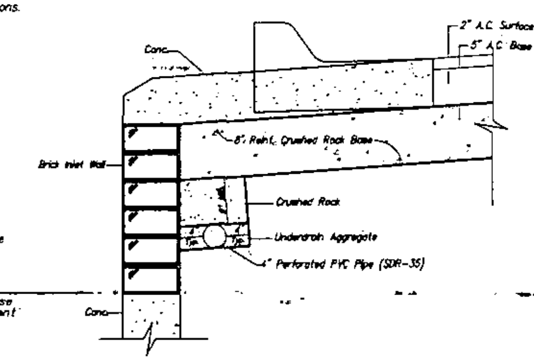
PLAN



(Min. 16 Perforations Per Lin. Ft. @ 1/4" Dia.) Perforations To Be on Bottom Half

SECTION A–A

PAVEMENT UNDERDRAIN DETAIL
NOT TO SCALE



TRENCH DRAIN DETAIL FOR ARTERIAL STREETS
NOT TO SCALE

29' RESIDENTIAL PAVEMENT SECTION
5 INCH ASPHALT CONCRETE PAVEMENT
WITH 5" REINFORCED CRUSHED ROCK BASE

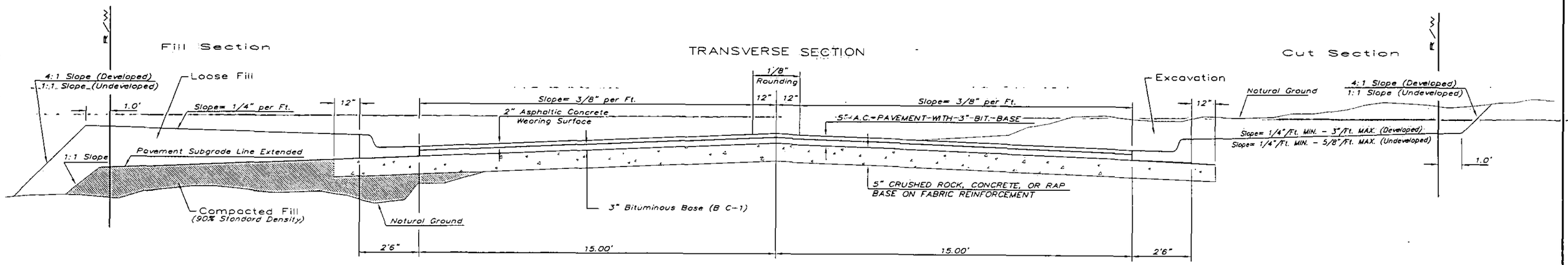
SRB
924 NORTH MAIN, WICHITA, KANSAS 67203
316-264-8008 FAX 264-4621
www.srb1.com E-mail srb@srb1.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

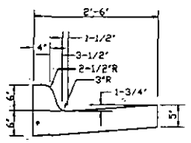
PROJECT NUMBER 472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
C.O.W.	Seal, Jr.				

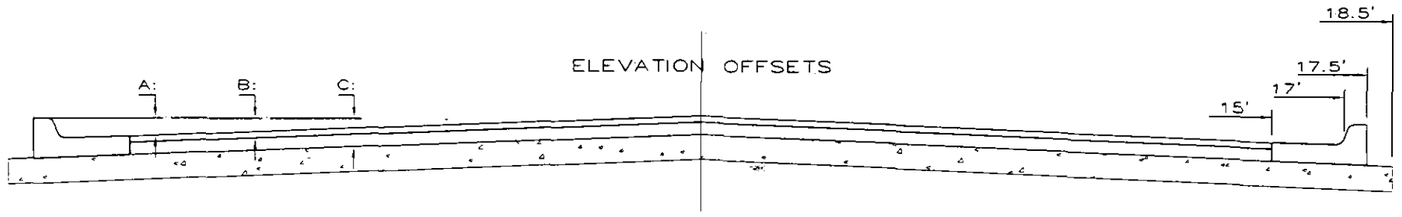
SHEET 2 OF 30

TYPICAL 35' B–B PAVEMENT DETAILS





STATE CURB
MODIFIED TYPE I
COMBINED CURB & GUTTER



4'	0'	2'	6'	8.5'	10'	12'	14'	15'	17'	17.5'	18.5'
A: Top of Curbs to Top of Surface Lift	0.04	0.08	0.14 0.21	0.29	0.33	0.39	0.46	0.49	–	–	–
B: Top of Curbs to Top of Upper Base Lift	0.21	0.25	0.37	0.45	0.50	0.56	0.62	0.65	–	–	–
C: Top of Curbs to Top of C. R. Subgrade	0.46	0.50	0.56 0.63	0.71	0.75	0.81	0.88	0.91	0.97	0.98	1.01

DISTANCE FROM CENTERLINE (LT. & RT.)

General Notes

FABRIC BASE REINFORCEMENT SHALL BE B X 1100 GEOGRID AS MANUFACTURED BY TENSAR CORPORATION OR APPROVED EQUAL. FABRIC BASE REINFORCEMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. CRUSHED ROCK SHALL BE UNIFORMLY GRADED FROM 1–1/2" MAXIMUM SIZE TO NOT MORE THAN 10% PASSING A NO. 200 SIEVE. ROCK QUALITY SHALL BE THE SAME AS SPECIFIED FOR COARSE AGGREGATE FOR CONCRETE MIXES.

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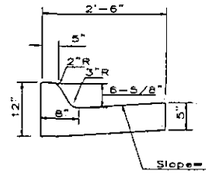
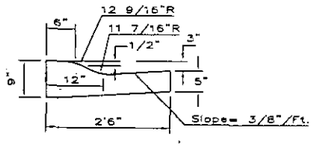
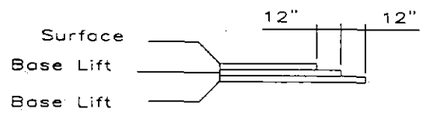


COMBINED CURB & GUTTER



COMBINED ROLL TYPE CURB & GUTTER

Transverse construction joints shall be constructed in flexible base pavements at locations where pavement joins existing flexible base pavement as shown by the detail. All costs associated with the construction of the transverse joint shall be included in the bid price for Square Yards 5" ASPHALTIC CONCRETE (3" BITUMINOUS BASE).



TRANSVERSE CONSTRUCTION JOINTS

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL – SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
(316) 268-4114 FAX

35' PAVEMENT
5" ASPHALTIC CONCRETE
W/ CRUSHED ROCK BASE

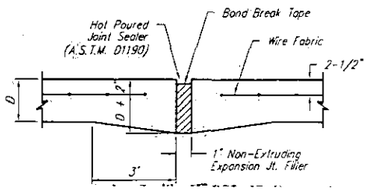
M. E. LINDEBAK P.E. – CITY ENGINEER

PROJECT NUMBER 472-83326

OCA #

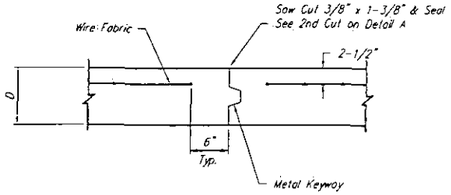
DATE MAR 96

SHEET 3 OF 30

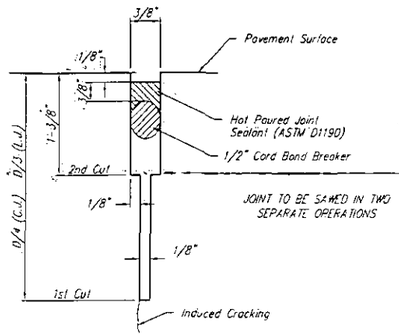


EXPANSION JOINT

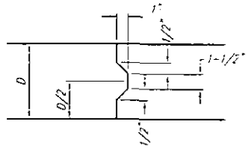
NOTE: Extra Thickness to be Subsidiary to Price of Square Yards Pavement



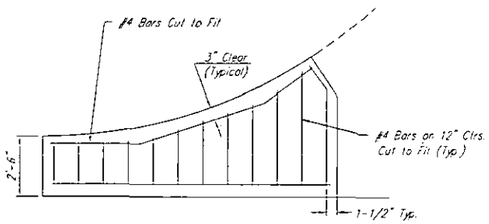
OPTIONAL CONTRACTION JOINT



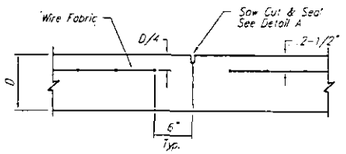
SAW JOINT DETAIL



KEYWAY DETAIL

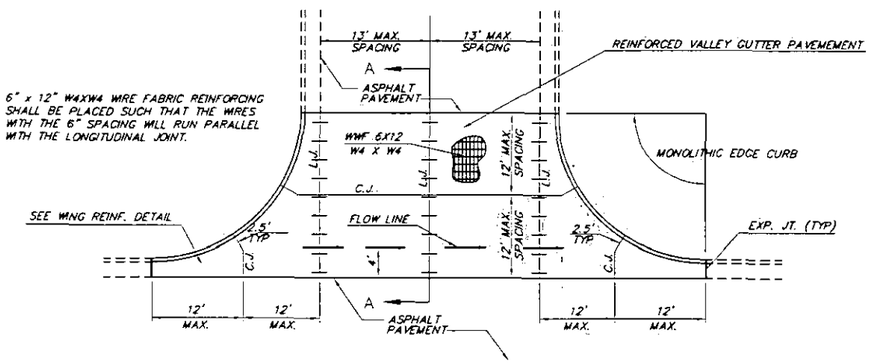


WING REINFORCING DETAIL

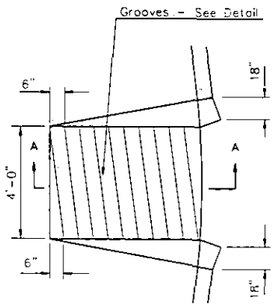


CONTRACTION JOINT DETAIL (C.J.)

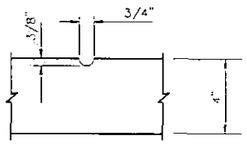
6" x 12" W4XW4 WIRE FABRIC REINFORCING SHALL BE PLACED SUCH THAT THE WIRES WITH THE 6" SPACING WILL RUN PARALLEL WITH THE LONGITUDINAL JOINT.



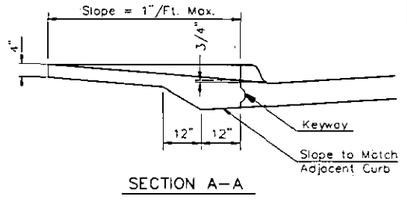
PLAN



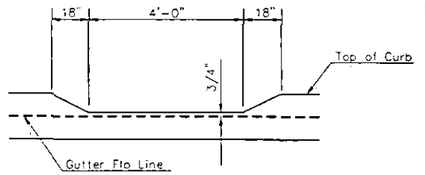
WHEELCHAIR RAMP PLAN VIEW



GROOVE DETAIL

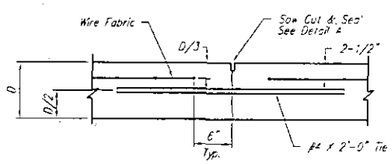


SECTION A-A

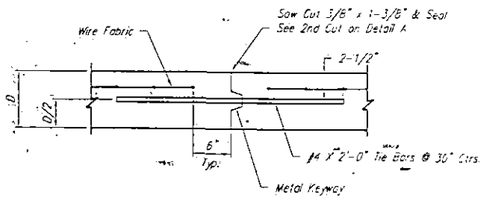


DEPRESSED CURB DETAIL

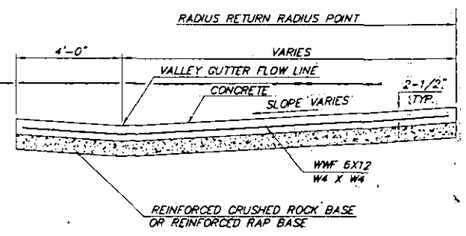
WHEELCHAIR RAMP DETAIL



LONGITUDINAL JOINT DETAIL (L.J.)



OPTIONAL LONGITUDINAL JOINT DETAIL (L.J.)



SECTION A-A

REINFORCED VALLEY GUTTER DETAIL

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4601
(316) 268-4114 FAX

VALLEY GUTTER DETAILS

WHEELCHAIR RAMP DETAILS

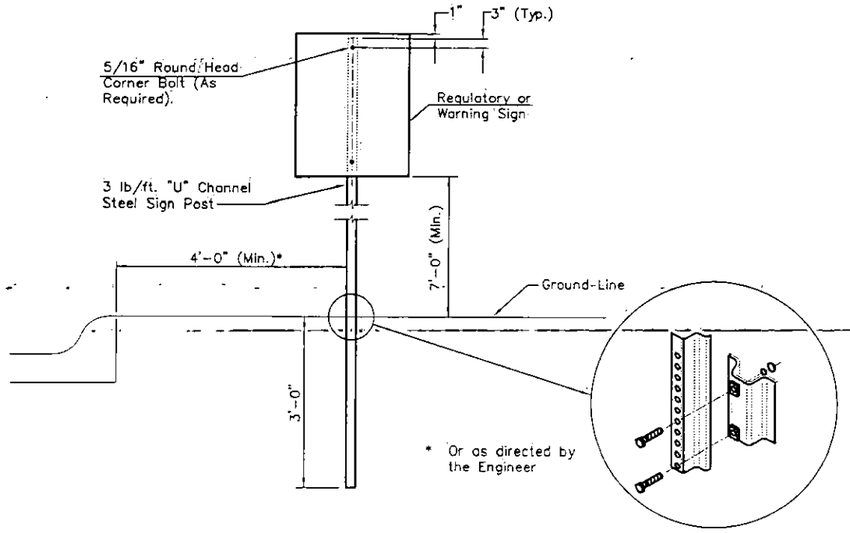
M. E. LINDEBAK P.E. - CITY ENGINEER

PROJECT NUMBER 472-83326

DCA #

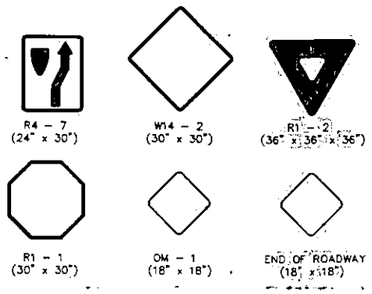
DATE MAR. 96

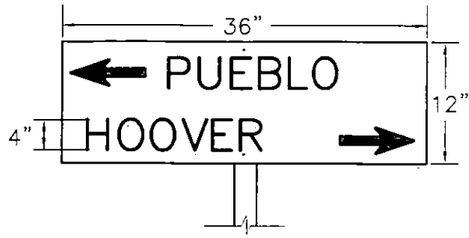
SHEET 4 OF 30



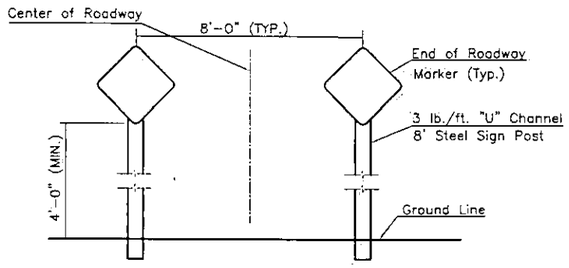
TYPICAL TRAFFIC CONTROL SIGN MOUNTING INSTALLATION

CURB AND GUTTER SECTION

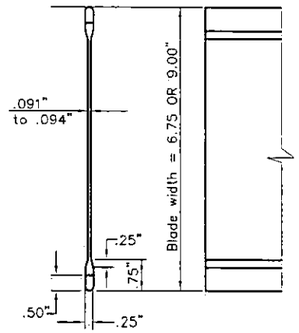




FLAT PLATE STREET NAME SIGN



TYPICAL END OF ROADWAY SIGN MOUNTING INSTALLATION



STREET NAME SIGN BLADE DETAILS

NOTE: REFERENCES BELOW TO "STANDARD SPECIFICATIONS" DENOTE "STANDARD SPECIFICATION FOR STATE ROAD AND BRIDGE CONSTRUCTION EDITION 1990" BY THE KANSAS DEPARTMENT OF TRANSPROTATION.

