

ABBOTT SURVEYS, PLANNING, and CIVIL DESIGN
16418 W. 51st. St. S.
Clearwater, Kansas 67026
Telephone: (316) 545-7097

Transmittal Letter

August
July, 1996

To: Mr. Michael Lindebak P.E.
City Engineer
City Hall
Wichita, Kansas

Reference: ANAYA ADDITION

Transmitted herewith is the Drainage Report for Anaya Addition in the City of Wichita, Sedgwick County, Kansas for your review and comments.

Respectfully,

William R. Abbott
William R. Abbott P.E., L.S.

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DRAINAGE
FOR
ANAYA ADDITION
REPORT

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GENERAL INFORMATION:

ANAYA ADDITION is an Unplatted Commercial Zoned Area of the City of Wichita. It is bounded on the East by Broadway Avenue, a concrete paved street with concrete curb and gutter. It is bounded on the South by Carp Road, a concrete paved street with lay-back curb. It is bounded on the West by Lawrence Avenue, a brick street with concrete headers on each side. It is bounded on the North by the Arkansas River, channelized in this area.

The only development existing, is an apartment complex on proposed Lot 3, at the Southwest corner of the Addition at the intersection of said Carp Road and Lawrence Avenue. The flow occurring on this developed area, flows Easterly and Westerly where all flows collect in the concrete parking area, which slopes Southerly to Carp Road. The flow continues Westerly in Carp Road to Lawrence Avenue.

No exterior drainage flows enter the Subdivision. In Broadway Avenue, which has recently been re-constructed, the flows in Broadway Avenue turn and enter the North gutter of Carp Road. The flows in Lawrence Avenue continue Southerly.

The existing interior drainage flows, drain slowly at a gentle slope from the Arkansas River Levy at the Northern boundary of the Addition, to the Southern Boundary. The flows continue Southerly across the parkway onto said Carp Road. The flows, then continue Westerly in Carp Road to Lawrence Avenue. The flows, turn and cross Carp Road at the West edge of Lawrence Avenue, and continue Southerly in Lawrence Avenue.

The undeveloped portions of the proposed Addition are well grassed or gravelled with no obvious signs of erosion or swales.

An existing 25' foot Landscape Easement along the Easterly side of proposed Lot 1, has been landscaped and no access to Broadway Ave. is allowed.

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Interior Drainage Area 1:

This Drainage Area consists solely of proposed Lot 1. The area of 0.49 acres is well graded, gravelled, and landscaped. The lot slopes Southwesterly to the concrete driveway at Carp Road which collects the flow of 0.83 c.f.s. and delivers the flow to Carp Road.

Interior Drainage Area 2:

This Drainage Area consists solely of proposed Lot 2. The area of 0.66 acres is well graded and gravelled. The lot slopes Southerly to Carp Road and Southeasterly to the concrete driveway at Carp Road. This flow of 1.12 c.f.s., joins the flow of 0.83 c.f.s. from Interior Area 1, where the combined flow of 1.95 c.f.s. is delivered to Carp Road. This flow, joins the flow of 0.76 c.f.s. from Exterior Area 1 (Broadway Ave.), and 0.44 c.f.s. from Carp Road. The combined flow of 3.15 c.f.s. continues Westerly in Carp Road.

Interior Drainage Area 3:

This Drainage Area of 2.33 acres consists of the Northwest portion, and the Easterly portion of Lot 3. The Northwest portion flows Easterly and Southeasterly to the Easterly portion. The flow drains Southeasterly away from the existing apartment building and joins the flow from the Northwest. This combined flow of 4.04 c.f.s. continues Southerly to Carp Road. This flow joins the flows 3.15 c.f.s. in Carp Road. This combined flow of 7.19 c.f.s. continues Westerly in Carp Road.

Interior Drainage Area 4:

This Drainage Area of 0.83 acres consists of the East apartment building and the area West of the building, and the West apartment building and the area East of the building, all on Lot 3.

This flow of 1.41 c.f.s. is collected in the concrete parking area and flows Southerly to the Driveway and Carp Road. This flow will join the flow of 7.19 c.f.s. in the gutter and 0.19 c.f.s. from Carp Road. The combined flow of 8.79 c.f.s. will continue Westerly in Carp Road.

