MASTER DRAINAGE PLAN

SUNRISE TERRACE UNITS III, IV, & V

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SUNRISE TERRACE SUBDIVISION UNITS III-V MASTER DRAINAGE PLAN

INTRODUCTION

Sunrise Terrace is located on Albuquerque's mostly undeveloped west mesa south of Central Avenue, west of 98th Street and just west (uphill) of Snow Vista Channel, north of Gibson Avenue, and east (downhill) of the Powerline Channel.

The present project consists of what was originally called Sunrise Terrace Unit II Phases B-1 and C-1, plus 10 additional acres adjacent to Snow Vista Channel south of Tower Rd. The total size is approximately 300 dwelling units on 55 acres. The proposed design addresses several changes that have occurred since the 1980's when the project (in somewhat different form) was initially designed by Scanlon & Associates, and when AMAFCA's Snow Vista Channel was designed and built.

The following pages discuss relevant project history, hydrologic analyses performed, and interim drainage solutions.

HISTORY

In 1986 Sunrise Terrace Unit II Phase A-1 was approved based on the proposed drainage for the whole of Unit II, which extended south from Tower Rd. roughly 0.6 mi between Sandpiper Dr. and Tanager Dr. All 99 lots of Unit II Phase A-1, adjacent to Tower Rd., have been built out. In the hydrologic analyses described below, Phase A-1 consists of basins 401, 402, & 403. Sunrise Terrace Unit I, north of Tower Rd. was platted in 1983 but not built. It is currently under redesign by others. In the hydrologic analyses, Unit I consists of basins 311 and 312.

At the time Sunrise Terrace was originally proposed, Bellamah Community Development controlled both units I & 2 and the offsite land west of Unit II. Since then, the lands have been sold and there are new, separate owners. The new owners of Unit I (north of Unit II) also control much of the land immediately west of old Unit II and the present project. Not all the easements needed to carry out the proposed drainage were actually granted, nor were all the proposed improvements - even as called for in Phase A-1 - built and maintained as planned. The lack of a water block at Tower road and Sandpiper Drive - a lack which allows water to fall back into the subdivision rather than flowing directly to the Snow Vista Channel - raises questions about the intent of the original drainage plan that have no ready answers.

Probably the single most significant other change is in required hydrology method. The new method yields substantially higher peak runoff for the study area, with the result that Snow Vista Channel does not have capacity for free discharge for full development at expected levels as originally intended. Previous owners contributed significantly to the construction of Snow Vista Channel in anticipation of free discharge.

After reviewing other plans in the same area, Ryals Engineering discussed the above circumstances with City staff. The consensus was that analysis and design should follow the original plan as much as possible, but that changes would be made to account for the new hydrology and for conditions that exist today. These conditions include the earth diversion channel (as designed, sans an existing gap), the temporary detention-desilting basin located west of Tanager as shown on Plates 1 and 2, and Tower Rd. paved to half-width (plus 4 feet of temporary pavement sloping down from the crown).

The outfall for areas west of Sunrise Terrace will be a storm drain running from the southwest corner of the project east to an existing curved concrete channel. The Scanlon and Herkenhoff analyses assumed the outfall in essentially the same location. The curved channel joins the existing Snow Vista Channel very shortly downstream. The new design flow is 424 cfs, compared to 290 per Snow Vista design. Existing construction provides adequate freeboard and superelevation for the higher flow rate.

HYDROLOGIC ANALYSES

GENERAL

The three hydrologic conditions analyzed for this project are: (1) "fair share" for all currently undeveloped basins, (2) Sunrise Terrace developed with fair share conditions offsite, and (3) Sunrise Terrace developed with existing, mostly undeveloped, conditions offsite.

AHYMO, a version of the computer program HYMO (HYdrologic MOdel) modified for Albuquerque by AMAFCA, was used to analyze these conditions. The design storm is the Albuquerque 100-year 6-hour storm for rain zone 1. The cumulative rainfall distribution is included in the AHYMO output (.out) files. One of AHYMO's capabilities is flood routing, wherein flow is attenuated - delayed and decreased in peak rate - as it is conveyed in a pipe or channel. Attenuation can have important effects in natural channels or in constructed channels on flat slopes. For many concrete channels, pipes, and streets attenuation is virtually nil, and routing may even yield a nominal increase in flow rate.

Plate 1 shows the AHYMO drainage basins for fair share and future conditions modelling; Plate 2 shows them for existing offsite conditions modelling. Note that the (temporary) pond at Tanager and Connemara is modelled only for offsite existing conditions. All ponds and channels on the west side of Tanager modelled in this project are assumed to be temporary, to be removed when upstream areas are developed. (It will be the responsibility of future developers to get developed condition flows to the Andalusian storm drain.)

Appendix A contains modelling schematics for the AHYMO runs. Because different features are in place between developed/fair share and existing conditions, some of the drainage basins identified are quite small, especially in the vicinity of Tower-Tanager-106th-Eucariz. This facilitates showing the differences and similarities between conditions analyzed, as a particular basin may, for example, drain east in one case and south in another.

Within Sunrise Terrace, Plates 1 and 2 do NOT show the final flow paths for Units III-V, although the basin boundaries are as shown. Primarily to provide favorable development phasing and to address City concerns as to street layout, late in the design cycle the streets, storm drains, and Halter DR. pond were changed to the locations shown on Plate 3.

The new Halter pond receives runoff from two small basins only and discharges slowly and directly to the Snow Vista Channel. For Units III-V the only other hydrologic routing is at the downstream margins, in large pipes (in Andalusian Ave. and Halter Dr.) which have approximately zero attenuation effects. Otherwise basin flows are simply added. Therefore, rearranging the flow paths to the final layout had essentially no effect external to the subdivision and it was not felt necessary to revise the hydrology layout. See the specific condition analyses for more.

One feature common to all the hydrologic analyses is "no sediment bulking". Individual pipes, channels, and ponds must be designed for sediment storage as required. Under fully-developed conditions the sediment load is small and can be neglected. Under undeveloped (existing) conditions the sediment-bulked peak flow is less than future (developed and/or fair share) condition flow. Further, even under offsite-undeveloped conditions most flows in the study area will be routed through desilting cum detention ponds before reaching Snow Vista Channel. Under existing conditions one fairly large area north of Tower Rd. is not desilted; this area primarily of basins 306, 307, 311, 312, and 315. All analyses use a "submerged weir" rating table developed from Snow Vista Channel as-built drawings to route flow through the Snow Vista Desilting Basin.

ONSITE FAIR SHARE DEVELOPMENT AND OFFSITE FAIR SHARE DEVELOPMENT

The purpose of the fair share analysis is to uniformly (fairly) reduce the level of future developed runoff so that the peak flow rate in AMAFCA's Snow Vista Channel just below Sunrise Terrace - based on current methods - matches that expected in the construction of the channel. The runoff levels identified in fair share are used for the offsite developed conditions analysis. The fair share analysis is for the purposes of this project only and is not a master plan for the surrounding area.

In a December 6, 1993 meeting at the City of Albuquerque, Cliff Anderson of AMAFCA agreed that peak flow rate (not volume) was the governing criterion in Snow Vista Channel. On Plate 2 of PHASE III DESIGN GUIDELINES - SNOW VISTA CHANNEL - WESTGATE DIVERSION CHANNELS (July 1982) Gordon Herkenhoff & Associates) identified the relevant flow rate as 701 cfs. However, the construction drawings (Sheet 36, July 1987 record drawing of 11/6/86 revision) show 774 cfs, which is the rate used in the fair share analysis.

