OJECT TITLE: Don Keith Mini Storage ZONE ATLAS/DRNG. FILE #: K11-D54

B #: _____ EPC #: _____ WORK ORDER #: _____

GAL DESCRIPTION: POR TRACT No 76 Town of ATRISCO Grant

TY ADDRESS: _____

IGINEERING FIRM:	Lovelady & Associates	CONTACT:	Frank D. Lovelady
ADDRESS:	300 ALAMOSA NW	PHONE:	345-2267 ALBUQUERQUE,
WNER:	Don Keith & Assoc	CONTACT:	Don Keith
ADDRESS:	7116 Edwina CT NE	PHONE:	884-4070
RCHITECT:	Rick Bennett, Architect	CONTACT:	Rick Bennett
ADDRESS:	1118 PARK AVE SW 87102	PHONE:	242-1859
URVEYOR:	SOUTHWEST SURVEY CO INC	CONTACT:	DAN GRANEY
ADDRESS:	333 LOMAS BLVD. NE 87102	PHONE:	247-4444
ONTRACTOR:	RAM CONSTRUCTION	CONTACT:	Wayne Lujan
ADDRESS:	1321 TOBACO RD.	PHONE:	452-1266

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
✓ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
___ OTHER

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D. APPROVAL
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
✓ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
___ OTHER _____ (SPECIFY)

DATE SUBMITTED: April 18, 1997

BY: Frank D. Lovelady

RECEIVED
APR 22 1997
HYDROLOGY SECTION

CITY OF
Albuquerque
Public Works Department

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

May 1,1997

Frank Lovelady
Lovelady and Associates
300 Alamosa NW Albuquerque, New Mexico 87107

RE: REVISED DRAINAGE PLAN FOR DON KEITH MINI STORAGE (K11-D54)
REVISION DATED 4/16/97

Dear Mr. Lovelady:

Based on the information provided on your April 22,1997 resubmittal, the above referenced site is approved for Building Permit. Please be advised that if the Building Permit has already been obtained, it is your responsibility to assure that the contractor is given a copy of this revised approved Drainage Plan.

Also, all the other requirements found on the October 9,1996 letter are still valid.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya CE
Associate Engineer

DRAINAGE INFORMATION SHEET

)JECT TITLE: Don KEITH MINI STORAGE ZONE ATLAS/DRNG. FILE #: K-11/D-54

3 #: _____ EPC #: _____ WORK ORDER #: _____

GAL DESCRIPTION: POR TRACT 76 WITHIN TOWN OF ATRISCO GRANT

CY ADDRESS: _____

GINEERING FIRM:	Lovelady & Associates	CONTACT:	Frank D. Lovelady
ADDRESS:	300 ALAMOSA NW	PHONE:	345-2267
NER:	DON KEITH	CONTACT:	DON KEITH
ADDRESS:	7116 EDWINA CT NE	PHONE:	884-4070
CHITECT:	RICK BENNETT, ARCHITECT	CONTACT:	RICK BENNETT
ADDRESS:	1118 PARK AVE SW	PHONE:	242-1859
RVEYOR:	SOUTHWEST SURVEYING CO.	CONTACT:	DAN GRANEY
ADDRESS:	333 LOMAS NE	PHONE:	247-4444
NTRACTOR:	RAM CONSTRUCTION	CONTACT:	WAYNE LUJAN
ADDRESS:	1321 TOBACCO ROAD SW 87105	PHONE:	883-2593

PE OF SUBMITTAL:

__ DRAINAGE REPORT
__ DRAINAGE PLAN
__ CONCEPTUAL GRADING & DRAINAGE PLAN
__ GRADING PLAN
__ EROSION CONTROL PLAN
✓ ENGINEER'S CERTIFICATION
__ OTHER

E-DESIGN MEETING:

__ YES
__ NO
__ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
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____ FINAL PLAT APPROVAL
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
✓ CERTIFICATE OF OCCUPANCY APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ S.A.D. DRAINAGE REPORT
____ DRAINAGE REQUIREMENTS
____ OTHER _____ (SPECIFY)

RECEIVED
SEP 22 1998
HYDROLOGY SECTION

TE SUBMITTED: SEPTEMBER 22, 1998

BY: Frank D. Lovelady

CITY OF
Albuquerque

October 5,1998

Frank Lovelady
Lovelady & Associates
300 Alamosa NW
Albuquerque, New Mexico 87107