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Interior Drainage Area 5:

This Drainage Area of 0.14 acres consists of the area West of the existing West apartment building on Lot 3. It slopes away from the building, and delivers the flow of 0.24 c.f.s. Southwesterly to Lawrence Ave. This flow continues Southerly in Lawrence Ave. to Carp Road.

Exterior Drainage Area 1:

This Drainage Area of 0.32 acres, consists of the West 1/2 of Broadway Ave., South of the Bridge and North of Carp Road. This flow of 0.76 c.f.s. will flow Westerly around the North curb return at Carp Road.

Exterior Drainage Area 2:

This Drainage Area of 0.41 acres consists of the North 1/2 of Carp Road, and generates a flow of 0.98 c.f.s..

Exterior Drainage Area 3:

This Drainage Area of 0.36 acres consists of, the East 1/2 of Lawrence Ave. North of Carp Road, and generates a flow of 0.86 c.f.s.. This flow is joined by the flow of 0.24 c.f.s. from Interior Area 5. This combined flow of 1.10 c.f.s. continues Southerly to Carp Road.

Combined Flows at Carp Road and Lawrence Ave.:

The flows of 9.14 c.f.s. in Carp Road, and 1.10 c.f.s. in Lawrence Ave., join and the combined flow of 10.24 c.f.s. continues Southerly across Carp Road at Lawrence Ave..

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AREA FLOW CALCULATIONS:

Rational Formula $Q = C^*I^*A$

C = 0.50 light commercial

I = 3.4, 6 hour duration, 10 year storm

I = 5.1, 6 hour duration, 100 year storm

A = area in acres

Interior Area 1 - $Q = 0.5 \times 3.4 \times 0.49 = 0.83$ c.f.s.
 $Q = 0.5 \times 5.1 \times 0.49 = 1.25$ c.f.s.

Interior Area 2 - $Q = 0.5 \times 3.4 \times 0.66 = 1.12$ c.f.s.
 $Q = 0.5 \times 5.1 \times 0.66 = 1.68$ c.f.s.

Interior Area 3 - $Q = 0.5 \times 3.4 \times 2.38 = 4.04$ c.f.s.
 $Q = 0.5 \times 5.1 \times 2.38 = 6.07$ c.f.s.

Interior Area 4 - $Q = 0.5 \times 3.4 \times 0.83 = 1.41$ c.f.s.
 $Q = 0.5 \times 5.1 \times 0.83 = 2.12$ c.f.s.

Interior Area 5 - $Q = 0.5 \times 3.4 \times 0.14 = 0.24$ c.f.s.
 $Q = 0.5 \times 5.1 \times 0.14 = 0.36$ c.f.s.

Exterior Area 1 - $Q = 0.7 \times 3.4 \times 0.32 = 0.76$ c.f.s.
 $Q = 0.7 \times 5.1 \times 0.32 = 1.14$ c.f.s.

Exterior Area 2 - $Q = 0.7 \times 3.4 \times 0.41 = 0.98$ c.f.s.
 $Q = 0.7 \times 5.1 \times 0.41 = 1.46$ c.f.s.

Exterior Area 3 - $Q = 0.7 \times 3.4 \times 0.36 = 0.86$ c.f.s.
 $Q = 0.7 \times 5.1 \times 0.36 = 1.29$ c.f.s.

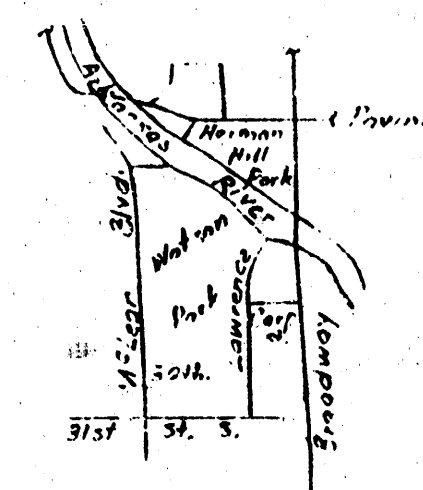
Combined Flows:

Carp Road $Q = E.A. 1 + E.A. 2 + I.A. 1 + I.A. 2 + I.A. 3 + I.A. 4$
 $Q = 0.76 + 0.98 + 0.83 + 1.12 + 4.04 + 1.41$
 $Q = 9.14$ c.f.s.

