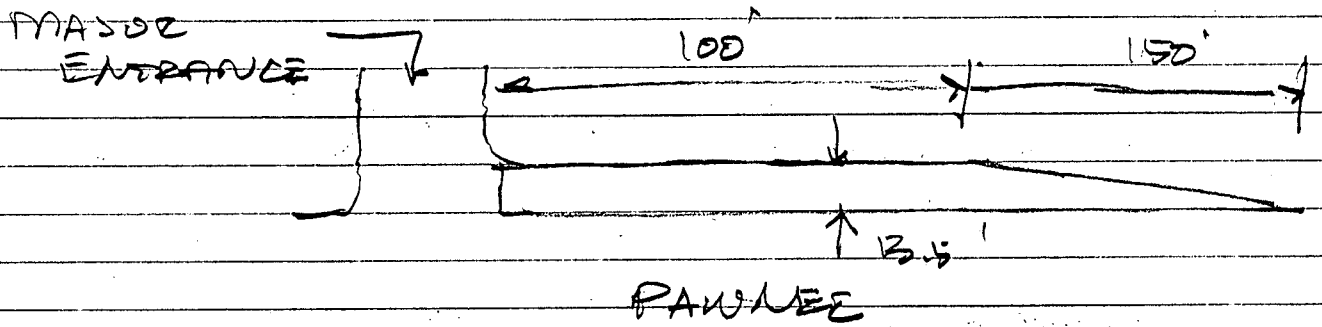


3-26-91

(2)

LOTAGE GARDENS

2ND PORTION FOR DECEL LANE AT MAJOR ENTRANCE



$$100 \times 13.5 = 1350$$

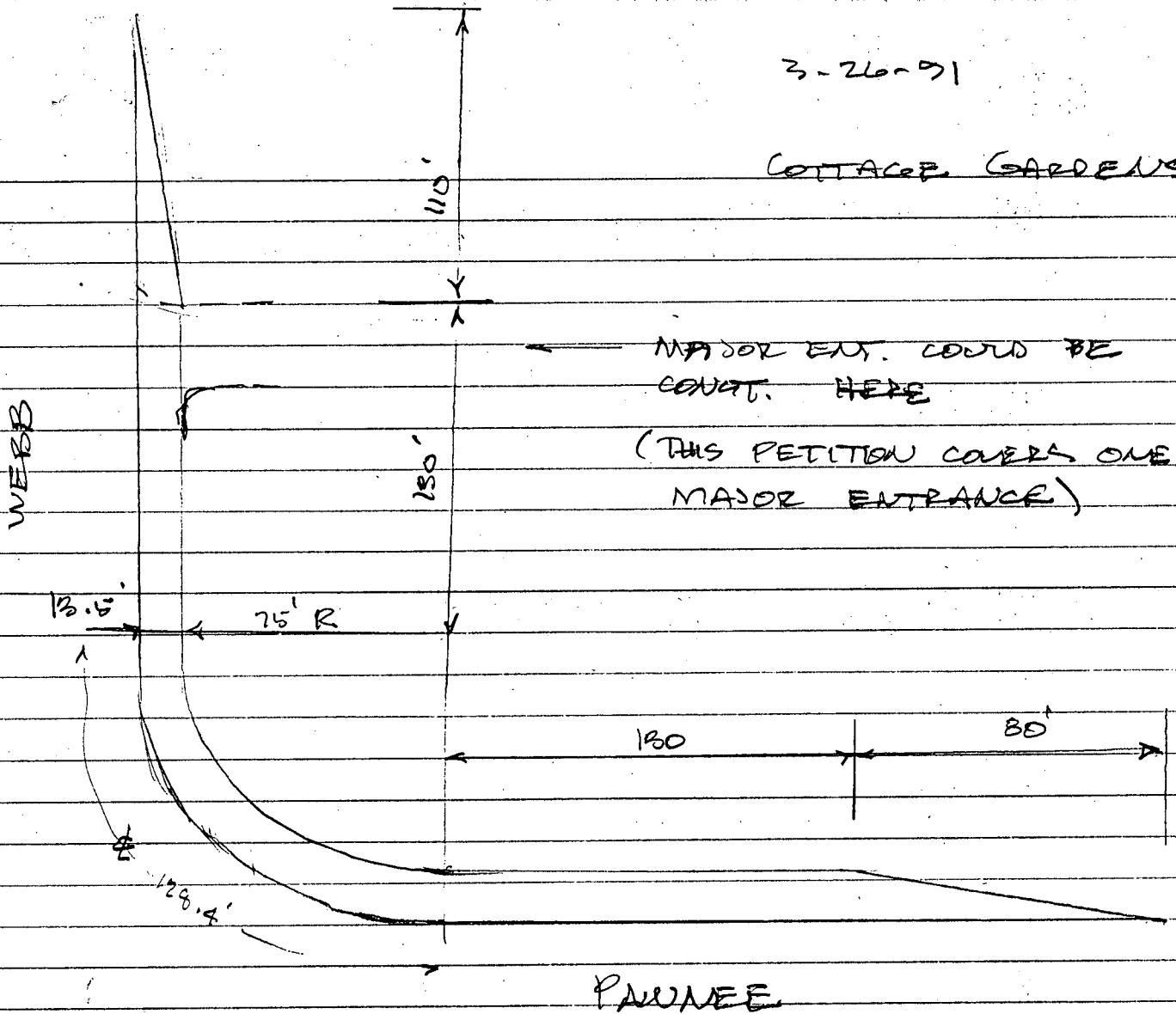
$$150 \times 13.5 \div 2 = \underline{1012.5}$$

