



## STORM SEWER CAPACITIES -

DA<sub>1</sub> - THE RECENTLY INSTALLED STORM SEWER IN VOLUNTA PROBABLY IS CAPABLE OF DISCHARGING LESS THAN THE ONE YEAR STORM.

DA<sub>2</sub> - THE EXISTING STORM SEWER IN 27TH ST. IS CAPABLE OF DISCHARGING UP TO 26 CFS WHICH IS ALSO LESS THAN THE ONE YEAR STORM.

## ALTERNATIVES -

1. EXPAND DRAINAGE EASEMENT BETWEEN LOTS B & 9 TO ALLOW OVERLAND FLOW FOR THE 100 YEAR STORM TO CROSS THE PROPOSED PLAT TO THE CHANNEL AT THE NORTH.

OVERLAND FLOW WOULD BE CARRIED FROM 27TH ST. INTO THE INTERIORE STREETS AND DISCHARGE THROUGH CONQUEST INTO THE DITCH.

2. CREATE A BACK LOT DITCH SECTION WHICH WOULD CROSS CONQUEST WITH A PIPE AND WOULD CONVEY THE 100 YEAR OVERFLOW FROM 27TH ST DIRECTLY TO THE CHANNEL.

THIS WOULD REQUIRE SOME REZONING OR LOT LINE ADJUSTMENT, WATER LINE ADJUSTMENT AND A STORM SEWER ADJUSTMENT.

3. INSTALL A PARALLEL STORM SEWER TO CONVEY RUNOFF OUT CONQUEST INTO THE DITCH.

THIS WOULD COST APPROX. \$60,000 AND STILL WOULD ONLY CONVEY THE MINOR STORM RUNOFF.

4. LEAVE THE SITUATION EXACTLY AS IT IS TODAY.

# DRAINAGE CONCEPT NOTES

1/23/12

By

Date

Page

Of



BAUGHMAN COMPANY, P.A.

## CONQUEST NORTH ADDITION

$$DA_1 = 44^{\frac{5}{8}} \text{ ACRES}$$

$$DA_2 = 41^{\frac{0}{8}} \text{ ACRES}$$

DA<sub>1</sub> = EXISTING DEVELOPED RESIDENTIAL HOMES W. SPOTS AND SOME INDUSTRIAL DEVELOPMENT

$$\text{TOTAL C FACTOR} = 0^{\frac{55}{8}}$$

DA<sub>2</sub> = EXISTING DEVELOPED RESIDENTIAL HOMES W SPOTS.

$$\text{TOTAL C FACTOR} = 0^{\frac{50}{8}}$$

ASSUME A 15 MIN. TIME OF CONCENTRATION

$$DA_1 = Q_2 = CIA = 0^{\frac{55}{8}} (3.83) 44^{\frac{5}{8}} = 93^{\frac{7}{8}} \text{ cfs.}$$

$$Q_{100} = 0^{\frac{55}{8}} (7.37) 44^{\frac{5}{8}} = 180^{\frac{4}{8}} \text{ cfs.}$$

NOTE - DA<sub>1</sub> WAS RELIEVED BY A STORM SEWER PROJECT CONSTRUCTED A FEW YEARS AGO ALONG VOLUTZIA FROM ZETA ST. TO ZETA ST. AND DISCHARGED INTO A CHANNEL TO THE NORTH AND WEST IN ABANDONED ZETA ST.

$$DA_2 = Q_2 = CIA = 0^{\frac{50}{8}} (3.83) (41^{\frac{0}{8}}) = 78^{\frac{5}{8}} \text{ cfs.}$$

$$Q_{100} = 0^{\frac{50}{8}} (7.37) (41^{\frac{0}{8}}) = 151^{\frac{0}{8}} \text{ cfs.}$$

NOTE: DA<sub>2</sub> IS PRESENTLY DISCHARGED FROM ZETA ST TO THE NORTHWEST ACROSS THIS PLAT BY AN EXISTING STORM SEWER SYSTEM.