1. POST ANCHORS: POSTS SHALL BE ANCHORED WITH A YIELDING BASE POST SUPPORT AS DETAILED.
2. POSTS FOR TRAFFIC CONTROL SIGNS: POSTS SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 1620 OF THE STANDARD SPECIFICATIONS EXCEPT THAT ALL POSTS SHALL WEIGH 3 LBS./FOOT MINIMUM.
3. POSTS FOR STREET NAME SIGNS (SNS): POSTS SHALL BE 9 FEET LONG, CONSTRUCTED FROM 2 3/8" O.D. GALVANIZED STEEL PIPE WEIGHING A MINIMUM OF 3 LBS./FOOT. POSTS SHALL BE POSITIONED SO THAT THE BOTTOM BLADE IS 7 FEET ABOVE GRADE.
4. POSTS FOR END OF ROADWAY SIGN TO BE 8' LONG AND INSTALLED A MINIMUM OF 4' FROM ROADWAY TO BOTTOM OF SIGN.
5. SIGN BLANKS FOR TRAFFIC CONTROL SIGNS: SIGN BLANKS SHALL BE FABRICATED FROM 0.080" ALUMINUM ALLOY 6063-T6 CONFORMING TO THE REQUIREMENTS OF SUBSECTION 1626 OF THE STANDARD SPECIFICATIONS.
6. SIGN BLADES FOR STREET NAME SIGNS: EXTRUDED ALUMINUM BLADES SHALL BE ALUMINUM ALLOY CONFORMING TO 6063-T6 OR 5052-H38 (ASTM SPECIFICATION B221, LATEST ISSUE). BLADES SHALL HAVE AN ALODINE OR PHOSPHATE ETCHED FINISH. BLADES SHALL HAVE SQUARE CORNERS AND NO HOLES.

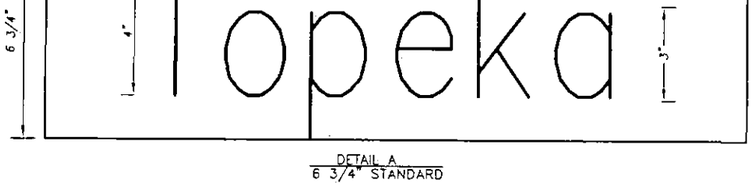
   MINIMUM BLADE LENGTH SHALL BE 24". MAXIMUM BLADE LENGTH SHALL BE 48". LENGTH VARIES BY INCREMENTS OF 6".

   BLADES BEARING THE STREET NAMES SHALL BE FIRMLY ATTACHED TO THE MOUNTING BRACKETS USING ALLEN-TYPE SET SCREWS. THE BLADES SHALL BE ORIENTED PARALLEL TO THE STREET.
7. MOUNTING BRACKETS FOR SIGNS: DIE-CAST ALUMINUM BRACKETS SHALL BE ALUMINUM ALLOY 360 HAVING A TENSILE STRENGTH OF 44,000 PSI. THE BRACKETS SHALL BE SMOOTHLY FINISHED FREE OF PITS, BURRS, AND FLAWS. EACH BRACKET SHALL BE TAPPED AND DRILLED FOR 5/16" ZINC-PLATED ALLEN-TYPE SET SCREWS HAVING SELF-LOCKING SAW-TOOTH ENDS.
8. FASTENERS: ALL STEEL FASTENERS FOR TRAFFIC CONTROL SIGNS SHALL BE GALVANIZED AND SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 1614 OF THE STANDARD SPECIFICATIONS.
9. REFLECTIVE SHEETING: REFLECTIVE SHEETING SHALL BE TYPE II - HIGH PERFORMANCE CLASS HA IN ACCORDANCE WITH SUBSECTION 2201 OF THE STANDARD SPECIFICATIONS.
10. PROCESS INK: ALL PROCESS INK SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 2202 OF THE STANDARD SPECIFICATIONS.
11. DETAILS: REGULATORY AND WARNING SIGNS SHALL CONFORM TO THE DETAILS IN "STANDARD HIGHWAY SIGNS", FHWA, 1979.
12. DETAILS - SNS: THE REFLECTIVE SHEETING FOR THE 6 3/4" STANDARD SIZE SNS IS TO BE THE HIGHWAY GREEN BACKGOUND WITH SILVER-WHITE #2 COPY WITH 4" UPPER CASE AND LOWER CASE PRIMARY COPY AND SUFFIX COPY, BOTH SERIES "C". FACES TO TRIM TO A 6 1/4". (SEE DETAIL A.)

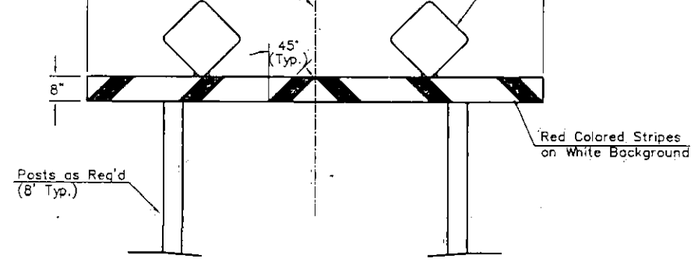
    THE REFLECTIVE SHEETING FOR THE 9" METRO SIZE SNS IS TO BE THE HIGHWAY GREEN BACKGROUND WITH SILVERWHITE #2 COPY WITH 5" UPPER CASE AND LOWER CASE PRIMARY COPY AND SUFFIX COPY, BOTH SERIES "C". THE CARDINAL DIRECTION CENTERED DIRECTLY BELOW THE BLOCK NUMBER SHALL BE AN UPPER CASE, 3" SERIES "C" LETTER. FACES TO TRIM TO A 8 1/2" WIDTH. (SEE DETAIL B.)

    FOR CUL-DE-SAC STREETS, A 9" METRO SIZE BLADE SHALL BE USED WITH THE HOUSE NUMBERS DISPLAYED BENEATH THE STREET NAME. LETTERING TO BE THE SAME AS FOR THE 6 3/4" SIZE BLADE, EXCEPT THAT THE HOUSE NUMBER INFORMATION SHALL BE 4" SERIES "C".

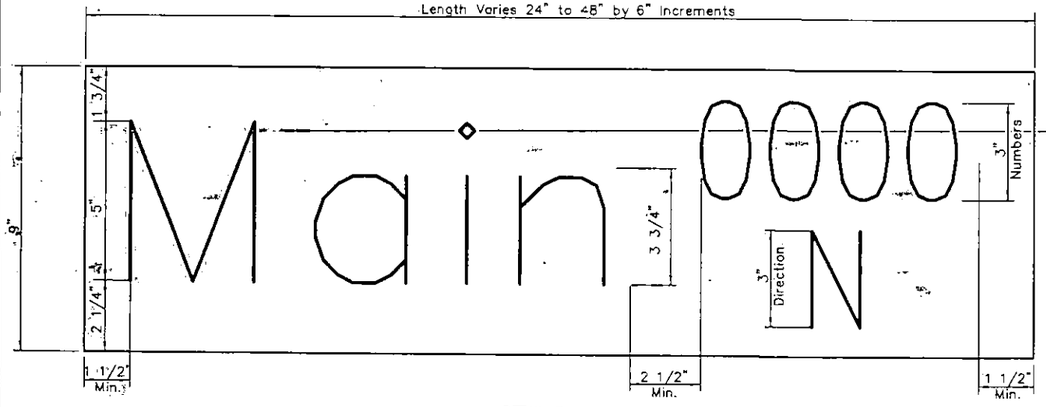
    SHOP DRAWINGS OF LAYOUT FOR SNS SHALL BE SUBMITTED TO THE TRAFFIC ENGINEERING DIVISION OF THE CITY OF WICHITA FOR APPROVAL PRIOR TO FABRICATION. THE FINISHED SIGNS AS SUPPLIED SHALL BE OF GOOD APPEARANCE, FREE FROM RAGGED EDGES, CRACKS SCALES OR BLISTERS AND SHALL BE CLEAN-CUT. SIGNS SHALL BE PACKED IN SUCH MANNER AS TO PREVENT DAMAGE OR DEFACEMENT DURING SHIPMENT OR STORAGE.



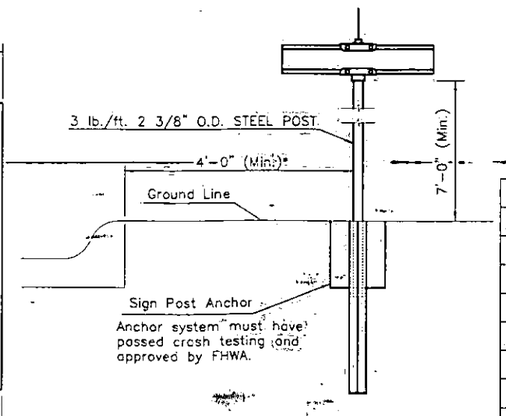
DETAIL A
6 3/4" STANDARD



TYPE I BARRICADE DETAIL W/ E.O.R. MARKER



DETAIL B
9" METRO



TYPICAL STREET NAME SIGN MOUNTING INSTALLATION

CURB AND GUTTER SECTION

SIGN ASSEMBLY TABLE

STATION	OFFSET	SIGN	QUANTITY*
0+50, Lotus	22.0' Lt.	R1-1	1
TOTAL			

* FOR INFORMATION ONLY

STREET NAME	NO. BLADES REQ'D 6 3/4" STD.	9" METRO
LOTUS 10300 W		1
MAIZE RD 2100 S		1
LOTUS	4	
LOTUS CT 10301-10317	1	
LOTUS CIR	1	
LYDIA	1	
LYDIA CIR	1	

13. PERMANENT TRAFFIC CONTROL AND SNS: PERMANENT TRAFFIC CONTROL AND SNS SHALL BE MEASURED AND PAID FOR AT THE LUMP SUM PRICE FOR SIGNING. THE PAYMENT AS SET FORTH ABOVE SHALL BE CONSIDERED FULL COMPENSATION FOR ALL EXCAVATION, BACKFILLING, POSTS, ANCHORS, FASTENERS, MATERIALS, LABOR, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK.

THE CITY OF WICHITA
CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
(316) 268-4114 FAX

SIGNING DETAILS

M. E. LINDEBAK P.E. - CITY ENGINEER

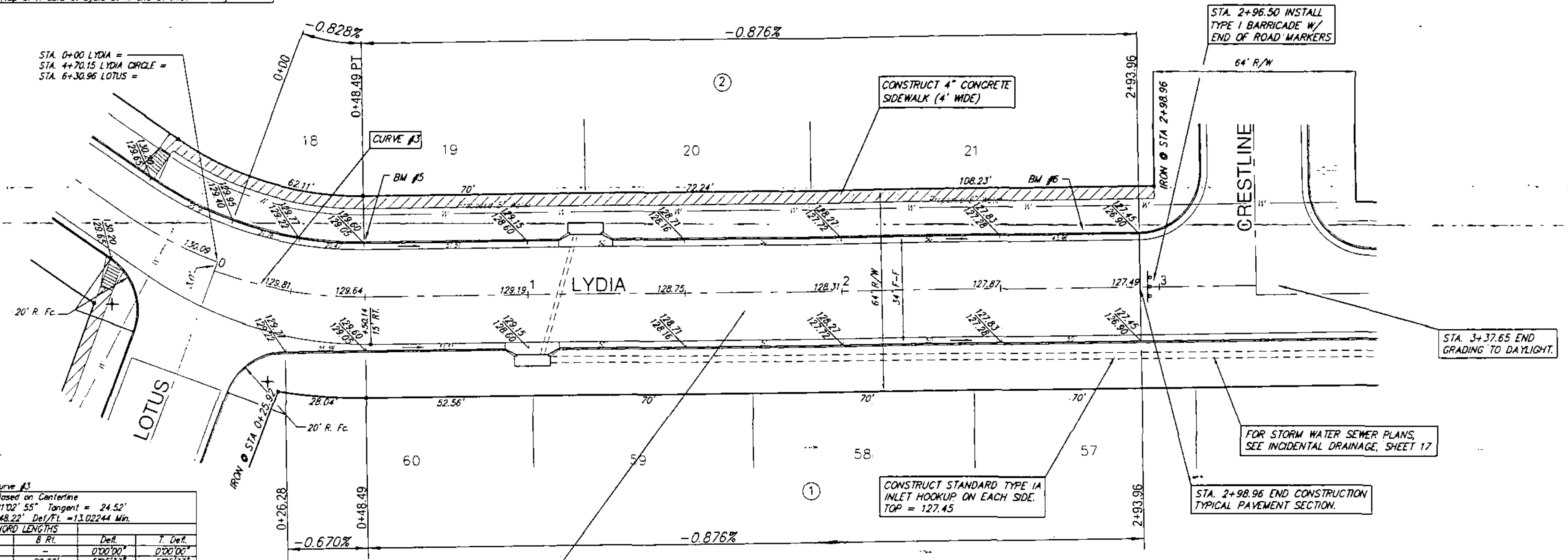
PROJECT NUMBER 472-83326 | OCA #

DATE JUNE 97 | SHEET 5 OF 30

Subdivision Bench Marks

No.	Street and Station	From CL	Description	Elevation
5	Lydia, Sta. 0+48.49	17.25' Lt	Top of N curb of Lydia at E end return	
6	Lydia, Sta. 2+76.51	17.25' Lt	Top of N curb of Lydia at W end of Inlet	

