Computation of Peak Discharge

Date: 09-12-1983

Title: MAXWELL ADDITION S.W.S...LOT 1 BLOCK 1 2ND ADD...NODE 102

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 95
Hyd. Len. 350 feet
Slope 2 %
% of HLM 75 %
% Imp. 85 %
Area of basin 1.4 acres

Computed Data

Basic Lag Factor (hrs.)	0.05
Hydr. Length Adj.	0.80
Imp. Area Adj.	0.78
Runoff Volume (in.)	7.20
Computed Time of Conc. (hrs.)	0.06

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)=	11.48 ← USE
Csm/in. =	728.59
Tc (hrs.) =	0.25

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) =	15.00 minutes
Intensity =	8.97 inches/hr.
C factor =	0.86
Peak Dis. (cfs)=	10.86

14112 G.B.

Computation of Peak Discharge
Date: 09-12-1983

Title: MAXWELL ADDITION S.W.S...LOT1 BLK 1 2ND ADD...NODE 104

Rainfall 4.5 inches
Recurrence Interval (yrs.) 5
Runoff Curve Number 95
Hyd. Len. 150 feet
Slope 2 %
% of HLM 75 %
% Imp. 85 %
Area of basin .7 acres

Computed Data

Basic Lag Factor (hrs.)	0.03
Hydr. Length Adj.	0.80
Imp. Area Adj.	0.78
Runoff Volume (in.)	3.92
Computed Time of Conc. (hrs.)	0.03

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)=	3.13
Csm/in. =	728.59
Tc (hrs.) =	0.25

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 5 year freq.

Time of Conc. (Tc) =	15.00 minutes
Intensity =	5.22 inches/hr.
C factor =	0.70
Peak Dis. (cfs)=	2.55

14112 G.B.

Computation of Peak Discharge

Date: 09-12-1983

Title: MAXWELL ADDITION S.W.S...LOT 1 BLK 1 2ND ADD...NODE 104

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 95
Hyd. Len. 150 feet
Slope 2 %
% of HLM 75 %
% Imp. 85 %
Area of basin .7 acres

Computed Data

Basic Lag Factor (hrs.)	0.03
Hydr. Length Adj.	0.80
Imp. Area Adj.	0.78
Runoff Volume (in.)	7.20
Computed Time of Conc. (hrs.)	0.03

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)=	5.74 ← USE
Csm/in. =	728.59
Tc (hrs.) =	0.25

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) =	15.00 minutes
Intensity =	8.97 inches/hr.
C factor =	0.86
Peak Dis. (cfs)=	5.43

14112 G.B.

Computation of Peak Discharge
Date: 09-23-1983

Title: MAXWELL ADDITION STORM DRAINS...AREA FH...

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 84
Hyd. Len. 600 feet
Slope .55 %
% of HLM 0 %
% Imp. 20 %
Area of basin 9.2 acres

Computed Data

Basic Lag Factor (hrs.)	0.25
Hydr. Length Adj.	1.00
Imp. Area Adj.	0.89
Runoff Volume (in.)	5.90
Computed Time of Conc. (hrs.)	0.37

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)=	50.80
Csm/in. =	598.61
Tc (hrs.) =	0.37

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) =	22.40 minutes
Intensity =	7.67 inches/hr.
C factor =	0.51
Peak Dis. (cfs)=	36.13

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Date 9-14-83 MNB Page ____ of ____

Project Manuell Add'n St Dr.

Item ~~Culvert~~ Outfall channel

Q_{100} = 42 cfs

At outlet, depth to existing ground ≈ 2'. Use 1' flow depth.