STORM SEWER -

ESTIMATE - 800 LF. PIPE @ \$45 = \$36,000<sup>-</sup>  
 4 MH @ 3000 = 12,000<sup>-</sup>

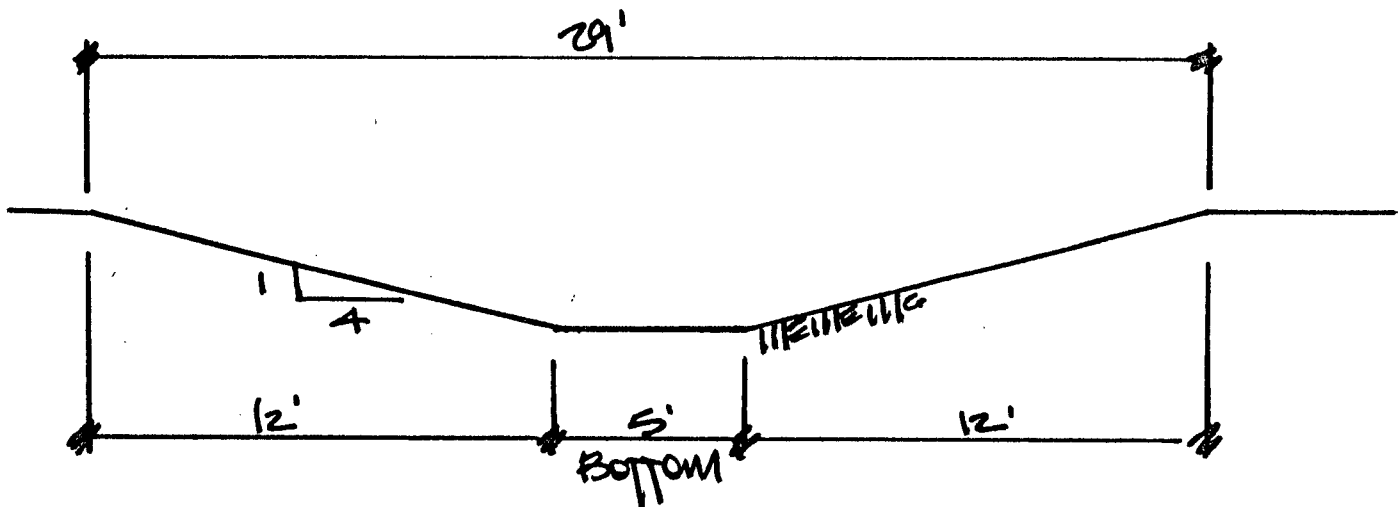
50% PAVING RR @ 20 = 1,000<sup>-</sup>

TOTAL = \$49,000<sup>-</sup>

+ 15%

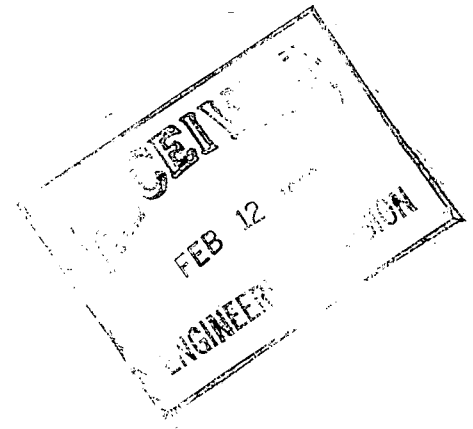
7,500<sup>-</sup>

TOTAL COST = \$57,000<sup>00</sup> TOTAL = \$56,500<sup>-</sup>



February 8, 1992

CONQUEST NORTH ADDITION  
DRAINAGE REPORT



The proposed plat of Conquest North Addition is an 18 acre parcel of land located north of 27th St. No. between Grove and Volutsia. The site presently has existing streets, sewers and water lines serving the property as well as an existing storm sewer system which collects flow from 27th St. No. and conveys runoff to the northwest corner of the parcel into the City Park property at a channel outlet.

Presently, approximately 85.8 acres of developed residential land located south of 27th St. No. drains to six inlets and the storm sewer on 27th St. No. A few years ago the City of Wichita constructed a secondary storm sewer along Volutsia at the southeast corner of the plat in an effort to eliminate some of the runoff from this drainage basin. This secondary storm sewer discharges to the north into a channel along the east and north sides of the proposed plat.

The existing storm sewer which collects runoff from the six inlets at 27th St. No. also has other interior collection lines and inlets within the proposed plat. This storm sewer line is inadequate to convey the 100 year storm from the entire basin even with the secondary storm sewer system along Volutsia.