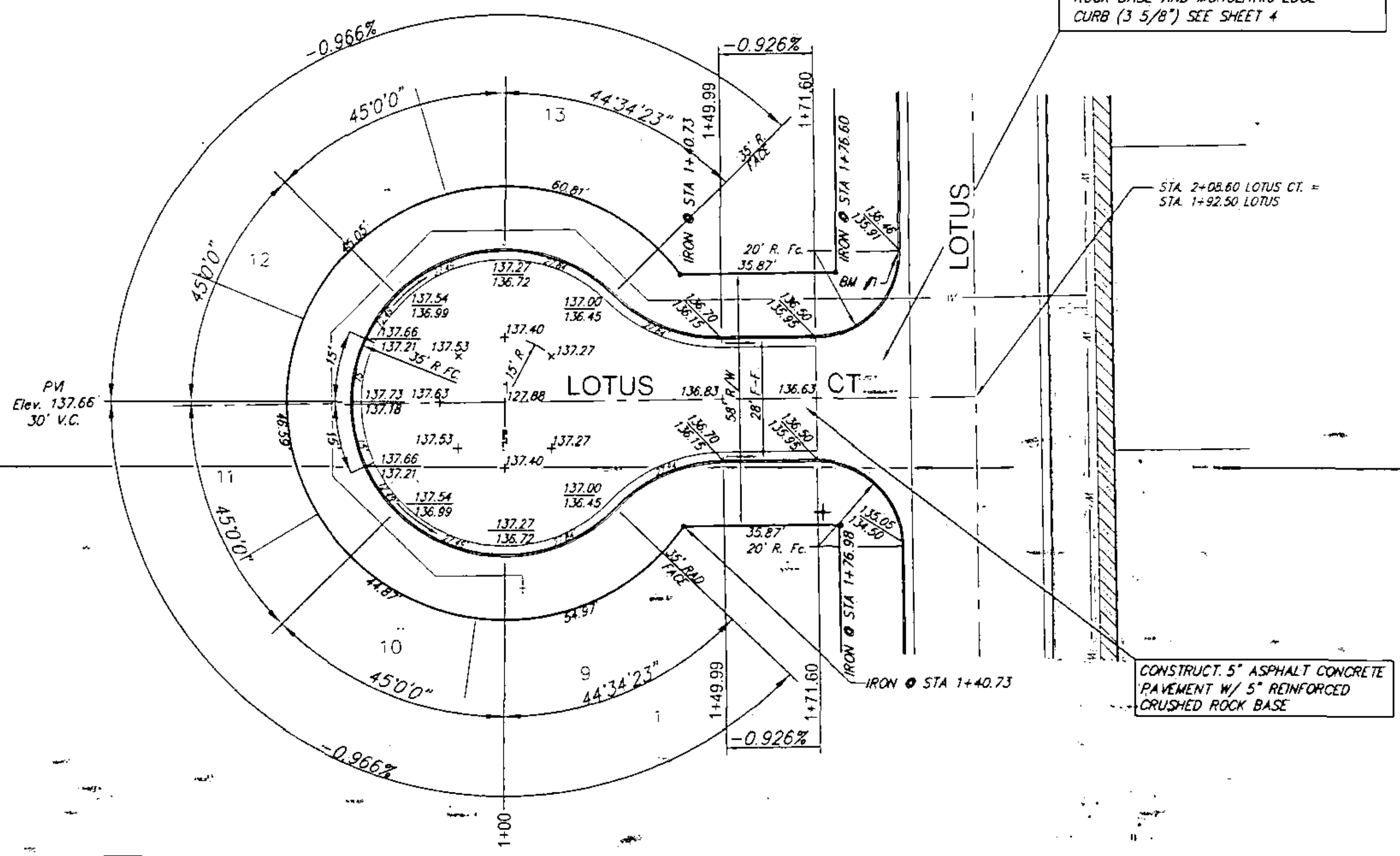
Shelly's Orchard



Curve #3

Curve Data Based on Centerline Rad. = 132' Delta = 21°02' 55" Tangent = 24.52' Arc = 48.49' L.C. = 48.22' Def/Ft. =13.02244 Min.					
		FACE CHORD LENGTHS			
Station	Arc	8 Lt.	8 Rt.	Defl.	T. Defl.
0+00.00	–	–	–	0°00'00"	0°00'00"
0+25.00	25.00'	20.24'	29.69'	5°25'33"	5°25'33"
0+48.49	23.49'	0.00'	0.00'	5°05'54"	10°31'27"

Addition



Subdivision Bench Marks

No.	Street and Station	From CL	Description	Elevation
1	Lotus, Sta. 1+58.78	17.25' Rt	Top of S curb of Lotus at N end of W return	

NOTE: ROLL TYPE CURB AND GUTTER TO BE CONSTRUCTED ALONG PAVEMENT DEPICTED ON THIS SHEET

Shelly's Orchard Addition
Lydia and Lotus Ct.
WICHITA, KANSAS

SRB 924 NORTH MAIN WICHITA, KANSAS 67203 www.srb1.com 316-264-8008 FAX 264-4621 E-mail: srb@srb1.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER 472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	TEB			Apr. 4, 2001	

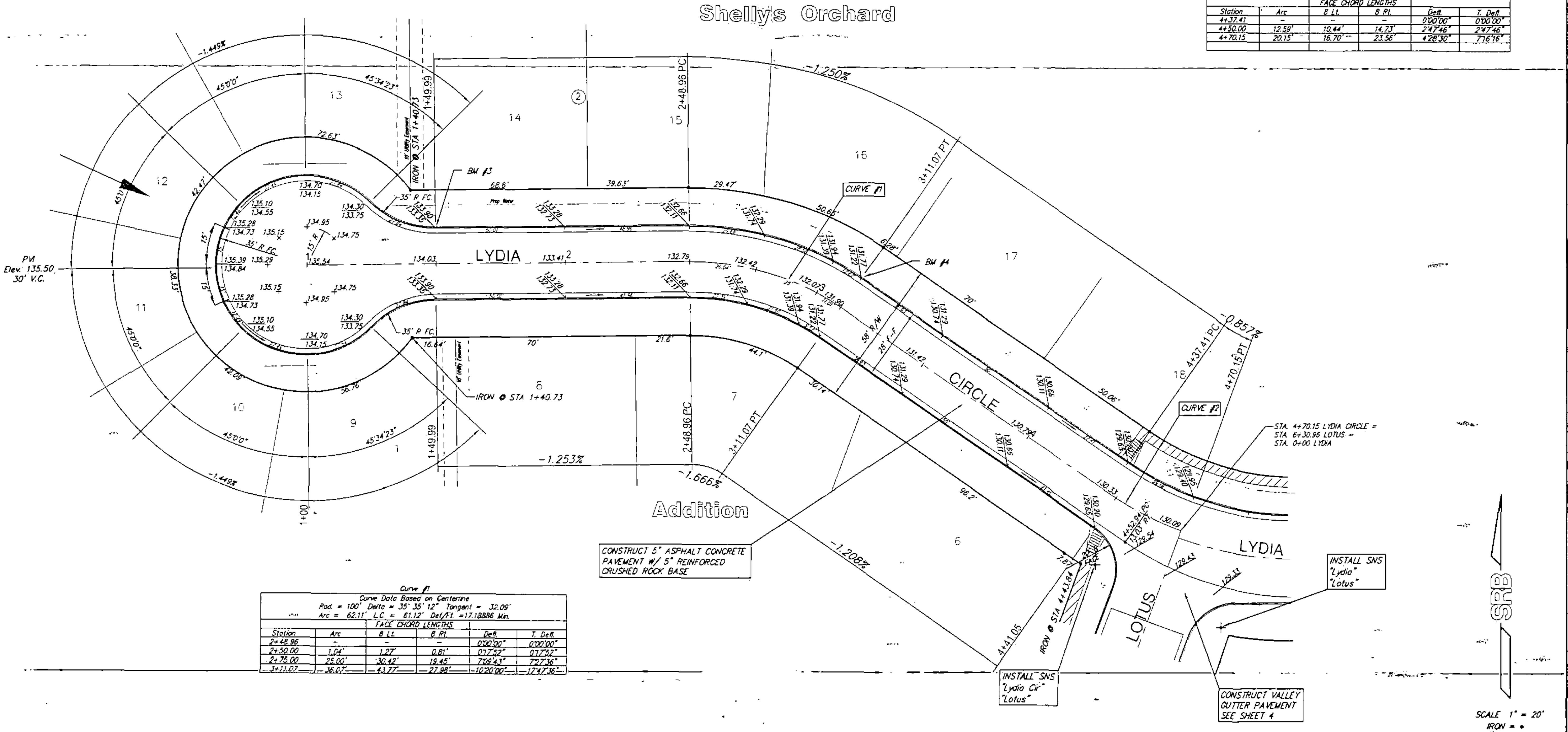
Subdivision Bench Marks

No.	Street and Station	From CL	Description	Elevation
3	Lydia Circle, Sta. 1+49.78	14.25' Lt	Top of N curb of Lydia Circle at E end return	
4	Lydia Circle, Sta. 3+11.07	14.25' Lt	Top of N curb of Lydia Circle at E end return	

Curve #2

Curve Data Based on Centerline
Rad. = 129' Delta = 14° 32' 17" Tangent = 16.45'
Arc = 32.73' L.C. = 32.64' Def/Ft. =13.32544 Min.

		FACE CHORD LENGTHS			
Station	Arc	8 Lt.	8 Rt.	Defl.	T. Defl.
4+37.41	–	–	–	0°00'00"	0°00'00"
4+50.00	12.59'	10.44'	14.73'	2°47'46"	2°47'46"
4+70.15	20.15'	16.70'	23.56'	4°28'30"	7°16'16"



Curve #1

Curve Data Based on Centerline
Rad. = 100' Delta = 35° 35' 12" Tangent = 32.09'
Arc = 62.11' L.C. = 61.12' Def/Ft. =17.18886 Min.

		FACE CHORD LENGTHS			
Station	Arc	8 Lt.	8 Rt.	Defl.	T. Defl.
2+48.96	–	–	–	0°00'00"	0°00'00"
2+50.00	1.04'	1.27'	0.81'	0°37'52"	0°37'52"
2+75.00	25.00'	30.42'	19.45'	7°09'43"	7°27'36"
3+11.07	36.07'	43.77'	27.98'	10°20'00"	17°47'36"

CONSTRUCT VALLEY GUTTER PAVEMENT SEE SHEET 4

SCALE 1" = 20'
IRON = •

NOTE: ROLL TYPE CURB AND GUTTER TO BE CONSTRUCTED ALONG PAVEMENT DEPICTED ON THIS SHEET

Shelly's Orchard Addition
Lydia Circle
WICHITA, KANSAS

SRB
924 NORTH MAIN
WICHITA KANSAS 67203
www.srb1.com
316-264-8008
FAX 264-4621
E-mail srb@srb1.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER 472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	TEB			Apr. 4, 2001	

DWG FILE Lydia Circle

SRB JOB 18556

Subdivision Bench Marks

No.	Street and Station	From CL	Description	Elevation
1	Lotus, Sta. 1+58.78	17.25' Rt.	Top of S curb of Lotus at N end of W return	
2	Lotus, Sta. 4+17.15	17.25' Rt.	Top of S curb of Lotus at N end of W return	

Curve #4

Curve Data Based on Centerline
Rad. = 150' Delta = 68° 57'05" Tangent = 103.00'
Arc = 180.51' L.C. = 169.82' Def/Ft. = 11.45943 Min.

Station	Arc	FACE CHORD LENGTHS: B Lt.	B Rt.	Defl.	T. Defl.
3+90.27	–	–	–	0°00'00"	0°00'00"
4+00.00	9.73'	8.11'	11.35'	1°51'30"	1°51'30"
4+25.00	25.00'	20.81'	29.13'	4°46'29"	6°37'59"
4+50.00	25.00'	20.81'	29.13'	4°46'29"	11°24'28"
4+75.00	25.00'	20.81'	29.13'	4°46'29"	16°10'57"
5+00.00	25.00'	20.81'	29.13'	4°46'29"	20°57'26"
5+25.00	25.00'	20.81'	29.13'	4°46'29"	25°43'56"
5+50.00	25.00'	20.81'	29.13'	4°46'29"	30°30'25"
5+70.78	20.78'	17.30'	24.22'	3°58'07"	34°28'32"

CONSTRUCT 4" CONCRETE SIDEWALK (4' WIDE) AND WHEEL CHAIR RAMP EACH SIDE

CONSTRUCT VALLEY GUTTER PAVEMENT 7" REINFORCED CONCRETE W/ 5" CRUSHED ROCK BASE AND MONOLITHIC EDGE CURB (3 5/8") SEE SHEET 4

CONSTRUCT TEMPORARY AC HOOKUP, 5" AC PAVEMENT W/ 5" REINFORCED CRUSHED ROCK BASE.

INSTALL R1-1 STOP SIGN

STA 0+50.0 – BEGIN TYPICAL PAVEMENT SECTION

INSTALL SNS "Lydia Cir" "Lotus"

INSTALL SNS "Maize Rd 2100 S" "Lotus" 10300 W"

INSTALL SNS "Lotus" "Lotus Ct 10301–10317"

INSTALL SNS "Lydia" "Lotus"

INSTALL SNS "Lotus" "Lotus Cir"

CONSTRUCT VALLEY GUTTER PAVEMENT 7" REINFORCED CONCRETE W/ 5" CRUSHED ROCK BASE AND MONOLITHIC EDGE CURB (3 5/8") SEE SHEET 4

CONSTRUCT VALLEY GUTTER PAVEMENT 7" REINFORCED CONCRETE W/ 5" CRUSHED ROCK BASE AND MONOLITHIC EDGE CURB (3 5/8") SEE SHEET 4

CONSTRUCT 5" ASPHALT CONCRETE PAVEMENT W/ 5" REINFORCED CRUSHED ROCK BASE

36" RCP TO BE INSTALLED WITH SANITARY SEWER PROJECT
USFL = 134.26
DSFL = 133.94

NOTE: ROLL TYPE CURB AND GUTTER TO BE CONSTRUCTED ALONG PAVEMENT DEPICTED ON THIS SHEET

SCALE 1" = 20'
IRON = ●

Shelly's Orchard Addition
Lotus
WICHITA, KANSAS

SRB 924 NORTH MAIN WICHITA KANSAS 67203 316-264-8606 FAX 264-4621 www.srb.com E-mail srb@srb.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER 472-88326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	TEB			Apr. 4, 2001	

SHEET 8 OF 30

CONSTRUCT VALLEY GUTTER PAVEMENT 7" REINFORCED CONCRETE W/ 5" CRUSHED ROCK BASE AND MONOLITHIC EDGE CURB (3 5/8") SEE SHEET 4

STA. 0+00 LOTUS CT. = STA. 4+44.54 LOTUS

LOTUS

IRON ● STA 0+29.67 0+33.86

20' R. Fc.

+0.625%

PM Elev. 132.15 40' V.C.

-1.077%

0+69.95 PC

1+30.40

1+90.85 PT

-0.812%

CURVE #5

Shelly's Orchard

Addition

LOTUS CIRCLE

BM #7

BM #8

Proposed 8" Water

8" Utility Easement

-1.230%

4+85.83

4+35.84

45°34'23"

55°27'17"

34°22'28"

45°0'0"

CONSTRUCT STANDARD TYPE IA INLET HOOKUP SEE INCIDENTAL DRAINAGE SHEET, 18.

PM Elev. 128.60 30' V.C.

PM Elev. 132.15 44.68' V.C.

