City of Albuquerque

P.O. BOX 1293   ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

January 10, 1985

Marvin R. Kortum
1605 Speakman Drive, SE
Albuquerque, New Mexico 87123

> RE: GRADING & DRAINAGE PLAN FOR TRACTS 57 & 58-A-1
>   1804, 08, 12, 16 PARAGON COURT, NW (G-13/D9)
>   RECEIVED DECEMBER 10, 1984

Mr. Kortum:

The referenced plan dated December 10, 1984, is approved.

Please attach a copy of this approved plan along with the appropriately approved "Drainage Facilities Within City Right-of-Way" document to the construction set prior to hydrology sign-off.

If I can be of further assistance, please call me at 766-7644.

Cordially,

Billy J. Goolsby, C.E.
Design Hydrology Section

BJG/bsj

DRAINAGE REPORT

TRACTS 57 AND 58-A-1 M.R.G.C.D.
MAP NO. 34 SAN ISIDRO ST. S.W.

I. ON-SITE CONDITIONS:

A. Site Characteristics:

Tracts 57 and 58-A-1 consist of a generally rectangular tract, 541.77 feet along the North side, 137.22 feet along the East side, 544.20 feet along the South side, and 98.88 feet along the West side, and consists of 1.6246 acres. It is proposed to subdivide the tract into four lots. (See attached plan). The tract is presently vacant. The West boundary is the San Isidro Street N.W. right-of-way, the North and South boundaries abut private property. The East boundary is common with the Valley High School sports field complex.

B. Soils:

The soils, as identified on the Bernalillo County Soils Survey by the SCS, USDA (Map 20) are Gila clay loam, slopes 0 to 1% (Ge). The Gila series consists of deep well drained soils that formed in recent alluvium on the flood plains along the Rio Grande. Run off is slow, and the hazard of water erosion is slight. The engineering characteristics of the soil do not present undue constraints on the porposed use of the area for single or two story residences with paved or surfaced streets and parking areas. The soils observed on the surface are loamy, with some plasticity, and appear to be properly classified. Structural foundations should be designed and built based on additional subsurface exploration. The surface appears to have been graded or worked recently, destroying obvious evidence of past uses, which may include trash pits or other abandon excavations. The present growth is mostly annual weeds, some heavier growth in the low spots.

C. Undeveloped Run Off:

The soils are identified as hydrologic soil group B, these soils which absorb more water than is typical. There is no defined drainage path on the tract, the area being practically dead level. There are shallow depressions along the West one-third, and in the Southeast corner which show surface water a few inches deep (2 to 3 inches) during heavy downpour. The maximum elevation change, generally from the high of 66.8 near the Northwest corner, to the low of 65.7, in the Southeast corner, is 1.1 feet, for an idealized slope of .002 feet per feet.

D. Direct Run Off Volume, Undeveloped Land:

The 6 hour 100 year frequency rainfall for Tracts 57 and 58-A-1 is 2.2 inches per NOAA Atlas 2, Volume IV (plate 22.2 D-1). The present surface is typical of cultivated land without conservation treatment, for which a curve number of CN = 81 is appropriate (plate 22.2 C-2). From plate 22.2, C-4,

D. Direct Run Off Volume, Undeveloped Land: (Cont'd)

read direct run off volume as 0.7 in., for a total volume of
$(0.7 \text{ in.} \times 1.6246 \text{ acre} \times 43560 \frac{\text{ft}^2}{\text{acre}} \times \frac{1 \text{ ft.}}{12 \text{ in.}}) = 4100 \text{ ft}^3$. In the
undeveloped state, this run off will accumulate in the local low spots,
estimate at 1/5 of the area by .1 ft. deep, or $\frac{1,6243 \text{ acre}}{5} \times 43560 \frac{\text{ft}^2}{\text{acre}} \times .1 \text{ ft.}$
$= 1400 \text{ ft}^3$. The remainder of 2700 ft³. would run generally South and East
across property boundaries.

E. Peak Run Off, Undeveloped Land:

Using a slope of .002, and a drainage path of 300 feet, a time of con-
centration is obtained by the Kirpich formula. TC = $.0078 \frac{L \, 0.77}{S \, 0.385}$ = 6.9 minutes.
Use the rainfall intensity factor for 10 minutes, of 2.15 (plate 22.2, D-2) the
rainfall of 2.2 (plate 22.2, D-1). Obtain a C factor from plate 22.2 C-1,
C = .34 for type B soils, zero percent impervious. The peak flow estimate by
the rational formula, therefore, is Q = C1A = (.34)(2.15)(2.2) 1.6246 = 2.6 ft³.
per sec.

