I certify that I have personally inspected the Tract 93 site and the surrounding terrain. The representation of the land and the contours are as presented on these drawings and the accompanying text as of October 1997.

Marvin R Kortum — Date 10/20/1997

Topographic survey by Southwest Survey Company, Inc. Boundary data shown is from recorded warrantee deed, filed in Bernalillo County, New Mexico, D92A PG 547. Apparent property corners are for orientation only.

NOTES

A All berms and earthwork supporting structures must be compacted to 95% of maximum dry density (Modified Proctor Test).

B Elevations of building pads are based on slab on grade.

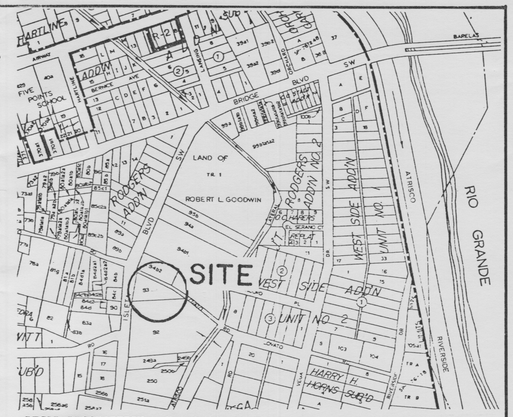
C Quantitative earthwork estimates should be based on more detailed topographic cross sections of the work area.

D. Add to the height of the existing berm along the west property line.

E. Construct swale through the east gate to permit outflow from the interior courtyard to the pond area.

F. Construct earthlined pond to dimensions noted. Sides of the pond are to be planted with vegetation to reduce erosion.

G. Install roof gutter to collect and direct roof runoff to the east pond. Gutter shall be 6 inches by 6 inches or larger, and shall be set at a 0.5% slope (1/8 inch per foot) or larger. The gutter shall direct the flow to a rundown into the pond, or empty directly into the center of the pond.



LEGAL DESCRIPTION: Tract 93, M. R. G. C. D. Map # 41, Section 30 T 10 N, R 3 E, Bernalillo County, New Mexico.

L-13

RECEIVED
NOV 17 1997
HYDROLOGY SECTION

LEGEND

- ◑ = POWER POLE
- Ⓢ = SEWER MANHOLE
- ▫ = WATER METER
- CL = CENTERLINE
- TP = TOP OF PAVEMENT (EDGE)
- PROPOSED SURFACE ELEVATION
- -44- PROPOSED CONTOUR

BASIS OF ELEVATIONS FOR THIS SURVEY IS ACS CONTROL STATION 10-L13 THE PUBLISHED ELEVATION IS 4944.553, AND IS LOCATED IN THE MEDIAN AT THE INTERSECTION OF BRIDGE BOULEVARD SW AND ISLETA BOULEVARD SW.

Preliminary APPROVALS, REVISIONS	Marvin R Kortum BY	October 20, 1997 DATE

MARVIN R. KORTUM, P.E.
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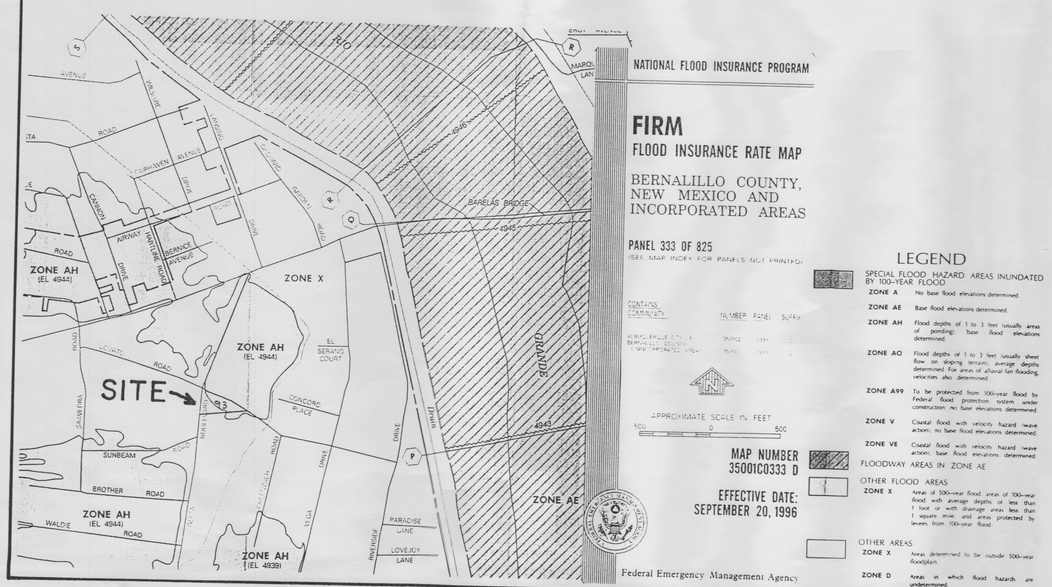
GRADING AND DRAINAGE
TRACT 93, MRGCD MAP NO. 41

