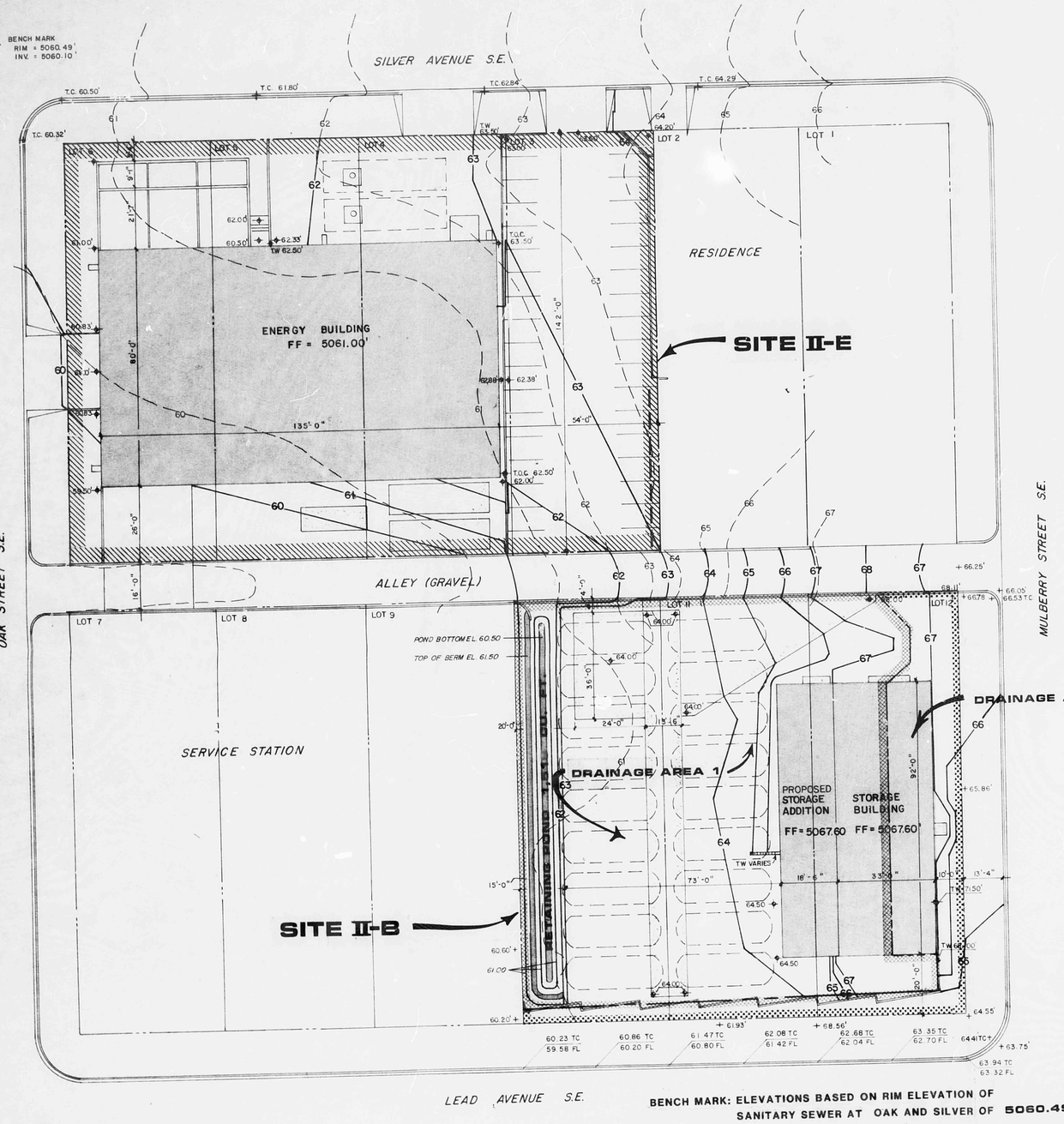
HYDROLOGY

L15/D17
ONE PLAN

L15-D17

1 PLAN



SITE PLAN

SCALE: 1"=20'

BENCH MARK: ELEVATIONS BASED ON RIM ELEVATION OF SANITARY SEWER AT OAK AND SILVER OF 5060.49

SUPPLEMENT A

ON-SITE FLOW RATES (Use Minimum t_c = 10 minutes)

A. Undeveloped Q = CIA i = 5.85 for 10 min. Minimum t_c
Q = 0.95 x 5.85 x 0.652 = 3.62 cfs

B. Developed Q = CIA
Q = 0.92 x 5.85 x 0.652 = 3.51 cfs

SUPPLEMENT B

ON-SITE FLOW RATES (Use Minimum t_c = 10 min.)