$$2362.5 \div 9 \times 27 = 7087.50$$

USE 8000.00

3-26-91

COTTAGE GARDENS



$$110 \times 13.5 \div 2 = 742.5$$

$$128.4 \times 13.5 = 1733.4$$

$$260 \times 13.5 = 3510$$

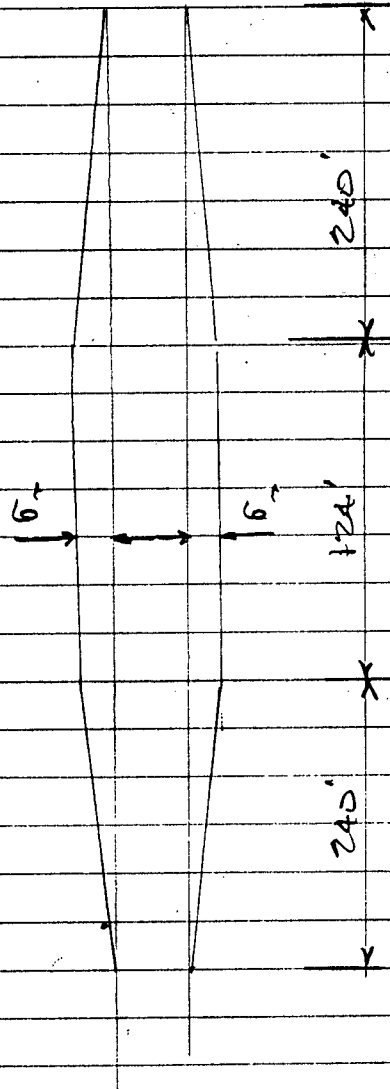
$$80 \times 13.5 \div 2 = 540$$

$$6525.9 \div 9 \times 27 = 19577.70$$

USE \$20,000

3-26-91

MOORING 6TH ADDN
NORTH SIDE CHURCH OF CHRIST
2125 JACKSON



DIMENSIONS FROM
BILL Mc KINLEY

LEFT TURN LANE
AT MAJOR CHURCH
ENTRANCE

$$6 \times 174 \times 2 = 1488$$

$$240 \times 6 \div 2 \times 4 = 2880$$

$$4368 \div 9 \times 27 = 13104$$

USE \$15000

GENE RATH ASK FOR TWO PETITIONS ONE TEMPORARY
AND ONE PERMANENT (GAME COST)