PROJECT NO.	MAP NO.	SHEET	OF
	L-13	1	3

Aerial Topography copied from sheet L-13, AMAFCA, with aerial photography dated June 1972 by Limbaugh Engineers, Inc. Scale: 1"=200'



I. PURPOSE

The purpose of this Grading and Drainage Plan is to obtain approval for the conversion and operation of a self-storage facility at a property that has in the past been used as apartments.

II. SITE DESCRIPTION

A. Tract 93 is a triangular shaped lot located about 1000 feet south of the intersection of Isleta Boulevard and Bridge Boulevard. The site is on level ground 2000 feet west of the west levee of the Rio Grande, on land that has been used for agriculture for well over 100 years, and irrigated land since the early 1900's. The buildings on the site appear to have been constructed after World War I, between 1920 and 1930, originally as a motel on the Pan-American Highway, (US 85), which was the only north to south highway along the Rio Grande. After World War II, the buildings were converted to apartment buildings, and in use for that purpose until recently. At this time the buildings have been refurbished and prepared for use as a self-storage or mini-storage site.

B. Currently most of the surrounding area is developed with housing or commercial development, with some vacant land and garden type agriculture use. The Atrisco Lateral, a major irrigation ditch for the Middle Rio Grande Conservancy District, passes from north to south about 300 feet east of the site. None of the land adjacent to the Tract 93 site is currently being irrigated.

C. The topography of the site is shown on the attached aerial photograph (date of photograph, June 1972) and the topographic survey from September, 1997. The road bed of Isleta Boulevard is raised above the surrounding terrain by about one foot, and the buildings on Tract 93 are about 9 inches above the surrounding area, and 3 to 4 inches above the interior courtyard of Tract 93. The historic and current runoff pattern for the site appears to be that all runoff from the site and the adjacent portion of Isleta Boulevard entered the lands on either side of Tract 93. The pattern of runoff onto adjacent properties is enhanced by the fact that the roof drains on the buildings are directed away from the interior courtyard onto the adjacent lands. The north portion of Tract 93, the strip north of the building, is that portion of Lovato Road which has been vacated by Bernalillo County action, and is part of the lower surrounding land which received the site runoff.

D. In the past, when adjacent lands were used for agriculture, and possibly under the same ownership, this runoff pattern away from the site was acceptable. The current trend of developing in the area dictates that runoff be contained on site, or directed to a designated off-site area. Other that the runoff to lower elevations on the surrounding land, there is no established flow channel for off-site flow. The presence of the Atrisco Lateral 300 feet to the east prevents direct flow to the riverside drain or to the river itself. The past use of the area as irrigated agriculture lands indicates that the slope of the land was shaped to provide a slight slope away from ant irrigation lateral to permit outward flow of irrigation water. Accumulated runoff, from precipitation or from irrigation, dissipated by means of percolation or evaporation. The soils on site, as identified in reference C, permit reasonable percolation.

