HYDROLOGY G13/D6 ONE PLAN

G13-D6

1 PLAN

MacCornack & Burns
consulting engineers, inc.
1721 Girard Boulevard, N.E.
Albuquerque, New Mexico 87106
a division of Boyle Engineering Corporation
505 / 266-7789

July 26, 1977

ASHCRAFT CONSTRUCTION CO.
Attention Clarence Ashcraft
811 Dallas N.E.
Albuquerque, NM 87108

Storm Drainage Study Relative to Site Plan Development of MATTHEW MEADOW, Albuquerque, New Mexico

Transmitted herewith is the "Storm Drainage Study relative to site plan development of Matthew Meadow, Albuquerque, New Mexico.

This study comprises a comprehensive analysis in accordance with the requirements of Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority, and the City of Albuquerque.

Thank you for the opportunity of participating in your project.

MacCORNACK & BURNS, Consulting Engineers

Fred Burns

Fred Burns, PE

bb
Enclosure

APR 12 1979

City of Albuquerque

WATER RESOURCES DEPARTMENT
ENGINEERING DIVISION

MEMORANDUM: April 9, 1979

TO: Mr. Gerald D. Davenport, Director
Department of Municipal Development

FROM: Paul D. Noland, Director
Water Resources Department

SUBJECT: MATTHEW MEADOWS SUBDIVISION

The drainage layout in Matthew Meadows, with estate curb and sidewalk depressed below the shoulder of the street creates an intolerable operation burden for this department. Even a small amount of rainfall fills up the water meter boxes with water and silt rendering the meters unreadable until they have been cleaned.

This department will not approve any future subdivisions with a drainage layout similar to Matthew Meadows unless adequate allowances are made to provide for installing water meters above the flooding level.

PDN:CALP:ler

cc: Richard Swallows
W. H. Nickerson, Jr.
M. E. Mendoza
C. A. L. Pilley
f/ Reader's

cc: Matthew Meadows file
ORIG: [illegible]

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

September 9, 1981

Mr. Fred Burns
Boyle Engineering
3939 San Pedro Drive N.E., Suite D
Albuquerque, New Mexico 87110

Re: Matthew Meadows Subdivision

Dear Mr. Burns:

The City granted approval to the development of the captioned subdivision on the strength of your findings and of the recommendations which were articulated in the drainage report, dated July, 1977.

In that report you related your anticipation that, on the basis of the results of the soil and infiltration tests performed, the runoff collected in the ponding areas adjacent to the streets would disperse in the ground over a period of 3 to 7 hours.

As you know, (see EPC Findings dated June 27, 1977) the provision of a satisfactory solution was one of the major concerns at the time of your application for subdivision approval.

Regrettably, three years of operations have conclusively demonstrated that the adopted scheme is altogether inadequate. Even after relatively minor storms, the ponds remain waterlogged and muddy for days, causing great inconveniences to the residents and constitute both a health as well as a safety hazard.

In view of the above, the City must ask your organization to review the existing conditions and submit recommendations for an effective resolution of this disturbing problem. Your findings must determine the reasons for the lack of performance observed and the means to solve the problem. The City will then request the developer to install the facilities required to remove this public nuisance.

While waiting to hear from you in the very near future I remain

Very truly yours,

Richard S. Heller

Richard S. Heller
City Engineer

BC/RSH/fs
cc: C. Rodolph, F. Bertoletti, M. deVesty, Ashcraft Const. Co.

Boyle Engineering Corporation

Suite D
3939 San Pedro N.E.
Albuquerque, New Mexico 87110

consulting engineers

505 / 883-7700

City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexic 87103

September 29, 1981

Attention: Mr. Richard S. Heller
City Engineer

RE: Mathew Meadow Subdivision

Dear Mr. Heller:

Our staff has made several trips to the Mathew Meadow Subdivision to determine the cause(s) of the apparent drainage problems referred to in your letter of September 9, 1981. We have also reviewed the subject drainage report and its supporting documents and have affirmed that its conclusions and recommendations were correct, based upon the soils report and estimated precipitation for the design storm return period. The said report was also based upon a City of Albuquerque requirement that complete on-site containment of storm water run-off be achieved to prevent any threat of flooding to adjacent properties.