Grade should be 0.2% to 0.5% range

From TI-59 Program

n = 0.035
S = 0.002
z = 4:1
b = 20'
y = 1'
Q = 41 cfs
V = 1.7 ft/sec

Use 20' bottom w/ 4:1 side slopes

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WICHITA, KANSAS 67211
(316) 262-2691

HYDROLOGY DATA SHEET

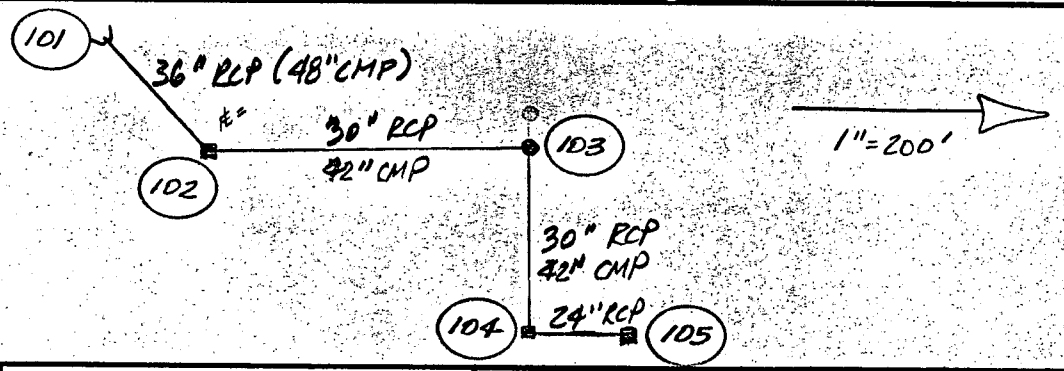
PAGE 1 OF 1

PROJECT: Maxwell Add. SWS. PROJECT NO. 32-83434-042

ITEM: Line No. 1 DATE: 9-12-83

RETURN PERIOD: 5/100 COMPUTATIONS BY: MWB REVISIONS BY:

SCHEMATIC DIAGRAM:



TRIBUTARY AREA								HYDROLOGY SUMMATION				CONDUIT DATA					
SUB-BASIN (1)	C (2)	AREA (acres) (3)	SLOPE (%) (4)	LENGTH (feet) (5)	T_{c_o} (minutes) (6)	I_o in./hr. (7)	Q_o (cfs) (8)	T_c (minutes) (9)	I in./hr. (10)	Q (cfs) (11)	Σ Q (cfs) (12)	PIPE (inches) (13)	SLOPE (%) (14)	VELOCITY (ft./sec.) (15)	LENGTH (feet) (16)	T_t (minutes) (17)	$T_c + T_t$ (minutes) (18)
105		9.2			18	8.37	30/59	18	8.37	26	26	24"	0.0132	8.3	100'	0.2	18.2
104	0.7 0.86	0.7			15	8.98	31/5.7	18.2	8.33	5.3	31.3	30"	0.0058	6.4	515'	1.3	19.5
102	0.7 0.86	1.4			15	8.98	6.3/11.5	19.5	8.11	10.4	41.7	36"	0.0039	5.9	150	0.4	19.9

Computation of Peak Discharge
Date: 09-12-1983

Title: MAXWELL ADDITION S.W.S...LOT1 BLOCK 1/2ND ADD...NODE 102

Rainfall 4.5 inches
Recurrence Interval (yrs.) 5
Runoff Curve Number 95
Hyd. Len. 350 feet
Slope 2 %
% of HLM 75 %
% Imp. 85 %
Area of basin 1.4 acres

Computed Data

Basic Lag Factor (hrs.)	0.05
Hydr. Length Adj.	0.80
Imp. Area Adj.	0.78
Runoff Volume (in.)	3.92
Computed Time of Conc. (hrs.)	0.06

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)=	6.26
Csm/in. =	728.59
Tc (hrs.) =	0.25

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 5 year freq.

