City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 11, 1994

Gregory Krenik, P.E.
D. Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, N.M. 87199

RE: ENGINEER'S CERTIFICATION FOR CACTUS HILLS SUBD (C13/D3)
RECEIVED JULY 5, 1994 FOR FINANCIAL GUARANTY RELEASE
ENGINEER'S STAMP DATED 7-1-94

Dear Mr. Krenik:

Based on the information included in the submittal referenced above, City Hydrology accepts the Engineer's Certification of grading & drainage and releases the Financial Guaranty for Project # 4720.90.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Lynda Michelle DeVanti, Project # 4720.90

WPHYD/7508/jpc

Accepted by Const. Mgmt
June, 1994?

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 9, 1993

Gregory Krenik, P.E.
D. Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, N.M. 87199

RE: DRAINAGE REPORT FOR CACTUS HILLS SUBDIVISION (C13/D3)
RECEIVED AUGUST 4, 1993 FOR WORK ORDER APPROVAL
ENGINEER'S STAMP DATED 7-22-93

Dear Mr. Krenik:

Based on the information included in the submittal referenced above, City Hydrology APPROVES this project for Work Order.

A Topsoil Disturbance Permit must be approved by Environmental Health prior to construction.

Engineer's Certification of grades per the DPM checklist must be approved before the Financial Guaranty will be released.

If you have any questions about this project, you may contact me at 768-2727.

Sincerely

John P. Curtin, P.E.
PWD/Hydrology

xc: Alan Martinez

WPHYD+7508;jpc

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 15, 1993

Gregory Krenik, P.E.
D. Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, N.M. 87199

RE: DRAINAGE REPORT FOR CACTUS HILLS SUBDIVISION (C13/D3)
RECEIVED APRIL 1, 1993 FOR FINAL PLAT APPROVAL
ENGINEER'S STAMP DATED 3-16-93

Dear Mr. Krenik:

Based on the information included in the submittal referenced above, City Hydrology APPROVES this project for Final Plat.

Include a profile of the Stone Hills storm drain in the construction plans for Work Order.

Engineer's Certification of grades per the DPM checklist must be approved before the Financial Guaranty will be released.

If you have any questions about this project, you may contact me at 768-2727.

Sincerely

John P. Curtin

John P. Curtin, P.E.
PWD/Hydrology

xc: Fred Aguirre, DRB

WPHYD+7508;jpc

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 2, 1993

Gregory Krenik, P.E.
D. Mark Goodwin & Assoc.
P.O. Box 90606
Albuquerque, N.M. 87199

C13/D3

RE: DRAINAGE REPORT & GRADING PLAN FOR CACTUS HILLS SUBDIVISION ~~(B12/D1E)~~
SUBMITTED FEBRUARY 19, 1993 FOR PRELIMINARY PLAT & ROUGH GRADING APPROVAL
STAMPED & DATED 2-18-93

Dear Mr. Krenik:

Based on the information included in the submittal referenced above, City Hydrology APPROVES this project for Preliminary Plat and Rough Grading. The extent of storm drain improvements may change as design details are determined.

The following comments need to be addressed prior to Work Order Approval:

1. Add Map of Off-Site Basins. Indicate the peak flow for the basin and the critical flow rate for the pond design at 16.5 minutes. Be careful how you use flow rates for basins. On page 5 of your discussion you discuss the peak flows for the basins in the same paragraph with the peak flow for the pond. This gives the impression that the sum of the individual peaks is equal to the peak at the pond. Label drainage basins on plan or refer to Sheet 26 of the report.

2. Check if there is a Hydraulic jump at the transition from a 6' to 10' chute @ 15. Page 85 of the DPM reduces the capacity of Type B inlets if they are not preceded by a Type A inlet. The inlets need to be closer to the chute to keep the runoff within the right of way.

3. Correct the Q entering the pond from Congress Avenue. Show standard curb & gutter on both sides of Cactus Hill on Sheet 2.

If you have any questions about this project, you may contact me at 768-2727.

Sincerely

John P. Curtin

John P. Curtin, P.E.
PWD/Hydrology

xc: Fred Aguirre, DRB
Alan Martinez, Permits

WPHYD+7508;jpc

DRAINAGE REPORT

FOR

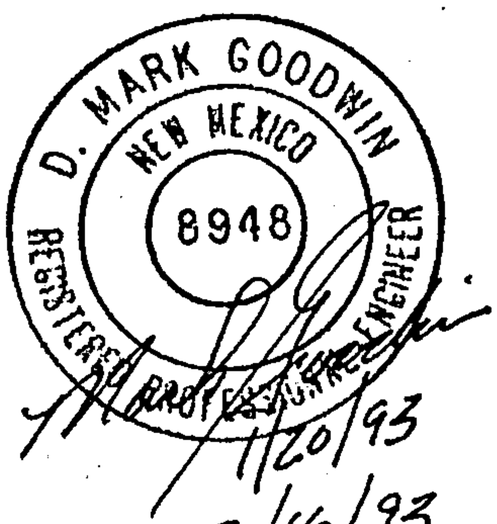
Cactus Hills Subdivision

C13/D13

Prepared for:

Alvarado Realty
10 Tramway Loop NE
Albuquerque, NM 87122

January 1993



1/20/93
2/16/93
3/16/93

PURPOSE

The purpose of this report is to present the drainage management plan for the Cactus Hills Subdivision to obtain final plat and work order approval. All applicable ordinances and the DPM were utilized to prepare this plan. Since we are tieing into the Eagle Ranch Stormdrain, the rational method was employed.