Anticipated development for the study area is primarily single-family residential. A reasonable estimate for such areas, corresponding to 5 dwelling units per gross acre, is 50% land treatment B and 50% treatment D. Herkenhoff's Snow Vista design documents expected that some area near Central Avenue would be developed commercially. The fair share analysis assumes that the 80 acres of basin 308 (north of Central) would tend to be 20% B and 80% D. The actual location of commercial development may be different.

The approach taken in this report is to assume that all developed areas will be a combination of land treatments B (lawn and landscaping) and D (impervious) and to uniformly adjust the percentage of land treatment B until the peak flow rate matches the target value. The results are: residential - 81.5%B, 18.5% D; commercial - 32.6%B, 67.4% D; Q peak = 773 cfs. Under this approach the various contributing basins have fairly high peak flows and low runoff volumes. This approach has been discussed with and accepted by the City for this project.

Others, working on the redesign of Sunrise Terrace Unit I, suggest detaining all flows higher than a uniformly allowable peak rate per acre. For their assumptions concerning future development patterns the rate is about 1.3 cfs per acre. For the present project one effect of using this approach would be to reduce the size of the pipe required to convey offsite flows down Andalusian Ave.

Offsite fair share basins (Plate 1) are based fairly closely on Scanlon & Associates' earlier basins, except divided smaller, with additional information from design and construction documents for AMAFCA's Snow Vista Channel. The future concrete Eucariz Rd. channel (approximately 3000 ft) is assumed in place. The earth diversion channel west of Tanager is assumed in place, ending at the Andalusian storm drain (previously the Section Line Channel); this is the same offsite outfall location used in Snow Vista Channel design. The Tanager pond is not part of the fair share analysis. Other offsite flows are routed in approximations of natural arroyos. While this is not a realistic model of future flow paths it may provide a reasonable approximation of a future mix of street flow and storm drains and it does not make specific assumptions about developed condition flow paths and routings. The real developed flow paths cannot be known at this time.

Within Units III-IV the fair share analysis is based final basins and on not-quite-final flowpaths, as discussed above. Analysis Point 7 represents flow entering Unit III from Sandpiper Dr. plus all flow from Units III-V except for Basin 108 along Andalusian Ave. Because of the lack of a water block in Sandpiper Dr. at Tower Rd., fair share analysis assumes that the first 23 cfs of Tower Rd. flow reenters Sunrise Terrace. This is half the total peak flow and slightly more than the 21 cfs capacity at depth equal to centerline height. See EXISTING CONDITIONS for further discussion.

The drainage design for the City of Albuquerque West Side Satellite Center (Basin 299) (Scanlon, March 1990) includes a series of ponds (now constructed) to completely retain the 5-year storm and to reduce peak outflow rate from the 100-year storm to about 0.5 cfs under existing conditions. All analyses use a uniform outflow rate from the ponds starting at t=1.17 hrs. For fair share and developed offsite condition analyses the rate is assumed to increase to 10 cfs. In all other cases existing development is assumed to be "as is".

ONSITE FULL DEVELOPMENT; OFFSITE FAIR SHARE DEVELOPMENT

For this case Sunrise Terrace is developed as shown on Plates 1 and 3. Compared to the fair share analysis the percent impervious for onsite development is increased; there is a storm drain system in Sandpiper, Paso Fino, and Halter which conveys flow from Basin 107 and the basins above 105 and 106, and a small detention pond between Halter Dr.and the Snow Vista Channel which receives runoff from basins 105 and 106. The entire earth diversion channel west of Tanager is assumed in place and the Tanager pond does not exist.

At approximately 5.5 dwelling units per gross acre, the project is 53.2% impervious (DPM Sec. 22.2 Table A-5), and "average" peak runoff is about 0.63 cfs per dwelling unit. Flows for storm drain system analysis are based on AHYMO results for entire basins and on "per dwelling unit" values for partial basins.

All onsite flow except from basins 105 and 106 passes through the subdivision in street flow and storm drains in what is essentially free discharge. Also included is offsite runoff entering Unit III at Sandpiper - all flow from basin 402 (already developed) and 23 cfs of Tower Rd. flow which falls into Sandpiper Dr. because Sandpiper has no appreciable water block. The remainder of Tower Rd. water is assumed to flow via catch basin inlets to the Snow Vista Channel. One inlet and two pipes are existing; the other inlet will be built with this project. A water block at Stetson Dr. will keep Tower Rd. flow from reentering Unit III. Tower Rd. capacity at Sandpiper is considerably more than the capacity at Tanager, where the slope is flatter: see OFFSITE EXISTING analysis.

Most onsite flow is collected in the Sandpiper-Paso Fino-Halter storm drain system. Analysis Point 7 sums this flow. Flow from basin 108 is collected in the Andalusisan system, which primarily serves to convey offsite flow from west of Sunrise Terrace. The two systems join at Andalusian and Halter. From there the storm drain leads diagonally across Tract A and enters - approximately tangential to centerline - the existing curved concrete channel stubbed from the Snow Vista Channel. (Tract A was created by the Sunrise Terrace Unit II Phase A plat and was reserved for parks, open space, and drainage. It is owned by the City of Albuquerque.)

The Halter Dr. detention pond will be owned and maintained by the City. Part of the pond lies on Tract A. The pond receives all flow from Basins 105 and 106 and none from elsewhere. Outfall will be directly to the Snow Vista Channel via an orifice-throttled 18-inch pipe. With basins 105 and 106 excluded from the AHYMO analysis (area effectively equal zero) the peak flow rate in the Snow Vista Channel just downstream of the project is 767.1 cfs, or 6.9 cfs less than the 774 allowed. Therefore a pond with peak outflow less than 6.9 cfs, when added to the remaining flow, meets the peak rate criterion without timing effects in Snow Vista Channel even being considered.

As designed, the Halter Dr. pond has a peak inflow of 38.4 cfs at 1.50 hrs. and a peak outflow of 6.7 cfs at 2.07 hrs. Outflow returns to 0.0 less than 6 hours after the first inflow. Maximum water depth is 6.65 feet at elevation 5195.15 and 0.80 acre-feet storage volume. Top of berm is at elevation 5196.00. The overflow spillway leads directly to AMAFCA's Snow Vista channel and will pass the 100-year peak inflow rate.

ONSITE FULL DEVELOPMENT, OFFSITE EXISTING CONDITIONS

The analysis assumes that Sunrise Terrace Units III-IV are developed and that existing undeveloped areas offsite are undeveloped. Undeveloped areas are assumed to be 97% treatment A (natural) and 3% treatment C (packed earth); existing

Sunrise Terrace development (basins 401, 402, & 403) is taken as 50% B and 50% D; and flow from the Westside Satellite Center is taken at the design value of 0.51 cfs. This case requires sediment analysis for areas west of Tanager Dr.

Conceptually this is the most complicated analysis with the least certainty in the drainage parameters. Assumed land treatment percentages are approximate. Near the north end of the study area some basin boundaries are questionable. Undocumented traffic and erosion patterns in unpaved roads may redirect flow. For example, depending on the extent of recent tire rutting, some of the flow leaving Analysis Point 4 may head south along 106th St. and bypass the Snow Vista Desilting Basin, instead of flowing as shown. However, undeveloped condition flows are so much smaller than fair share flows that this case never governs and the discrepancies can be considered minor. Sunrise Terrace flows are based on developed conditions density and Analysis Point 7 is as in the Onsite Full-Offsite Fair Share analysis.

