HYDROLOGY L22/D15 ONE PLAN

L22-D15

1 PLAN

4/24
Fred Please
Review RC.

LETTER OF TRANSMITTAL

MEURER, SERAFINI AND MEURER, INC.

2601 Wyoming Blvd., N.E. Suite F
Albuquerque, N.M. 87112/505 292-1936

RECEIVED
FEB 25 1980
CITY ENGINEER

Date Feb. 22, 1980

To Hydrology Dept.
Municipal Development Dept.
City of Albuquerque

Attn. Mr. Bruno Carvegliano

Re: Drainage Report for McDonald's @ Tramway and Central NE - 13301 E. Central

Comments: Two copies of the referenced drainage report are attached for your review & approval.

Enclosures:

Quantity	Type of Enclosure and Description
2	Drainage Reports

Thanks

Signed: Joseph W. Abbott

Copy to: File

If enclosures are not as noted, kindly notify us at once.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 28, 1980

RECEIVED
APR - 1 1980
M.S.M., INC.

Joseph W. Abbott
Meurer, Serafini and Meurer, Inc.
2601 Wyoming Blvd. NE Suite F
Albuquerque, New Mexico 87112

RE: McDONALD'S AT TRAMWAY & CENTRAL N.E.

Dear Mr. Abbott:

The following are my comments concerning the above referenced Drainage Report submitted to this office on March 26, 1980.

There is no positive discharge of the ponds as required by the Nov. Interim Drainage Guidelines.

There is a possibility of erosion from offsite flows along the East property line and the subsequent sediment deposit onto the roadway.

There is no balance indicated between the pond and the respective drainage area.

Are there any structures in close proximity of the proposed pond alongside the west property line?

If you have any questions concerning these comments, please feel free to call me.

Sincerely,

Fred J. Aguirre
Civil Engineer

FJA/tsl

cc: Drainage File

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DL

April 10, 1980

Mr. Joseph W. Abbott
Civil Engineer
Meurer, Serafini and Meurer, Inc.
2601 Wyoming Boulevard N. E.
Albuquerque, New Mexico 87112

Re: McDonald - Tramway and Central Drainage Report

Dear Mr. Abbott:

The referenced drainage report is approved, however, as per our telephone conversation on April 8, 1980 we agreed that you would relocate the drain pipe into the curb, per City standards, and that you would also provide piping protection for the inlet portion of the pipe that will be connected into the curb.

If you have any questions, please feel free to contact me.

Very truly yours,

Fred Aguirre

Fred Aguirre
Civil Engineer

FA:pp

cc: Mr. Rich Leonard, AMFCA
Drainage File

DRAINAGE REPORT

MCDONALD's AT TRAMWAY AND CENTRAL N.E.

ALBUQUERQUE, NEW MEXICO

FEBRUARY, 1980

Prepared for:

McDonald's Corporation
5353 Mission Center Road
Suite 209
San Diego, California 92108

Prepared by:

Meurer, Serafini and Meurer, Inc.
2601 Wyoming Blvd. N.E., Suite F
Albuquerque, New Mexico 87112
(505) 292-1936

BIBLIOGRAPHY OF REFERENCES

(1) Herkenhoff, Gordon & Associates, "Master Plan of Drainage City of Albuquerque, New Mexico and Environs, 1963". Albuquerque; Gordon Herkenhoff & Associates, Consulting Engineers.

(2) Wright-McLaughlin Engineers, "Urban Storm Drainage Criteria Manual, Volume 1", Denver, Colorado: Wright-McLaughlin Engineers, 1969.

(3) U.S. Department of Commerce, "Technical Paper, No. 40, Rainfall Frequency Atlas of the United States", Washington, D.C., U.S. Government Printing Office, 1963.

DRAINAGE REPORT

MCDONALDS AT TRAMWAY AND CENTRAL

GENERAL

This report presents the data, analysis, and calculations resulting from the drainage study of the proposed McDonalds at Tramway and Central, N.E.. It is situated within Section 27, Township 10 North, Range 4 East, N.M.P.M. The property encompasses 1.68 acres.

The existing site is bordered on the north by Interstate Highway 40 and on the south by East Central Avenue. There is also an existing Exxon station to the east of the site. The land has a general slope of approximately 3.5% and will drain from the northeast corner to the southwest corner of the property. The soil at the site is generally comprised of sandy soil.