EXISTING CONDITIONS

The project comprises an area of 31.5705 acres at the east end of Paradise Hills (better known as Tracts 14A-1, 14A-2 & 13A-1 of Eagle Ranch). This site is bounded by the existing Congress Heights Subdivision to the west, Congress Avenue to the north, Eagle Ranch Road to the southeast, Tract 17-B (Leslie Homes) to the southwest and the State Farm Insurance parcel to the east. (See the attached Vicinity Map.)

The tract is fairly steep, sloping from southwest to northeast at approximately 10 percent with some areas at 20 percent. Vegetative cover is typical of west side property, and the soils are sandy. There is an existing drainage pond on site which serves the site and the area northwest of the site. This pond is part of the Eagle Ranch Stormdrain that runs along and through the east side of the site. There is a 30 inch concrete outfall in the southwest corner of the site which conveys the flow from part of Congress Heights onto this site. The water then flows overland to the drainage pond which is connected to the stormdrain. The site drains overland and into the pond from the west. From the south it is collected in a recessed area and directly discharged into the Eagle Ranch Stormdrain through an inlet. In addition to the outfall from the Congress Heights Subdivision, it appears, due to noncompliance with the approved drainage plan for said subdivision on file with the City of Albuquerque, there are flows caused by rear yard ponding areas that were not constructed or eliminated. This causes sheet flow to pass through an existing cedar fence onto the project site.

To complete this report, which basically states how we can tie into the existing Eagle Ranch Stormdrain, involved the research and analysis of seven (7) previous drainage reports. All of these reports, except one, were to use the Eagle Ranch Stormdrain Report (ERSR) (Appendix A) prepared by Easterling and Associates, Inc., January 1985, as their guidelines. The one report which is excluded from the group was the report by Leverton-Easterling, Inc. entitled "Conceptual Drainage Plan for Eagle Ranch, June 22, 1984," (Appendix B) which was the base for the ERSR.

This report will go through the addition of the reports as to how they relate to the ERSR chronologically because there are major discrepancies in the outflow from the designed properties and what was allowed in the ERSR.

Allowed Outflow to Eagle Ranch Stormdrain per Parcel, per Approved ERSR

Parcel Name	Outflow (cfs)
Congress Heights, along Paradise Boulevard	116
R.J. Shaefer	30
Tract 17-A	3
Tract 17-B (Leslie Homes)	14
Tract 14 (Cactus Hills)	6
Pond on Tract 14	34
Potential Cubby Hole Property	11
Adobe Wells Subdivision	10
TOTAL	224 cfs

The first development was the Congress Heights Subdivision (Appendix C). This report was completed by Tierra Engineering Consultants, Inc., March 10, 1987. The subdivision drains 2/3 of it's runoff directly offsite, and the remainder goes into a pond on the Cactus Ridge parcel along Paradise Boulevard. Of the 2/3, half drains onto Congress Avenue and into the pond on Tract 14. The remaining area drains onto Tract 14 through a 30 inch outfall and then flows overland to the pond on Tract 14.

Summary of Congress Heights

Flow Area	Flow (cfs)
On Congress Avenue	51.7
Into Pond on Paradise Boulevard	77.0
Onto Tract 14	39.9

The second development was the Adobe Wells Subdivision (Appendix D). This was completed by Bohannan-Huston, Inc., July 30, 1985. This report shows the runoff directly into the Eagle Ranch Stormdrain with a total Q of 85.6 cfs. This is much greater than the 10 cfs allowed by the ERSR. This is not a problem at this point until the tracts upstream are developed. This report was started before the ERSR but was not completed until after the ERSR was finalized.

The third development to occur was the Albuquerque West Unit One Drainage Report, October 22, 1990 (AKA; R.J. Shaefer) (Appendix E). This subdivision drains onto Eagle Ranch Road, Paradise Boulevard and a detention pond at the terminus of the Eagle Ranch Stormdrain.

The problem with this report is it used the conceptual 1984 report (Appendix B) to obtain its offsite flow into the Eagle Ranch Stormdrain. The outfall from this parcel is 57.7 cfs as compared to the allowable 30 cfs, per the Appoved ERSR. The consequences are 1) available capacity for the downstream owners, including the pond on Tract 14, is gone, 2) the Eagle Ranch Stormdrain is over capacity where this line ties into it. This added flow is the main problem with the development of any tract downstream.

With this area combined with the previous two reports, the total Q in the line is 220.3 cfs. This almost equals the 224 cfs the system was designed for and there are still six (6) tracts to be added to the system.

The fourth report is for a portion of the Adobe Wells Subdivision, the U.S. New Mexico Federal Credit Union, completed by Jeff Mortensen & Associates, Inc., June 14, 1991 (Appendix F). Reference was made to the ERSR and the design flow from the report was used for this point but with no regard to any of the previous reports. The problem is a total Q of 22.3 cfs was added which is greater than the 10 cfs allowed for the entire tract in the previous report.

To this point, no analysis of combined flow in the Eagle Ranch Stormdrain system was done. Each report should not have allowed more than the allowed amount per the Approved ERSR.