F. Run Off From Developed Land

The site is to be developed as four individual residential houses. For
purposes of computing run off, the following uses will be considered:

TOTAL AREA	1.6246 acres	70,800 ft².
4 residential buildings, with garage, patio, at 2,500 ft². per building		10,000 ft².
4 concrete driveways		2,500 ft².
Gravel access drive		13,000 ft².
Total impervious area		25,500 ft².
Percent impervious		36%

G. Direct Run Off For Developed Property:

The above indicates an area that compares favorably with the land use
description for residential, ¼ acre, 38% impervious, for a CN = 75 (plate 22.2
C-2) for type B soils. Direct run off is .55 inches (plate 22.2, C-4), for a
volume of $.55 \times 70,800 \times \frac{1}{12} = 3245 \text{ ft}^3$. This is a decrease over the unde-
veloped state of 4100 - 3245 = 855 ft³. This is not unexpected, as the present
bare soil surface would not be as receptive to absorbing rain as the expected
lawn and garden portion of the developed residential area.

H. Peak Run Off For The Developed Property:

The proposed site improvements will result in the development of
drainage paths for run off. Generally drainage will be from South to
North, (back lot toward the front) where run off will be collected and
piped by gravity flow toward the under street storm drain, using the
time of concentration of 10 minutes, the C factor of 0.5 for 36%
impervious, the total peak flow would be $Q = CFA = (.5)(2.15)(2.2)(1.6246) = 3.8$ ft^3. per second.

II. OFF-SITE FLOWS:

A. Major Surface Terrain Features:

Tracts 57 and 58-A-1 are not in the channel or natural flow path of
any significant storm run off. The natural terrain is flat, with a gentle
slope generally North to South, and East to West. About 1/2 mile East of the
site is the Greigo Lateral, an irrigation ditch with two to four feet high
berms. To the West, 1/3 mile, is the Griegos Drain. Both feautres would
tend to deflect or spread major inflows. Some minor back up of major surface
run off could occur as the San Isidro curb and gutter flow are higher than the
prevailing surface of tracts 57 and 58-A-1, being flow line, 66.82 and 66.17,
and top of curb 67.47 and 66.85.

B. Subsurface Drainage:

There is a large subsurface drainage system with the drainage basin
between the Griegos Lateral and the Griegos Drain, draining 200 to 300 acres
by gravity drain to the Griegos Drain. Tracts 57 and 58-A-1 are near the mid-
point on this system. Blockage of the system downstream may cause minor
surface overflow, generally being directed down and along the San Isidro
Street between curbs.

C. Local And Nuisance Flows:

Some flow can be expected from vacant private properties to the immediate
North of the site. Developed properties are mostly walled or fenced, control-
ling most of the precipitation on the lot. The surface of the Valley High
School sports field, adjacent to the East property line, is about 1/2 foot
lower, which will prevent inflow from that area of storm run off. The
surface run off from the school grounds appears to flow over private prop-
erty some 500 feet South of tracts 57 and 58-A-1, the surface there being
generally a foot or more lower than tracts 57 and 58-A-1.

III. TRACTS 57 AND 58-A-1   RUN OFF OPTIONS:

A. Fill And Drain:

Tracts 57 and 58-A-1 are lower than the adjacent public right-of-way
along San Isidro Street N.W. One approach would be to place sufficient fill
within the lots to raise the new surface to permit surface drainage to this
right-of-way. The amount of fill required to obtain gravity drain over the
curb would be about two feet average over the entire lot, for a total of
5,000 to 6,000 cubic yards. Boundary line retaining walls would also be
required, and the drainage slope would be about .3%.

B. Subsurface Drain:

A gravity subsurface drain to the adjacent subsurface storm drain within the San Isidro right-of-way is possible. The San Isidro drain consists of 24 inches diameter pipe, with an invert at the Northwest corner of Tracts 57 and 58-A-1 of 61.55. There is a manhole near the Northeast corner that can be tapped for the entry to the storm drain system without the need for additional in right-of-way public infra structure. Consider an outlet into the manhole at an elevation of 2.5 feet above the invert, or 61.55 + 2.5 = 64.05 ft. Place inlet catch basins at the common property line between Lots 1 and 2, and the common property line between Lots 3 and 4. The distance to the furthest point is 330 feet, for a slope of 0.2%, the inlet at Lots 3 and 4 would be 64.05 + .66 = 64.71. Flow rates for discharge pipes at this slope are as follows: (PVC SDR 35 sewer pipe).