An offsite area north of the existing Exxon station which comprises approximately .34 acres will contribute an offsite undeveloped flow. This area still exists in its natural state.

DESIGN CRITERIA

In analyzing the storm runoff, the Rational Formula, $Q = CIA\ C_f$, is used.[1]

Where:

Q = Runoff quantity in cubic feet/second.

A = Contributing area in acres.

C_f = Frequency factor for Rational Formula.

I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Figure II, Intensity Duration Frequency Curves, Albuquerque Area 1961. (Note: Where a Time of Concentration (T_C) is less than ten minutes from Figure III, the intensity value derived from the T_C equal to ten minutes is employed).

C = Runoff Coefficient (No Unit). This coefficient represents the integrated effects of infiltration, detention storage, evaporation, retention, flow routing, and interception which all affect the time distribution and peak rate of runoff.

ESTIMATED RUNOFF UNDEVELOPED STATE

Drainage within the boundary of the site is basically overland flow. As previously mentioned, approximately 0.34 acres of overland off-site flow enters the property along the east boundary line. This flow is historic and will pass through the site. Within the boundary of the site itself, there exists 1.12 acres of pervious area and 0.56 acres of impervious area.

The total runoff in the undeveloped site forms the basis for comparison with the flow in the developed state.

ESTIMATED RUNOFF DEVELOPED STATE

As development occurs, the area of impervious surfaces increases and thereby the amount of runoff also increases. To offset this increase,

onsite restrictions of flows must be incorporated into the development. While this can take different forms, the most practical solution for this type of development is to utilize on-lot ponding. The on-site ponding shall be within three ponding areas. The northern pond shall retain most of the runoff from the unimproved area to the north of the parking lot. The southern ponding areas shall retain the remaining portion of the developed runoff from this site. This approach will satisfy AMAFCA's requirement that the runoff rate from the developed tract will not exceed the runoff rate from the tract in its natural state. The runoff coefficients, for various surfaces are as follows:

Walks, Drives, and Parking Lots	C = 0.90
Roofs	C = 0.90
Undeveloped Area	C = 0.40

Prepared by:

Joseph W. Abbott
Joseph W. Abbott
Project Engineer

Approved by:

James E. Blackwell, P.E.
Land Development
Department Head

JWA:vlt

JAMES E. BLACKWELL
NEW MEXICO
7145
REGISTERED PROFESSIONAL ENGINEER

APPENDIX - 1

COMPOSITE RUNOFF COEFFICIENT

Undeveloped State

Site Area	1.68 acres
Off-site Area	0.34 acres
Gross Contributing Area	2.02 acres

Existing Impervious Area	0.56 acres
Existing On-site Pervious area	1.12 acres
Existing Off-site pervious area	0.34 acres

Existing impervious area	27.72% @ 0.90	.249
Existing On-site pervious area	55.45% @ 0.40	.222
Existing Off-site pervious area	16.83% @ 0.40	.067
Undeveloped Composite Runoff		.538

Developed State

Site Area	1.68 acres
Off-site Area	0.34 acres
Gross Contributing Area	2.02 acres

Developed impervious area	1.059 acres
Developed On-site pervious area	.276 acres
Developed Off-site pervious area	0.34 acres

APPENDIX - 1

COMPOSITE RUNOFF COEFFICIENT

CONTINUED

Developed impervious area	63.22% @ 0.90	.569
Developed On-site pervious area	16.48% @ 0.40	.066
Developed Off-site pervious area	20.30% @ 0.40	.081
Developed Composite Runoff		.716

APPENDIX - 2

POND VOLUME REQUIREMENTS

100 year, 6 hour precipitation = 2.2 inches

Volume = Runoff Coefficient X Area X Precipitation

Undeveloped Volume

$$V = 0.538 \times 2.02 \times 43560 \times \frac{2.2}{12} = 8678 \text{ cu.ft.}$$

Developed Volume

$$V = 0.716 \times 1.675 \times 43560 \times \frac{2.2}{12} = 9577 \text{ cu.ft.}$$

Required Pond Volume = Developed Volume - Undeveloped Volume =

9577 - 8678 = 899 cu.ft.

1 8 5 4