The fifth report completed by Bohannan-Huston, Inc., February 1992, was for the Cactus Ridge Subdivision (Appendix G). This parcel is the same parcel that the first report put its drainage pond on. A thorough investigation of the ERSR was completed. The final analysis showed a final Q entering the system of 107.6 cfs, which actually was less than the 116 cfs allowed by the ERSR.

Below are the actual conditions per all of the drainage reports.

Parcel	Design Reports Flow (cfs)	ERSR Design Flow (cfs)
Entrance to system along Paradise Boulevard	107.6	116
R.J. Shaefer	57.7	30
Tract 17-A	---	3
Tract 17-B	---	14
Tract 14	---	6
Pond on Tract 14	52.0	34
Cubby Hole	11.0	11
Adobe Wells Subdivision	85.6	10
TOTAL	313.9	224

Obviously changes to the system need to be made. Not all of these designs are constructed to date, namely the Proposed Cubby Hole storage facility and Adobe Wells Subdivision. The Proposed Management Plan will show how this system can be made to work.

HYDROLOGIC ANALYSIS

The rational method was utilized for this analysis because the initial system and all other systems had employed it. All of the pertinent hydrologic parameters and calculation methods are located in the appendix of this report.

PROPOSED MANAGEMENT PLAN

As a developed site, this plan proposes to discharge stormwater runoff at five (5) locations. Four (4) of the locations ultimately will reach the same drainage system, the Eagle Ranch Stormdrain, while the other will runoff into Eagle Ranch Road and ultimately end up at Coors Road. The site will discharge 33.78 cfs into the drainage pond along Congress Avenue via 2 catch basins and a concrete channel, 40.76 cfs directly into the Eagle Ranch Stormdrain and 1.1529 cfs onto Eagle Ranch Road. Also, the 39.9 cfs which is discharged from the Congress Heights Subdivision will flow through this site and into the drainage pond (see drainage maps 1 & 2).

The 33.78 cfs joins with the 39.9 cfs from Congress Heights (Appendix C), the 81.0 cfs from Eagle Ranch Basin F2 (Appendix C), the 76.4 cfs from Eagle Ranch Basin F3 (Appendix C) and the 120.0 cfs from Eagle Ranch Basin F4 (Appendix H and Sheet 19 of the Calculations) to combine to a peak inflow to the drainage pond of Q = 248.0 cfs at T=16.5 minutes. The pond will discharge at a Q of 10 cfs into the Eagle Ranch Stormdrain. Note that the peak flows from each basin do not add directly to obtain the 248 cfs. There is a lag time on each and is graphically shown on Sheet 23 of the Calculations.

From the previous information it is not possible to add the Cactus Hills flow to the existing approved conditions for the Eagle Ranch Stormdrain. Therefore, the system has been reanalyzed to allow additional discharge from the undeveloped properties along the system.

REDESIGN OF EAGLE RANCH STORMDRAIN

See Eagle Ranch Stormdrain area map for overview.

This design includes the developed flows for Tract 17-B, as well as those of Cactus Hills. The first step was simulating the information from the ERSR using the HYDRAFLOW computer program. Once this was accomplished it was then a matter of inserting the existing flows in place of the designed flows. This was not an acceptable solution because the hydraulic gradeline was averaging 20-25 feet above the manholes.

Refer to Appendix A for individual line locations of the Eagle Ranch Stormdrain. These lines are cross-referenced in the Hydraulic Report for same.

The end result requires additional fill over line 3 and parts of lines 2 and 4, in addition to the sealing of some manholes. These redesigned flows are expressed in the following table:

Parcel	Designed Report Flow (cfs)		Reanalyzed Flows (cfs)
Congress Heights & Cactus Ridge along Paradise Boulevard	107.6		107.6
R.J. Shaefer	57.7		57.7
Tract 17-A	---		3.0
Tract 17-B	28.0 *		28.0
Cactus Hills	40.76		40.76
Pond on Tract 14	52.0		10.0
Cubby Hole	11.0		6.0
Adobe Wells Subdivision	85.6	0.1 cfs/acre =	2.31
TOTAL	382.66		255.37

* report submitted simultaneously with this report

The critical area of the redesign was restricting the pond discharge and reducing the outflow of the Adobe Wells commercial section.

The data for the reanalysis is expressed in printout form as well as graphical. From the output it is clear the system will work as stated above. With the reanalysis of the Eagle Ranch Stormdrain (E.R.S.) restricting the drainage pond was imperative. The entire runoff from the areas which drain into the Cactus Hill pond (8.6047 AC-FT) can be contained without outflow. The total pond volume is 9.9761 AC-FT. The outflow was reduced from 52 cfs to 10 cfs by installing a 12" orifice plate over the existing outflow structure. Total depth of the pond is nine (9) feet and the total runoff stage is eight (8) feet. The pond therefore has an additional storage capacity of one (1) foot or approximately 1.32 AC-FT. Since the pond is under both ten (10) AC-FT and ten (10) feet in depth it does not fall under the State Engineer's jurisdiction. There is no need to modify the existing rip-rap emergency spillway onto Congress Avenue with this design.

The final solution is based on the fact that it is easier to pond a commercial site than a residential site and an agreement prior to this submittal with the City's Hydrology Department.

The area of Cactus Hills that was able to be drained into the pond was about 45%. The remainder of which is discharged directly into the ERS.

Likewise, the logistics of Tract 17-B, location of entrance and slope, leave it as a total direct discharge site.