Diameter	Velocity FPS Q	1,000 Gal./Day	Q CFS at .2% slope
4"	1.14	63	0.1
6"	1.49	183	0.28
8"	1.81	398	0.61
10"	2.10	722	1.12
12"	2.36	1147	1.77

The above flows could be effectively doubled by increasing the slope to .8%. A slope of .8% could be obtained by placing the entry point at an elevation of about 62.05, or 6 inches above the invert of the 24 inches diameter storm drain, which is of no advantage when the storm drain is running full, as the hydraulic gradient would be less than the pipe slope. The alternative of raising the far inlet would require considerable fill on the most distant lot (Lot 4).

C. Ponding And Subsurface Drain:

A reasonable alternative would be some combination of subsurface piping and surface ponding. Using the run off data from above, for the developed property;

Total run off = 3245 ft^3.

Peak run off = 3.8 ft^3./sec.

Ponding for storing total run off: 30' x 100' x 1'
Discharge rate for 24 hour discharge: .038 CFS

A 6" diameter pipe would permit immediate discharge of about 10% of the peak flow. Peak accumulation within the time of concentration, less than 10% outflow, would be about 2,000 ft^3. Ponding area or depressed landscaping to accommodate this collection of run off will be adequate. Large diameter pipes would be impractical due to the shallow coverage. Placing additional 6" diameter pipes in parallel is an alternative, but cumbersome and would require additional structures to transition into the manhole without weakening the manhole walls.

IV. CONCLUSIONS:

A. The Tracts 57 and 58-A-1 are not within the 100 year or 10 year flood hazard, as identified by the Albuquerque Master Drainage Study.

IV. CONCLUSIONS: (Cont'd)

B. Tracts 57 and 58-A-1 are not effected by any significant off-site flows.

C. Tracts 57 and 58-A-1 can be effectively drained of storm run off by a subsurface drain which discharges into the existing San Isidro Street N.W. storm drain.