Plate 2 shows the basins used for analysis. Routing is different from the fair share and offsite developed analysis in several places. Eucariz channel is not in place. The diversion channel west of Tanager does not flow continuously south to the Andalusian storm drain. Instead the Tanager detention pond (at Connemara). receives flow from the earth diversion channel on the north, a natural swale-arroyo on the west, and a north-flowing asphalt channel on the south. The pond outfalls via a small storm drain in Tanager south to the storm drain in Andalusian. The asphalt channel, pond, and outlet pipe are modelled only with existing conditions offsite.

The Tanager pond desilts flow from offsite basins 302.2 and 303 from the south and west respectively in addition to reducing peak flow rates. Inflow from basin 302.2 is via temporary asphalt channel in excess Tanager right of way. The pond will not provide sediment storage for Basins 304, 351, and 352 from the north. Instead the earth channel is designed to have a non-erosive peak velocity of less than 2 ft/sec and has capacity for sediment storage plus 100-year peak flow. Pond and channel provide sediment storage for at least 5 average years plus a 100-year storm. Sediment load from basins was calculated using MUSLE (Modified Universal Soil Loss Equation) with a multiplier of 3 for local use. Sediment load from the natural entering the pond from the west channel was calculated using procedures in AMAFCA's SEDIMENT AND EROSION DESIGN GUIDE, March 1992 draft with April 1993 bed material transport equation.

Outflow from the Tanager pond is via pipe in Tanager right of way to the storm drain in Andalusian Ave. Should the pond overtop in an extraordinary event overflow would be down Connemara in roughly the historical location. Runoff from basin 302.1 on the south is collected in a temporary catch basin in excess Tanager right of way then join flow from the Tanager pond outlet pipe at the Andalusian Storm drain. As described in INTERIM DRAINAGE SOLUTIONS below, construction of Unit III, the first new unit to be built, does not involve Tanager south of the pond, and the outlet pipe and the asphalt swale will be constructed with a subsequent unit.

The existing conditions situation near the intersection of Tower, Tanager, and 106th St. is somewhat complicated. Basins 355 & 403 deliver runoff to the intersection. Flow from basins 307, 353, and 354 is assumed to pass just north of the intersection and to flow through Sunrise Terrace Unit I (Basin 311, not developed). There is no paving north of the intersection.

The 20'-wide south half of Tower Rd. downstream (east) from the intersection has been built but not the north half. The design slope is 1% and the capacity at centerline width and centerline height (12 cfs) is approximately the same as the 100-year runoff from basin 403 (existing development) which drains to Tanager. Additional flow, above centerline capacity, will spill across centerline and into Sunrise Terrace Unit I (Basin 312, not developed). Existing grades in Unit I are such that Basin 312 flow reenters Tower Rd. near Snow Vista Channel; in other cases Basin 312 is modelled as entering Snow Vista directly, Above Tower Rd.

Between Tanager and Sandpiper sidewalk culverts bring flow from Basin 401 to Tower Rd. Here the slope is steeper and the centerline capacity is 21 cfs. This is not enough to convey the combined flow and there is a second spill to basin 312. Because there is no appreciable water block at Sandpiper, again the first 23 cfs is assumed to fall back into Sunrise Terrace.

INTERIM DRAINAGE SOLUTIONS

Unit III will be constructed first, then IV, then V. Because of the extent of the drainage infrastructure required for this project it is essentially economically• impossible to construct all the drainage infrastructure with the first Unit. Certain improvements, including the Andalusian storm drain and the paved Tanager swale, will be deferred until construction of Unit IV. The following is a summary of proposed interim solutions for the required conveyance of both onsite and offsite drainage. See Plates 3 and 4.

OFFSITE

Unit III construction includes regrading the Tanager pond and the earth swale north of the pond. It does not include construction of the asphalt swale entering from the south. Under these conditions the combined sediment storage (for 5 average years plus 100-yr storm) and 100-year storm inflow volume is 5.03 ac-ft. (see RTPOO.SUM) Primarily the pond is to be excavated below existing grade. Storage capacity is 6.05 ac-ft at the spillway crest (elev 5253) and 5.11 ac-ft one foot below the spillway crest. For Unit III construction the pond has a graded spillway which discharges at the Connemara intersection.

The Connemara intersection is the approximate location of a swale which heads generally southeast across the site. Per discussion with the City, the portion of Connemara east from the Tanager pond and the upstream end of Unit III will be graded (but not paved) to provide a path through Unit III for spillway flow. A temporary stilling basin in the Connemara-Vaquero intersection will desilt flow entering Unit III prior to constructing Unit IV. In Unit IV a water block (high area) just east of this intersection will divert normal flows (100-yr or less) south to Paso Fino.

Unit IV improvements for offsite drainage include the entire paved swale in Tanager; the sediment trap berm, improved spillway, outlet structure, and outlet pipe for the Tanager pond; and the entire Andalusian storm drain (located in Unit V) except for the inlets which serve Unit V local inflow.

ONSITE

Unit III construction includes the Halter Dr. pond for basins 105 and 106 and its associated structures. All of the Sandpiper-Paso Fino-Halter storm drain piping will be constructed with Unit III. This includes the junction structure at Halter-Andalusian, the conduit joining to the existing stub channel, and all catch basin laterals. Only those catch basins within Unit III will be built with Unit III. A new catch basin in Tower Rd. opposite Foyt Drive will connect to an existing lateral leading to the Snow Vista Channel.

In fully developed conditions there will be a mixture of street and storm drain flow along the storm drain routes because only in small storms do catch basins intercept all the street flow. To prevent street flow in Sandpiper from spilling onto undeveloped Unit IV and causing problems a temporary stilling basin will extend from the end of Unit III paving in Sandpiper to the Sandpiper-Hackamore intersection. The sump condition will allow all remaining street flow to enter the storm drain through a temporary inlet structure.

With the construction of Unit IV the temporary inlet between Hackamore and Connemara will be replaced with permanent catch basins and the stilling basin and temporary inlet will be moved to the Sandpiper-Paso Fino intersection.

APPENDICES

A: HYDROLOGY

B: SEDIMENTATION

C: HYDRAULICS

APPENDIX A: HYDROLOGY

A1: MISCELLANEOUS CALCULATIONS
A2: TIME OF CONCENTRATION
A3: CHANNEL, STREET, & ARROYO CROSS SECTIONS
A4: AHYMO FILE LIST
A5: AHYMO SCHEMATICS
A6: AHYMO FILES

A1: MISCELLANEOUS CALCULATIONS

[illegible]

[illegible]	[illegible]	[illegible]	100*	100**
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	1.97	(1.97)
[illegible]	[illegible]	[illegible]	2.20	(2.20)
[illegible]	[illegible]	[illegible]	2.65	(2.66)
[illegible]	[illegible]	[illegible]		
[illegible]	10	10		
[illegible]	[illegible]	[illegible]		