The proposed Cubby Hole site has a pond on it. This pond is capable of retaining the entire runoff for its particular drainage area (see calculations, page 39). Also, this site is slated to be commercial use. Since the pond retains the entire runoff, the discharge to the ERS could be reduced to 6 cfs. In fact, if need be, it can be reduced even more.

The Adobe Wells Subdivision is a mixture of both residential and commercial use. The area running along the ERS is commercial and therefore the discharge rate was reduced. It is possible for the area nearest the arroyo to discharge through its own outfall which would decrease the ponding area.

The Congress Heights / Cactus Ridge area is a residential use and built out. This area did not require revision since its discharge is below the allowed value.

The R.J. Schaefer discharge overloads the systems from its connection to the ERS to where Tract 17-B connects to the ERS. As this site develops, care should be taken to reduce the discharge of the area inton the ERS.

Tract 17-A is undeveloped and could be developed as either residential or commercial. The original value of this tract was used for the ERS design. The only problem this site has is its runoff will discharge into an over capacity line from the R.J. Schaefer discharge.

INTERIM EROSION CONTROL

Due to the sensitive nature of the sandy soils associated with this site, an Erosion Control Plan is part of this report and project.

The plan centers on the fact that storm waters will not be allowed free discharge during the construction process until all street paving is accomplished.

CONCLUSIONS

The proposed Cactus Hills Subdivision, comprising 119 lots on 31.5705 acres, can be readily accommodated through the implementation of this plan. The only improvements would be to place a reducing orifice plate on the drainage pond outflow on the Cactus Hills site and also on the small pond on the Cubby Hole site, raise the manhole at the high end of line 2, as well as add fill to match the new rim elevation and seal the manholes at the high end of line 4 and at the high end of line 12. It has been adequately shown in this report that the redesign system will work and the added flows from Cactus Hills and Tract 17-B will not overload the Eagle Ranch Stormdrain, and in doing so meets all current City requirements. This solution should be desirable since runoff control will be placed on likely commercial tracts in lieu of residential projects. Existing developments will not have to be modified and future developments will have reasonable discharge rates. Only minor modifications to the existing ponding area and storm drain will need to be accomplished and no new facilities will be required.