Drainage Area 1

A. Undeveloped Q = 0.51 x 5.85 x 0.3985 = 1.19 cfs

B. Developed Q = 0.85 x 5.85 x 0.3985 = 1.98 cfs

Drainage Area 2

A. Undeveloped Q = 0.5 x 5.85 x 0.489 = 1.43 cfs

B. Developed Q = 0.68 x 5.85 x 0.489 = 1.95 cfs

Emergency Spillway (Use trapezoidal weir formula, Q = 3.367 $LH^{3/2}$) size to handle the 100 year undeveloped peak flow. Depth of flow is below top of berm (elev. 60.92) h = (60.92 - 60.65) = 2 (Average) = 0.14' L = 8' Q = 3.36 ([illegible] 14)$^{3/2}$ = 1.41 cfs > 1.19 cfs

LEGEND

EXISTING ELEVATION	+
PROPOSED ELEVATION	✦
TOP OF CURB ELEVATION	TC
FLOW LINE ELEVATION	FL
TOP OF WALL ELEVATION	TW
EXISTING CONTOUR	— — 61 — —
PROPOSED CONTOUR	—— 61 ——

DRAINAGE AREA II-E, ENERGY BUILDING

NOTE: What follows is a re-statement of the original drainage study of 1-4-79 submitted by Boyle Engineering Corporation. Values of runoff are slightly different from those in the 1-4-79 report due to a reduced area of landscaping. The terms "present" or "existing" refer to site conditions existing at the time of writing of the original report.

DESCRIPTION

Lots 3, 4, 5 and 6, Block 17, Terrace Addition
Silver Avenue, S.E. between Oak St. and Mulberry St.
Zone Classification SU-2, SU-1
Zone Atlas Sheet K-15-Z

Area = 4x50'x142' = 28,400 ft^2 = 0.652 Acres

The study area is located in the southeast heights area of Albuquerque. There are no natural or artificial water courses crossing the site and the site is not located in the 100 year flood plain. At present the study site is completely paved with a small existing building at the southwest corner of the site.

On the north side of the site is Silver Avenue which has been fully developed with curbs and gutters containing runoff and drainage directly to the west. On the east side of the site is a residential lot with a retaining wall separating the two properties. As a result there is no runoff to the site for either the north or the east which are the upstream directions of the study site. The site drains to the southwest toward the gravel alley or to Oak St. All runoff flowing from the study site is caused by on-site rain-fall with no upstream contributions.

The proposed development plans include an energy building, cooling towers, transformer pad, coal bin, and 1500 ft^2 of landscaping. Neither Silver Avenue to the north nor the remaining wall to the east will be changed under the proposed development. Therefore, there will not be any change in the upstream run-off pattern to the study site. The drainage pattern of the proposed development will not be changed and will continue to flow to the southwest.

With the proposed development plan, which includes approximately 1500 ft^2 of landscaping, the coefficient of runoff will be decreased from 0.95 to 0.92 with a corresponding decrease in both the rate and volume of runoff. As a result, the proposed development will not include a permanent ponding area.

It is our opinion that if developed as proposed in this study, the site will not be susceptible to flooding from on-site or upstream runoff and will not increase the threat of flooding to downstream areas.

Present Average Coefficient of Runoff

27,950 $Ft.^2$ paved parking lot
450 $Ft.^2$ existing building
28,400 $Ft.^2$ Total area is developed, therefore C=0.95

Present Volume of Runoff

P_6 = 2.4in. Ref. 6-hour, 100-year Precipitation map

$Vol = CAP_6 = 0.95(28,400)(\frac{2.4}{12})$

$= 5,396\ ft.^3$

Proposed Average Coefficient of Runoff

Description	A	C	CA
Developed Area	26,900	0.95	25,555
Landscaping	1,500	0.40	600
	28,400		26,155 ÷ 28,400=0.92 C avg.

Proposed Volume of Runoff

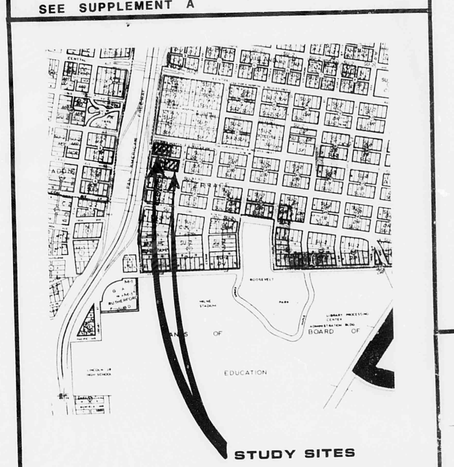
$Vol = CAP_6$

$= 0.92(28,400)(\frac{2.4}{12})$

$= 5,226 < 5,396\ ft^3$

Therefore no ponding is required.

SEE SUPPLEMENT A



SITE LOCATION MAP

DRAINAGE AREA II-B, SITE OF STORAGE BUILDING

NOTE: What follows is a revision to the original drainage study of 12-29-78 submitted by Boyle Engineering Corporation. The terms "present" or "existing" refer to site conditions existing at the time of writing of the original report.