3-25-91

COTTAGE GARDENS
DRAINAGE ON S. SIDE OF PALMEE
LOTS 24, 25 Bk 3 D.A. = 6.9 AC

OVERLAND FLOW S = 0.7% 150' @ .23 f/s = 10.9 MIN

DITCH FLOW 910' @ 2 f/s AVERAGE = 7.6 MIN

TC = 18.5 MIN.	4.4 AC LC	C = 80	3.52
	2.5 AC REVD.	C = 73	<u>1.83</u>
			5.35

COMPOSITE C = 0.77

$Q_5 = 6.9 \times 0.77 \times 4.15 = 22.0 \text{ cfs}$

$Q_{100} = 6.9 \times 0.77 \times 6.76 = 35.9 \text{ cfs}$

STREET GRADE FROM WEYERS TO LAUREL = 2%

4' BB = 0.47' DEEP @ 22 cfs SPREAD 15' O.K.

4' BB = 0.17' DEEP @ 41 cfs O.K.

ADD 3.8 AC AT LAUREL

DA = 10.7 AC 160' DITCH FLOW @ 2 f/s = 1.3 MIN.

1.3 + 18.5 = 19.8 USE 20 MIN TC

3.9 AC REGID. LOTS $C = .73 = 2.85$

$$\begin{array}{r} 5.35 \\ \hline 8.20 \div 10.7 \end{array}$$

$C = 0.77$

$Q_5 = 10.7 \times 0.77 \times 4.00 = 32.9 \text{ cfs}$

$Q_{100} = 10.7 \times 0.77 \times 6.53 = 53.8 \text{ cfs}$

STREET GRADE 2% 4' BB

5 YR CAPACITY 0.15' DEEP @ 25 cfs SPREAD 10'

100 YR CAPACITY 0.73' DEEP* @ 54 cfs O.K.

* DEPTH FROM F.L. GUTTER

NEED STORM SEWER FOR 7.9 cfs

ADD 2.9 AC AND 2.3 AC @ COOPER

DA = 15.9 AC 340' DITCH FLOW @ 2 cfs = 2.6 MIN

1.8 + 2.6 = 22.4 USE 22.5 MIN TC

5.2 AC REGI. LOTS $C = 0.73$

$$\begin{array}{r} 3.80 \\ 8.20 \\ \hline 12.0 \div 15.9 = 0.75 = C \end{array}$$

$Q_5 = 15.9 \times 0.75 \times 3.77 = 45.0 \text{ cfs}$

$Q_{100} = 15.9 \times 0.75 \times 6.22 = 75.9 \text{ cfs}$ ON PAWNEE

STREET GRADE 2% 41' BB

5 YR CAPACITY 25 cfs NEED 20 cfs CAPACITY IN STORM SEWER

100 YR STREET FLOW 0.9' DEEP FROM GUTTER F.L. 0' ON PAWNEE

○ DA = 6.7 AC FROM BLOCK 1-4-7-8

$$Q_5 = 6.7 \times 0.60 \times 4.56 = 18.3 \text{ cfs}$$

$$Q_{100} = 6.7 \times 0.73 \times 7.37 = 36.0 \text{ cfs}$$

$$36.0 - 18.3 \text{ IN STORM SEWER} = 17.7 \text{ cfs IN STREET}$$

Q_{100} @ 1.3% GT. GRADE = 0.45' DEEP @ GUTTER F.L. OK.
39 cfs/side

○ DA = 5.4 AC FROM BLOCK 5

$$Q_5 = 5.4 \times 0.6 \times 4.56 = 14.8 \text{ cfs}$$

$$Q_{100} = 5.4 \times 0.73 \times 7.37 = 29.1 \text{ cfs}$$

$$29.1 - 14.8 \text{ IN STORM SEWER} = 14.3 \text{ cfs IN STREET}$$

$Q_{100} = 7.2 \text{ cfs/side IN STREET @ 1.3\% = 0.4' DEEP}$
OK.