DESIGN REPORT

FOR

EAGLE RANCH STORMDRAIN

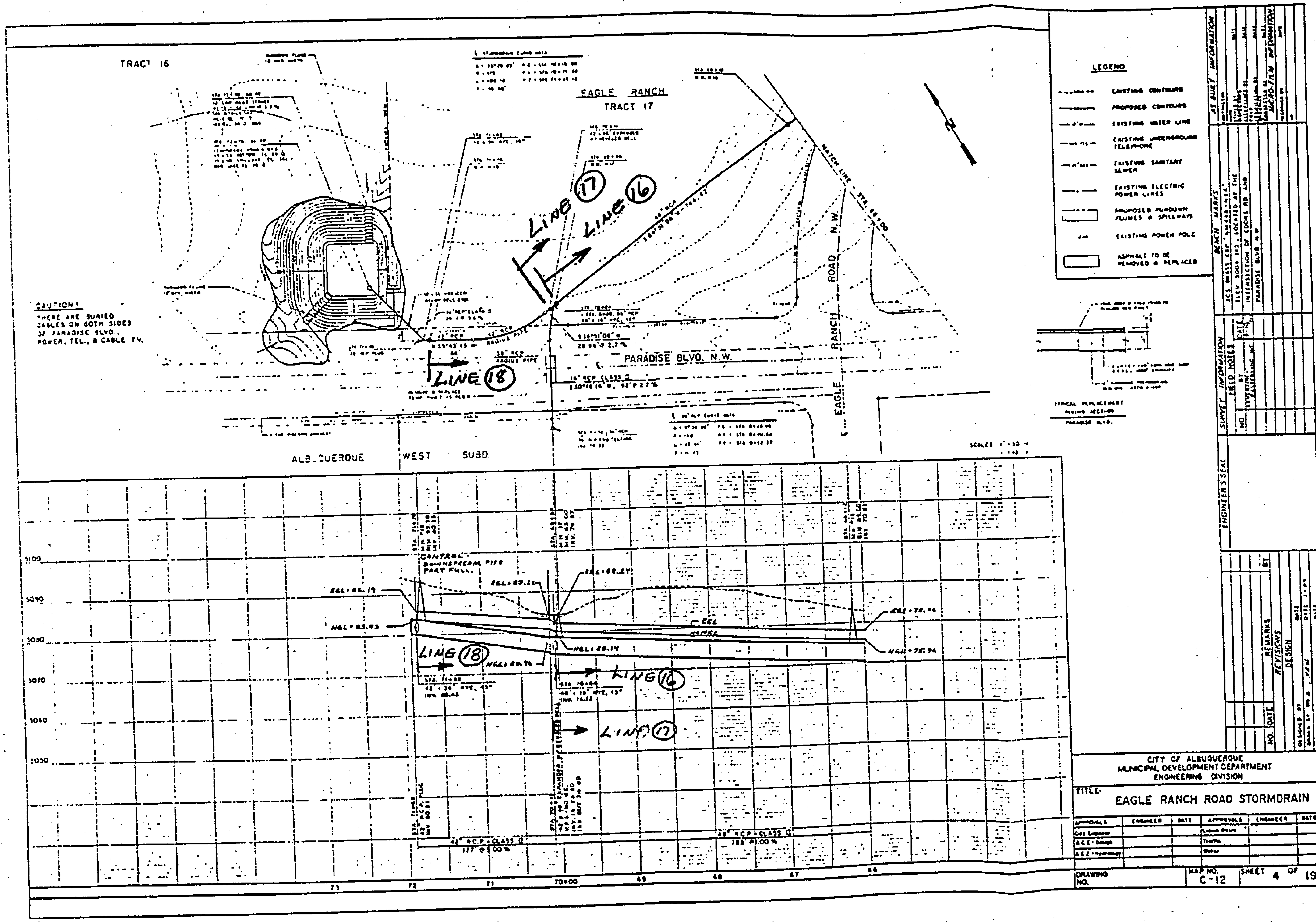
JANUARY, 1985

PREPARED FOR

BELLAMAH COMMUNITY DEVELOPMENT
6121 INDIAN SCHOOL ROAD, NE
ALBUQUERQUE, NEW MEXICO 87110

PREPARED BY

EASTERLING AND ASSOCIATES, INC.
5643 PARADISE BOULEVARD, NW
ALBUQUERQUE, NEW MEXICO 87114


TRACT 16
EAGLE RANCH
TRACT 17
LINE 17
LINE 16
LINE 18
CAUTION!
THERE ARE BURIED CABLES ON BOTH SIDES OF PARADISE BLVD., POWER, TEL., & CABLE TV.
PARADISE BLVD. N.W.
EAGLE RANCH ROAD N.W.
MATCH LINE - STA. 66+00
ALBUQUERQUE WEST SUBD.
LEGEND
EXISTING CONTOURS
PROPOSED CONTOURS
EXISTING WATER LINE
EXISTING UNDERGROUND TELEPHONE
EXISTING SANITARY SEWER
EXISTING ELECTRIC POWER LINES
PROPOSED RUNDOWN FLUMES & SPILLWAYS
EXISTING POWER POLE
ASPHALT TO BE REMOVED & REPLACED
TYPICAL REPLACEMENT PAVING SECTION PARADISE BLVD.
CONTROL: DOWNSTREAM PIPE PART FULL
EGL
HGL
LINE 18
LINE 16
LINE 17
48" RCP CLASS III
42" RCP CLASS III
AS BUILT INFORMATION
MICRO-FILM INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES
ENGINEER'S SEAL
REVISIONS
NO. DATE REMARKS BY
DESIGN
CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION
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APPROVALS ENGINEER DATE
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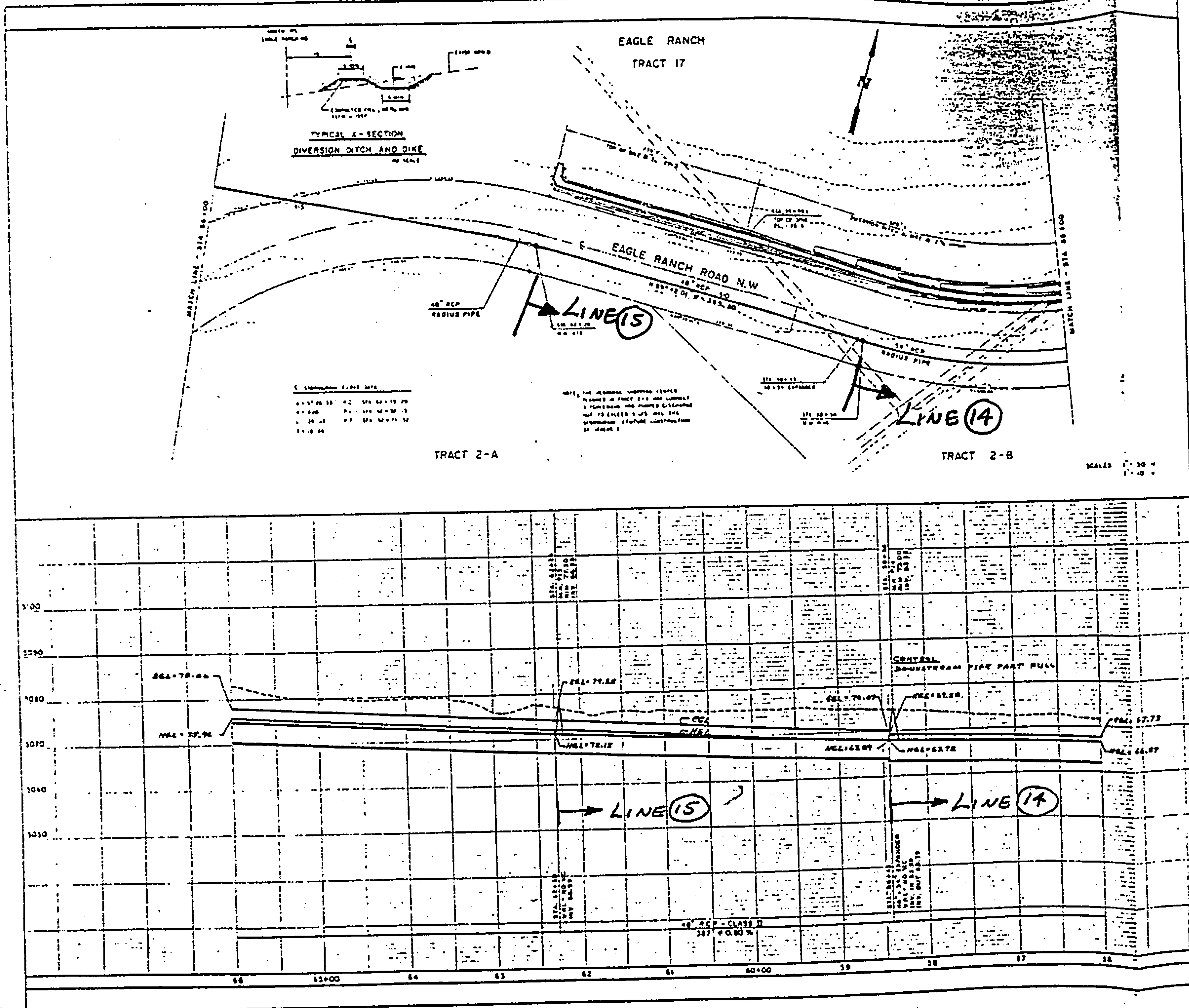
MAP NO. C-12
SHEET 4 OF 19