-0.813%

-0.841%

CONSTRUCT 5" ASPHALT CONCRETE PAVEMENT W/ 5" REINFORCED CRUSHED ROCK BASE

SRB

SCALE 1" = 20'

IRON = ●

Subdivision Bench Marks

No.	Street and Station	From CL	Description	Elevation
7	Lotus Circle, Sta. 1+90.85	14.25' Lt	Top of N curb of Lotus Circle at E end return	
8	Lotus Circle, Sta. 4+35.84	14.25' Lt	Top of N curb of Lotus Circle at E end return	

Curve #5

Curve Data Based on Centerline

Rad. = 100' Delta = 69°16'10" Tangent = 69.07'

Arc = 120.9' L.C. = 113.67' Def/Ft. = 17.18845' Min.

Station	Arc	FACE CHORD LENGTHS B.Lt.	FACE CHORD LENGTHS B.Rt.	Deff.	T. Deff.
0+69.95	–	–	–	0°00'00"	0°00'00"
0+75.00	5.05'	6.16'	3.64'	1°26'48"	1°26'48"
1+00.00	25.00'	30.42'	19.45'	7°09'42"	8°36'31"
1+25.00	25.00'	30.42'	19.45'	7°09'42"	15°46'13"
1+50.00	25.00'	30.42'	19.45'	7°09'42"	22°55'56"
1+90.85	40.85'	49.48'	31.64'	11°42'09"	34°38'05"

NOTE: ROLL TYPE CURB AND GUTTER TO BE CONSTRUCTED ALONG PAVEMENT DEPICTED ON THIS SHEET

Shelly's Orchard Addition

Lotus Circle

WICHITA, KANSAS

SRB 924 NORTH MAIN WICHITA KANSAS 67203 316-264-8008 FAX 264-4621 www.srb1.com E-mail: srb@srb1.com

SAVOY, RUGGLES & BOHM, P.A.

ENGINEERING & SURVEYING

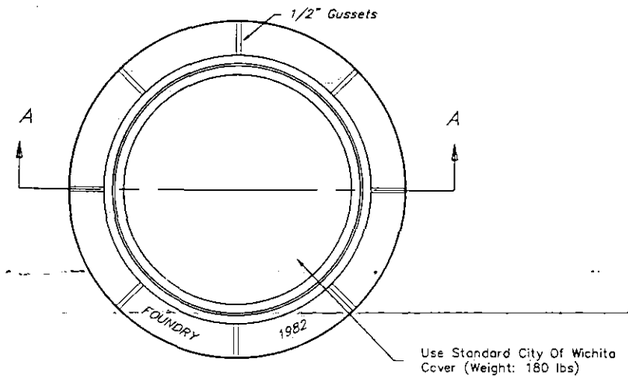
PROJECT NUMBER 472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
DMB	TEB			Apr. 4, 2001	

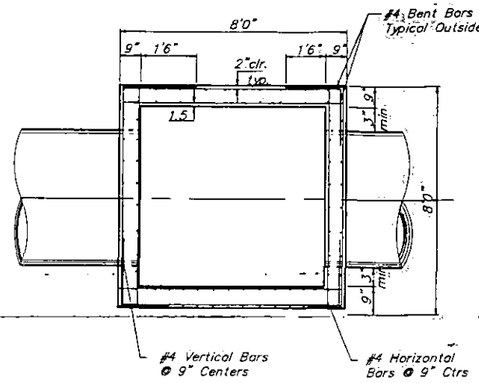
SRB JOB NO. 1002E

Lotus Circle

SHEET 9 OF 30

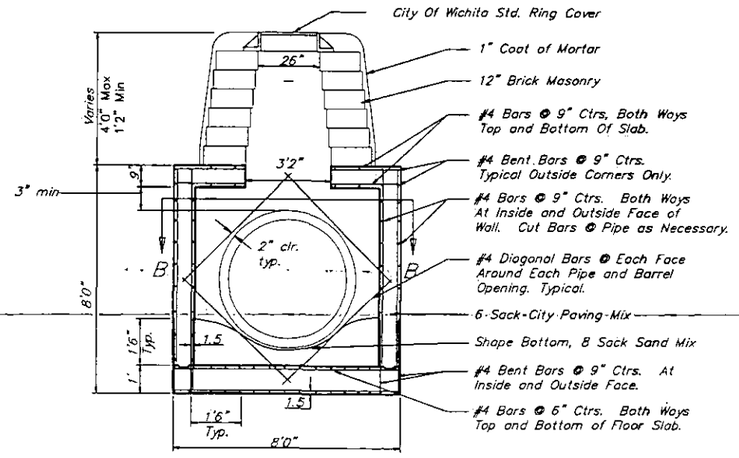


TOP VIEW

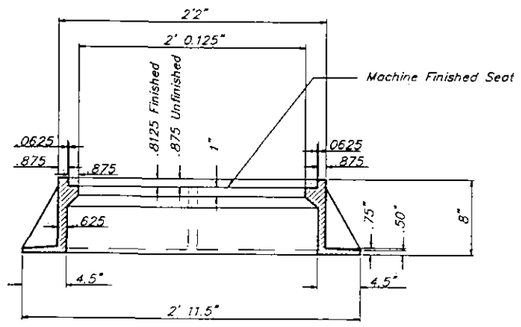


NOTE:
Bend Bars Not More Than 8" to Clear Pipes, or Cut Bars 2" Clear of Pipe, as Necessary.

SECTION B-B



REINFORCED CONCRETE MANHOLE
STACK 2.33' TO 4'0"



SECTION A-A

MANHOLE FRAME
Weight: 240 Lbs.

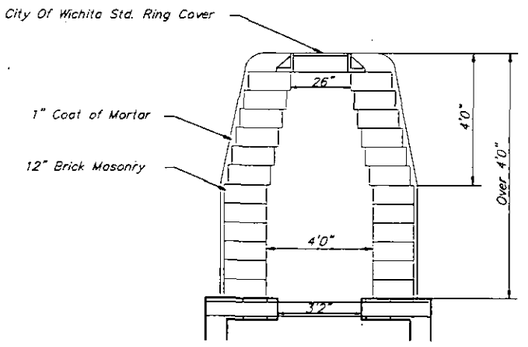
GENERAL NOTES:

1. MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 SACKS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE WALLS AND BASES SHALL CONFORM TO THE REQUIREMENTS FOR CONCRETE PAVEMENT CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS, USING CITY CONCRETE PAVEMENT MIX WITHOUT AIR ENTRAINING ADMIXTURE. MORTAR SHALL BE PLACED AROUND THE MANHOLE RING AS SHOWN ON THE DRAWINGS WHEN MANHOLES ARE CONSTRUCTED IN UNPAVED AREAS. COMPLETED MANHOLE SHALL BE WITHOUT LEAKS AND WATER TIGHT.

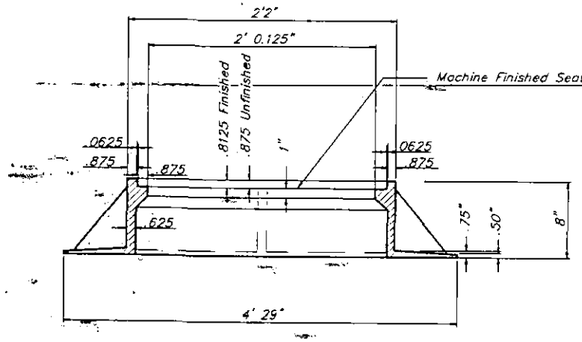
2. THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF CLEANING. USING 8-SACK SAND MIX CONCRETE. FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM HALVES OF THE INFLOWING PIPES AND THE OUTFLOWING PIPE. MANHOLE FLOORS SHALL HAVE SLOPES OF 3 INCHES PER FOOT IN THE AREAS OUTSIDE OF THE FLOW CHANNELS SLOPED TOWARD THE FLOW CHANNELS.

3. MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWING.

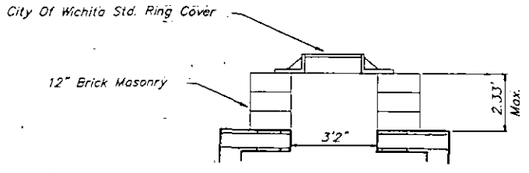
4. THE ENDS OF ALL PIPES IN MANHOLES SHALL BE CUT OFF FLUSH WITH THE INSIDE FACE OF MANHOLE WALL.



MANHOLE STACK OVER 4'0"



WIDE FLANGE RING
Weight: 705 Lbs.



MANHOLE STACK LESS THAN 2.33'

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4301
(316) 268-4114 FAX

REINFORCED CONCRETE MANHOLE

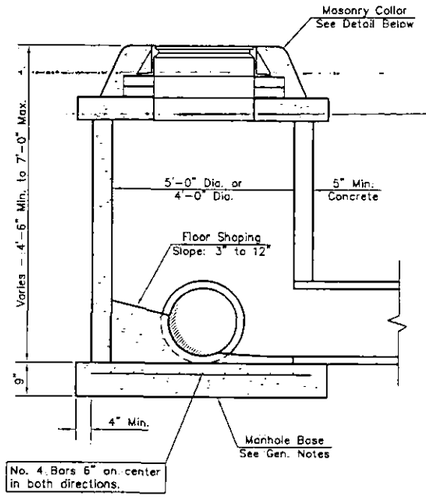
M. E. LINDEBAK P.E. - CITY ENGINEER

PROJECT NUMBER 472-83326

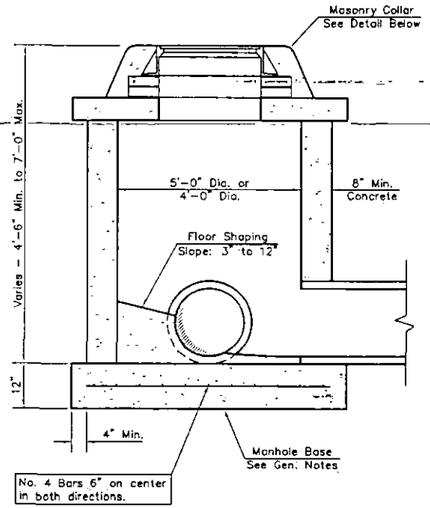
DCA #

DATE MAR 96

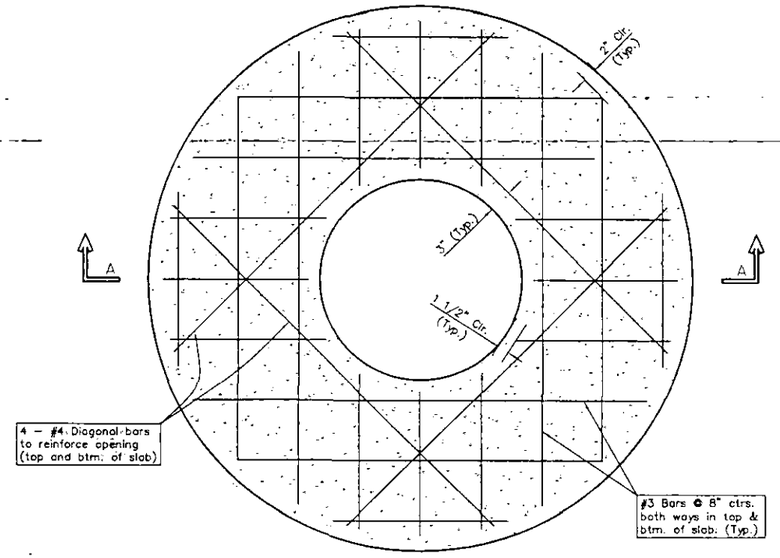
SHEET 10 OF 30



SHALLOW TYPE "P" MANHOLE



SHALLOW TYPE "C" MANHOLE



PLAN

GENERAL NOTES

1. Mortar used in masonry construction shall contain 8 sacks of cement per cubic yard. Concrete used in manhole bases shall conform to the requirements of concrete for concrete pavement construction as specified in the city standard paving specifications using city concrete cement mix without air entraining admixture. Mortar shall be placed around the manhole ring as shown on the drawings when manholes are constructed in unpaved areas. Manholes constructed where pipe sizes are smaller than 24" shall have an inside diameter of 4'. Manholes constructed where pipe sizes are 24" or larger shall have an inside diameter of 5'. Completed manhole shall be without leaks and water tight.

2. Reinforcing steel shall be installed in the manhole bases and shall consist of no. 4 bars placed on 6" centers in both directions. The manhole base reinforcement shall be placed 6" above the bottom of the manhole base. All costs for furnishing and installing reinforcing steel shall be included in the unit price bid for the manhole.

3. The floors of all manholes shall be shaped with flow channels such that the manholes will be self cleaning and free of areas where solids could be deposited as sewage flows through the manhole from all inlet pipes to the outlet pipe. Flow channels shall be formed to match the bottom halves of the inflowing pipes and the outflowing pipe as shown by the drawings. Manhole floors shall have slopes of 3 inches per foot in the areas outside of the flow channels sloped toward the flow channels. Pipes laid through manholes shall have the top half removed to neat lines for the full inside diameter of the manhole. Manhole floors shall then be shaped around the bottom half of the pipe which forms the flow channel.

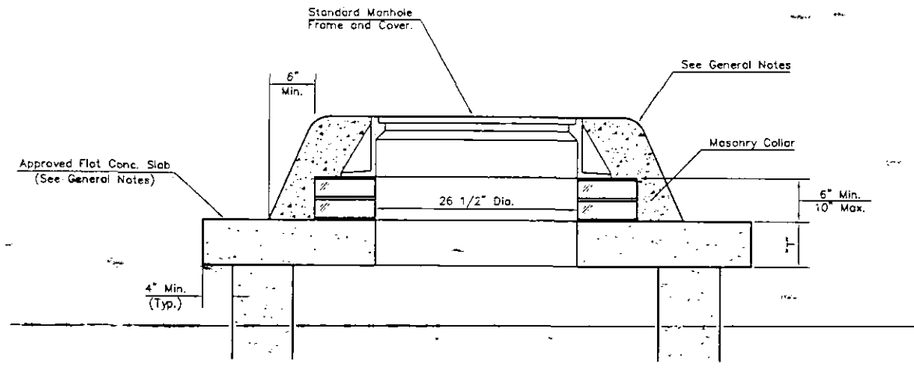
4. Pipes installed within the excavation made for the manhole shall be cradled with concrete to the limits of the manhole excavation. When clay pipe is used, the cradle shall extend to the first joint outside the manhole. The cradle shall be terminated at the clay pipe joint in a manner which will maintain the flexibility of the joint. Cost of cradle within manhole excavation or to clay pipe joints adjacent to manhole shall be included in the unit price bid for the manhole.

5. Manhole cover castings and manhole frame castings shall conform to the requirements as indicated in the standard specifications and as shown in the standard detail drawings.

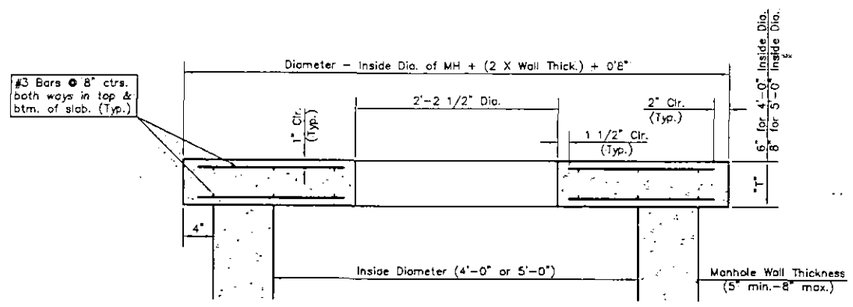
6. The crowns of inflowing pipes shall never be set lower than the crown of the outflowing pipe.