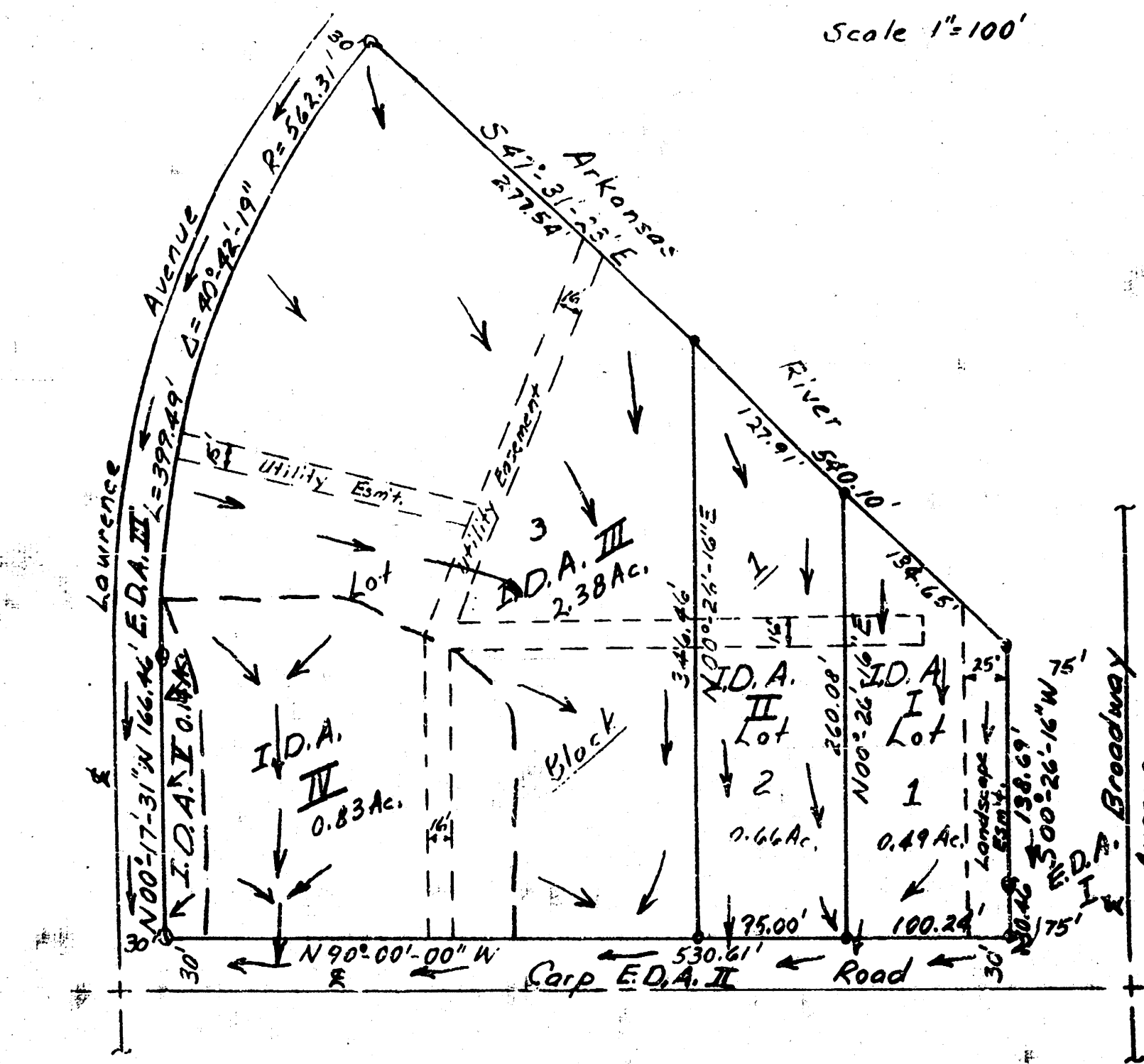
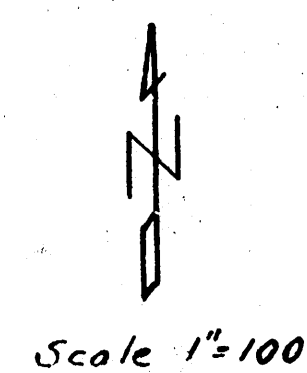
Lawrence Ave. $Q = 0.24 + 0.86 = 1.10$ c.f.s.

Combined Flows: $Q = 10.24$ c.f.s.

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Vicinity Map



ANAYA ADDITION

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