AS BUILT INFORMATION

MICRO-FILM INFORMATION

BENCH MARKS

ACS BRASS CAP

INTERSECTION OF COORS RD AND PARADISE BLVD N.W.

SURVEY INFORMATION

FIELD NOTES

ENGINEER'S SEAL

NO	DATE	REMARKS	BY
		REVISIONS	

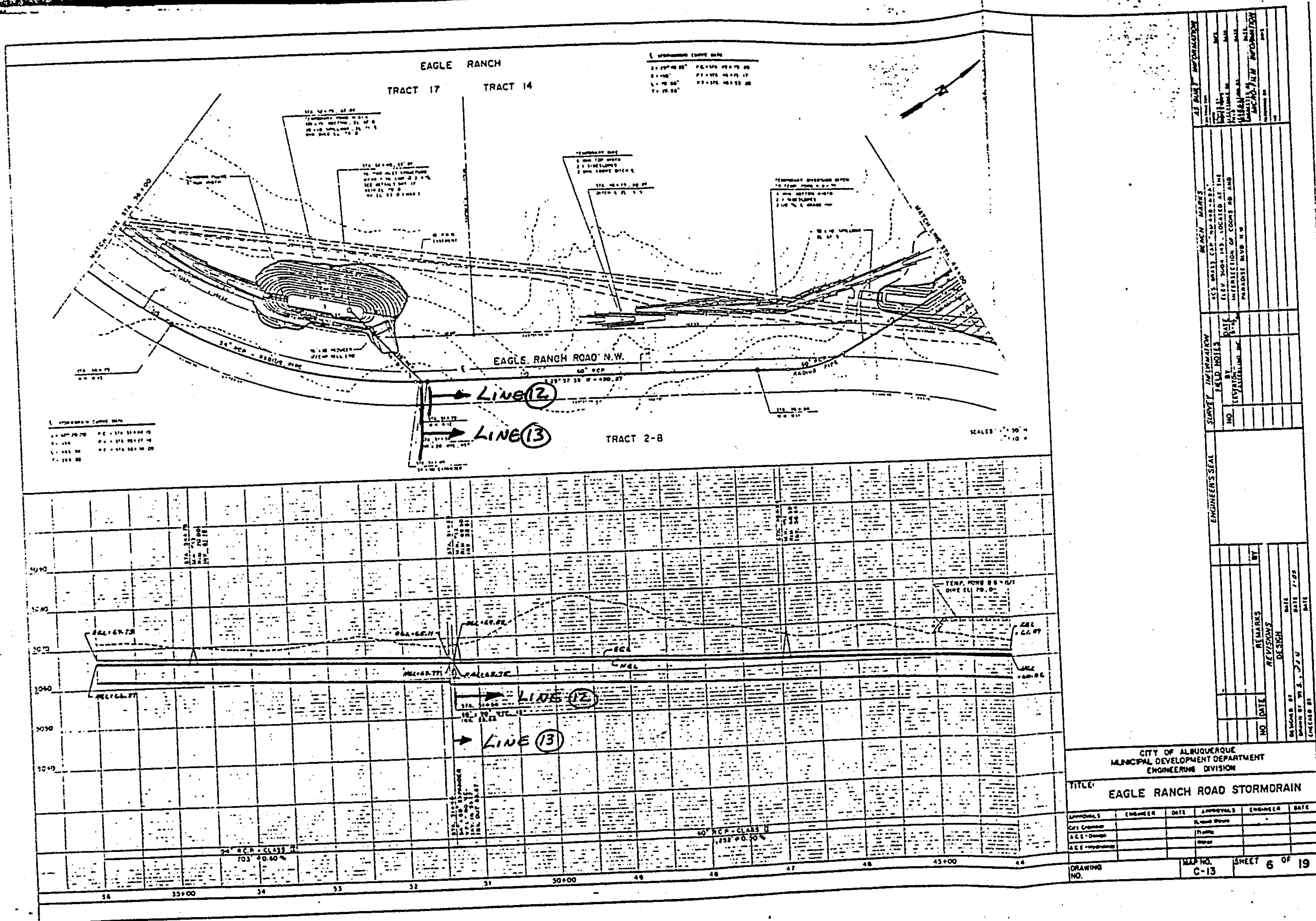
DESIGN

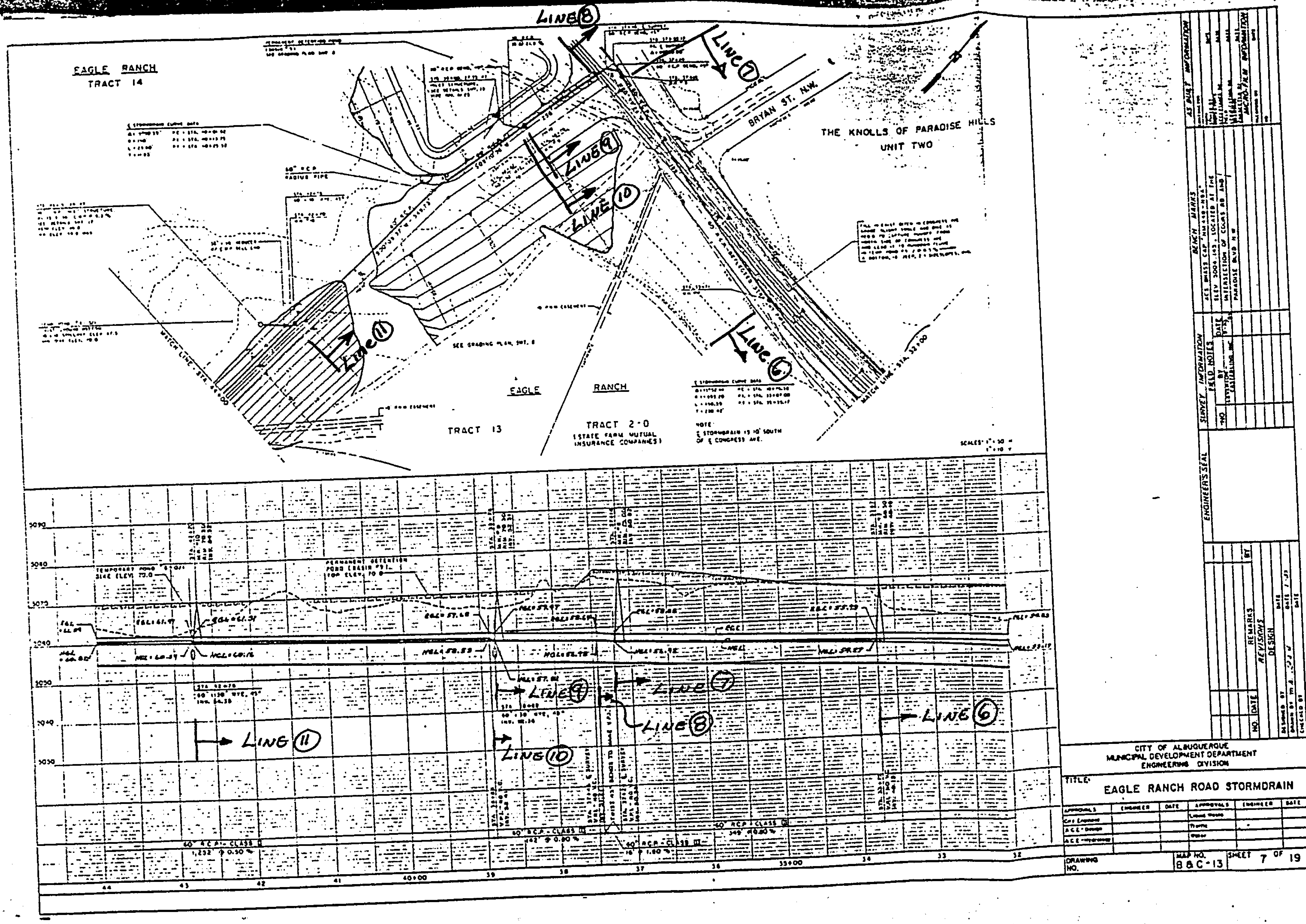
CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: EAGLE RANCH ROAD STORMDRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E. - Design			Traffic		
A.C.E. - Hydrology			Water		

DRAWING NO. | MAP NO. C-13 | SHEET 5 OF 19


EAGLE RANCH
TRACT 17
TRACT 14
EAGLE RANCH ROAD N.W.
LINE 12
LINE 13
TRACT 2-8
LINE 12
LINE 13
CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION
TITLE: EAGLE RANCH ROAD STORMDRAIN
DRAWING NO.
MAP NO. C-13
SHEET 6 OF 19
ENGINEER'S SEAL
SURVEY INFORMATION
FIELD NOTES
BENCH MARKS
AS BUILT INFORMATION
REMARKS
REVISIONS
DESIGN


EAGLE RANCH
TRACT 14
THE KNOLLS OF PARADISE HILLS
UNIT TWO
BRYAN ST. N.W.
EAGLE RANCH
TRACT 13
TRACT 2-0
(STATE FARM MUTUAL INSURANCE COMPANIES)
SEE GRADING PLAN, SHT. 8
LINE 6
LINE 7
LINE 8
LINE 9
LINE 10
LINE 11
60" R.C.P. - CLASS III
ENGINEER'S SEAL
SURVEY INFORMATION
FIELD NOTES
BENCH MARKS
AS BUILT INFORMATION
REVISIONS
REMARKS
DESIGN
CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION
TITLE: EAGLE RANCH ROAD STORMDRAIN
DRAWING NO.
MAP NO. B&C-13
SHEET 7 OF 19

EAGLE RANCH
TRACT G

TRACT F

IRVING BLVD. N.W.

