September 6, 1988

Ms. Susan Hayes
Storm Drainage Department
City of Fort Collins
P.O. Box 570
Fort Collins, Colorado 80522

RE: FINAL DRAINAGE REPORT FOR THE ELEVENTH FILING OF THE CENTRE FOR ADVANCED TECHNOLOGY

The Eleventh Filing to the Centre for Advanced Technology is located south of the Sixth Filing, north of the Fourth Filing, west of Research Boulevard and east of the New Mercer Ditch (see following vicinity map). More specifically this site is located near the middle of the south half of Section 23, Township 7 North, Range 69 West of the 6th Principal Meridian.

This location is, as is most of the Center site, covered with natural grasses. The ground slopes to the southeast at about 0.5%. The only recent change to the existing ground is that a detention pond was constructed on the northern part of this site. The detention pond is only temporary until the development of this site.

Developed flows from the site will be combined with the developed flows from the Sixth and Third Filings. These flows will accumulate in a permanent detention pond located in the central or main parking lot. This pond will be facilitated by the use of nine area inlets (see Drainage and Grading Plan) and a series of concrete pans. The maximum water surface for this pond will be at elevation 5038.08 which is 1.48 feet above the flow line of the inlets. The pond will have a maximum 100 year design storage volume of 1.738 ac.-ft. which compares to a required volume of 1.675 ac.-ft. (see following calculations). A 5 1/4 inch orifice plate will be placed at the invert-out of the most easterly manhole. This will be done to restrict the developed flows from this site, the Third Filing and the Sixth Filing to their two year historic level. This easterly manhole will then be connected to the storm drain system in Research Boulevard which was master planned as Basin A3 from the Drainage Report for the
Centre for Advanced Technology Special Improvement District, by RBD, Inc. Engineering Consultants, Feb. 1987. Any emergency overflow from this pond would flow east to a 5' type "R" inlet in Research Boulevard (see Drainage and Grading Plan).

This project was designed according to the City of Fort Collins Drainage Specifications to promote safe and positive drainage through this site.

Sincerely,

RBD, Inc.

\[Signature\]

Stan A. Myers, P.E.
Project Manager

\[Signature\]

Brian Cole, P.E.
Project Engineer

cc: 035-069
DATE: 2/22/88
PROJECT: CENTRE 6TH FILING
JOB NUMBER: 035-051
DESIGN ENGINEER: SAM

BASIN DESIGNATION = 3RD & 6TH COMBINED

DETERMINE EXISTING Q FOR 2 YEAR STORM

HISTORIC RUNOFF COEFFICIENT
BASIN SLOPE: .5 PERCENT
BASIN LENGTH 770 FEET
AREA: 3.66 ACRES

\[
\text{HIST TC} = 1.87 \times (1.1 - (1 \times \text{SARROOT})^{770}) \div 58,82643 \times 60,000 \times 60,000
\]

HISTORIC RAINFALL INTENSITY: .9558186 INCHES/HOUR
HISTORIC OUTFALL: .6996592 CUBIC FEET PER SECOND

DETERMINATION OF DETENTION POND VOLUME FOR DEVELOPED CONDITIONS

DEVELOPED STORM: 100 YEAR STORM
DEVELOPED RUNOFF COEFFICIENT 6.93

\[
\text{CCFAC} = \frac{6.93}{3.66} \times 3.170475 \times 1.25 \times 1
\]

DURATION GROSS VOL. OUTFLOW VOL. DETENTION VOL.
MIN CU. FT. CU. FT.
5 8674.42 209.8978 8464.521
10 13354.04 419.7956 129342.25
15 17006.43 629.6933 153767.74
30 23512.24 1259.387 22252.86
45 28248.93 1889.08 26359.85
60 29789.78 2518.773 27271.01
90 32186.66 3778.16 28408.5
120 32871.49 5037.546 27833.94
180 35640.77 7556.32 28054.45
360 39719.71 15112.64 24607.07

REQUIRED DETENTION VOLUME IS 6521693 ACRE FEET

ORIFICE DESIGN

\[
\text{WATER SURFACE} = 38.08
\text{INLET 1 IN. OUT} = 32.53
\text{EQ. USED: Q = 0.51 A} \sqrt{H}
\text{TR = 5 ¼" ORIFICE}
\text{Q = 1.65 cfs}
\text{Q \text{REQU.} = 1.64 cfs}
\therefore \text{CUT 5 ¼" ORIFICE}
\]

This unofficial copy was downloaded on Jul-11-2019 from the City of Fort Collins Public Records Website: http://citydocs.fcgov.com
For additional information or an official copy, please contact City of Fort Collins Utilities 700 Wood Street Fort Collins, CO 80524 USA