7. Standard shallow manholes type "P" and "C" shall be paid for at the unit price bid per each for the type and diameter indicated. All standard shallow manhole diameters will be 4' unless indicated otherwise.

8. All brick used in manhole construction shall meet Grade SW of ASTM C652 or C62-87.



MASONRY COLLAR DETAIL



SECTION A-A

FLAT CONCRETE SLAB DETAILS

THE CITY OF WICHITA
CITY ENGINEER'S OFFICE
CITY HALL – SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
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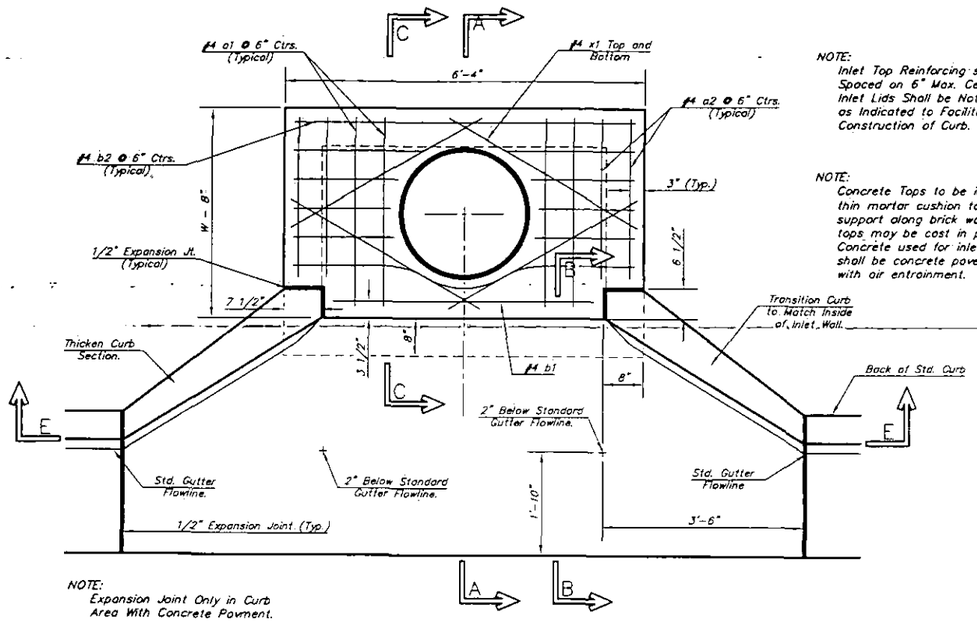
SHALLOW MANHOLES TYPE 'P' AND 'C'

W. E. LINDEBAK P.E. – CITY ENGINEER

PROJECT NUMBER 472-83326

DCA #

DATE MAR 96

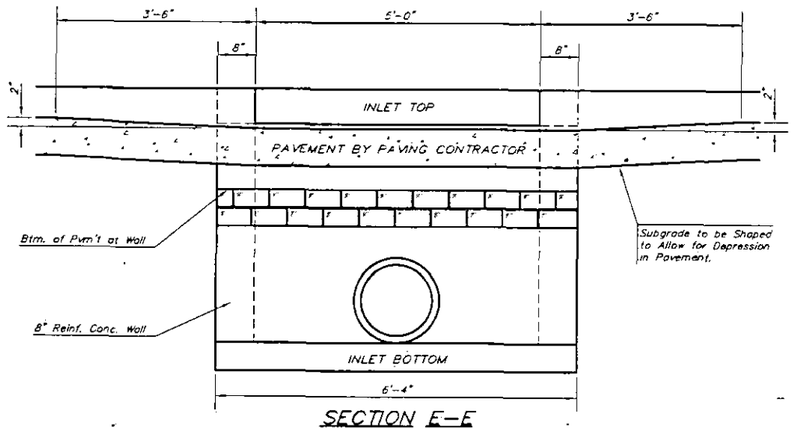


NOTE:
Expansion Joint Only in Curb Area With Concrete Pavment.

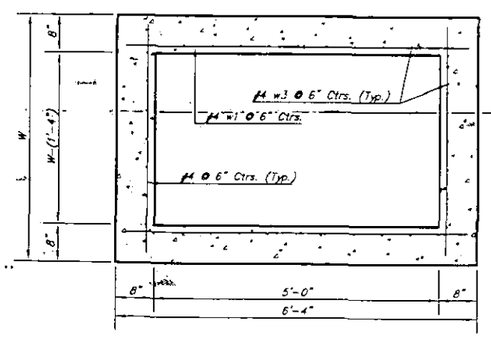
NOTE:
Inlet Top Reinforcing shall be Spaced on 6" Max. Centers. Inlet Lids Shall be Notched Out as Indicated to Facilitate Construction of Curb.

NOTE:
Concrete Tops to be installed on thin mortar cushion to insure full support along brick walls. Concrete tops may be cast in place or precast. Concrete used for inlet construction shall be concrete pavement mix with air entrainment.

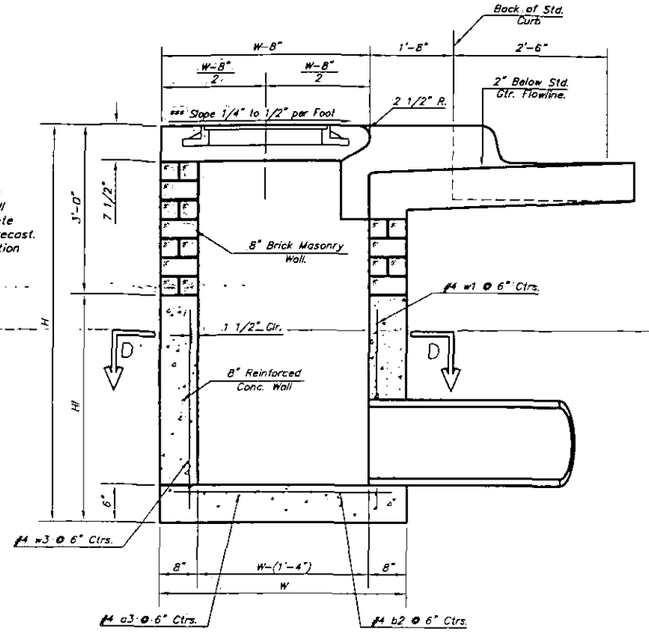
PLAN



SECTION E-E

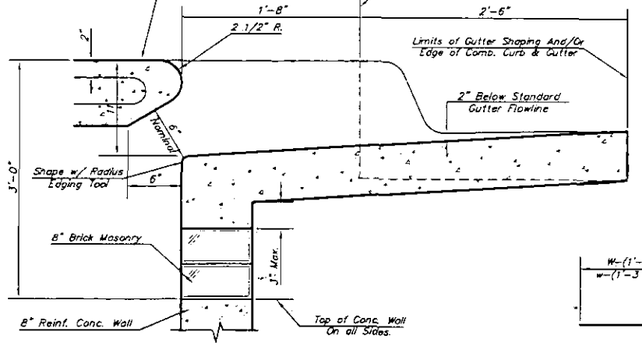


SECTION D-D

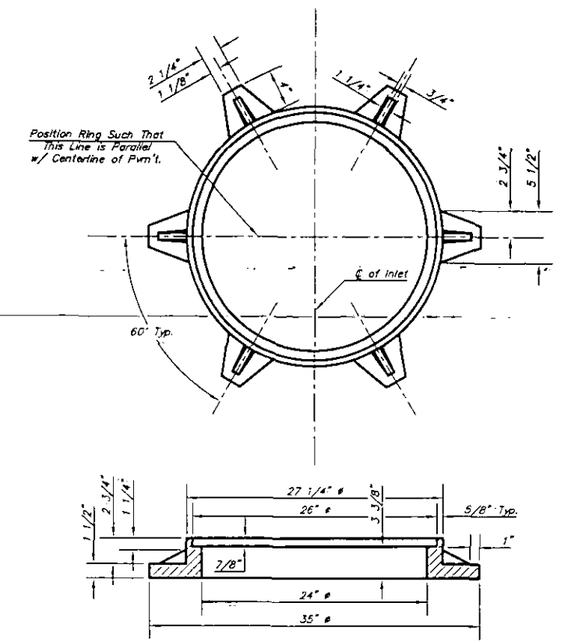


SECTION A-A

***NOTE: Slope of inlet tops to Match Sidewalk or Parking Slopes within Limits Indicated.



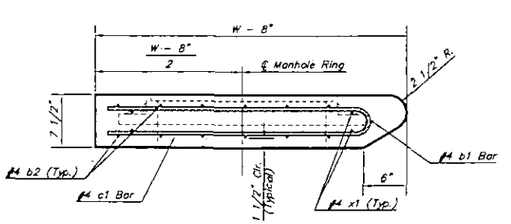
SECTION B-B



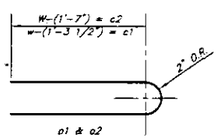
MANHOLE RING AND COVER

Weight = 180 Lbs.

*See City of Wichita Standard Manhole Ring and Cover Detail Sheet for Cover Details to Be Used With Inlet Frame.



SECTION A-A



BENDING DIAGRAM

NOTE: Contractor shall have the option of constructing 8" brick masonry walls between the concrete inlet base and top on this inlet when W=6'-4" and H=7'-0" or less.

- Additional curb and gutter construction necessary to connect set-back inlet to pavement will be paid for at the unit price bid for each inlet hookup.

Inlet invert shall be shaped with 8 sack sand mix concrete to create flow channels and to increase hydraulic efficiency such that the inlet will be self-cleaning between all inlet and/or outlet pipes.

The ends of all pipes installed in inlets shall be cut off flush with the inside face of the inlet wall.

PRECAST SLAB AND FLOOR REINFORCING

		W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
MARK	SIZE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
* a1	#4	6	6'-7"	6	8'-7"	6	10'-7"	6	12'-7"	6	14'-7"
a2	#4	4	6'-0"	4	8'-0"	4	10'-0"	4	12'-0"	4	14'-0"
a3	#4	13	4'-1"	13	5'-1"	13	6'-1"	13	7'-1	13	8'-1"
b1	#4	1	4'-9"	1	4'-9"	1	4'-9"	1	4'-9"	1	4'-9"
* b2	#4	23	6'-1"	29	6'-1"	35	6'-1"	41	6'-1"	47	6'-1"
x1	#4	8	3'-10"	8	4'-2"	8	4'-6"	8	4'-10"	8	5'-2"

WALL REINFORCING

		W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"	
MARK	SIZE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
w1	#4	①	6'-1"	①	6'-1"	①	6'-1"	①	6'-1"	①	6'-1"
w2	#4	①	4'-1"	①	5'-1"	①	6'-1"	①	7'-1"	①	8'-1"
w3	#4	32	②	36	②	40	②	44	②	48	②

* Field Bend or Cut Reinforcing as Required for Clearance.
① H (HI - 12") (HI - 21") Rounded down to nearest 0.5'
② HI - 3"

STANDARD CURB INLET PRECAST TOPS

W	PRE-CAST TOP SIZE	PIPE SIZE	CU. YD. CONC.
4'-4"	3'-8" x 6'-4" x 7 1/2"	21" & SMALLER	0.38±
5'-4"	4'-8" x 6'-4" x 7 1/2"	24" & 30"	0.51±
6'-4"	5'-8" x 6'-4" x 7 1/2"	36" & 42"	0.64±
7'-4"	6'-8" x 6'-4" x 7 1/2"	48" & 54"	0.77±
8'-4"	7'-8" x 6'-4" x 7 1/2"	60" & 66"	0.90±

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
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STANDARD TYPE 1-A CURB INLET OPENING = 6"x5'-0"

M. E. LINDEBAK P.E. - CITY ENGINEER

PROJECT NUMBER 472-83326

OCA #

DATE MAR 96

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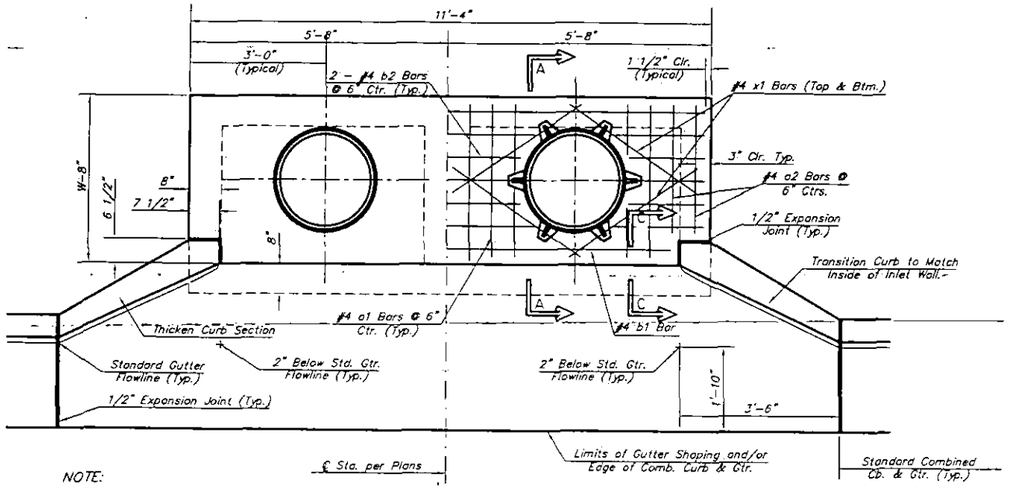
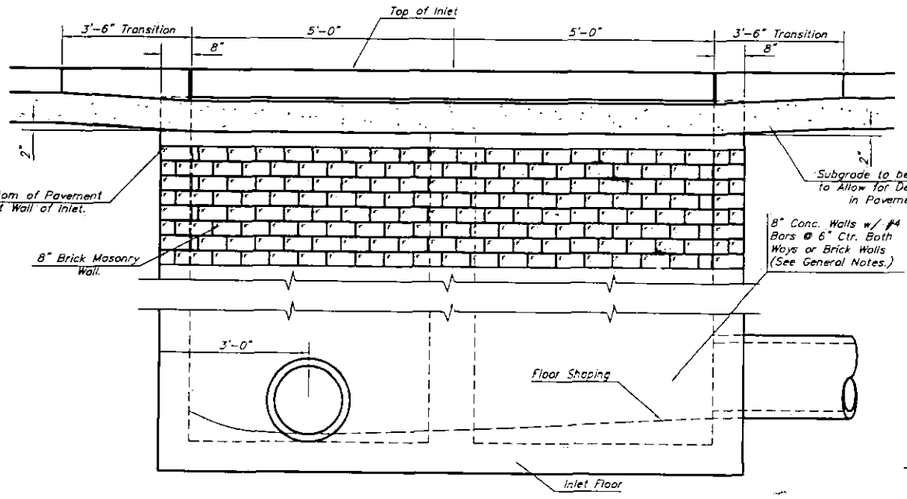


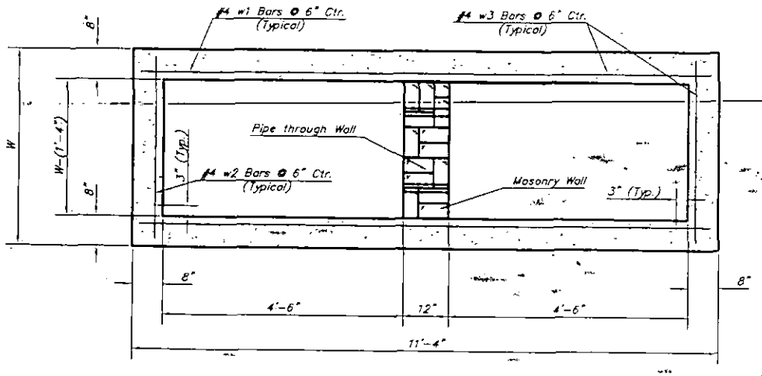
NOTE:
Expansion Joint Only in Curb Area with Concrete Pavement.