Time of Conc. (Tc) =	15.00	minutes
Intensity =	5.22	inches/hr.
C factor =	0.70	
Peak Dis. (cfs)=	5.10	

14112 G.B.

PROFESSIONAL ENGINEERING CONSULTANTS
PROFESSIONAL ASSOCIATION
1440 EAST ENGLISH
WICHITA, KANSAS
ZIP CODE / 67211

MEMO

TO: Chris Breitenstein, P.E.
7th Floor - City Hall
Wichita KS 67202

PROJECT NO. 32-83434-042
PROJECT: Maxwell Add. St. Dr

COPIES TO:

ATTN:

DATE: 9-23-83

FROM: Michael W Berry, E.I.T.

REFERENCE: Design calc's Line No. 1
Proj No 468-76-245-81287-000-000-001

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

Attached herewith are the drainage computations for the re-design of Line No. 1. The reduction in pipe size from the approved drainage plan is based on the capacity of the existing culvert under Douglas Ave.

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Date 9-12-83 MB Page 1 of

Project Maxwell Add st Dr 32-83434-042

Item Line No. 1

A. Check capacity of 24" RCP @ Douglas.

Assume HW Elev = 173.4 = North T.C.
Assume TW Elev = 171.5 = 1' below TC @ parking lot
Assume .05' head loss for total minor losses

$\therefore H = (3.4 - 1.5) - 1 = 0.9'$

$S = \frac{0.9}{80'} = 1.125\%$

for 24" (n = 0.013) K = 226

$Q = 226\sqrt{0.01125} = 30$ cfs ← OUTLET CONTROL

Check inlet control

HW = 73.4 - 69.9 = 3.5'

$\frac{HW}{D} \rightarrow \frac{3.5}{2} = 1.75$

Q = 26 cfs ← INLET CONTROL

→ SAY CAPACITY = 26 CFS ←

PIPE CAPACITY = 26 CFS. Q_{100} = [illegible] CFS. ASSUME DIFFERENCE IS STORED IN DOUGLAS OR UPSTREAM IN FOREST HILLS.

NOTE: SITE GRADING WILL PROVIDE OVERFLOW RELIEF BEFORE BUILDING IS FLOODED.

Area FH

Q = 9.2 Ac
1 acre lots — 20% Imp
(See attached computer printout.

Q_{100} = 51 cfs
T_c = 22 min i_{100} = 7.67 in/hr

$Q_{DES} = \frac{30}{51} \cdot 7.67 = 4.51$ in/hr

4.51 in/hr ≈ 6 yr storm by SCS

AS DESIGNED, THE SYSTEM CARRIES THE 6-yr storm from THE NORTH & THE 100-YR FROM MAXWELL ADDITION

Note:
If Q_{100} = 36 cfs by Rossmiller -

$\frac{30}{36} \cdot 7.67 = 6.39$ in/hr ≈ 36 yr storm by Rossmiller

THE CITY OF WICHITA

OFFICE OF MAPD/DESIGN DATE May 8, 1985

TO Glen Lytle, Special Assistant for Zoning

FROM Mike Lindebak, City Engineer

SUBJECT Maxwell 2nd Addition

We have reviewed the proposed development plan on part of Lots 1, 4 and 5, Maxwell 2nd Addition and have the following comments.

1. Grading, paving and retaining wall can be constructed in the floodway reserve area provided that the applicant submits a grading plan and supporting drainage and hydraulic calculations to show that the encroachment will not cause any adverse affect.

2. We recommend that the sanitary sewer main on the north side of the property be relocated to the north of the proposed retaining wall.

3. The detention-retention pond can be reworked to maintain the required storage volume. A revised grading plan should be submitted to the City Engineer's office for approval. The applicant should be advised that the pond is currently under contract to be constructed. The construction should be stopped until the location of the inlet structure and the grading plan of the pond are finalized.

4. There is an existing sewer line in the north-south easement which will have to be abandoned. Alternate ingress-egress and utility easements are required to provide services to the remaining portion of Lot 5 and Lot 6 if the existing easements are vacated.

5. Only the easements shown on the plat are in effect.

6. The developer is responsible to extend utilities from Webb Road to site.

If you have any questions, please call me.

Mike Lindebak, City Engineer

ML:VH:gf

0073G-10