Although our staff found some scattered sites that were not completely drained, no large puddles of standing water were observed. The lots on which water tended to remain in the front ponding area, were not graded in accordance with our recommendation that a minimum of 50% of each lot and roof structure drain to a back yard pond. These back yard ponds should have a minimum storage capacity of 483 cubic feet. It was also observed that the homes that seem to be having drainage problems were newly constructed, relative to the other homes in the subdivision, and had not been landscaped.

We recommend that each lot not draining properly be inspected for conformance with our grading recommendation and be regraded if necessary. We further recommend that each lot be landscaped as soon as possible after construction, this will minimize the opportunity for clays and silts from newly disturbed soil to wash into the ponding areas and decrease absorbtion capacity. A typical plan for the back lot ponding area is enclosed.

If we can be of further assistance please feel free to call.

Sincerely yours,

BOYLE ENGINEERING CORPORATION

Fred Burns

Fred Burns, P.E.
Regional Vice President

RSH	DMA	ADM	
HRO		SUR	
CDS		COUN	
DES		SEC	
RSP		(CE)	
(HYDRO)		RETURN	→

RECEIVED
SEP 30 1981
CITY ENGINEER

Does not seem to answer the original question! Please respond

FB:cc
Enclosure

STORM DRAINAGE STUDY

RELATIVE TO SITE PLAN DEVELOPMENT OF

MATTHEW MEADOW

ALBUQUERQUE, NEW MEXICO

JULY, 1977

MacCORNACK & BURNS, Consulting Engineers
a division of BOYLE ENGINEERING CORPORATION
1721 Girard Boulevard N.E.
Albuquerque, New Mexico 87106

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STORM DRAINAGE STUDY

RELATIVE TO SITE PLAN DEVELOPMENT OF

MATTHEW MEADOW

ALBUQUERQUE, NEW MEXICO

I. PURPOSE: This report is to present storm runoff drainage data relative to the proposed development of Matthew Meadow. Contents of this report outline development construction guidelines that will provide for on-site storage of storm runoff and eliminate the threat of flooding on the study site and adjacent areas in the event of a 100-year storm.

2. SCOPE: Information presented in this report is limited to an investigation of on-site storage of storm runoff and the results of storm runoff from immediately adjacent properties. It is not within the scope of this report to define potential flow rates or water surface elevations as a result of a 100-year storm in the Rio Grande drainage basin. Though limited in scope, this report does satisfy the requirements of AMAFCA Resolution 1972-2, Section 3, Paragraphs A and B, in that existing water courses will not be affected nor will their capacity be exceeded as a result of the proposed construction. Analysis of the study site has been based on development in accordance with RA-1 zoning regulations and runoff coefficient of .35.

3. LOCATION: Matthew Meadow is located in the south half of Section 6, T10N, R3E NMPM and is a portion of the area

bounded by 12th Street, Matthew Avenue, Rio Grande Boulevard and Candelaria with approximately 2,200 feet of frontage on Matthew Avenue and consisting of approximately 84.5 acres.

4. EXISTING DRAINAGE CONDITIONS: The tract is located in the valley section of Albuquerque in an area that is generally very flat with slopes of .11 percent or less. Drainage is generally in a southern direction following what was the Rio Grande overbank flood plain. Development of the area has, until recently, been devoted to agriculture; as a result, the original flow patterns have been disrupted by natural and man-made ponding areas, irrigation ditches and drainage laterals. With the recent development of nearby areas in either a suburban or rural residential atmosphere, large runoff areas have been isolated which minimize the threat of flooding from these areas.