The development of the Conquest North Addition does not propose and significant changes to the site. The proposed drainage plan for this plat is identified on Plan A and basically provides a relief for the 100 year storm. This plan proposes to create a 5 foot bottom ditch section across the middle of the plat along the back yards of the lots within a 40' drainage easement which will discharge into the channel along the north side of the plat. The 100 year storm will pond at 27th St. No. and spill overland into the proposed ditch section to be conveyed north thereby providing a 100 year relief for the sump at 27th St. No. The planned route will require a street crossing with a pipe as indicated on the plan. The proposed ditch section will provide a 100 year discharge outlet for the ponding at 27th St. No.

The drainage basin areas and runoff calculations are attached on separate sheets for this area. The improvements as planned will be private installations to be done concurrently with the development of this residential plat. No other proposed storm-sewer improvements are required for the site.

## CONCRETE NORTH ADDITION - DRAINAGE CALCULATIONS

Basin 1 = 40<sup>±</sup> ACRES - SOUTH OF 27TH ST. (GROVE TO VOLUNTA)

Basin 2 = 45<sup>±</sup> ACRES - SOUTH OF 27TH ST (VOLUNTA TO HILLSIDE)

Basin 3 = 18<sup>±</sup> ACRES - CONCRETE NORTH ADDITION

ASSUME A T<sub>c</sub> OF 24 MIN. @ C = 0.39 (TWO VENTS) GROUP B  
C = 0.57 (100 VENTS) " B

Basin 1  $Q_{12} = 0.39 (3.03) (40) = 47 \text{ cfs}$

$Q_{100} = 0.57 (6.01) (40) = 137 \text{ cfs}$

Basin 2  $Q_{12} = \quad \quad (45) = 54 \text{ cfs}$

$Q_{100} = \quad \quad (45) = 156 \text{ cfs}$

Basin 3  $Q_{12} = 0.48 (3.83) (18) = 33 \text{ cfs} \quad (w t_c = 15 \text{ min})$

$Q_{100} = 0.68 (7.97) (18) = 64 \text{ cfs} \quad ( \quad \quad )$



## EXISTING STORM SEWER CAPACITIES -

STORM SEWER 1 - 6 inlets @ 27th St. w 20" & 36" pipe crossing Concordia North Addition -

EXISTING CAPACITY EXISTING FROM 27th St

$$= 35 \text{ cfs @ } 5 = 0.70 \%$$

THIS ALLOWS APPROX 58 cfs PER INLET AT 27th St.

STORM SEWER 2 - STORM SEWER ALONG VOLUNTEA.

EXISTING CAPACITY PER BYPASS INLET = 36 cfs.

TOTAL SUMP DISCHARGE CAPACITY = 71 cfs.  
OF EXISTING STORM SEWER SYSTEMS -

PROPOSED INTERIOR DRAINAGE WITH CONCRETE NORTH WALL EXISTING POND AROUND THE INLETS OR SURFACES DRAIN TO THE NORTH DURING THE HEAVY STORM PROBLEMS. NO CHANGES PLANNED TO THE EXISTING SYSTEM.

## PROPOSED IMPROVEMENTS -

- ①. CONSTRUCT TYPICAL 5' BOTTOM DITCH WITHIN 40' DRAINAGE EASEMENT.  
PER TYPICAL DITCH SECTION  
PER PLAN -
- ②. CONSTRUCT A FLUME OPENING AT THE UPPER END OF THE CHANNEL AT SE CORNER OF THE PLAT.

# CENTRAVEST NORTH ADDITION

NBW 2/1/02

By

Date

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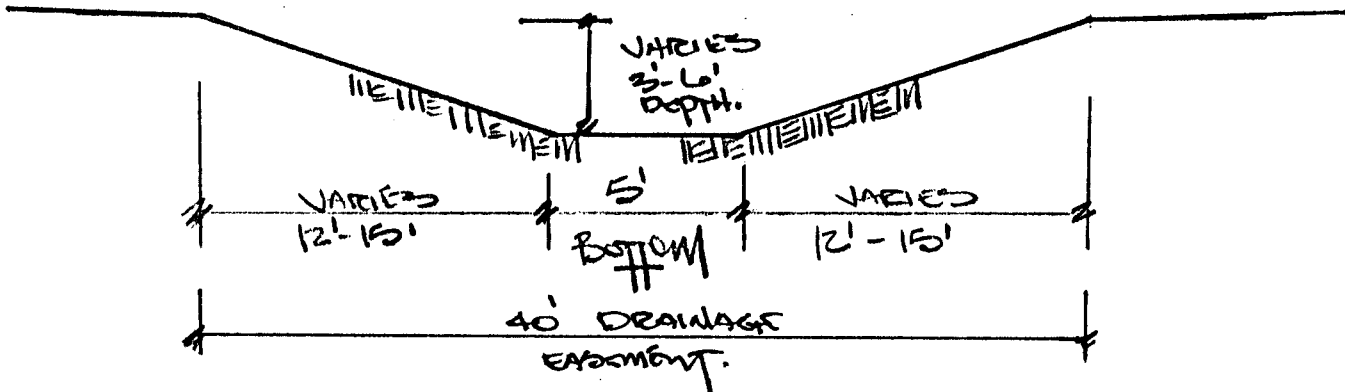
Of