E. For development approval it is proposed that ponding be developed on site to retain the runoff from the site, at least until such time in the future that a master plan for the surrounding area be developed which will accommodate the runoff for the area. Table A shows the estimated runoff for the complete site. The available area for ponding will not permit one pond to be constructed which will handle the estimated runoff for the 100 year-10 day storm. Tables A-1 and A-2 show the amounts of runoff for portions of the site. Table A-1 is for the buildings and the interior courtyard, to include the east area used for ponding. The ponds for the runoff estimated on Table A-1 are shown on table D, the triangular shaped ponds. The east yard pond is designed with earth sides at a 2.5 horizontal to 1 vertical side slopes and an 8 feet separation from the adjacent property. The pond is completely below the adjacent terrain, so an overflow is not needed, when the pond overflows, the adjacent area will also be covered with water, so no significant erosion will occur. The east yard pond is not large enough to handle all of the estimated runoff, so a portion of the interior yard is lowered to provide for overflow. The lower portion of the interior courtyard will also serve as a swale to direct runoff from the courtyard into the east pond. The runoff from the north building could continue to be directed onto the adjacent surface, with a swale developed that will direct the runoff to the proposed ponding area. However, to do so will require considerable earthwork on that area. The solution proposed is that a separate pond be developed for the strip of land on the north side of the north building, and that the runoff from the north building be directed to the east pond by means of a roof gutter. The south building appears to discharge directly onto adjacent properties. It is proposed that the owner of Tract 93 obtain an easement for surface discharge of the runoff onto that property, or alternatively obtain an overhang easement to permit placing a collecting drain along the building to collect the runoff and pipe the runoff to the proposed pond area to the east of the buildings. The interior building and courtyard can continue to pond the water, with a swale to direct unwanted water to the proposed pond east of the buildings. Inasmuch as there is no established downstream channel or capacity, it is proposed that the pond be developed with sufficient capacity to hold the 100 year-10 day storm. The estimated requirement for the 100 year-10 day storm is shown on Table A, A-1 and A-2. The pond capacity is based on no percolation for the period of the storm, and on a silting factor of 10% for the north strip, and 8% for the east pond. The small silting factor is reasonable for the site because the site is very flat, and the largest concentrated flow will be in the collector for the roof drains. Table C shows the estimated runoff from the roofs of the north and the south buildings, and Table E shows the required size for the roof gutters.

F. The buildings on site are presently on a community water and sewer system. In excavating for the ponds, care must be taken in the event that abandoned septic tank and draiin fields are uncovered. Bernalillo County Environmental Health Department should be contacted in such an event.

IiI. OFF SITE DRAINAGE

A. No significant off-site flows enter the .66 acre tract. The runoff from the centerline of the pavement on Isleta Boulevard flows to the ditch line between the pavement and the west property line of Tract 93, then to the north, entering the land that was previously Lovato Road, then flowing to the lower surrounding areas. Currently some of this water is collected in potholes along side of the Isleta Boulevard pavement. Table B shows the estimated runoff for this area.

B. The Federal Emergency Management Agency Flood Insurance Rate Map for Bernalillo County, New Mexico, map number 35001C0333, Panel 333 of 825, effective Date: September 20 1997. shows that part of the Tract 93 site is within a Special Flood Hazard Area Inundated by 100-year Flood. The floodplain is designated Zone AH, which are zones with flood depths of 1 to 3 feet. For the particular Zone AH which includes part of Tract 93, the base flood elevation is designated as elevation 4944. The map indicated that the flood ponding area extends from the north, along the east side of the Isleta Boulevard roadbed, extending through the existing buildings. The current topography does not support the designation of the area as a part of the flood ponding area because the area of the building is above the flood elevation of 4944, and the interior courtyard is blocked from inflow by the building and the higher ground north and south of the buildings. The finished floor elevations for the buildings are 4944.25 and 4944.28 for the north and south buildings, respectively, and 4944.86 for the interior building, all of which are above the designated flood elevation. For the protection of future patrons and users of the storage facilities, it is suggested that the owner post a sign, provide a statement with the rental agreement, or otherwise notify such patrons with a statement similar to the following:

"NOTICE: The Federal Emergency Managemant Agency has determined that the east portion of the north building, storage bins number ___ to ___, are within a Special Flood Hazard Area which may be inundated by a 100 year flood. Locally it has been determined that the floor elevations are above any such flood level, and there has been no known flooding of the area in the 70 years that the building has existed."