* FROM FIGS 22.2 G1, G2, G3

** TYPICAL ZONE 1, FOR COMPARISON ONLY

SUNRISE TERRACE UNIT II % IMPERVIOUS 11/26/93

USED DPM TABLE A-5 for single family Residential

$\% \text{ IMPV} = 7\sqrt{N \cdot N + N \cdot 5}$

N = # DU/gross acre includes local streets
N ≤ 6

PHASE A-1 = BUILT = EXISTING

# DU = 5 + 38 + 34 + (78-60) = 95
AREA = 80.49 in² @ 1" = 100'
= 804900 SF
= 18.48 AC
DU/AC = 95/18.48 = 5.14

$\% \text{IMPV} = 7(5.14^2 + 5.14 \cdot 5)^{1/2}$
= 50.53

RECHECK 2/16/94 GIVES 4.895 du/AC
⟹ 48.72% IMP USE 50%

REST = PROPOSED

DU = 26 + 33 + (26-5) + 99 + (61-35) = 205

AREA = 196.5 in² @ 1" = 100' − 40·2000±
= 1,885,000 SF
= 43.27 AC
DU/AC = 205/43.27 = 4.74

$\% \text{IMPV} = 7(4.74^2 + 4.74 \cdot 5)^{1/2}$
= 47.56

NOT INCLUDING CONCRETE SECTION LINE CHANNEL

— OLD — FINAL = 300 UNITS II-V ON ±55 AC

A2: TIME OF CONCENTRATION

SUN RISE TERRACE 11/29/93

AHYMO T_c = time of concentration

→ use K = 2 & K = 0.7 in upper parts of watersheds even though using developed condition land treatments

⇒ rational = poss/prob some flow paths with be "sideways" rather than all down hill.

BASIN 301

A_{TOT} = 90.8 Ac = 0.14188 mi^2

L_{TOT} = 4660 Δel tot ≈ 189.5 S_{AV} = 0.0407 (> 0.04)

Since L_{TOT} > 4000 ft use transition eqn 6-6 for Tc requires info from method for L ≤ 4000'

Since slope (overall) > 0.04% use method for adjusting S → S' & K → K' or K''

Start downstream end

(1) $\frac{L_1}{K_1\sqrt{S_1}} = \frac{2400}{3\sqrt{.0323}} = 4451$

(2) $\frac{L_2}{K_2\sqrt{S_2}} = \frac{260}{3\sqrt{.0538}} = 374$

(3) $\frac{L_3}{K_3\sqrt{S_3}} = \frac{1700}{2\sqrt{.0476}} = 3896$

(4) $\frac{L_4}{K_4\sqrt{S_4}} = \frac{300}{0.7\sqrt{.0567}} = 1800$

$\Sigma = 10\,521$

$K = \frac{L_{TOT}\sqrt{S_{AV}}}{\Sigma L_i/(K_i\sqrt{S_i})} = \frac{4660\sqrt{.0407}}{10521} = \frac{23099}{10521} = 2.253$

Kn = 0.021 - Med density urban proposed, flow in streets, storm sewers, & improved (not lined) channels

LCA = 2330 LCA/L = 2330/4660 = 0.50

SKT
AHYMO Tc CONT
B 301 CONT

for 'L > 4000' & < 12000 ft eqn b-6

$$t_c = \frac{(12000 - L)}{72000 \cdot K_i \sqrt{S}} + \frac{(L-4000)(L_{CA}/L)^{.33}(K_n)}{552.2 \cdot S^{0.165}}$$

$$= \frac{7340}{72000(2.253)\sqrt{.0407}} + \frac{(660)(.5)^{.33}(0.021)}{552.2 \cdot (.0407)^{.165}}$$

$= 0.224 + .034$

$= 0.258$ hrs (15.5 min)

$t_p = (2/3)\, t_c$ eqn b-9

$= 0.172$ hrs $= 10.33$ min

$Q_p = 252$ cfs @ 1.53 hrs (AHYMO run)

CHECK STEEP SLOPE STUFF $S = 0.0407 > 0.04$ criterion

$S' = 0.052467 + (0.063627 \cdot .5) - 0.18197\, \exp(-62.375 \cdot .5)$ ...
$= 0.0407$ = no change to this precision

$K' = 0.302 \times S^{-1/2}\, Q_p^{0.18} = 4.05 > K = 2.253 \Rightarrow$ no change
$K''\ 0.207 \times$ " $= 2.78 >$ " $\Rightarrow K = 2.78$

redo t_c, Q_p w $K = 2.78$
note that much of eqn for t_c stays same

$t_c = 0.224 \times \frac{2.253}{2.78} + 0.034 = 0.1815 + 0.034$
$= 0.2155$ hr

$t_p = (2/3)\, t_c = 0.144$ hr (8.6 min)

$Q_p = 276.34$ cfs

$276/252 = 1.095 < 1.10$ (10% test) = OK

$\therefore$ use $t_c = 0.144$ hr

{ ✓ for giggles $K' = 4.19$ $K'' = 2.82 \Rightarrow K = 2.82$
$t_c = 0.1815\,(2.78/2.82) + 0.034 = 0.2129$
$t_p = 0.1420$ hr
$Q_p = 278$ $278/276 < 1.10 \Rightarrow$ 10% test ok }

SRT AHYMO 11/29/93
tc CONT

SPOT ~~CHECK~~ Larger basins
IF tc Larger < 0.2 hrs = tc min, then smaller basins will have tc = tc min = 0.2 hr

B 302

A_{TOT} = 55.2 Ac = 0.08625 mi²
L_{TOT} = 900 + 1450 + 300 = 2650'
ΔEL_{TOT} = 36 + 70 + 28.5 = 134.5
S_{AV} = 0.0508 > 0.04

$\frac{L_1}{K_1\sqrt{S_1}} = \frac{900}{3\sqrt{.04}} = 1500$

$\frac{L_2}{K_2\sqrt{S_2}} = \frac{1300}{2\sqrt{.0483}} = 2958$

$\frac{L_3}{K_3\sqrt{S_3}} = \frac{306}{0.7\sqrt{.1095}} = 1390$

Total: 5848

$K = \frac{2650/\sqrt{.0508}}{5848} = 2.011$ eqn b-5

S'_{AV} = 0.0480

$\frac{L_1}{K_1\sqrt{S_1'}} = \frac{900}{3\sqrt{.04}} = 1500$ (no change)

$\frac{L_2}{K_2\sqrt{S_2'}} = \frac{1300}{2\sqrt{.0466}} = 3011$

$\frac{L_3}{K_3\sqrt{S_3'}} = \frac{300}{.7\sqrt{.0580}}$ 1779

Total: 6290

$K = \frac{2650/\sqrt{.048}}{6290} = 1.923$ eqn b-5

⇒ tc = 629.0 sec = 10.48 min = 0.175 hr
tc = tc min = 0.2 hrs
⇒ tp = 0.13333 hrs

from AHYMO Q_p = 177 cfs @ 1.5 hrs

$K' = 0.302 (S')^{-1/2} \cdot Q_p^{0.18}$ = 3.500 > K = 2.011 ⇒ no change
K'' = 0.207 " " = 2.399 ≥ k = 2.011 ⇒ use K = 2.399

$t_c = \frac{L_{TOT}}{10 \cdot K_{eff}\sqrt{S_{AV}'}} = \frac{2650}{10 \cdot 2.399\sqrt{.0480}}$ = 504 sec = 8.40 min = 0.140 hr

tc = tc min = 0.2 hr = same ⇒ Q_p same ⇒ no more change

SRT 11/28/93

AHYMO tc/tp CONT

✓ B 308 semi offsite north of Central

A_{TOT} = 80 Ac = 0.1250 mi²
L_{TOT} = ~2300'
ΔEL_{TOT} ~ 2100×.04 + 200×.01 = 86'
S_{AV} = 86/2300 = 0.0374

$\frac{L_1}{10 K_1 \sqrt{S_1}} = \frac{200}{10.3 \sqrt{.01}} = 67 = t_1$ sec

$\frac{L_2}{10 K_2 \sqrt{S_2}} = \frac{1100}{10.3 \sqrt{.04}} = 183$ t_2

$\frac{L_3}{10 K_3 \sqrt{S_3}} = \frac{1000}{10.2 \sqrt{.04}} = 250$ t_3

500 sec = 8.33 min = 0.139 hr

0.139 hr < 0.2 hr min
$t_c = t_{cmin}$ = 0.2 hrs

✓B 309 "