CONGRESS AVE NW

Line (5)

Line (4)

Line (3)

Line (2)

SCALES: 1"=50'H
1"=10'V

REMOVE EXIST. 72" RCP & S.D.M.H. RECONNECT 18" RCP INLET PIPE TO NEW MANHOLE. PROVIDE SUITABLE 18" RCP BEND IF REQ'D. CLEAN OUT EXIST. CURB INLET AND MAKE SURE CONNECTION PIPE IS OPEN.

FILL IN EXIST. DITCH AND GRADE OUT TO MATCH ADJACENT GROUND.

60" RCP - CLASS III
949' @ 1.00 %

60" RCP - CLASS III
135' @ 0.85 %

60" RCP - CLASS III
419' @ 4.50 %

5080
5070
5060
5050
5040
5030
5020

32 31 30+00 29 28 27 26 25+00 24 23 22 21 20+00

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES BY
DATE

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: EAGLE RANCH ROAD STORMDRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Land Development		
A.C.E. - Design			Traffic		
A.C.E. - Inspection			Water		

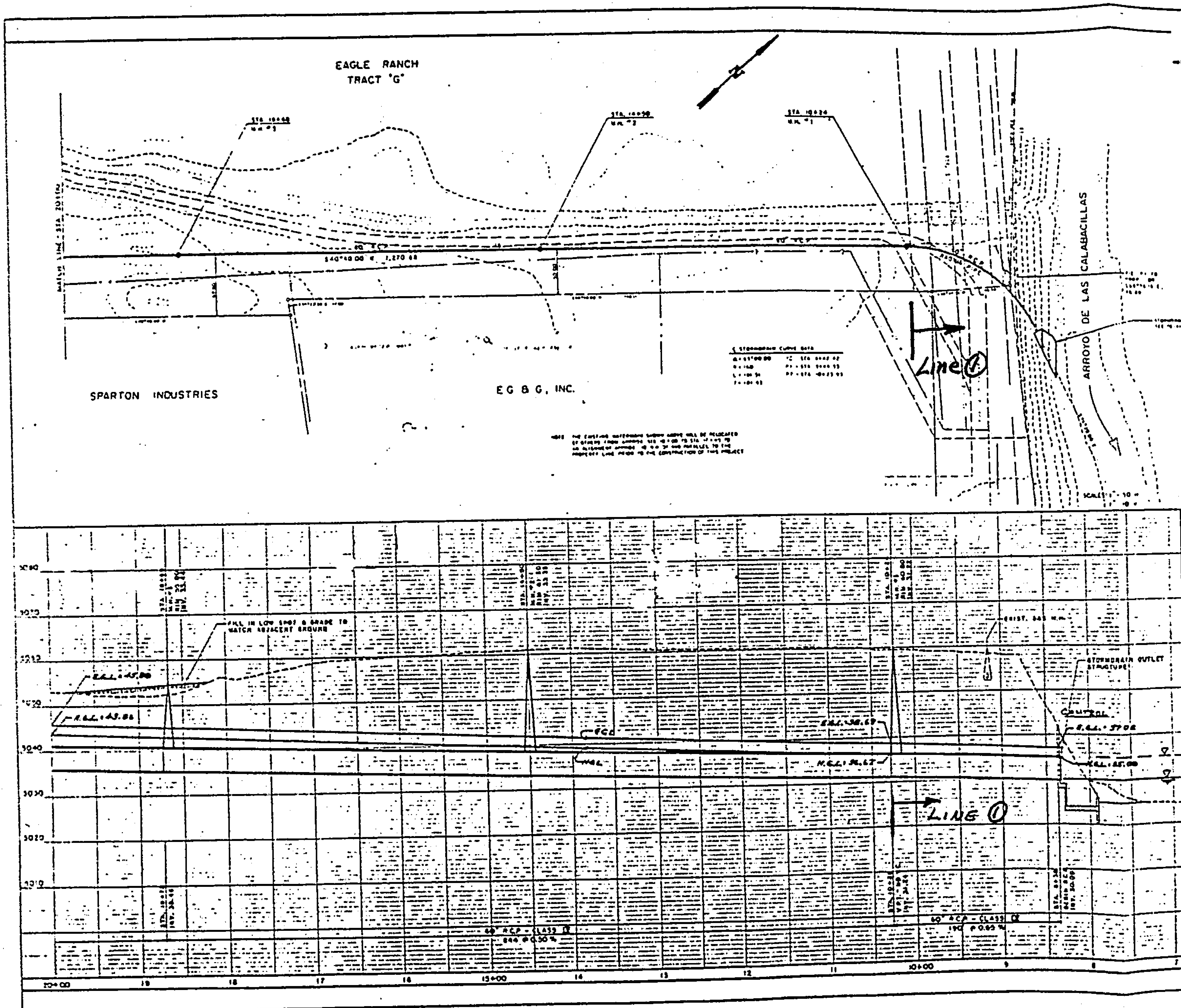
DRAWING NO.

MAP NO. B-13

SHEET 9 OF 19

ENGINEER'S SEAL

REMARKS
REVISIONS
DESIGN
DRAWN BY
CHECKED BY



AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

ENGINEER'S SEAL

NO.	DATE	REVISIONS	BY

DESIGN

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: EAGLE RANCH ROAD STORMDRAIN

DRAWING NO. | MAP NO. 8-13 | SHEET 10 OF 19