D. Finished floor elevations on Lots 1, 2, 3 and 4 of Tracts 57 and 58-A-1 should be placed at or above 68.00 to minimize water damage due to extraordinary flooding.
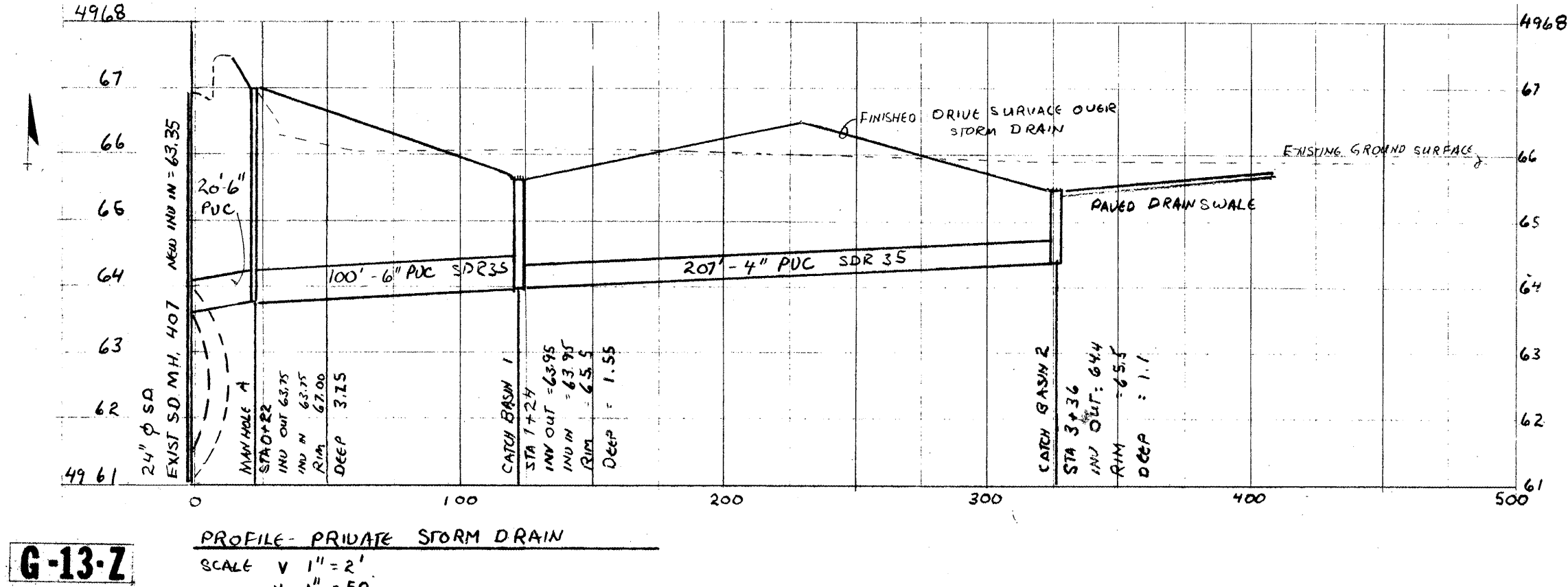
SCALE 1" = 20'
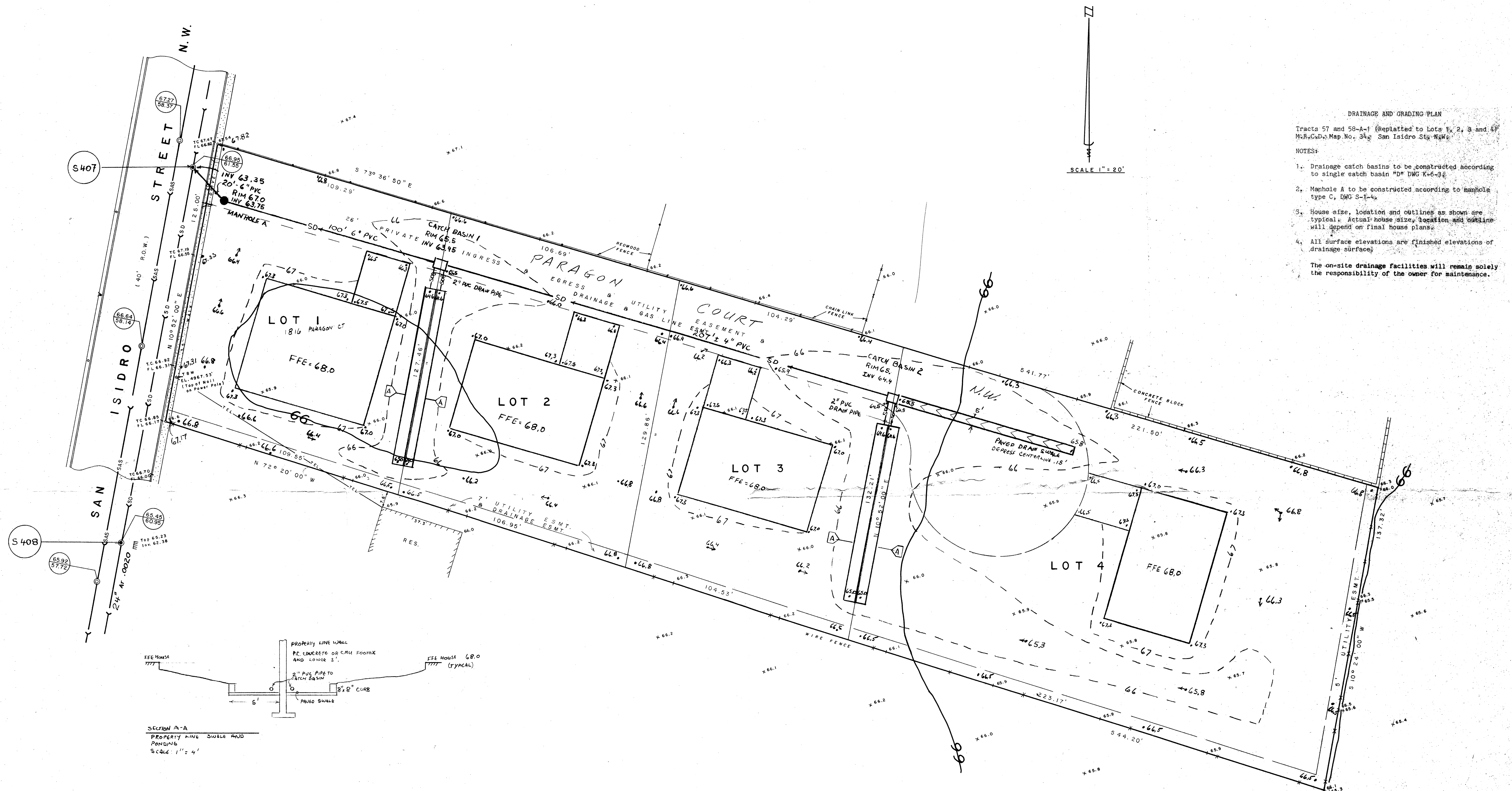
DRAINAGE AND GRADING PLAN