Such a notice will inform the patrons of the hazard as indentified by the Federal Emergency Management Agency, and they may make their own choice concerning storage of items, or placing of items on duckboards, or otherwise.

Additionally, the owner may request a change to the flood plain designation in accordance with current Federal Emergency Management Agency regulations for Letter of Map Amendment for floodplain designations.

IV. SOILS

The soils within the Tract B area are identified by reference C Gila loam (Gb). The Gila series consists of deep, well drained soils that formed in recent alluvium on the flood plain along the Rio Grande. Runoff is slow, and the hazard of water erosion is slight. The soils on the site have been greatly disturbed, with buildings and other improvements.

V. CONCLUSIONS

A. The development proposed will not produce runoff which will be a hazard to the site or to downstream properties.

B. The site is partially within a 100 year flood plain, but the floodplain does not create a hazard interior to the buildings.

REFERENCES:

A. Bernalillo County Ordinance No. 88-42.
B. Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria, for the City of Albuquerque...Bernalillo County...AMAFCA, January 1993.
C. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, USDA-SCS.
D. Flood Insurance Rate Map, City of Albuquerque, Bernalillo County, Federal Emergency Management Agency, Panel 333 of 825, effective date: September 20, 1996.
E. Urban Storm Drainage Criteria Manual, Volume 2, Wright-McLaughlin Engineers, Denver Colorado, March 1969.
F. Sediment and Erosion Design Guide, for AMAFCA, by Resource Consultants and Engineers, Inc. March 1994.

Preliminary APPROVALS, REVISIONS — Marvin R Kortum BY — October 20, 1997 DATE

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GRADING AND DRAINAGE PLAN
TRACT 93, MRGCD MAP NO. 41
NOTES

OCTOBER 20, 1997
RUNOFF FOR TRACT 93, M. R. G. C. D MAP 41
TOTAL AREA IS 0.6606 ACRES.

TABLE I A
Runoff Estimate: For on-site Basin A of 0.6606 acres, for the complete site, with gravel surface between the buildings

Runoff Factors Zone 1 | CURRENT USE | PROPOSED USE

	Land use	Peak	Total	Area	Percent	Peak Runoff	Total Runoff	Area	Percent	Peak Runoff	Total Runoff
		CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
1	A	1.29	0.44	28775.00	1.000	0.9	1055.1	0.00	0.000	0.0	0.0
2	B	2.03	0.67	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
3	C	2.87	0.99	0.00	0.000	0.0	0.0	21375.00	0.743	1.4	1763.4
4	D	4.37	1.97	0.00	0.000	0.0	0.0	7400.00	0.257	0.7	1214.8
5			1.47				0.0				906.5
TOTALS				28775.00	1.000	0.9	1055.1	28775.00	1.000	2.2	3884.8
				0.6606 acre				0.6606 acre			

TABLE I A-1
Runoff Estimate: For on-site Basin A-1 of 0.5952 acres with gravel surface between the buildings
Basin A-1 consists of buildings, interior courtyard and east yard.

Runoff Factors Zone 1 | CURRENT USE | PROPOSED USE

	Land use	Peak	Total	Area	Percent	Peak Runoff	Total Runoff	Area	Percent	Peak Runoff	Total Runoff
		CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
1	A	1.29	0.44	25925.00	1.000	0.8	950.6	0.00	0.000	0.0	0.0
2	B	2.03	0.67	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
3	C	2.87	0.99	0.00	0.000	0.0	0.0	18525.00	0.715	1.2	1528.3
4	D	4.37	1.97	0.00	0.000	0.0	0.0	7400.00	0.285	0.7	1214.8
5			1.47				0.0				906.5
TOTALS				25925.00	1.000	0.8	950.6	25925.00	1.000	2.0	3649.6
				0.5952 acre				0.5952 acre			

TABLE I A-2
Runoff Estimate: For on-site Basin A of 0.0654 acres with gravel surface between the buildings
Basin A-2 is the strip of land north of the north building