Threat of flooding from the east heights of Albuquerque, historically the pattern for the valley areas, has been virtually eliminated by the construction of the Twin Ditches. Local storm drainage systems dispose of the local nuisance accumulations.

The site itself is presently undeveloped and has been used for agricultural purposes. Drainage on the site is to the south although the area, for the most part, is relatively flat. In the past, excessive storm runoff drained from the site to the Alameda drain through an existing culvert located at the south edge of the property. Development plans as outlined in this report have been directed to containing

runoff on the site in order to prevent any threat of flooding to adjacent properties.

Soils on the site consist primarily of shallow intervals of clayey, silty sands and clay and silt overlying clean to silty sand or clayey sands. Ground water was not encountered in the test holes which ranged from fifteen to twenty feet in depth. The low water table will allow for disposal of the ponded water through percolation. Percolation rates on the site varied from sixteen to twenty-eight minutes per inch. With on-site storage requiring ponding depths of up to fifteen inches, ponding areas will be emptied through percolation in less than twenty-four hours.

Flow from adjacent properties is minimal due to existing ditches, drainage laterals and existing storm drain systems. Areas immediately north of the site, which may contribute flow to the study site, are either vacant or used for agriculture.

5. PROPOSED DRAINAGE PLANS:

A. Criteria:

1. General: Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority. At the request of the City of Albuquerque, special emphasis has been placed on preventing storm runoff from leaving the property.

2. Project Storm: 100-year intensity; frequency

duration as shown on the Curves Chart 1, "1963 Master Plan of Drainage for the City of Albuquerque and Environs", as prepared by Gordon Herkenhoff and Associates, Inc., Consulting Engineers.

3. Supplemental Reports: "Soil Investigation - Matthew Meadow," as prepared by F. M. Fox & Associates, Inc., Consulting Engineers and Geologists.

B. Flood Protection:

1. Existing Conditions: As noted earlier, there are no natural watercourses on the site nor large adjacent areas contributing runoff. The small existing flows from adjacent areas to the north can be contained with small berms with no adverse effect. Flows from other nearby adjacent areas are diverted by either berms, ditches, streets, or the existing topography. Conditions on the site itself will be maintained using on-site storage to prevent the escape of storm runoff to adjacent downstream properties.

2. Future Development: As development of the nearby rural areas continues, existing ponding areas will be eliminated. Assuming that the criteria for the future development of adjacent areas will be identical to the development which is the subject of this report, future development will not significantly alter drainage patterns on the site.

C. Site Drainage:

Proposed plans for the development of the site are based on RA-1 zoning regulations with a density of approximately 2.3 dwellings per acre. Zero storm runoff from the site will be maintained using on-site storage ponds. Ponding will be provided adjacent to the new residential streets and in shallow ponds located in the rear of each lot. Residential streets will be the estate type sections with four foot sidewalks on either side of the road. Sidewalks will be installed fifteen inches below the top of the curbing in order to provide a minimum of 1200 cubic feet of storage per lot. The additional storage created through the use of back yard ponding will provide an additional 478 cubic feet of storage per lot. Typical back yard grading and sidewalk sections are included in Figure 1.

The depressed sidewalks will not extend across the lot driveways. This will prevent flows from lot to lot and force ponding on each lot contributing the runoff.

Disposal of the ponded water will be through percolation into the subsoil. Results of percolation tests throughout the site indicate a minimum disposal rate of one inch in 28 minutes and a maximum of one inch in 16 minutes. Tests were run over a four hour period and the results indicated are the average infiltration rates. As a result of these tests, it is anticipated that ponded water will be disposed of in three to seven hours.

Adjacent areas which possibly could contribute flow to the site are presently undeveloped or being used for

agriculture. Installation of berms approximately one foot high will prevent flows onto the site and will have no adverse effect on the adjacent properties.

6. CONCLUSIONS AND RECOMMENDATIONS:

A. Provide site grading such that a minimum of fifty percent (50%) of each lot and roof structure will drain to a back yard pond containing a minimum storage volume of 483 cubic feet.