Tracts 57 and 58-A-1 (Replatted to Lots 1, 2, 3 and 4)
M.R.C.D. Map No. 34, San Isidro St. N.W.

NOTES:

1. Drainage catch basins to be constructed according to single catch basin "D" DWG K-6-3½.

2. Manhole A to be constructed according to manhole type C, DWG S-1-4.

3. House size, location and outlines as shown are typical. Actual house size, location and outline will depend on final house plans.

4. All surface elevations are finished elevations of drainage surfaces.

The on-site drainage facilities will remain solely the responsibility of the owner for maintenance.

STREET N.W.

SAN ISIDRO

S 407

S 408

MANHOLE A
INV 63.35
20' 6" PVC
RIM 67.0
INV 63.75

PARAGON COURT

S 73° 36' 50" E

CATCH BASIN 1
RIM 65.5
INV 65.95

PRIVATE INGRESS
EGRESS DRAINAGE & UTILITY GAS LINE ESMT.

CATCH BASIN 2
RIM 65.
INV 64.4

PAVED DRAIN SWALE
DEPRESS CENTERLINE .15'

2" PVC DRAIN PIPE

LOT 1
1816 PARAGON CT.
FFE = 68.0

LOT 2
FFE = 68.0

LOT 3
FFE = 68.0

LOT 4
FFE 68.0

7' UTILITY ESMT.
DRAINAGE ESMT.

N 72° 20' 00" W

RES.

CONCRETE BLOCK FENCE

CHAIN LINK FENCE

REDWOOD FENCE

WIRE FENCE

SECTION A-A
PROPERTY LINE SWALE AND PONDING
SCALE 1" = 4'

PROPERTY LINE WALL
P.C. CONCRETE OR CMU FOOTING AND LOWER 3'.
2" PVC PIPE TO CATCH BASIN
8"x 8" CURB
PAVED SWALE
FFE HOUSE
FFE HOUSE 68.0 (TYPICAL)

Location: Located at the intersection of Cherokee Rd. N.W. and San Isidro N.W.

Benchmark Description: A square " " chiseled in top of concrete curb at the SSW.

Elevation: 04967.70

SITE

G-13-Z

PROFILE - PRIVATE STORM DRAIN
SCALE V 1" = 2' H 1" = 50'

100' 6" PVC SDR35
20' 4" PVC SDR 35
FINISHED DRIVE SURFACE OVER STORM DRAIN
EXISTING GROUND SURFACE
PAVED DRAIN SWALE

LEGEND

FINISHED ELEVATIONS •65,8
FINISHED CONTOURS —66—
EXISTING ELEVATIONS +65.8
EXISTING CONTOURS —66—
FINISHED FLOOR ELEVATION FFE
SWALE CENTERLINE ELEVATION
STORM DRAIN —SD—

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REVISION #1 NOV 19, 1984

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HYDROLOGY SECTION

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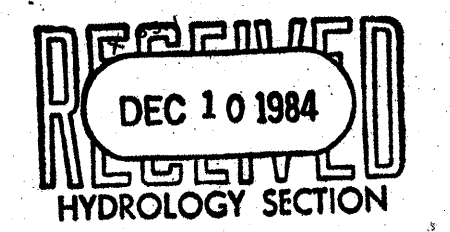
DRAINAGE AND GRADING PLAN
TRACTS 57 AND 58-A-1
(REPLATTED TO LOTS 1,2,3 &4)
M.R.G.C.D MAP NO. 34
SAN ISIDRO STREET N.W.

MAP G-13
DATE: OCT. 24, 1984

SHEET 1 OF 1