○

DA = 5.4 AC. + 2.3 AC + 3.4 AC TO COOPER

Δ DA = 11.1 AC

95' OVERLAND FLOW @ 0.12 FPS = 7.9 MIN

1800' STREET FLOW @ 2 FPS = 15 MIN

22.9 MIN USE TC = 23 MIN.

$Q_{100} = 11.1 \times 0.73 \times 6.13 = 49.7 \text{ cfs}$

49.7 - 23.8 IN STORM SEWER = 25.9 cfs IN COOPER FROM CYPRESS TO PALMIER

STREET CAPACITY 0.58' DEPTH @ FL O.K.

DA = 3.4 AC ON BEECH

$Q_{100} = 3.4 \times 0.73 \times 7.37 = 18.3 \text{ cfs}$

ASSUME 4 cfs ON CARSON

14.3 cfs IN BEECH @ 0.4% = 0.47' DEEP *
* FROM FL.

DA 3.8 AC TO LAUREL

$$Q_{100} = 3.8 \times 0.73 \times 7.37 = 20.4 \text{ cfs}$$

0.57' DEEP @ 10.2 cfs / SIDE *

STREET GRADE @ 0.32%

GRADE @ R/W MUST BE 0.3' ABOVE T.C.

2-4-91

RATIONAL METHOD

D.A. = 64.3 AC

OVERLAND FLOW 80' @ 1% @ 0.28 f/s = 4.8 MIN

STREET FLOW 1770' @ 2 f/s AVERAGE = 14.8 MIN

19.55 MIN

USE $T_c = 20$ MIN.

SOIL GROUP		C	%	
C-D	LIGHT COMM	.80	5.3	4.24
C	RESIDENTIAL LOTS	.75	35.2	25.70
D	"	.79	20.6	16.27
C	OPEN SPACE	.53	1.8	0.95
D	"	.65	1.4	0.91
			64.3	<u>48.07</u>

$$C = \frac{48.07}{64.3} = 0.75$$

$$i_{100} = 6.53$$

$$Q_{100} = 64.3 \times 0.75 \times 6.53 = 315 \text{ cfs}$$

URBAN HYDROLOGY FOR SMALL WATERSHEDS (TR-55)
 PEAK DISCHARGE WORKSHEET
 FOR CHAPTER 4 (APPENDICES D & E)

Project COTTAGE GARDENS By K. Hill Date 2-4-91
 Checked _____ Date _____

Steps Peak Discharge Computations for up to 3 Storms: Type II, Duration 6 hours.

1. Data: Watershed Condition = _____ (present or future)

Drainage Area (DA) = 64.3 acres. Ave. Watershed Slope (S) = 1.5 %.

2. Runoff Curve Number (CN)

Hydrologic Soil Group (Appendix B)	Land Use Description Include Treatment, Practice & Condition (Table 2-2)	CN (Table 2-2) (3)	% or Area (acres) (4)	Product (3)x(4) (5)
C	LIGHT COMMERCIAL	94	3.2	300
D	" "	95	2.1	200
C	RESIDENTIAL 1/4 & 1/8 AC LOTS	83-90	35.2	3045
D	" "	92-87	20.6	1844
C	OPEN SPACE	74	1.8	133
D	" "	80	1.4	112
Totals =			64.3	5634

$$CN \text{ (weighted)} = \frac{\text{total col. (5)}}{\text{total col. (4)}} \left[\frac{5634}{64.3} \right] = 87.6$$
 use CN = 88

3. Rainfall Frequency (F)

Rainfall Depth (P)

1st Storm	2nd Storm	3rd Storm	
2 yr	2.5 yr	100 yr	yrs.
2.5	4.6	5.9	inches

4. Runoff Depth (Q)

Use P, CN, and Table 2-1.