BAUGHMAN COMPANY, P.A.

Proposed

TYPICAL DITCH SECTION -



$S = 0.25\%$   
Bottom: 5'  
Grassed side slopes.

3' min. Depth.  
 $M = 0.03$

Permeability = 175 cfs  
C3 FT

Velocity = 3 fps ±

C3<sup>5</sup> FT = 250 cfs

$V = 2.4$  fps ±

# KAW VALLEY ENGINEERING & DEVELOPMENT, INC.

2319 NORTH JACKSON  
P.O. BOX 1304  
JUNCTION CITY, KANSAS 66441  
TEL: (913) 762-5040  
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122 NW PARKWAY  
RIVERSIDE, MISSOURI 64150  
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FAX: (816) 587-0129

April 23, 1992  
92-1399

City of Wichita  
Engineering Department  
455 N Main, 7th Floor  
Wichita, KS 67202

ATTN Vicky Huang, P E

RE Commercial Development Site at 36th and  
North Rock Road, Wichita, Kansas

Dear Vicky

Please find enclosed a copy of the Preliminary Drainage Study for the Comotara Power Center site at 36th and North Rock Road in Wichita for your review. Also enclosed is a copy of the final plat.

Please contact me at any time if you have questions or need further information.

Sincerely



Leon D Osbourn, P E  
Project Engineer

LDO/js

Enclosures

# KAW VALLEY ENGINEERING & DEVELOPMENT, INC.

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122 NW PARKWAY  
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June 5, 1992  
 92-1399

City of Wichita  
 Engineering Department  
 455 N Main, 7th Floor  
 Wichita, KS 67202

ATTN Vicky Huang, P E

RE Commercial Development Site at 36th and North  
 Rock Road, Wichita, Kansas

Dear Vicky

As you discussed with Leon Osbourn of this office we have reexamined the storm drainage study originally provided you on the above referenced project to estimate the effects of detaining the storm water from the proposed development of this 45-acre site. Although it is possible as we originally stated, that continuing to add detention storage for each site in the development may result in a higher maximum discharge at some specific given point somewhere downstream, we believe it is still necessary to provide some detention to store the increased runoff from this site.

An analysis of the watershed to determine water surface elevations at specific points in time and specific locations downstream would require a large amount of data and study, which we believe is far beyond the scope of an individual development. We have therefore, completed a preliminary design to size detention storage to retain the additional runoff from a storm of 100-year frequency that would occur after this 45-acre site is fully developed.

The runoff from the existing condition of the site is estimated at 158 cfs, and when fully developed with all paving, streets, and buildings in place, it is estimated that this could increase to 382 cfs from a storm of 100-year frequency. To detain that difference requires a detention storage of 8.1 acre/feet. This can be achieved by constructing a dry detention basin immediately upstream from the box bridge on Inwood. As stated in the original report, the water discharging from the existing detention basins East of Rock Road would be passed through without further detention, and only the increased runoff from this site would be detained in a normally dry detention basin.

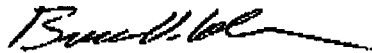
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To	Vicky Huang	From	Baruc Collins
Co.	City of Wichita	Co.	KVE
Dept.	Engineering	Phone #	
Fax #	316-268-4663	Fax #	
Next copy follows			

City of Wichita  
ATTN Vicky Huang, P E  
June 5, 1992 - Page 2 -

The above quantities are preliminary estimates and are conservative, based on preliminary storm drainage and site development plans. It is believed that the final design of the detention storage will result in somewhat less volume, and construction of that facility will provide the downstream protection, which leaves the greatest flexibility for other storm water management decisions in the watershed.

We sincerely appreciate your assistance in this project; and please allow us the opportunity to respond to any questions or comments you may have.

Sincerely



Bruce V Collins, P E  
Project Engineer

BVC/js