RE: REVISED ENGINEER CERTIFICATION FOR DON KEITH MINI STORAGE UNITS
(K11-D54) REVISED CERTIFICATION STATEMENT DATED 9/22/98

Dear Mr. Lovelady:

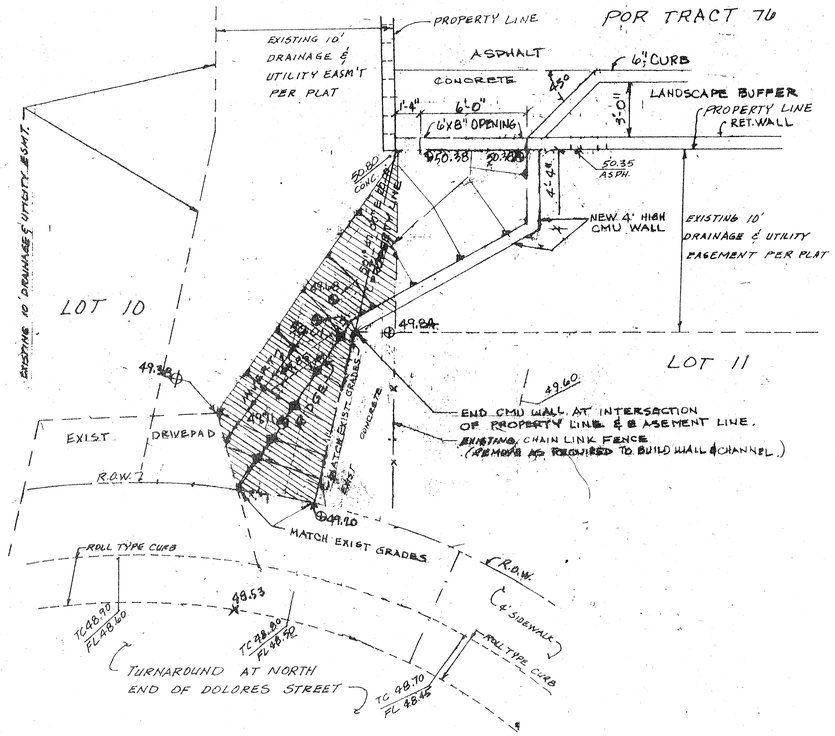
Based on the information provided on your September 22,1998 resubmittal, Engineer Certification for the above referenced site is acceptable.

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya CE
Associate Engineer



PLAN - OUTFALL

1/4" = 1'-0"

EXISTING CONDITIONS:

The site is located on the south side of west Central Avenue between 57th Street and 59th Street. 58th Street intersects Central Avenue on the north side only and the intersection is across the street from the site, Central Avenue is paved with standard curb and gutter. The site is presently partially occupied by a motel which is used as apartments. The motel covers the westerly portion of the site. There is a very significant drop in elevation from the northwest corner of the site, elevation 5068.0, to the southeast corner of the site, 5049.0. The property west of the site is vacant between the site and 59th Street. The property east of the site is developed with an office building and asphalt parking lot. There is a concrete wall along the northern two-thirds of the east property line that is part of the office building development. The site is surrounded on the west, north and east sides by a six-foot-high wrought iron fence. Along the south side there is a concrete block wall on Lot 10, Bentwood Ridge Subdivision. There is no wall between the site and Lot 11, Bentwood Ridge Subdivision. (The Zone Atlas map shows the subdivision name as *Brentwood* Ridge Subdivision which is apparently erroneous since the plat is filed under the name *Bentwood* Ridge Subdivision). The street serving Bentwood Ridge Subdivision is Dolores Drive which is paved with roll-type curb and gutter. There is a 30" RCP storm sewer line in Churchill Road with inlets at the NW and SW curb returns of the intersection of Dolores Drive and Churchill Road.

PROPOSED CONDITIONS:

It is proposed to develop a portion of the site as a mini-storage facility as shown on the plan. The development shown is Phase One. No design has been prepared for Phase Two but it is assumed that it will be entirely pavement or roof surface and will occupy the entire area shown as phase two on the drainage plan. Calculations for Phase Two are also shown so that the drainage outfall structure can be designed for the entire development. It is proposed to be discharged through existing platted drainage easements into Dolores Road. The alternative would be to pump all runoff into Central Avenue which is to be avoided, if possible.

DRAINAGE CRITERIA:

The calculations shown on this plan were prepared in accordance with Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque in cooperation with Bernalillo County, New Mexico and the Albuquerque Metropolitan Arroyo Flood Control Authority, January 1993.