1.39	3.30	4.54	inches
------	------	------	--------

5. Basic Peak Discharge (q)

Use S, DA, CN, and Figure D-2.

For graph labeled: Flat (S = less than 3%)
 Moderate (S = 3% to 7.9%)
 Steep (S = 8% & greater)

x			
36.0			cfs/inch of Q

x			
1.15			

6. Watershed Slope Factor

Use S, DA, and Table E-1.

=			
58	137	188	cfs

7. Peak Discharge (q_p)

where q_p = Steps #4 x 5 x 6

See Steps 8 to 13 for adjustments that may be applicable.

TR-55, CHAPTER 4 (APPENDICES D & E), PEAK DISCHARGE WORKSHEET (CONT.)

Steps Peak Discharge Computations with Adjustments

8. Data: Obtain if Adjustments are Applicable

Ponding and Swamy areas (PND) = 1.6 acres, 2.5 % of DA
 Impervious Area (IMP) = _____ acres, 52 % of DA
 Total Hydraulic Length (HL) = 1800 feet
 Hydraulic Length Modified (HLM) = 1320 feet, 72 % of HL

Rainfall Frequency (F) from Step 3

1st Storm	2nd Storm	3rd Storm	
2	25	100	yrs.

Peak Discharge (q_p) from Step 7

58	137	188	cfs
x	x	x	
.69	.75	.82	

*9. Ponding and Swamy Area Peak Factor

Use % PND, F, and Tables E-2, 3 or 4,
 Location in } at Design Point (E-2)
 Watershed: } Center or Spreadout (E-3)
 (check one) } Upper Reaches (E-4)

*10. Watershed Shape Peak Factor

Use HL with Figure E-1 and read;
 Equiv. Drainage Area (EDA) = 37 acres.

Use Figure D-2 graph from Step 5, CN, and EDA for;
 Equiv. Peak/Inch Runoff (q_e) = 25 cfs/in.

$$\text{Factor} = \left[\frac{q_e}{q \text{ from Step 5}} \right] \times \left[\frac{DA}{EDA} \right]$$

$$\text{Factor} = \left[\frac{25}{36} \right] \times \left[\frac{64.3}{37} \right] =$$

*11. Impervious Area Peak Factor
 Use % IMP, CN and Figure 4-1.

*12. Hydraulic Length Modified Peak Factor
 Use % HLM, CN and Figure 4-2.

13. Adjusted Peak Discharge (q_p)

$$q_p = q_p \text{ (from Step 7)} \times \text{Steps \#9} \times 10 \times 11 \times 12$$

* If the adjustment is not applicable, enter a Factor of 1.0

	x		
	1.21		
	x		
	1.19		
	x		
	1.30		
	=		
75	192	289	cfs

URBAN HYDROLOGY FOR SMALL WATERSHEDS (TR-55)
 PEAK DISCHARGE WORKSHEET
 FOR CHAPTER 4 (APPENDICES D & E)

Project COTTAGE GARDENS By K. Hill Date 2-4-91
 Checked _____ Date _____

Steps Peak Discharge Computations for up to 3 Storms: Type II, Duration 24 hours.

1. Data: Watershed Condition = _____ (present or future).

Drainage Area (DA) = 64.3 acres. Ave. Watershed Slope (S) = 1.5 %.

2. Runoff Curve Number (CN)

Hydrologic Soil Group (Appendix B)	Land Use Description Include Treatment, Practice & Condition (Table 2-2)	CN (Table 2-2) (3)	% or Area (acres) (4)	Product (3)x(4) (5)
C	LIGHT COMMERCIAL	94	3.2	300
D	"	95	2.1	200
C	RESIDENTIAL LOTS 1/3 & 1/4 AC	90-83	35.2	3045
D	"	92-87	20.6	1844
C	OPEN SPACE	74	1.8	150
D	"	80	1.4	110
Totals =			64.3	5649

La
 Ta
 La-Ce
 Rd-Ta

$$CN \text{ (weighted)} = \frac{\text{total col. (5)}}{\text{total col. (4)}} \left[\frac{5649}{64.3} \right] = 87.8 ; \text{ use CN} = \boxed{88}$$

3. Rainfall Frequency (F)

Rainfall Depth (P)

1st Storm	2nd Storm	3rd Storm	
10	25	100	yr.
5.4	6.3	8.0	inches

4. Runoff Depth (Q)

Use P, CN, and Table 2-1.