PLAN

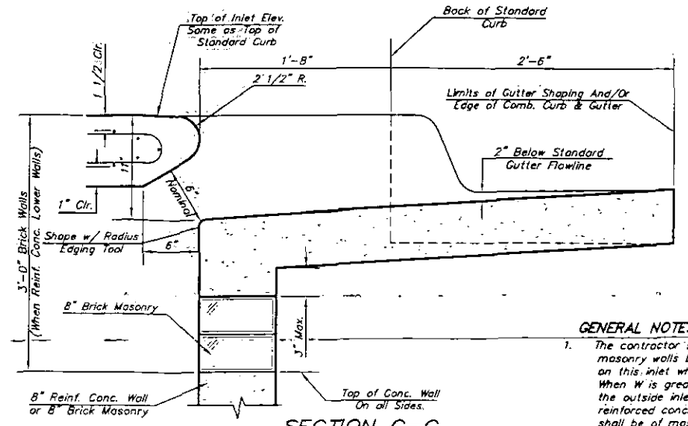
*Left Side Shown Without Slab Reinforcing, Right Side Shown With Slab Reinforcing



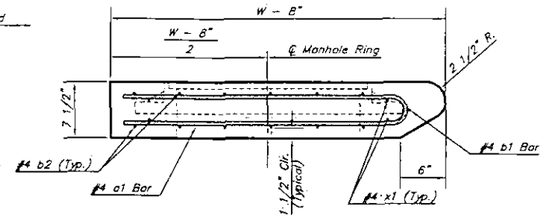
ELEVATION



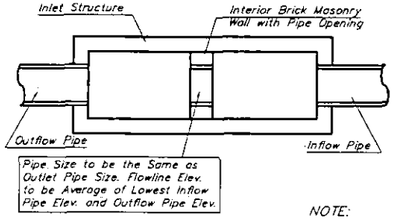
SECTION B-B



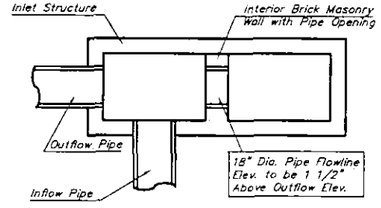
SECTION C-C



SECTION A-A

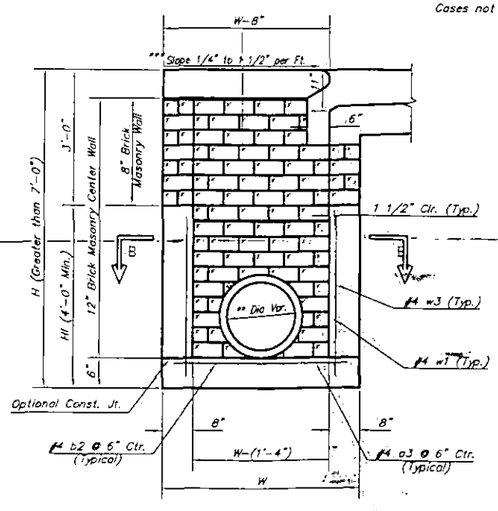


CASE I



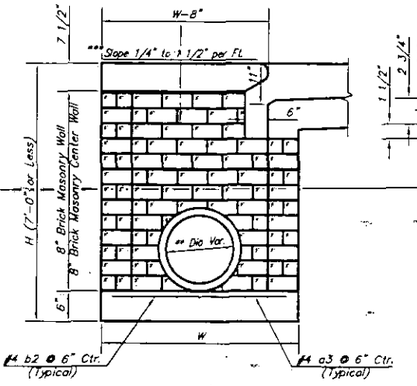
CASE II

NOTE:
Center Wall Pipe Size shall be as Specified in Inlet Construction Notes on the Plan/Profile Sheets for those Cases not Shown Here.



TYPICAL INLET SECTION AT CENTER WALL

(Reinforced Concrete Walls)



TYPICAL INLET SECTION AT CENTER WALL

(Masonry Walls)

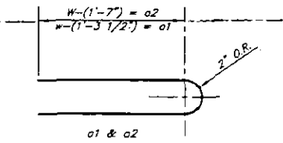
NOTES:
** A center wall opening shall be provided by means of a section of reinforced concrete pipe. See Case I and Case II above.
*** Slope of inlet tops to match sidewalk of parking slopes within limits indicated.

PRECAST SLAB AND FLOOR REINFORCING										
		W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"
MARK	SIZE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
* a1	#4	13	6'-7"	13	8'-7"	13	10'-7"	13	12'-7"	13	14'-7"
a2	#4	4	6'-0"	4	8'-0"	4	10'-0"	4	12'-0"	4	14'-0"
a3	#4	23	4'-1"	23	5'-1"	23	6'-1"	23	7'-1	23	8'-1"
b1	#4	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"	1	9'-9"
* b2	#4	23	11'-1"	29	11'-1"	35	11'-1"	41	11'-1"	47	11'-1"
x1	#4	16	3'-10"	16	4'-2"	16	4'-6"	16	4'-10"	16	5'-2"
WALL REINFORCING										
		W = 4'-4"		W = 5'-4"		W = 6'-4"		W = 7'-4"		W = 8'-4"
MARK	SIZE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
w1	#4	①	11'-1"	①	11'-1"	①	11'-1"	①	11'-1"	①	11'-1"
w2	#4	①	4'-1"	①	5'-1"	①	6'-1"	①	7'-1"	①	8'-1"
w3	#4	52	②	56	②	60	②	64	②	68	②

* Field Bend or Cut Reinforcing as Required for Clearance.
① 4'-(H - 12") (H - 21") Rounded down to nearest 0.5'
② H - 3"

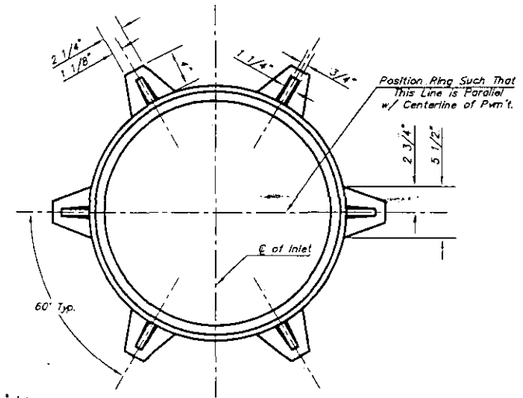
GENERAL NOTES:

1. The contractor shall be required to construct 8" brick masonry walls between the concrete inlet base and top on this inlet when W=6'-4" or less and H=7'-0" or less. When W is greater than 6'-4" and H is less than 7'-0" the outside inlet walls below the brick stack shall be reinforced concrete construction and the center wall shall be of masonry construction as shown for the masonry wall option.
2. Inlet invert shall be shaped with B sack sand mix concrete to create flow channels and to increase hydraulic efficiency such that the inlet will be self cleaning between all inlet and/or outlet pipes.
3. Concrete tops to be installed on thin mortar cushion to insure full support along brick walls. Concrete tops may be cast in place or precast. Concrete used for inlet construction shall be concrete pavement mix.
4. Inlet top reinforcing shall be spaced on 6" max. centers. Inlet lids shall be notched out as indicated to facilitate construction of curb. Bars in inlet top to be field bent or cut to clear manhole ring.
5. The ends of all pipes installed in inlets shall be cut off flush with the inside face of the inlet wall.



BENDING DIAGRAM

STANDARD CURB INLET PRECAST TOPS			
W	PRE-CAST TOP SIZE	PIPE SIZE	CU. YD. CONC.
4'-4"	3'-8" 11'-4" 7 1/2"	21" & SMALLER	0.83±
5'-4"	4'-8" 11'-4" 7 1/2"	24" & 30"	1.09±
6'-4"	5'-8" 11'-4" 7 1/2"	36" & 42"	1.35±
7'-4"	6'-8" 11'-4" 7 1/2"	48" & 54"	1.61±
8'-4"	7'-8" 11'-4" 7 1/2"	60" & 66"	1.87±



MANHOLE RING AND COVER

Weight ≈ 180 lbs.

*See City of Wichita Standard Manhole Ring and Cover Detail Sheet for Cover Details to Be Used With Inlet Frame.

THE CITY OF WICHITA

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(316) 268-4501
(316) 268-4114 FAX

STANDARD TYPE 1-A CURB INLET OPENING = 6"x10'-0"

M. E. LINDEBAK P.E. - CITY ENGINEER

PROJECT NUMBER 472-83326

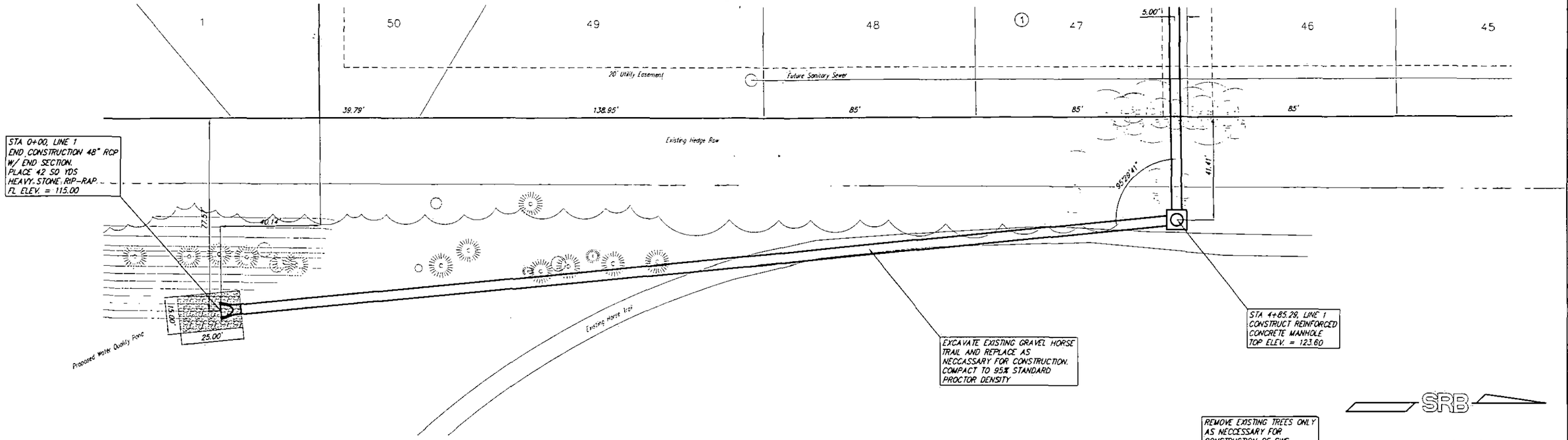
DCA #

DATE MAR 96

SHEET 13 OF 30

Prarie Woods Addition

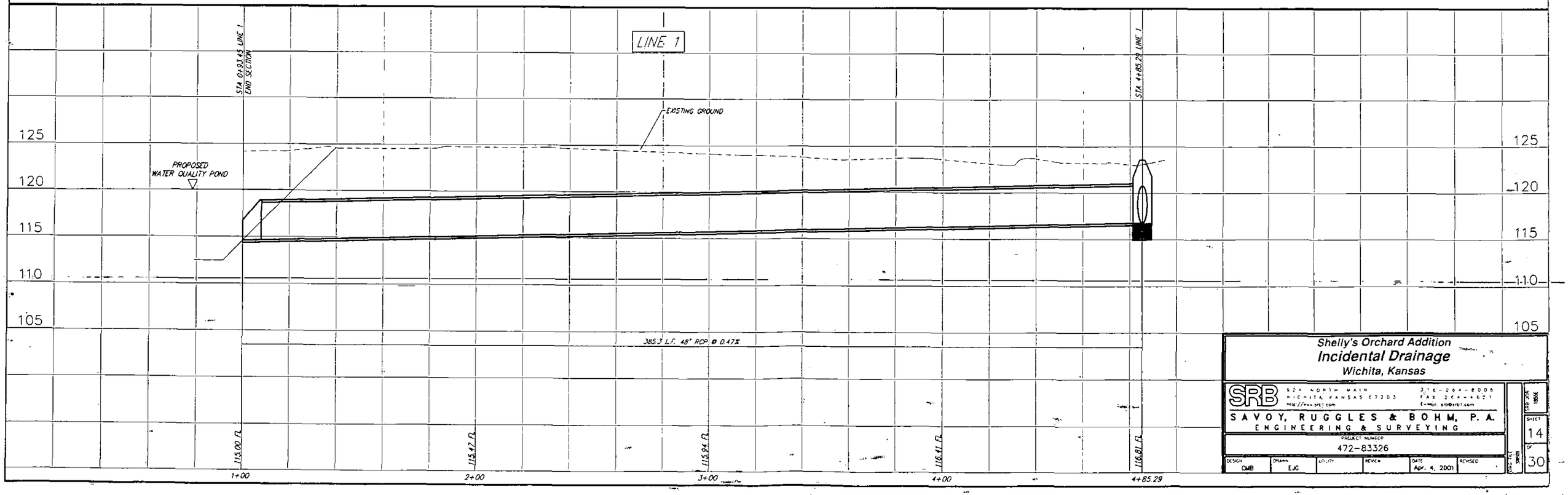
Shelly's Orchard Addition



REMOVE EXISTING TREES ONLY AS NECCESSARY FOR CONSTRUCTION OF SWS SUBSIDIARY TO SITE CLEARING AND RESTORATION

SRB

SCALE 1" = 20'
IRON = •



Shelly's Orchard Addition
Incidental Drainage
Wichita, Kansas

SRB
504 NORTH MAIN
WICHITA, KANSAS 67203
http://www.srb1.com
316-264-8008
FAX 264-4621
E-mail: srb@srb1.com
SAVOY, RUGGLES & BOHM, P. A.
ENGINEERING & SURVEYING

PROJECT NUMBER
472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	EJG			Apr. 4, 2001	

SRB JOB 1806
SHEET 14 OF 30

STA 8+25.56 LINE 1 =
STA 0+00 LINE 2 =
LYDIA STA 4+70.63, 17.33' RT.
CONSTRUCT STD. TYPE 1-A INLET
L = 10.0' W = 6.0'
TOP ELEV. = 125.30
48" STUB NORTH

STA 11+95.13 LINE 1 =
LYDIA STA 1+01.05, 19.31' RT.
CONSTRUCT STD. TYPE 1-A INLET
L = 6'-4" W = 5'-4"
TOP ELEV. = 129.15

STA 12+40.50 LINE 1 =
LYDIA STA 1+18.49, 19.31' LT.
CONSTRUCT STD. TYPE 1-A INLET
L = 6'-4" W = 5'-4"
TOP ELEV. = 129.00

PLACE 40 L.F.
FLOWABLE FILL
12" MIN.