PRECIPITATION ZONE:

The site is west of the Rio Grande River and is, therefore, in Precipitation Zone 1.

LAND TREATMENTS, EXCESS PRECIPITATION AND UNIT PEAK DISCH.:

The peak discharge per acre and excess precipitation are shown for the four land treatments in Zone 1 in the table below, the values contained in which are from the City of Albuquerque, D.P.M.

EXCESS PRECIPITATION (E) AND UNIT PEAK DISCHARGE (q)

Land Treatment	q(cfs/acre) 100-year	q(cfs/acre) 10-year	E(Inches) 100-year	E(Inches) 10-year
A	1.29	0.24	0.44	0.08
B	2.03	0.76	0.67	0.22
C	2.87	1.49	0.99	0.44
D	4.37	2.89	1.97	1.24

EXISTING AND DEVELOPED LAND TREATMENT PERCENTAGES:

Land Treatments	Existing Land Treat. Areas Percent of Site	Area of Site Sq.Ft.	Acres	PHASE ONE Developed Land Treat. Areas Percent of Site	Area of Site Sq.Ft.	Acres
A	-	-	-	-	-	-
B	-	-	-	3.5	2,032	0.047
C	90.3	52,069	1.195	61.1	35,217	0.808
D	9.7	5,566	0.128	35.4	20386	0.468
TOTALS	100.0	57,635	1.323	100.0	57,635	1.323

PHASE TWO

Land Treatments	Developed Land Treat. Areas Percent of Site	Area of Site Sq.Ft.	Acres
A	-	-	-
B	3.5	2,032	0.047
C	33.8	19,468	0.447
D	62.7	36,135	0.829
TOTALS	100.0	57,635	1.323

WEIGHTED UNIT PEAK DISCHARGE VALUES:

Existing q_{W100} = 0.903 X 2.87 + 0.097 X 4.37 = **3.02**
q_{W10} = 0.903 X 1.49 + 0.097 X 2.98 = **1.63**

Phase One q_{W100} = 0.035 X 2.03 + 0.611 X 2.87 + 0.354 X 4.37 = **3.37**
q_{W10} = 0.035 X 0.76 + 0.611 X 1.49 + 0.354 X 2.89 = **1.96**

Phase Two q_{W100} = 0.035 X 2.03 + 0.338 X 2.87 + 0.627 X 4.37 = **3.78**
q_{W10} = 0.035 X 0.76 + 0.338 X 1.49 + 0.627 X 2.89 = **2.34**

WEIGHTED EXCESS PRECIPITATION:

Existing E_{W100} = 0.903 X 0.99 + 0.097 X 1.97 = **1.09**
E_{W10} = 0.903 X 0.44 + 0.097 X 1.24 = **0.52**

Phase One E_{W100} = 0.035 X 0.67 + 0.611 X 0.99 + 0.354 X 1.97 = **1.33**
E_{W10} = 0.035 X 0.22 + 0.611 X 0.44 X 0.354 X 1.24 = **0.72**

Phase Two E_{W100} = 0.035 X 0.67 + 0.338 X 0.99 + 0.627 X 1.97 = **1.59**
E_{W10} = 0.035 X 0.22 + 0.338 X 0.44 + 0.627 X 1.24 = **0.93**

SUMMARY OF VOLUMES AND PEAK DISCHARGE RATES

	V100	V10	Q100	Q10
EXISTING	5235	2498	4.00	2.16
PHASE ONE	6388	3458	4.46	2.59
PHASE TWO	7637	4467	5.00	3.10

CHANNEL BETWEEN STORAGE UNITS (DETAIL "A"):

Area drained = 180' X 130' = 23,400 sf = 0.5372 ac.
qW = 0.05 X 2.03 + 0.05 X 2.87 + 0.9 X 4.37 = 4.18 cfs
Q100 = 0.5372 X 4.18 = 2.25 cfs

Analyze inlet by Weir Equation, $Q = CLH^{3/2}$ C = 3.0 L = 6.0 H = 0.25
$Q = 3.0 \times 6.0 \times 0.25^{3/2} = 2.25$ cfs (Adequate).
Analyze Channel By RV dump using Manning's Equation:
$Q = A(1.486/N) R^{2/3} S^{1/2}$ A = 3 X 0.25 = 0.75 cfs P = 3.5' R = 0.2143
S = 0.0113
$Q = 0.75 (1.486 / 0.017) 0.2143^{2/3} (0.0113)^{1/2} = 2.49$ cfs > 2.25 cfs (Adequate).