A_{TOT} = 4.0 + 44.5 = 88.5 Ac = 0.13828 mi²
L_{TOT} = 2000 + 500 + 250 + 100 = 2850'
Δel_{TOT} = 52 + 12 + 15 + 2 = 81'
S_{AV} = 81/2850 = 0.2842

$\frac{L_1}{K_1 \sqrt{S_1}} = \frac{2000}{3\sqrt{.026}} = 4134$

$\frac{L_2}{K_2 \sqrt{S_2}} = \frac{500}{3\sqrt{.024}} = 1076$

$\frac{L_3}{K_3 \sqrt{S_3'}} = \frac{200}{2\sqrt{.0520}} = 439$ (S = .06)

$\frac{L_4}{K_4 \sqrt{S_4}} = \frac{100}{.7\sqrt{.02}} = 1010$

6659

t_c = 6659/10 = 666 sec = 11.1 min
= 0.185 hr
$t_c = t_{c\,min}$ = 0.2 hr
$t_p = t_{p\,min}$ = 2/3 $t_{c\,min}$ = 0.13333 hr

✓ alt def of S based on S' where appropriate
here S = (1/2650)(52 + 12 + 13 + 2) = 79/2650 = 0.02981

A3: CHANNEL, STREET, & ARROYO CROSS SECTIONS

CHANNEL & ARROYO

CROSS-SECTIONS

USED FOR AHYMO ANALYSES

SUNRISE TERRACE
UNITS III-V

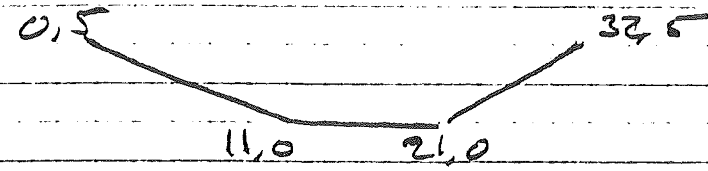
NOTE:
(1) NOT ALL SECTIONS SHOWN FINALLY USED

(2) SOME SECTIONS FINALLY USED NOT SHOWN HERE (ESPECIALLY STORM DRAINS

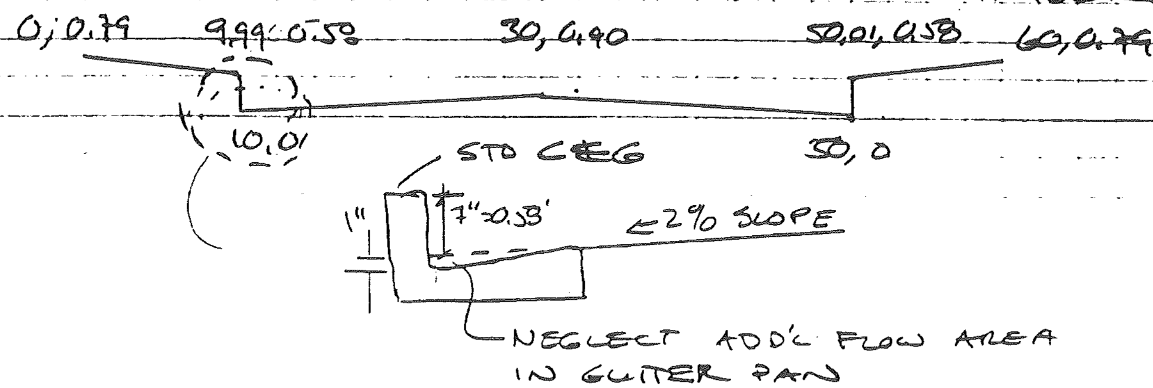
SUNRISE TERRACE – AHYMO 11/29/93

CHANNEL SECTIONS

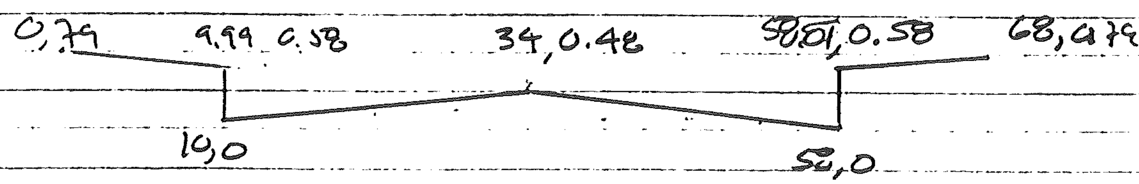
(A) CONC DRAINAGE CHANNEL – AMAFCA/COA TYP
10' BOTTOM 2H:1V SIDESLOPES
ASSUME 5' DEEP TYP n=0.015



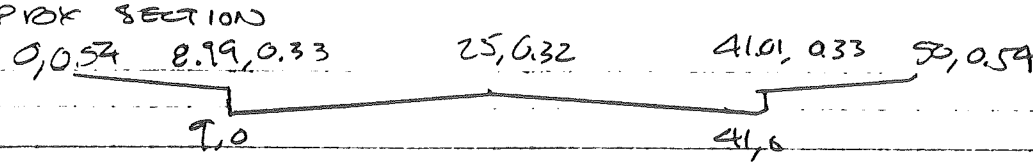
(B) STD C&G 40 FACE TO FACE TOWER ROAD
60' R.O.W. S PART TANAGER



(C) STD C&G 48' FACE TO FACE – N PART TANAGER
SIMILAR TO ABOVE, ONLY 68' R.O.W.



(D) MOUNTABLE ROLL CURB 32 FF, 50 ROW
APPROX SECTION

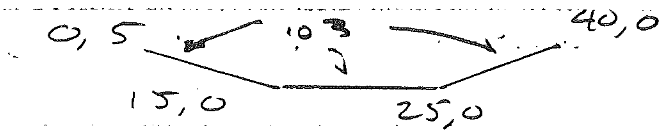


SUNRISE TERRACE AHYMO 11/29/93

CHANNEL SECTIONS CONT

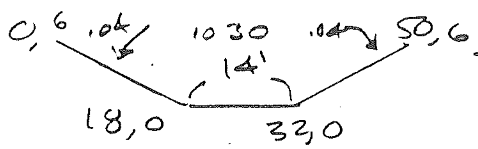
(E): EARTH DIVERSION ALONG TANAGER

NOTE: PROB NOT FIT WITHIN R.O.W
: PROB NEED SLOPE GRADING EASEMENT OR SLOPE STABILIZATION
: WAS 10' BOTTOM WIDTH IN SCANLON / SRT PLANS
: MAX DEPTH ACTUAL ~ 1.5',
USE ~ 5 TO CHECK CAPACITY