106°27'51"

Shellys Orchard Addition

54 | 55 | 56 | 57 | 58 | 59 | 60

74.72' | 70' | 70' | 70' | 70'

9.62

11.38'

Lydia
Future A.C. Pavement

Lydia
Prop. A.C. Pavement

Future Water

Proposed Water

110'

Crestline

Future A.C. Pavement

108.23' | 72.24' | 70'

34 | 33 | 21 | 20 | 19

SCALE 1" = 20'
IRON = •

LINE 1

STA 8+25.56 LINE 1 =
STA 0+00 LINE 2 =
LYDIA STA 4+70.63, 17.33' RT.
CONSTRUCT STD. TYPE 1-A INLET

STA 11+95.13 LINE 1 =
LYDIA STA 1+01.05, 19.31' RT.
CONSTRUCT STD. TYPE 1-A INLET

STA 12+40.50 LINE 1 =
LYDIA STA 1+18.49, 19.31' LT.
CONSTRUCT STD. TYPE 1-A INLET

EXISTING GROUND
FUTURE GROUND

PLACE 40 L.F.
FLOWABLE FILL
12" MIN.

45.37 L.F. 18" RCP
@ 0.992%

369.57 L.F. 18" RCP @ 1.228%

112.51 FL. OUT
117.51 STUB FL. (E)
119.51 FL. IN (S)
120.01 FL. IN (W)

120.92 FL.
122.15 FL.
123.38 FL.
124.55 FL.

125.00 FL.

12+40.50

125 | 120 | 115 | 110

130 | 125 | 120 | 110

8+25.56 | 9+00 | 10+00 | 11+00 | 11+95.13

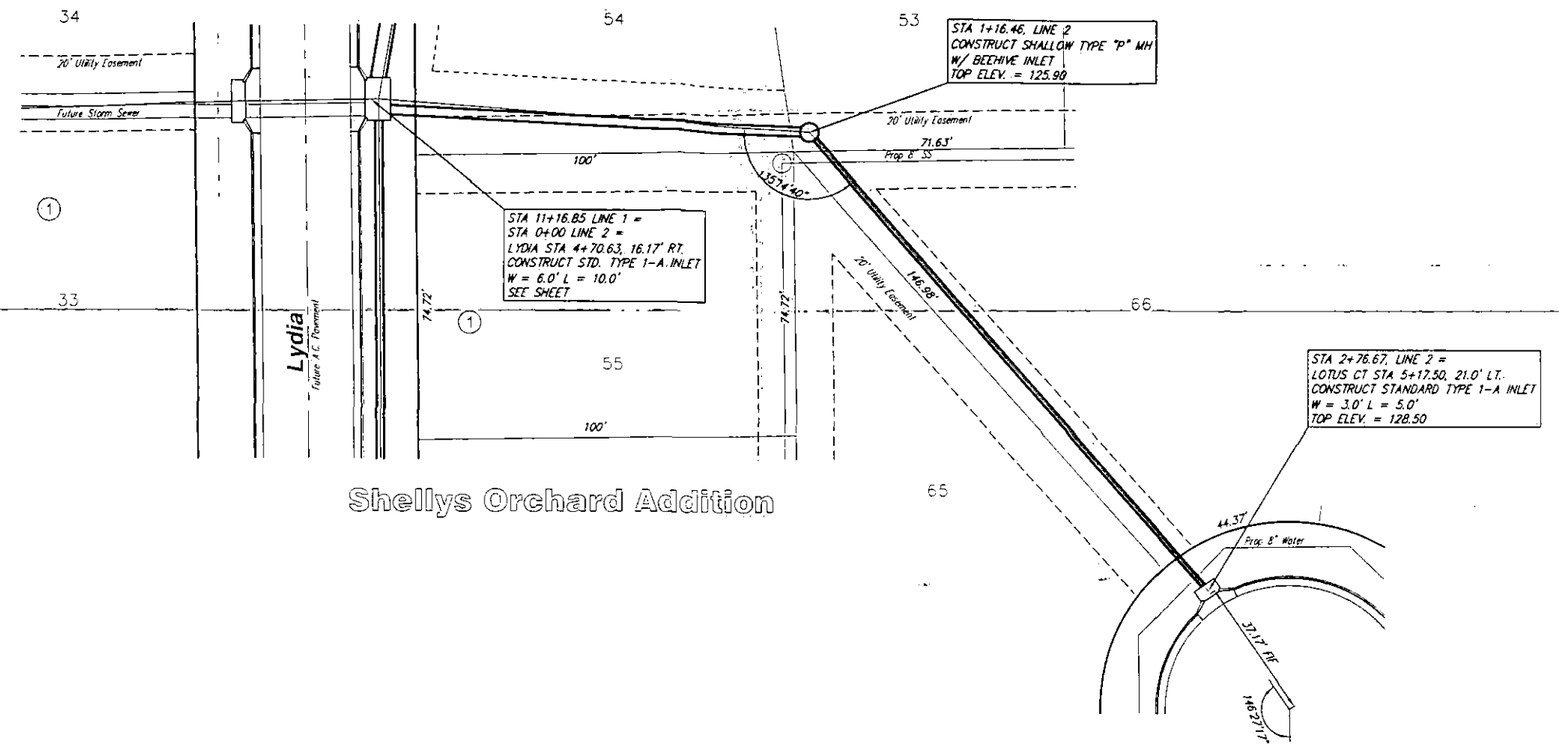
Shelly's Orchard Addition
Incidental Drainage
Wichita, Kansas

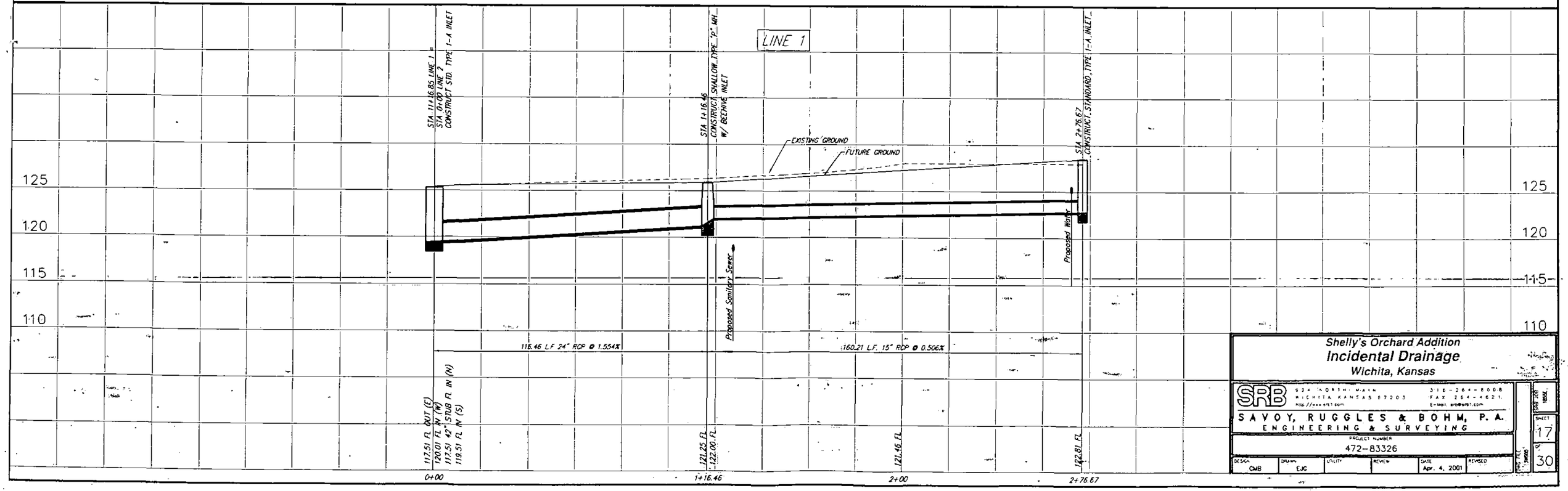
SRB
924 NORTH MAIN
WICHITA KANSAS 67203
316-264-8006
FAX 264-4621
http://www.srbl.com
E-mail srb@srbl.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER
472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	EJG			Apr. 4, 2001	

SHEET 16 OF 30





Shelly's Orchard Addition
Incidental Drainage
Wichita, Kansas

SRB
924 NORTH MAIN
WICHITA KANSAS 67203
316-264-8008
FAX 264-4621
http://www.srb1.com
E-mail: srb@srb1.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER
472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	EJC			Apr. 4, 2001	

SHEET 17 OF 30

SHELLEY'S ORCHARD ADDITION

PRAIRIE WOODS ADDITION

PAWNEE PRAIRIE PARK

49

50

SCALE — 1" = 20'

IRON = •

Proposed 48" RCP

Horse Trail

Static Pool = 120.00

Water Quality Storage Level = 121.50

1322

1320

1318

1316

1314

1312

1313

1314

1316

1318

1320

1322

1324

1326

ADJUST POND BACKSLOPE TO MINIMIZE TREE REMOVAL.

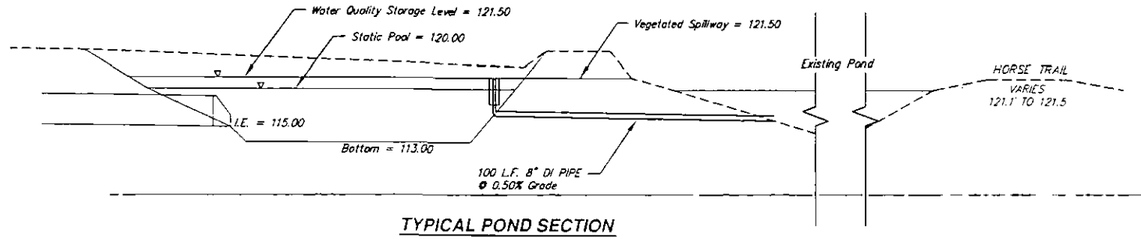
WATER QUALITY POND
STATIC POOL = 120.00
POND BOTTOM = 113.00
3:1 SIDE SLOPES BELOW STATIC POOL
4:1 SIDE SLOPES ABOVE STATIC POOL
L = 200'
W = 63' (AVG)
L/W = 3.17

POND SPILLWAY 121.50
LIVE STORAGE VOLUME = 22,353 CU. FT.
DEAD STORAGE VOLUME = 46,130 CU. FT.

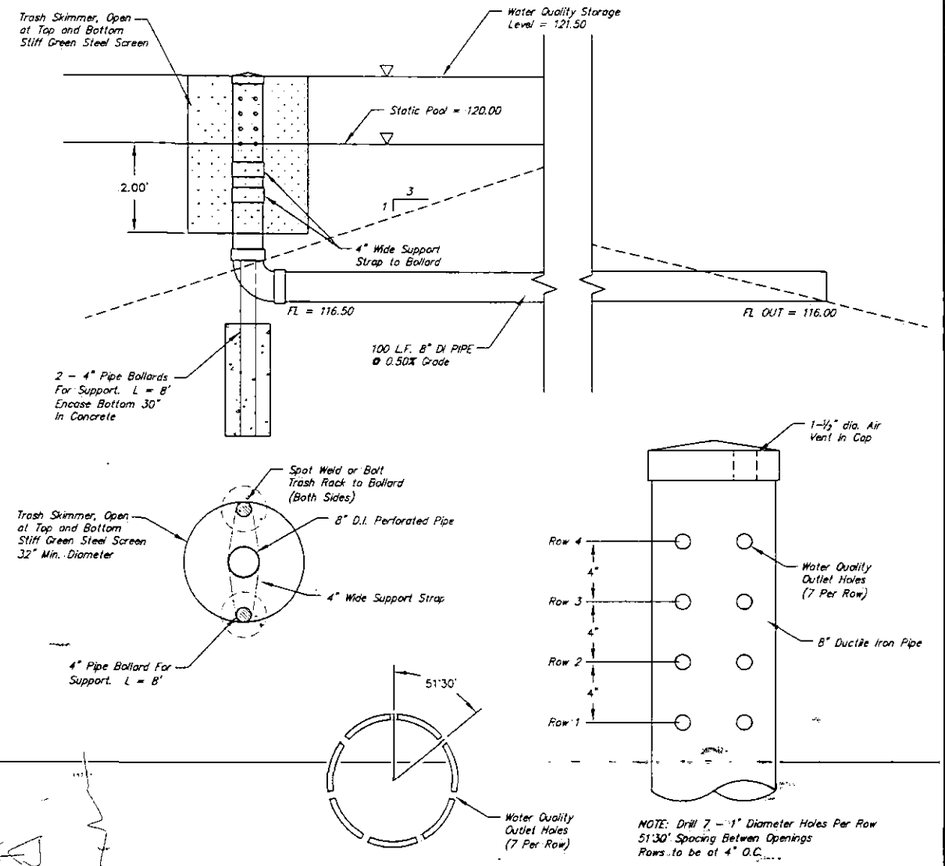
100 L.F. 8" D.I. PIPE @ 0.50% GRADE. SEE RISER DETAIL THIS SHEET.

CONSTRUCT 20' CHANNEL @ 0.00% GRADE. ELEV. = 121.50 PLANT CHANNEL WITH WETLAND VEGETATION.

Existing Pond



TYPICAL POND SECTION



SHELLEY'S ORCHARD ADDITION PHASE 2 STREETS

WATER QUALITY POND

WICHITA, KANSAS

SRB
924 NORTH MAIN
WICHITA, KANSAS 67203
316-267-6002
FAX 264-4621
www.srb1.com
E-mail: srb@srb1.com

SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING

PROJECT NUMBER

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	KWL			June 22, 2001	

SRB JOB NO. 18002

SHEET 18 OF 30

DWG FILE POND

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

140 135 130

2+07

140 135 130

1+92.50

140 135 130

1+78

140 135 130

1+58.50

140 135 130

1+00

140 135 130

0+48.19

140 135

0+12.85

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

Shelly's Orchard Addition
Lotus
Sta. 0+12.85 to 2+07
19/30
XS-LOTUS1

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

135
130
125

4+44.54

135
130
125

4+32.73

135
130

4+17.11

135
130

3+90.27

135
130

3+50

135
130

3+00

135
130

2+50

140
135
130

2+26.50

Shelly's Orchard Addition
Lotus
Sta. 2+26.50 to 4+44.54 | 20 / 30
XS-LOTUS2

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

135 130 125 135 130 125 135 130 135 130 135

5+93.12

135 130 135 130 135

5+50

135 130 135 130 135

5+00

135 130 140 135 130

4+71.86

140 135 130

4+56.34

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

Shelly's Orchard Addition
Lotus
Sta. 4+56.34 to 5+93.12 | 21 / 30
XS-LOTUS3

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

135
130
125

3+50

135
130
125

3+00

135
130
125

2+50

135
130
125

2+00

135
130
125

1+50

135
130
125

1+00

135
130
125

0+50

135
130
125

0+33.88

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

Shelly's Orchard Addition
Lotus Court
Sta. 0+33.88 to 3+50 | 22/30
XS-LOTUS-CTI

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

130 125

2+00

130 125

1+50

135 130 125

1+00

135 130 125

0+48.49

135 130 125

0+26.28

135 130 125

0+13.79

135 130 125

0+00

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

Shelly's Orchard Addition
Lydia
Sta. 0+00 to 2+00
25/30
XSLYDIA1.