ANALYSIS OF DOWNSTREAM CONDITIONS:

It is proposed to discharge runoff from the site into the north end of Dolores Drive by means of sidewalk culverts extending from the south edge of the site to the end of the turnaround and occupying the extreme westerly end of Lot 11, Bentwood Ridge Subdivision. The plat for Bentwood Ridge Subdivision shows a 10' drainage and utility easement along the north side of Lot 11 and along the east side of Lot 10. Crossing Lot 10 is not practical since there is a concrete block wall between the two lots and Lot 10 is paved with concrete. It is more direct to take the drainage straight out across Lot 11 even though an easement must be obtained for the short distance between the existing drainage easement and the turnaround.

The capacity of Dolores Drive will be analyzed below. There are inlets at the NW and SW corners of Churchill Avenue and Dolores Drive.

There are two projects scheduled for 1996 downstream from the site, the Osage/La Media storm drain and the detention pond east of Coors between Churchill and Gonzales. The site is an infill site and the increase in runoff resulting from development is not large. Therefore, detention ponding would not appear to be a requirement.

OFF-SITE FLOW:

The site has minimal off-site flow from the vacant lot to the west. It appears that about half of that lot could possibly drain onto the site under the wrought iron security fence. The area is covered with native grasses and weeds and is considered to be Land Treatment A. The area is a triangular area approximately 95' X 250' = 11,875 SF or 0.27 acres. q_{100} = 1.29 cfs / acre Q_{100} = 0.27 X 1.29 = 0.35 cfs

The off-site flow from this area is accepted by means of a single "D" inlet placed at the SW corner of the site as shown. The inlet is drained through the site by an 8" PVC pipe to another single "D" inlet and then to a double "D" inlet which collects all of the site runoff. The grate elevation of the off-site flow inlet is 54.30; the invert is 52.30. Use Orifice Equation, $Q = CA(2GH)^{1/2}$ C = 0.6 A = 0.3494 H = 2.0 - 0.33 = 1.67
$Q = 0.6 \times 0.3494 (2 \times 32.2 \times 1.67)^{1/2} = 2.17$ cfs > 0.35 cfs. The larger diameter pipe will give some protection against clogging.

DOUBLE "D" INLET - CAPACITY OF OUTLET PIPES:

It is proposed to use 4 each 6" PVC pipes through the rear retaining wall so the the flow profile will be as low as possible as it enters the drainge channel that leads to the sidewalk culvert. Design Q = 5.35 cfs. Use Orifice Equation $Q = CA(2GH)^{1/2}$ C = 0.6 A = 0.1963 H = (53.0 - 49.7) - 0.25 = 3.05'
$Q = 0.6 \times 0.1963 (2 \times 32.2 \times 3.05)^{1/2} = 1.65$ cfs' 4 X 1.65 = 6.60 cfs 5.35 cfs The four 6" PVC pipes are adequate.

ANALYSIS OF DOWNSTREAM CAPACITY:

According to the drainage plan for Bentwood Ridge Subdivision by Community Sciences Corporation, November 1978, each lot is supposed to pond runoff on site. The street right-of-way only was to generate runoff that would leave the subdivision. The total peak discharge, including off-site flow, that the street would have to carry was7.8 CFS. The hydrology has since changed and it is not certain if all, or any, of the residences actually ponded on-site. Therefore, the total site area is assumed to discharge to Dolores Drive. Area = 3.666 Ac. Assume 20% Treatment B, 10% Treatment C and 70% Treatment D.
qW = 0.2 X 2.03 + 0.1 X 2.87 + 0.7 X 4.37 = 3.75 cfs/ac

Q = 3.66 X 3.75 = 13.73 CFS Off-site flow from the mini-storage site is 5.35 cfs
Total Q = 13.73 + 5.35 cfs = 19.08 cfs

The street carrying capacity of Dolores Drive is calculated by Manning's Equation based on the Standard Drawing 2415 for roll type curb and assuming a cross slope of 2% from the lip of the curb. Total area = 2.36 SF P = 2.625 + 13.5 = 16.13 ft.
R = A/P = 2.36 / 16.13 = 0.1463 S = 0.0414
V = (1.486 / 0.017)(0.1463)2/3(0.0414)1/2 = 4.93 fps
Q = AV = 2.36 X 4.93 = 11.63 cfs or 23.26 cfs for the total street cross section. There is adequate capacity in the street for the anticipated peak flow.