DESCRIPTION

Lots 10,11, and 12, Block 17, Terrace Addition,Lead Avenue, S.E., between Oak St. and Mulberry St , S.E. Zone classification: SU-2,SU-1
Zone Atlas Sheet K-15-Z

AREA = 3x50'x142' = 21,300 ft^2 = 0.489 Acres

The study site is located in the southeast heights area of Albuquerque. There are no natural or artificial water courses crossing the site, and the site is not in the 100-year flood plain.

On the south side of the site is Lead Avenue which has fully developed drainage patterns away from the site. To the east is Mulberry Street which has been fully developed with curbs and gutters, containing runoff which has been fully developed with curbs and gutters, containing runoff east of the site. To the north is a gravelled alley and to the west is an existing service station. Lots 10 and 11 currently drain to the alley, the service station, and Lead Avenue. Lot 12 drains to the east and south due to the presence of a retaining wall on the west property line of Lot 12.

At present Lots 10 and 11 are residential areas with an average coefficient of runoff C=0.51. Lot 12 is like wise a residential area with C=0.60. The proposed development calls for a pitched roof storage building having a roof ridge running north-south. As a result of the proposed grading, runoff down the eastern portion of this roof will flow from Lot 12 onto Mulberry St. to the east and to some extent onto Lead Ave. on the south. A retaining wall set in an average of 6 feet from the south property line will insure that all runoff from the remainder of the building and from the paved parking area north of the wall will flow to the retention pond on the west.

The pond volume is such that it will fill up, but not overflow during the 100-year storm. The existing grade in the gutter of Lead Ave. at the southwest corner of Area II-B is too high to permit positive discharge from the bottom of the pond into the street. Moreover, as this report is a revision to the 12-29-78 report, the current requirement to provide positive 5-year discharge from a detention pond will not be invoked retroactively, i.e., a retention pond will still be acceptable.

Present Conditions

P_6 = 2.4in. Ref. 6-hour, 100-year precipitation map

Areas draining to the west property line: Lots 10 and 11

	A	C	CA
Developed Area	2,751	0.95	2,614 ft^2
Undeveloped Area	11,449	0.40	4,580 ft^2
	14,200		7,194 ÷ 14,200=0.51 C avg.

$Vol = CAP_6 = 0.51(14,200)(\frac{2.4}{12}) = 1,448\ ft^3$

Area draining to Mulberry St. and Lead Ave: Lot 12

	A	C	CA
Developed Area	1,290	0.95	1,225
Undeveloped Area	5,810	0.40	2,324
	7,100		3,549 ÷ 7,100=0.50 C avg.

$Vol = 0.5(7,100)(\frac{2.4}{12}) = 710\ ft^3$

Proposed Conditions

Drainage Area 1

Areas draining to retention pond at west property line: Lots 10 and 11 and westerly portion of Lot 12

	A	C	CA
Developed Area	15,166	0.95	14,408
Undeveloped Area	550	0.40	224
Ponding Area	1,632	0	0
Sub Total	17,358		14,673 ÷ 17,358=0.85 C avg.

$Vol = 0.85(17,358)(\frac{2.4}{12}) = 2,950\ ft^3$

Drainage Area 2

Area drainage to Lead Ave., remainder of Lot 12 and southerly strip of Lots 10 and 11.

	A	C	AC
Developed Area	1,982	0.95	1,883
Undeveloped Area	1,960	0.40	784
Sub Total	3,942		2,667 ÷ 3,942=0.68 C avg.
Total Area	21,300		

$Vol = 0.68\ (3,942)(\frac{2.4}{12}) = 536$ 710 ft^3 existing

Volume of pond required to intercept runoff reaching west property line of Area II-B:

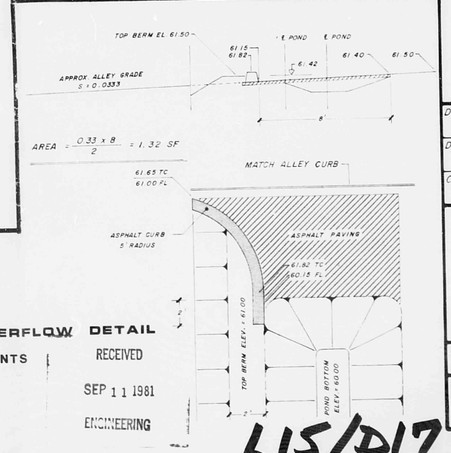
$V = 2,950 - 1,448 = 1,502\ ft^3$

Volume of retention pond provided by grading plan

= Average area x Depth

$= (7.5)(35) \times 15 = 1,519\ ft^3 > 1,502\ ft^3$ O.K.

SEE SUPPLEMENT B



POND OWERFLOW DETAIL

NTS

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SEP 11 1981
ENGINEERING

L15/D17

Revision Mark	Date

Boyle Engineering Corporation

Hamilton McDonald 8-14-81
Date

REVISIONS TO 12-29-78 AND 1-4-79
DRAINAGE STUDIES
PRESBYTERIAN HOSPITAL
ENERGY AND STORAGE BUILDING SITES

Designed by: TDS
Drawn by: BCM
Checked by: FDL

Job Number: AL-SOI-200-01
Sheet No. 1 OF 1