4.06	4.92	6.57	inches
------	------	------	--------

5. Basic Peak Discharge (q)

Use S, DA, CN, and Figure D-2.

For graph labeled: Flat (S = less than 3%)
 Moderate (S = 3% to 7.9%)
 Steep (S = 8% & greater)

x			
36.0			cfs/inch of Q
x			
1.15			
=			
168	204	272	cfs

*6. Watershed Slope Factor

Use S, DA, and Table E-1.

7. Peak Discharge (q_p)

where q_p = Steps #4 x 5 x 6

See Steps 8 to 13 for adjustments that may be applicable.

TR-55, CHAPTER 4 (APPENDICES D & E), PEAK DISCHARGE WORKSHEET (CONT.)

Steps Peak Discharge Computations with Adjustments

8. Data: Obtain if Adjustments are Applicable

Ponding and Swampy areas (PND) = 1.0 acres, 2.5 % of DA
 Impervious Area (IMP) = _____ acres, 52 % of DA
 Total Hydraulic Length (HL) = 1800 feet
 Hydraulic Length Modified (HLM) = 1300 feet, 72 % of HL

Rainfall Frequency (F) from Step 3

1st Storm	2nd Storm	3rd Storm	
10	25	100	yrs.

Peak Discharge (q_p) from Step 7

168	204	272	cfs
X	X	X	
172	175	182	

*9. Ponding and Swampy Area Peak Factor

Use % PND, F, and Tables E-2, 3 or 4.
 Location in } at Design Point (E-2)
 Watershed: } Center or Spreadout (E-3)
 (check one) } Upper Reaches (E-4)

*10. Watershed Shape Peak Factor

Use HL with Figure E-1 and read:
 Equiv. Drainage Area (EDA) = 37 acres.

Use Figure D-2 graph from Step 5, CN, and EDA for;
 Equiv. Peak/Inch Runoff (q_e) = 25 cfs/in.

$$\text{Factor} = \left[\frac{q_e}{q \text{ from Step 5}} \right] \times \left[\frac{DA}{EDA} \right]$$

$$\text{Factor} = \left[\frac{25}{36} \right] \times \left[\frac{64.3}{37} \right] =$$

X
1.21
X
1.19
X
1.30
=

*11. Impervious Area Peak Factor

Use % IMP, CN and Figure 4-1.