B. Construct forty-eight inch (48") sidewalks, fifteen inches (15") below curb elevation to provide a minimum of 1,205 cubic feet of ponding volume for each lot.

C. Construct one foot (1') berms as shown on Figure 1 to prevent flows from adjacent property.

D. Set finished floor elevation a minimum of one foot (1') above curb elevation in order to provide adequate drainage and to minimize the effect of the temporary ponding on the residential foundations.

Provided the above listed recommendations are implemented concurrent with the development of the property, it is concluded that the proposed development will not create a flood hazard to surrounding properties, nor will the property itself be in danger of flooding.

Respectfully submitted,

MacCORNACK & BURNS, Consulting Engineers

Fred Burns

Fred Burns, PE

New Mexico Registration #4000

APPENDIX

Job Matthew Meadows
Subject Drainage Study
Client
Sheet No. 1 of
Job No. A07-100-50
By VJC Date 7/8/77

MAC CORNACK & BURNS Consulting Engineers, Inc., Albuquerque, NM

Drainage Study Based on Containing On-Site Runoff

Acreage of Site = 84.5 Ac.

Runoff Coefficient = .35

Total No. of Lots = 196

Total Runoff = 84.5 (3/12)(43560)(.35) = 322,072 ft^3

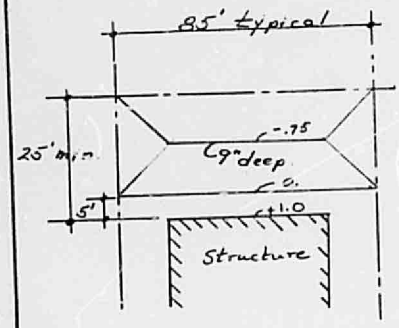
Ave Storage Req. per Lot = 1643 ft^3

Typical Lot ≈ 85' x 130'

Ck. Min. Cap. for back yard Storage Available.

Rear Yard Setback = 25'

Min. Dist. from Foundation = 5'



Min. Vol. Avail. = 15(85)(.5)(.25) = 478 ft^3

Ck. for Adeq. flow to back yard ponds.

Grade for 50% of lot & roof area to flow to back yard.

For typical lot
Vol. = .35 (85)(130)(.5)(3/12) = 483 ft^3
∴ Total Pond Capacity will be used.

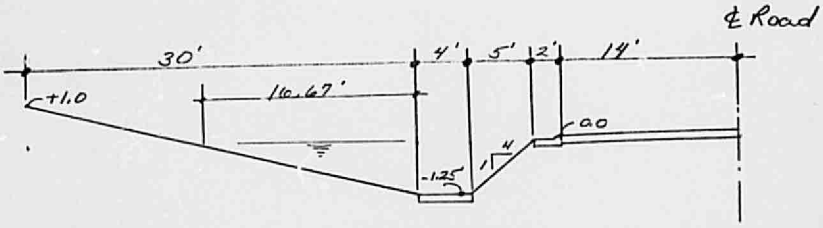
Job Matthew Meadow
Subject Drainage Study
Client

Sheet No. 2 of
Job No. A07-1007-50
By VJC Date 7/11/77

MAC CORNACK & BURNS Consulting Engineers, Inc., Albuquerque, NM

Remaining Storage Req. = 1643 − 478 = 1165 ft^3 per lot.

Min. Frontage Avail. = 85' less 20' for driveways = 65'



Vol per foot = 16.67(1.25)(.5) + 1.25(4) + 1.25(5)(.5) = 18.5 ft^3/ft

Storage Avail. = 18.5(65') = 1205 ft^3 > 1165 ∴ ok.

∴ With proper grading on-site storage is available to eliminate storm runoff in the event of a 100-yr. storm.

Max. Percolation time required.

Front − t = 15 inches (28) $\frac{min}{inch}$ = 420 min = 7 hrs.

Back t = 9 (28) = 252 min. = 4.2 hrs.

1 8 7 9