N = 0.03
SOME WEEDS'S
S = 0.001 ft/ft

(F) NATURAL CHANNEL BASIN 307
SCALE APPROX FROM 1" = 200' TOPO narrow count



n = 0.030 SAND & WEEDS
→ ACTUAL SLOPE ~ 0.03

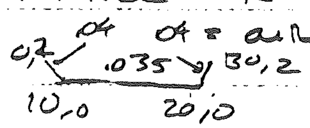
Quick & Dirty < 40 Ac For 25.4 Ac 50% B & 50% D Zone 1
Qp = (.5 × 2.03 + .5 × 4.37) · 25.4 = 81.28 cfs

(1st try S = 0.013 ⇒ y = 0.9733 ~1' Fr (AH) = 0.96 OK
Fr (y) = 0.80)

F↓ as y↓ & Q↓

(G) NATURAL CHANNEL N SIDE OF B 303 QPC|CFS ←
.04 = OUTLET POND 2 COA WESTSIDE SATELLITE CENTER ✓

ASSUME:



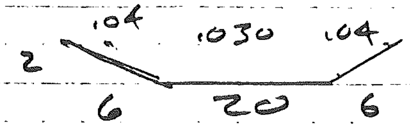
S = 0.031 ±

NOTE: MADE

SUNRISE TERRACE AHYMO 11/29/93

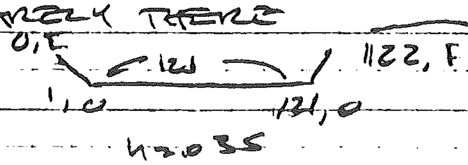
CHANNEL SECTIONS CONT

(H) NATURAL CHANNEL B 309
CHANNEL VARIES - NARROW & DEEP → WIDE & SHALLOW
EST AS THROUGH OUT, FROM TOPO



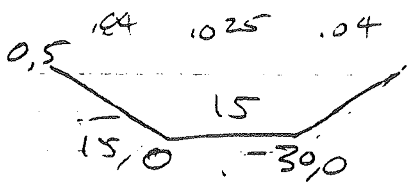
S = 0.02
n = 0.030 center
deeper, sand w weeds

I NATURAL CHANNEL B 310 E OF 106th
CHANNEL BARELY THERE
EST AS



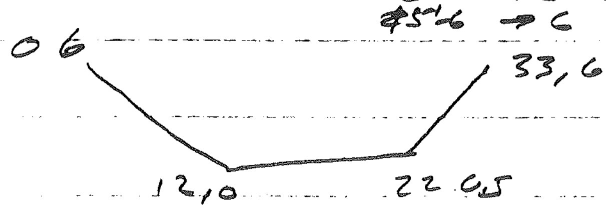
$S \approx \frac{22}{830} \approx 0.0265$
n = 0.035
shallow

J NAT CHAN B 310 DOWNSTREAM OF ↑ I ABOVE
INCISED AGAIN - ALSO FUTURE PILOT CHANNEL
EST AS



n = 0.030

K CONC CHANNEL - SIM TO A
SNOW VISTA UPSTREAM OF SECTION LINE
ACTUAL CHANNEL VARIES 5'→5'-6" W SAME BOTTOM & SIDE SLOPES
~~5'-6~~ → 6



SRT

11/29/93

AHYMO VALLEY SECTIONS FOR ROUTING

#	XSECT	LENGTH	SLOPE	NOTES
1	A	1145 ~~1200~~	.01089 ~~.1008~~	rev 12/3 from as builts
2	A	535 ~~700~~	.01400 ~~.1008~~	"
3	A	500 ~~1480~~	.00400 ~~.008~~	
4	A	977 ~~870~~	.01229 ~~.029~~	
5		816	Sav = 0.02364	
31	G	1820	.0316	
32	E	500	.001	L=500' ⇒ INPUT @ MID SECTION, NOT WHERE SHOWN. NOTE ALT POSS CHOICE FOR FLOW PATH
33	E	1000	.001	
34	F	2320	.0316	
35	H	2500	.02560	S = Sav 2000 @ .026 + 500 @ .024
36	I	860	.02558	
37	J	740	.02432	
41	B	950	.02947	S = 28/950
42	PIPE 25'=D	1150	.01826	S = 21/1150
43	A	1450	.03615	inlet channel @ downstream end
44	A	517	.0181	
45	A	320	.0316	curved part
38	A	1200	.0167	

SRF A HYMO 11/29/03

BASIN DATA

#	Acres	mi²	%B	%D	tp,hr	Qp
301	90.8	.14188	50	50	0.144	
302	55.2	.08625	↓	↓	.13333	
303	42.8	.06688	↓	↓	↓	
304	18.8	.02938	↓	↓	↓	
305	44.2	.06906	↓	↓	↓	
306	25.4	.03969	↓	↓	↓	
307	19.3	.03016	↓	↓	↓	
308	80.0	.12500	20	80	↓	
309	48.5	.07575	50	50	↓	
310	25.6	.04000	↓	↓	↓	
311	33.4	.05219	↓	↓	↓	
312	16.5	.02578				
401	9.4	.01469	50	50	.13333	
402	9.9	.01547	↓	↓	↓	
403	11.3	.01766	↓	↓	↓	
404	15.00	.02344	↓	↓	↓	
405	7.8	.01219	↓	↓	↓	
406	11.3	.01766	↓	↓	↓	
299	48.1	.07516	DNA			

A4: AHYMO FILE LIST

AHYMO FILES

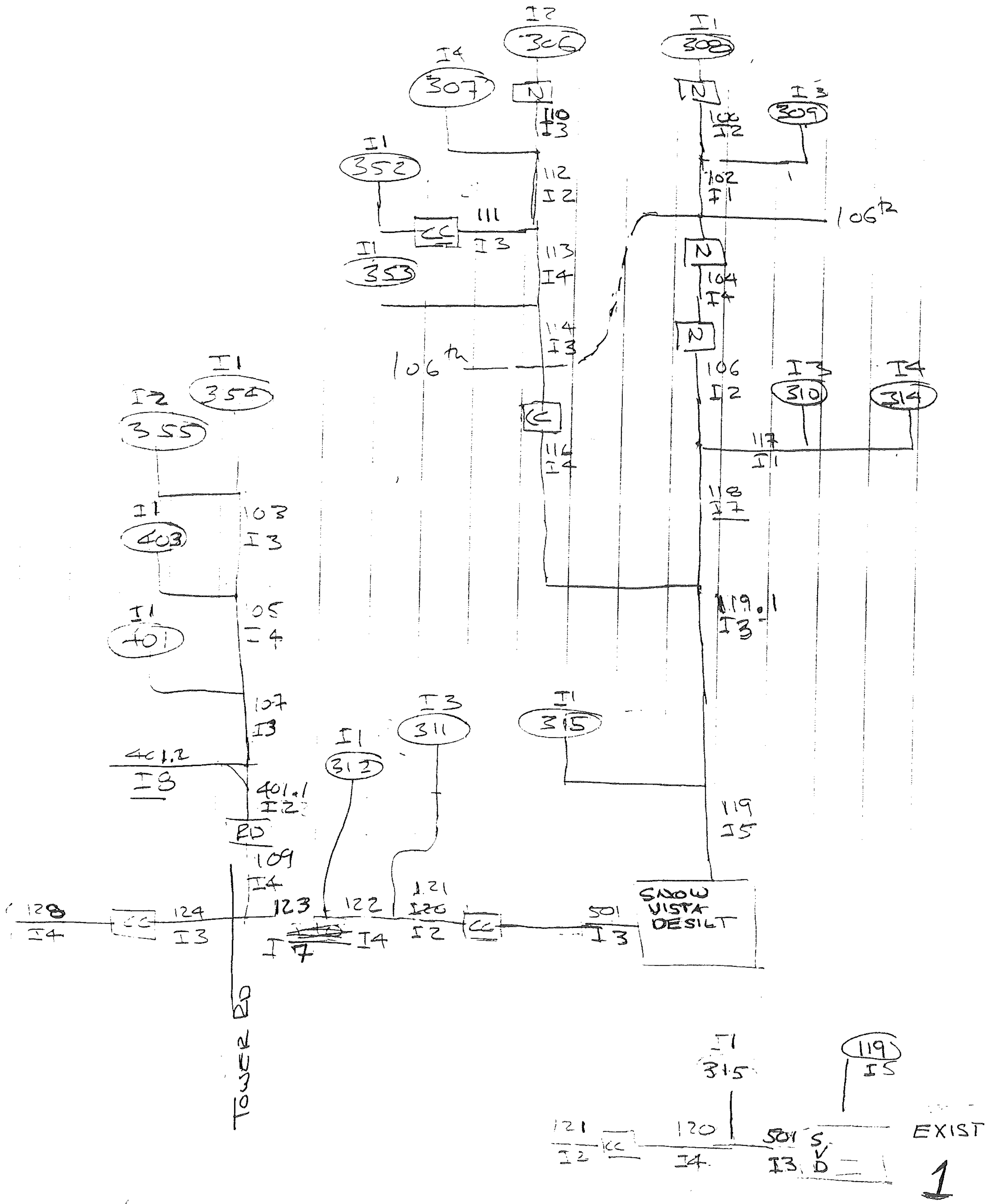
NOTE: R==>REVISED, 00==>100-YEAR, 10==>10-YEAR, 2==>2-YEAR