*12. Hydraulic Length Modified Peak Factor

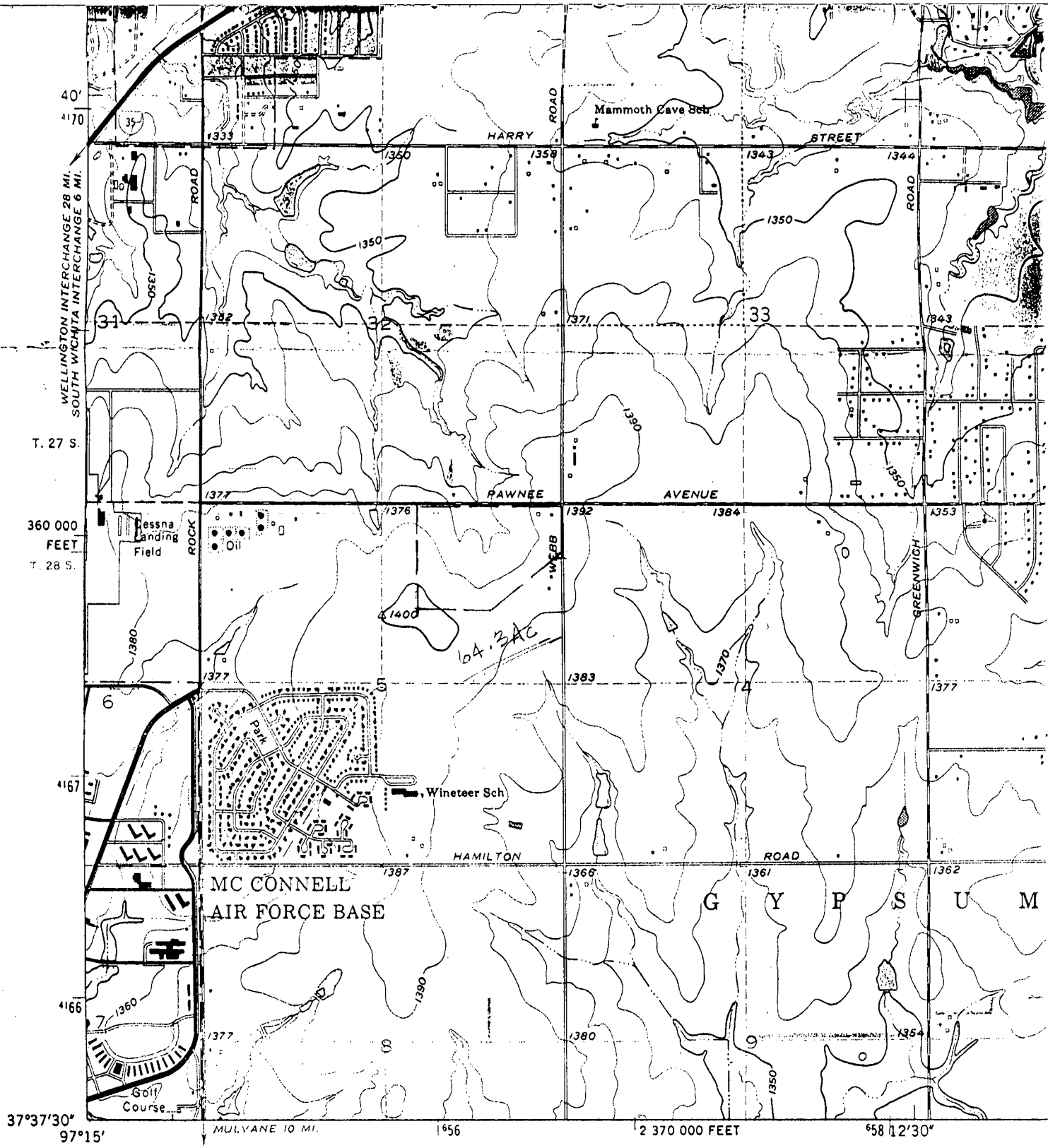
Use % HLM, CN and Figure 4-2.

13. Adjusted Peak Discharge (q_p)

$$q_p = q_p \text{ (from Step 7) } \times \text{Steps \#9} \times \text{10} \times \text{11} \times \text{12}$$

226	286	417	cfs
-----	-----	-----	-----

* If the adjustment is not applicable, enter a Factor of 1.0



(DERBY)
6559 III SE

Mapped, edited, and published by the Geological Survey
in cooperation with State of Kansas agencies

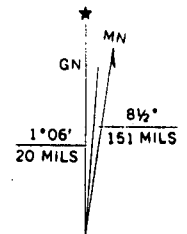
Control by USGS and USC&GS

Culture and drainage in part compiled from aerial photographs
taken 1954-1955. Topography by planetable surveys 1941-1942
Revised 1961

Polyconic projection. 1927 North American datum
10,000-foot grid based on Kansas coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks,
zone 14, shown in blue

Red tint indicates area in which only
landmark buildings are shown

Fine red dashed lines indicate selected fence and field lines where
generally visible on aerial photographs. This information is unchecked



UTM GRID AND 1970 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

FOR SALE BY U
A FOI