Runoff Factors Zone 1 | CURRENT USE | PROPOSED USE

	Land use	Peak	Total	Area	Percent	Peak Runoff	Total Runoff	Area	Percent	Peak Runoff	Total Runoff
		CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
1	A	1.29	0.44	2850.00	1.000	0.1	104.5	0.00	0.000	0.0	0.0
2	B	2.03	0.67	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
3	C	2.87	0.99	0.00	0.000	0.0	0.0	2850.00	1.000	0.2	235.1
4	D	4.37	1.97	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
5			1.47				0.0				0.0
TOTALS				2850.00	1.000	0.1	104.5	2850.00	1.000	0.2	235.1
				0.0654 acre				0.0654 acre			

TABLE B
Runoff Estimate: For Off-site Basin B of 0.0976 acres, (1/2 off Isleta Blvd. along west of Tract 93)

Runoff Factors Zone 1 | CURRENT USE | PROPOSED USE

	Land use	Peak	Total	Area	Percent	Peak Runoff	Total Runoff	Area	Percent	Peak Runoff	Total Runoff
		CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
1	A	1.29	0.44	4250.00	1.000	0.1	155.8	0.00	0.000	0.0	0.0
2	B	2.03	0.67	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
3	C	2.87	0.99	0.00	0.000	0.0	0.0	850.00	0.200	0.1	70.1
4	D	4.37	1.97	0.00	0.000	0.0	0.0	3400.00	0.800	0.3	558.2
5			1.47				0.0				416.5
TOTALS				4250.00	1.000	0.1	155.8	4250.00	1.000	0.4	1044.8
				0.0976 acre				0.0976 acre			

TABLE C
Runoff Estimate: For roof runoff.

Runoff Factors Zone 1 | NORTH BUILDING | SOUTH BUILDING

	Land use	Peak	Total	Area	Percent	Peak Runoff	Total Runoff	Area	Percent	Peak Runoff	Total Runoff
		CFS/acre	inches	SF		CFS	CF	SF		CFS	CF
1	A	1.29	0.44	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
2	B	2.03	0.67	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
3	C	2.87	0.99	0.00	0.000	0.0	0.0	0.00	0.000	0.0	0.0
4	D	4.37	1.97	2826.00	1.000	0.3	463.9	2685.60	1.000	0.3	440.9
5			1.47				346.2				329.0
TOTALS				2826.00	1.000	0.3	810.1	2685.60	1.000	0.3	769.9
				0.0649 acre				0.0617 acre			

NOTES:
a. Runoff factors from Section 22.2, DPM, January, 1993
b. Land use descriptions: A. Uncompacted soil
B. Landscaped
C. Compacted soil
D. Impervious areas
c. Peak runoff = Area (acres) x factor (CFS/acre) = CFS
d. Total runoff = Area (SF) x factor (inches) / 12 (inches /foot) = CF
e. Peak and total runoff is based on 6 hour, 100 year frequency storm
f. Line 5 estimates additional contribution for 10 day storm, equation a-9, Section 22.2, DPM
[V10 day=V360+ADx(P10 day-P360)/12]; P10 day=3.67'', P360=2.20''so P10-P360=1.47

The numbers shown on the tables are recorded to the significant number shown primarily to aid in tracking computations. Results are reasonably valid only to the first number, ie. 5643.7 represents a result between about 5000 and 6000.

OCTOBER 20, 1997
TABLE D
POND CONFIGURATION, TRACT 93

FOR RECTANGULAR SHAPED PONDS
Volume of ponds: V=volume of pyramid for end sections plus volume of prism for mid section.
(d/3(Area of top surface + Area of bottom + square root of At x Ab)+cross section area of prism x length
Side slope: feet horizontal to feet vertical

		Top dimensions		Bottom dimensions			
depth	side slope	length	width	length	width	Capacity	Area
d (ft)	(ft/ft)	lt (ft)	wt (ft)	lb (ft)	wb (ft)	V (CF)	SF
PONDS FOR TRACT 93, BASIN A-2, DIRECT PRECIPITATION ONLY							
1	3	54	8	48	2	258.0	432
PONDS FOR TRACT 93, BASIN A-2, INCLUDINNG SOME ROOF RUNOFF FROM THE NORTH BUILDING							
1.5	3	100	10	91	1	798.0	1000