ENGINEER'S CERTIFICATION:

Having inspected the site represented by this plan and having taken spot elevations of finish floors and at critical locations, I hereby certify that the as-constructed grading and drainage plan is in substantial compliance with the approved grading and drainage plan with engineer's stamp dated 4/14/95, and most recently revised 4/16/97.

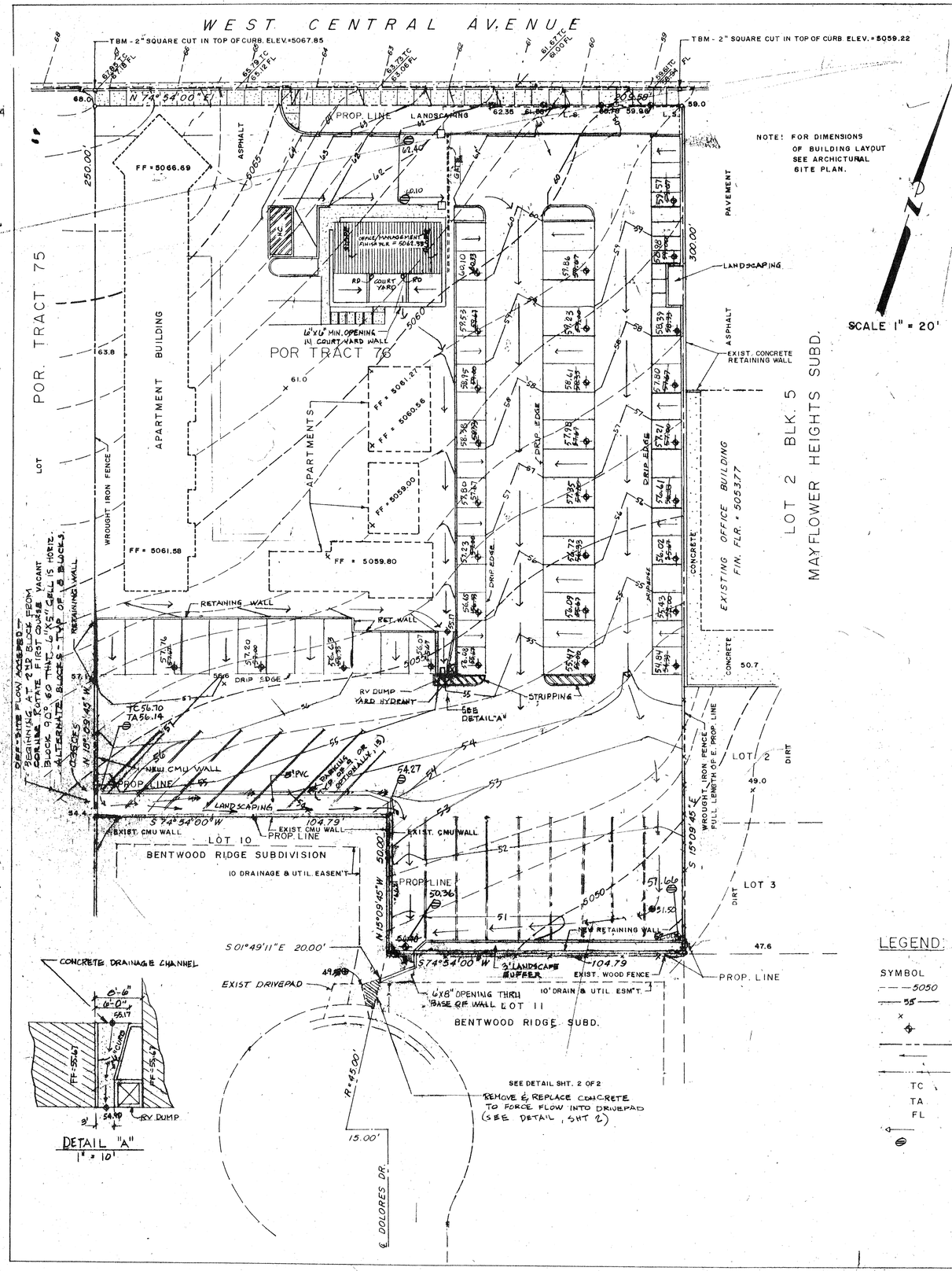
Frank D. Lovelady N.M.P.E. 6512 9-22-98
(Signature) (Date)