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

130
125
130
125
130
125

3+37

2+93.96

2+50

130
125
130
125
130
125

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

Shelly's Orchard Addition
Lydia
Sta. 2+50 to 2+93.96 26/30
XSLYDIA2


-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40
135
130
2+50
2+00
1+49.99
1+15
1+00
0+85
0+64.50
0+50
Shelly's Orchard Addition
Lydia Circle
Sta. 0+50 to 2+50
27/30
XS-LYDIA-CIRCLE1

-40 -35 -30 -25 -20 -15 -10 -5 0 5 10 15 20 25 30 35 40

135 130 125

4+70.15

135 130 125

4+55.99

135 130 125

4+37.41

135 130 125

4+00

135 130

3+50

135 130

3+00

Shelly's Orchard Addition
Lydia Circle
Sta. 3+00 to 4+70.15 28/30
XS-LYDIA-CIRCLE2

LYDIA

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+00	175.97	0.00	89.25	0.00	89.25	0.00
0+13.79	157.67	0.00	71.36	0.00	160.61	0.00
0+26.28	140.46	0.00	113.19	0.00	273.80	0.00
0+48.49	131.33	0.00	235.97	0.00	509.77	0.00
1+00	116.05	0.00	204.37	0.00	714.14	0.00
1+50	104.67	0.00	186.22	0.00	900.36	0.00
2+00	96.44	0.00	186.28	0.00	1086.64	0.00
2+50	104.74	0.00	156.27	0.00	1242.90	0.00
2+93.96	87.21	0.00	69.51	0.00	1312.41	0.00
3+37	0.00	0.00	0.00	0.00	1312.41	0.00

LOTUS

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+12.85	78.39	0.00	51.30	125.92	51.30	125.92
0+48.19	0.00	192.40	0.00	325.44	51.30	451.35
1+00	0.00	146.79	0.00	262.12	51.30	713.47
1+58.50	0.00	95.16	0.00	59.22	51.30	772.69
1+78	0.00	68.82	0.00	34.92	51.30	807.61
1+92.50	0.00	61.24	0.00	30.66	51.30	838.27
2+07	0.00	52.93	0.41	32.81	51.71	871.07
2+26.50	1.13	37.92	3.38	27.21	55.09	898.28
2+50	6.65	24.59	32.40	28.11	87.49	926.39
3+00	28.34	5.77	88.57	5.35	176.06	931.74
3+50	67.32	0.00	115.95	0.00	292.01	931.74
3+90.27	88.17	0.00	93.63	0.00	385.64	931.74
4+17.11	101.84	0.00	66.26	0.00	451.90	931.74
4+32.73	126.45	0.00	56.09	0.00	507.99	931.74
4+44.54	127.14	0.00	58.04	0.00	566.02	931.74
4+56.34	136.47	0.00	77.51	0.00	643.53	931.74
4+71.86	133.36	0.00	140.74	0.00	784.27	931.74
5+00	138.43	0.00	272.83	0.00	1057.10	931.74
5+50	156.84	0.00	263.21	0.00	1320.31	931.74
5+93.12	172.79	0.00	0.00	0.00	1320.31	931.74

LOTUS COURT

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+50	0.00	0.00	0.00	36.04	0.00	36.04
0+64.50	0.00	134.23	0.00	156.50	0.00	192.54
0+85	0.00	278.01	0.00	151.19	0.00	343.73
1+00	0.00	266.28	0.00	136.92	0.00	480.65
1+15	0.00	226.64	0.00	244.06	0.00	724.71
1+49.99	0.00	150.03	0.00	114.39	0.00	839.11
1+71.60	0.00	135.83	0.00	0.00	0.00	839.11

LOTUS COURT

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+33.88	47.15	0.64	25.88	0.80	25.88	0.80
0+50	39.55	2.04	64.47	13.81	90.36	14.61
1+00	30.00	13.66	55.49	28.09	145.85	42.70
1+50	29.97	15.19	31.89	52.09	177.74	94.79
2+00	5.24	38.26	7.17	75.34	184.92	170.13
2+50	2.51	43.11	3.16	85.35	188.07	255.48
3+00	0.90	49.07	2.82	86.51	190.89	341.99
3+50	2.14	44.36	6.23	78.29	197.11	420.28
4+00	4.58	40.19	5.90	53.20	203.01	473.48
4+35.84	4.30	39.97	9.77	51.35	212.78	524.82
4+70.83	10.77	39.28	8.22	19.73	220.99	544.55
4+85.83	18.81	31.75	10.91	15.62	231.90	560.17
5+00.83	20.46	24.47	7.77	36.33	239.67	596.51
5+21.33	0.00	71.24	0.00	19.13	239.67	615.63
5+35.83	0.00	0.00	0.00	0.00	239.67	615.63

LYDIA CIRCLE

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+50	0.00	0.00	0.00	4.07	0.00	4.07
0+64.50	0.00	15.16	8.70	17.91	8.70	21.98
0+85	22.92	32.02	18.32	15.14	27.02	37.12
1+00	43.03	22.48	23.99	13.41	51.01	50.53
1+15	43.34	25.79	44.68	27.20	95.69	77.72
1+49.99	25.62	16.18	53.72	23.64	149.42	101.36
2+00	32.39	9.34	68.14	10.00	217.55	111.36
2+50	41.20	1.46	110.70	1.48	328.25	112.84
3+00	78.63	0.00	152.63	0.00	480.89	112.84
3+50	86.22	0.00	171.46	0.00	652.35	112.84
4+00	98.96	0.00	152.11	0.00	804.46	112.84
4+37.41	120.60	0.00	101.92	0.00	906.38	112.84
4+55.99	165.75	0.00	91.32	0.00	997.71	112.84
4+70.15	161.21	0.00	0.00	0.00	997.71	112.84

TOTALS

STATION	VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL
LYDIA	1312.41	0.00	1312.41	0
LOTUS	1320.31	931.74	2632.72	931.74
LOTUS-COURT	0.00	839.11	2632.72	1770.85
LOTUS-COURT	239.67	615.63	2872.39	2386.48
LYDIA-CIRCLE	997.71	112.84	3870.10	2499.32
			3870.10	2499.32

STREET IMROVEMENTS

CROSS SECTION QUANTITIES

SHELLY'S ORCHARD ADDITION, WICHITA, KANSAS

SRB
324 NORTH MAIN
WICHITA, KANSAS 67203
316-264-8008
FAX 264-4621
E-mail srb@srbsf.com
SAVOY, RUGGLES & BOHM, P. A.
ENGINEERING & SURVEYING

PROJECT NUMBER 472-83326

DESIGN	DRAWN	UTILITY	REVIEW	DATE	REVISED
CMB	TEB			Mar. 21, 2001	

SHEET 29 OF 30

SHELLY'S ORCHARD ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

State of Kansas)
Sedgwick County) SS

We, Savoy, Ruggles & Bohm, P.A., Surveyors in aforesaid county and state do hereby certify that, under the supervision of the undersigned, we have surveyed and platted "SHELLY'S ORCHARD ADDITION", Wichita, Sedgwick County, Kansas, and that the accompanying plat is a true and correct exhibit of the property surveyed, described as follows:

That part of the NW1/4 of the SW1/4 of Sec 32, Twp. 27-S, R-1-W of the 6th P.M., Sedgwick County, Kansas, except the north 115 feet thereof.

All Public easements and dedications being vacated by virtue of K.S.A. 12-512(b).

Savoy, Ruggles & Bohm, P.A.

Date ____________

____________________ Surveyor
Mark A. Savoy RLS #788

Know all men by these presents that we, the undersigned have caused the land described in the surveyor's certificate to be platted into Lots, Blocks, Reserves and Streets to be known as "SHELLY'S ORCHARD ADDITION", Wichita, Sedgwick County Kansas. The utility easements are hereby granted as indicated for the construction and maintenance of all public utilities. The Streets are hereby dedicated to and for the use of the public. Access Controls are hereby granted to the City of Wichita (as indicated on the face of the plat), with the location of openings to be approved by the City Engineer. Minimum building pad elevation for lowest opening to a structure is as shown on the face of the plat.

Rick Thompson Construction Inc.

____________________ President
Rick Thompson

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this ________ day of ____________ 1998, by Rick Thompson, President, Rick Thompson Construction Inc., on behalf of the corporation.

____________________ Notary Public

My App't. Exp. ____________

This plat of "SHELLY'S ORCHARD ADDITION", Wichita, Sedgwick County, Kansas, has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.
Dated this ____ day of ____________, 1997.

Wichita-Sedgwick County Metropolitan Area Planning Commission

____________________ Chairman
John C. Frye

____________________ Secretary
Marvin S. Krout

This plat approved and all dedications shown hereon, accepted by the City Council of the City of Wichita, Kansas, this ____ day of ____________, 1998.

____________________ Mayor
Bob Knight

____________________ City Clerk
Pat Burnett

Entered on transfer record this ____ day of ____________, 1998.

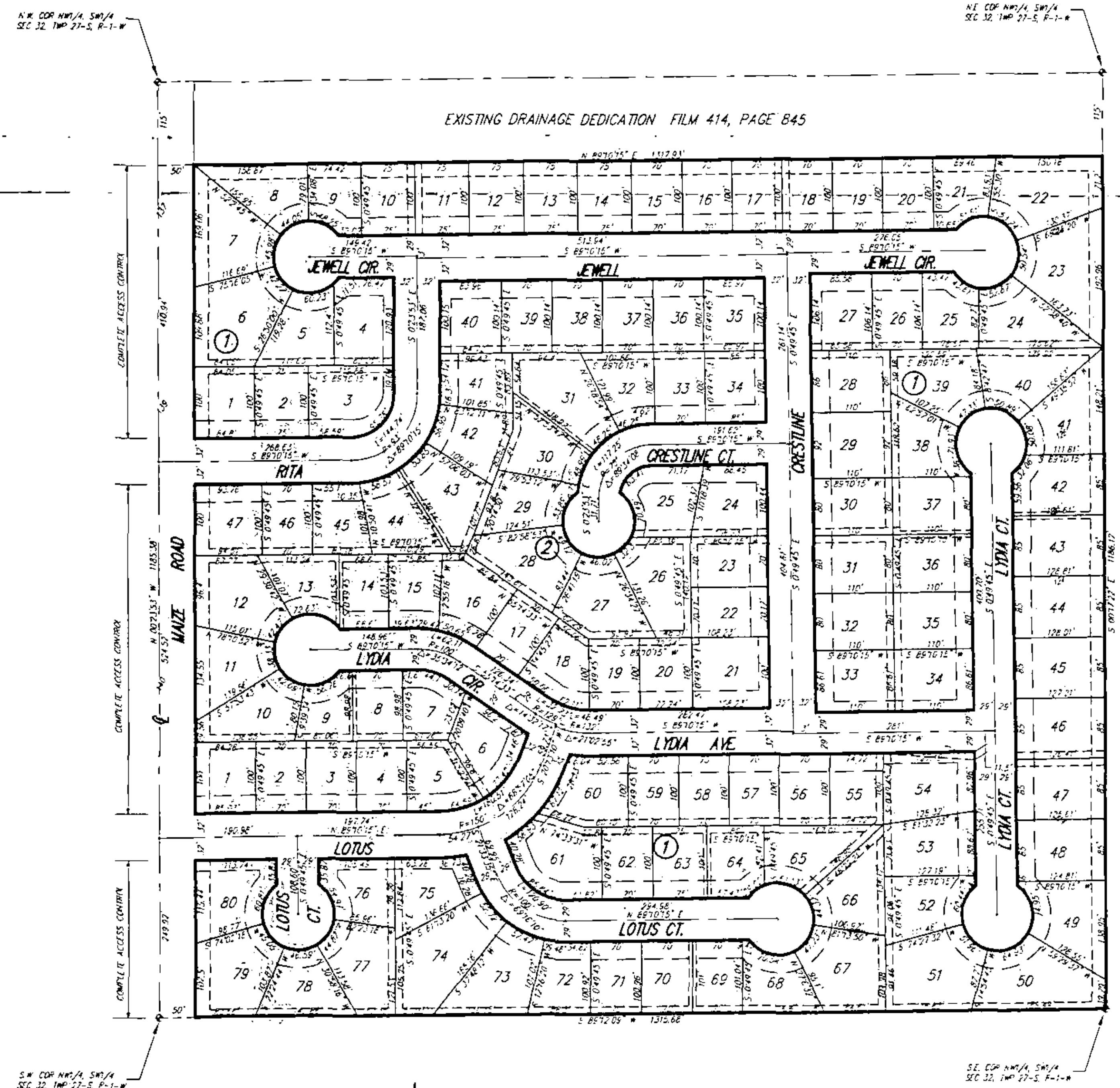
____________________ County Clerk
James Alford

State of Kansas)
Sedgwick County) SS

This is to certify that this plat has been filed for record in the office of the Register of Deeds, this ____ day of ____________, 1998, at ________ o'clock __M: and is duly recorded.

____________________ Register of Deeds
Larry Consolver

____________________ Deputy
Michael D. Hurtt



MINIMUM BUILDING PAD ELEVATION FOR LOWEST OPENING TO A STRUCTURE			
LOT	BLOCK	ELEVATION	
		CITY DATUM	N.G.V.D.
8, 9, 10	1	133.5	1320.9
11, 12, 13	1	132.0	1319.4
14, 15, 16	1	130.5	1317.9
17, 18, 19	1	130.0	1317.4
20, 21, 22	1	129.5	1316.9

1" = 100'

• = 1/2" REBAR w/SRB CAP

S.B. = BUILDING SETBACK

C.A.C. = COMPLETE ACCESS CONTROL

BENCHMARK
City of Wichita Benchmark disc @ Maize Road and May Street 31.5' S. and 38' E. of centerline both.
Elev.=137.67 (City Datum)
Elev.=1325.07 (NGVD)

DWG FILE: 005368PLAT
PROJECT NO. 99-005368

SRB
574 NORTH MAIN
WICHITA KANSAS 67202
http://www.feist.com/~srb
316-264-8008
FAX 264-4621
E-mail: srb@feist.com
SAVOY, RUGGLES & BOHM, P.A.
ENGINEERING & SURVEYING