FOR DIRECT PRECIPITATION ONLY
REQUIRED 100 YEAR, 6 HOUR STORM 235.1 CF
REQUIRED 100 YEAR, 10 DAY STORM 235.1 CF
WITH 10% SILTING FACTOR
REQUIRED 100 YEAR, 6 HOUR STORM 258.6 CF
REQUIRED 100 YEAR, 10 DAY STORM 258.6 CF

FOR TRIANGULAR SHAPED PONDS
Volume of ponds: V=volume of pyramid
(d/3(Area of top surface + Area of bottom + square root of At x Ab)+cross section area of prism x length
Side slope: feet horizontal to feet vertical

		Top dimensions				Bottom dimensions				
depth	side slope	width base	length perpendicular		area	length	width	area	Capacity	Area
d (ft)	(ft/ft)	lt (ft)	wt (ft)		SF	lb (ft)	wb (ft)	SF	V (CF)	SF
SHALLOW POND IN THE INTERIOR COURTYARD										
1	3	83	38		1577	68	31	1054	950.7	1577
MAIN POND IN THE BACK YARD										
6	2.5	60	48		1440	5	4	10	3051.8	1440
								TOTAL	4002.5	

REQUIRED 100 YEAR, 6 HOUR STORM 2743.1 CF
REQUIRED 100 YEAR, 10 DAY STORM 3649.6 CF

WITH 8% SILTING FACTOR
REQUIRED 100 YEAR, 6 HOUR STORM 2962.5 CF
REQUIRED 100 YEAR, 10 DAY STORM 3941.6 CF 4002.5 capacity is more than need 3941.6

TABLE E
ROOF GUTTER CAPACITIES
TRACT 93
OCTOBER 20, 1997

Ditch capacities of portland cement concrete channel.
Q=Area x Velocity; Velocity=1.486/n x (Rh)^.6667 x (s)^.5

	Mannings n	Ditch Slope (A)	Side slope (B)	Bottom width Ft	Depth Ft	Top Width FT	Area SF	Wetted Perimeter Ft	Hydraulic Radius Ft	Velocity FPS	Capacity CFS	Froude # V/(gL)^.5 (C)	Sequent depth Rectangular (D) Ft	Sloped (E) F	Trapezoid (F) Ft
FOR ROOF GUTTERS ALONG NORTH AND SOUTH BUILDINGS															
1	0.011	5.000	0	0.330	0.20	0.3	0.1	0.730	0.090	1.924	0.127	0.76	0.14	0.16	0.12
2	0.011	10.000	0	0.330	0.20	0.3	0.1	0.730	0.090	2.721	0.180	1.07	0.22	0.26	0.19
3	0.011	5.000	0	0.500	0.20	0.5	0.1	0.900	0.111	2.208	0.221	0.87	0.17	0.20	0.14
4	0.011	10.000	0	0.500	0.20	0.5	0.1	0.900	0.111	3.122	0.312	1.23	0.26	0.31	0.22
5	0.011	5.000	0	0.500	0.33	0.5	0.2	1.160	0.142	2.603	0.429	0.80	0.24	0.29	0.21
6	0.011	10.000	0	0.500	0.33	0.5	0.2	1.160	0.142	3.681	0.607	1.13	0.39	0.46	0.33

REQUIRED Q100 = 0.3 CFS

(A) Ft(vertical)/1000 Ft(horizontal)
(B) Ft(horizontal)/1 Ft(vertical)
(C) Froude No. (Fn)=velocity/(g x area/top width)^.5
(D) Sequent depth for rectangular level channel, y2=(y1/2)x(√(1+8 x Fn^2)^.5) -1)
(E) Sequent depth for sloping rectangular channel
y2=((y1/2)/cos slope angle) x (((1+8(((10^(.027 x slope angle))^2) x Fn^2)^.5-1)
(F) Correction factor for trapezoidal channel, figure 3.4
(G) Reference: Richard H French, Open Channel Hydraulics, 1985

Preliminary APPROVALS, REVISIONS | Marvin R Kortum BY | October 20, 1997 DATE

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GRADING AND DRAINAGE PLAN
TRACT 93, MRGCD MAP NO. 41
ESTIMATES