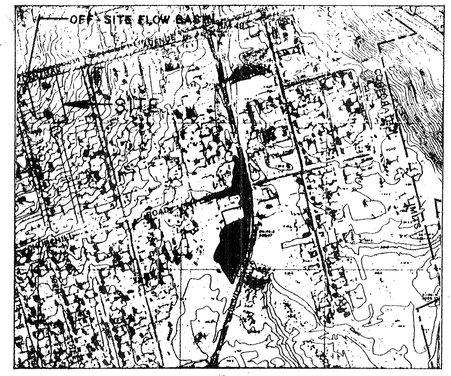
REVISED 9/22/98
REVISED 4/16/97
REVISED 2/27/97
REVISED 9/13/96
REVISED 11/7/95

FRANK D LOVELADY NEW MEXICO REGISTERED PROFESSIONAL ENGINEER 6512 4/14/95

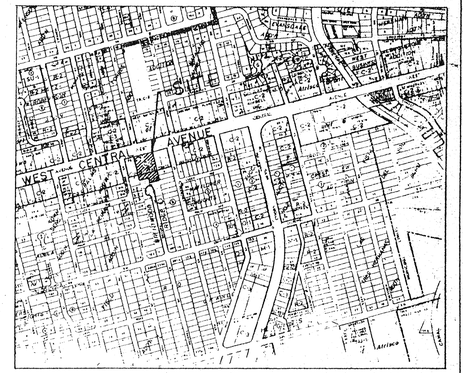
REVISED 5-23-95

FRANK D. LOVELADY P.E. 300 ALAMOSA ROAD N.W. ALBUQUERQUE, N.M. 87107 (505) 345-2267	DON KEITH MINI-STORAGE GRADING & DRAINAGE PLAN			Sheet D-2 Of 2
Designed: FDL Drawn: STAFF Checked: FDL	Scale: See Details	Date: 4/95	Job: 474	





FLOODWAY MAP PANEL 27 OF 50



VICINITY MAP K-11

LEGAL DESCRIPTION:

Portion of Tract No. 76 within the Town of Atrisco Grant in Unit No. 6 as filled in Bernalillo County, New Mexico on December 5, 1944.

BENCH MARK:

Elevations shown on this plan have been established form New Mexico State Highway Commission Station No. NM 448-C1 , located at the intersection of Central Avenue and 59th Street SW. Elevation = 5074.028.

EROSION CONTROL NOTES:

The contractor shall be responsible for compliance with the following:

1. No sediment-bearing water shall be allowed to discharge from the site during construction.
2. During grading operations and until the project has been completed, all adjacent property, rights-of-way, and easements shall be protected from flooding by runoff from the site.
3. Should the contractor fail to prevent sediment-bearing water from entering public right-of-way, he shall promptly remove from the public right-of-way any and all sedimentation originating from the site.
4. Control of sediment-bearing waters will be accomplished by use of a compacted earth berm of adequate height. The berm shall be located along the downstream perimeter of the property.

ENGINEER'S CERTIFICATION:

Having inspected the site represented by this plan and having taken spot elevations of finish floors and at critical locations, I hereby certify that the as-constructed grading and drainage plan is in substantial compliance with the approved grading and drainage plan with engineer's stamp dated 4/14/95, and most recently revised 4/16/97.

Frank D. Lovelady N.M.P.E. 6512 9/22/98
(Signature) (Date)

LEGEND:

SYMBOL	DESCRIPTION
5050	EXISTING CONTOUR
55	NEW CONTOUR
×	EXIST. SPOT ELEV.
⊕	NEW SPOT ELEV.
	PROPERTY LINE
	SHEET FLOW
	SWALE
TC	TOP OF CURB
TA	TOP OF ASPHALT
FL	FLOWLINE
	ROOF FLOW DIRECTION
S	AS-Constructed Spot Elev.

Revised 9/22/98
Revised 7/24/98
REVISED 4/16/97
REVISED 2/27/97
REVISED 9/10/96
REVISED 4/4/96

FRANK B. LOVELADY NEW MEXICO 6512 REGISTERED PROFESSIONAL ENGINEER 6-12 4/14/97

REVISED 5-23-95
REVISED 11-1-95

RECEIVED SEP 22 1998 HYDROLOGY SECTION

RECEIVED APR 22 1997 HYDROLOGY SECTION

FRANK D. LOVELADY P.E.
300 ALAMOSA ROAD N.W.
ALBUQUERQUE, N.M. 87107
(505) 345-2267

DON KEITH MINI-STORAGE
GRADING & DRAINAGE PLAN

Sheet D-1 of 2

Designed: FDL	Drawn STAFF	Checked: FDL	Scale: 1"=20'	Date: 4/95	Job: 474