FILE NAME	DESCRIPTION / USE
RSFAIR00	REVISED FAIR SHARE, 100-YEAR STORM ESTABLISH ALLOWABLE RUNOFF RATES
PAS001	POND NEAR PASO FINO & HALTER, PART 1 ONSITE DEVELOPED, WITHOUT BASINS 105 & 106 GET ALLOWED OUTFALL RATE FOR SMALL POND
PAS002	POND NEAR PASO FINO & HALTER, PART 2 VERIFY POND FOR BASINS 105 & 106
RSFOE00	SUNRISE FULL DEVELOPMENT OFFSITE EXISTING WITH TANAGER POND & ASPHALT SWALE JUST AFTER PROJECT COMPLETED
RTP00	TANAGER POND AREA ONLY VERIFY POND, SWALES, OUTLET
TANGER00 TANGER10 TANGER2	TANAGER POND INFLOW - EARLY FLOWS FOR SEDIMENT CALCULATIONS
RSFOF10	SUNRISE FULL DEVELOPMENT, OFFSITE FAIR SHARE INTERIM POND IN SANDPIPER, 10-YEAR

A5: AHYMO SCHEMATICS

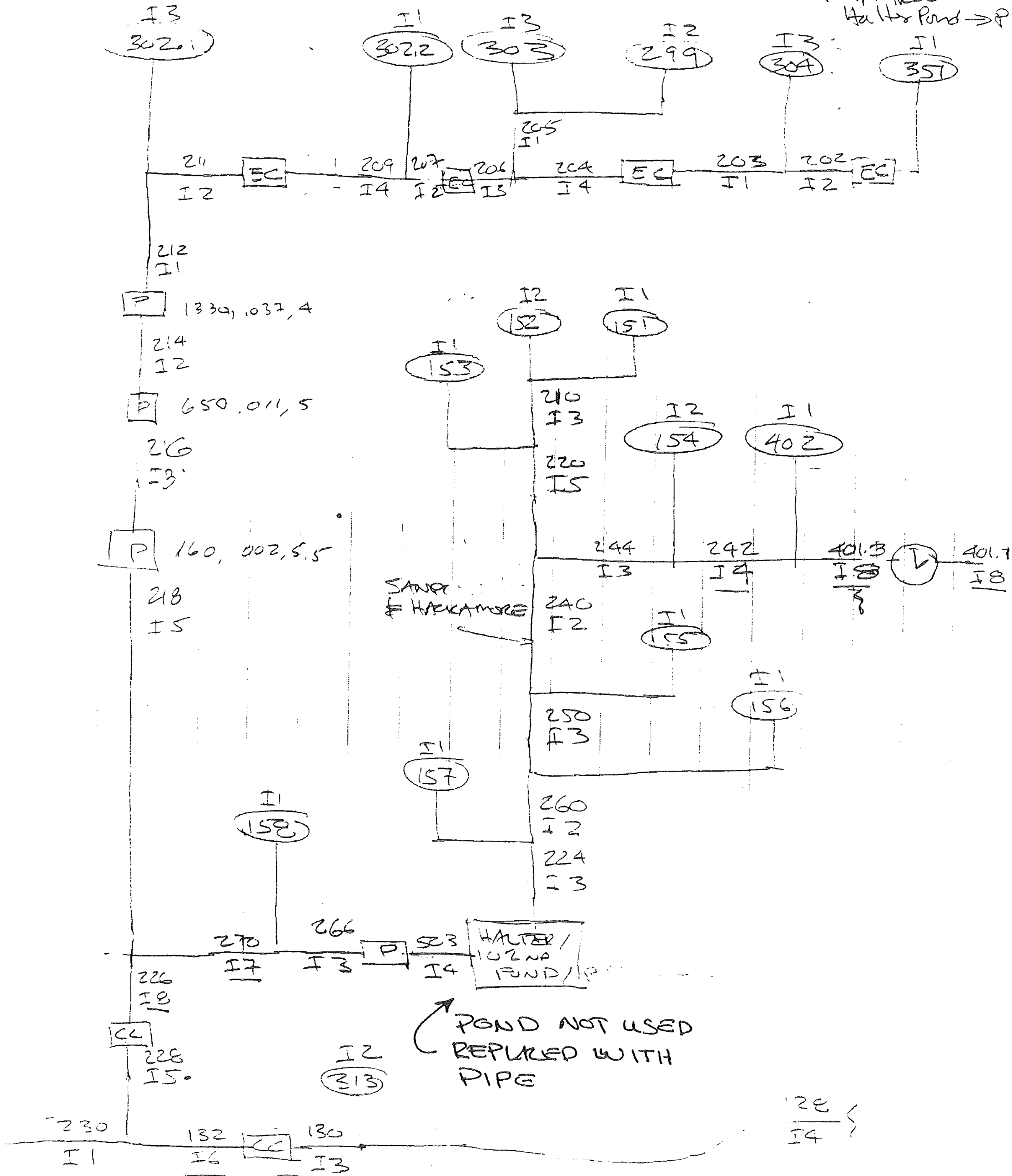
RSF0F00 3-16-94
RSFA1R00 3-19-94

NORTH HALF



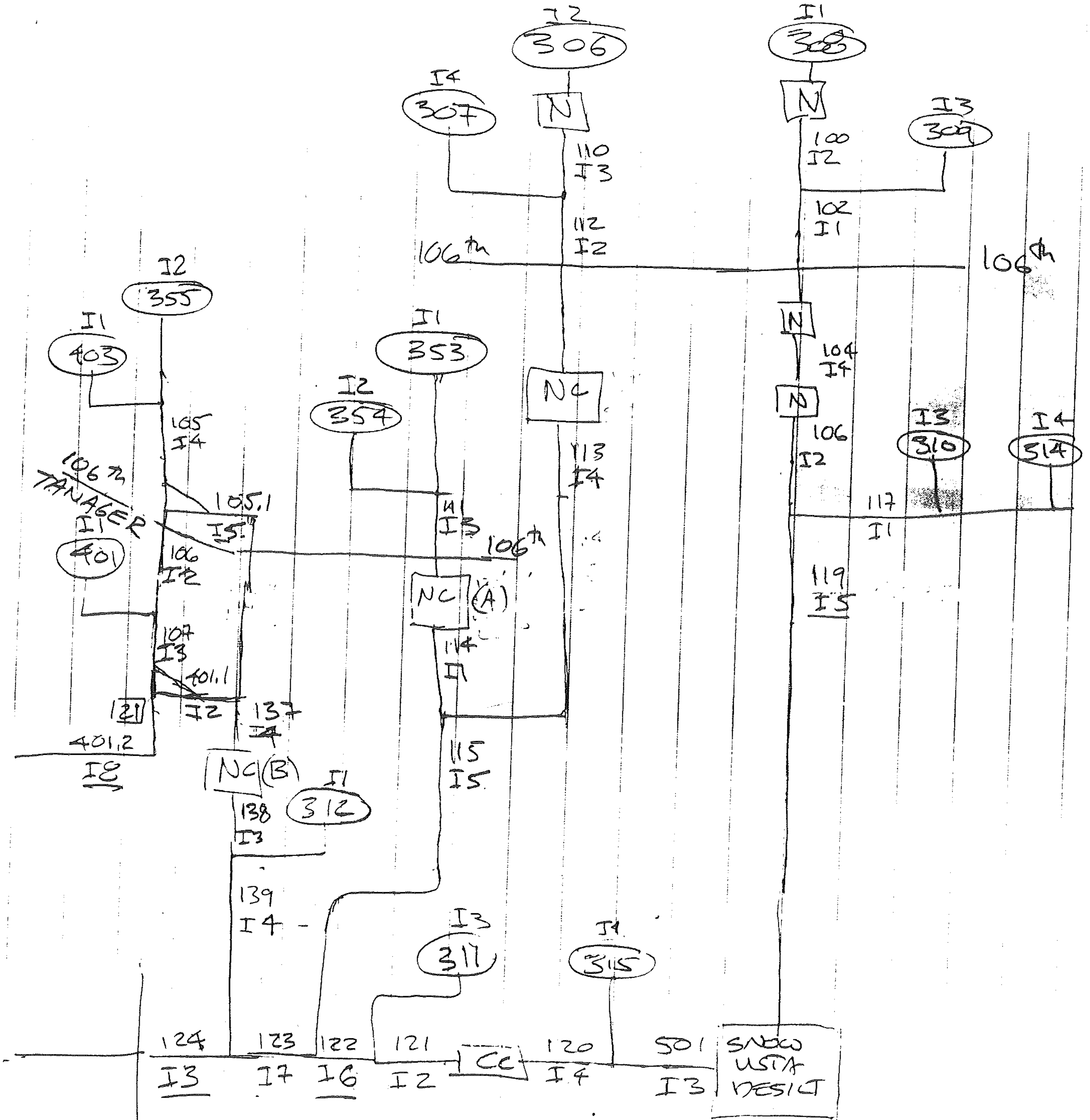
SOUTH HALF

RSFOF00 3/10/94
RSFAIR00
Halter Pond → Pipe



NORTH

RSFOE00
Routed Sunrise Full Offsite Basin
100 yr Storm
3-31-94



TOWER RD

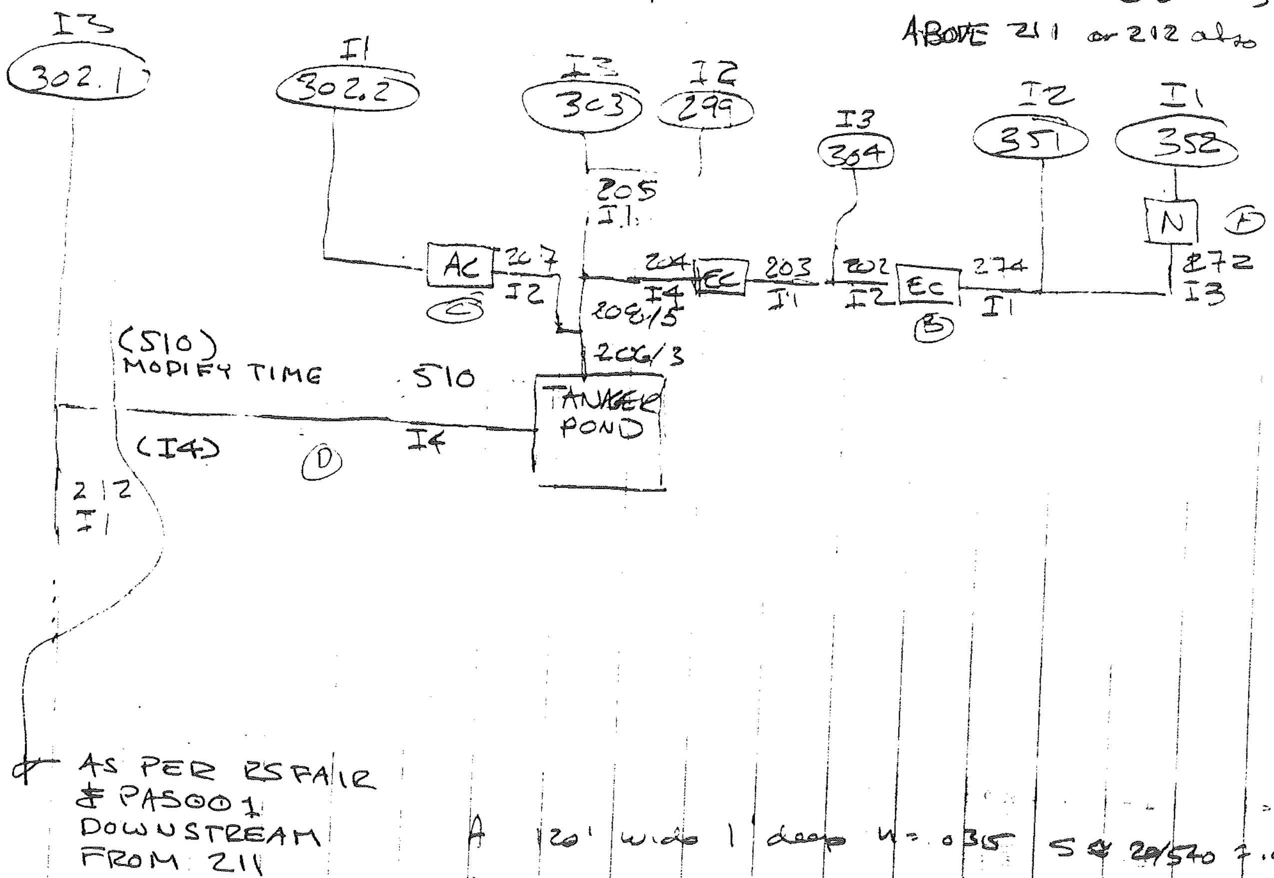
A ~120' W x 1' DEEP S=3% n=.035 L=900
~ OVERLAND IN 311 PARALLEL TO "ZEAL"
JOIN UP FROM SNOW VISTA, NEGLECT
ADD'L TRAVEL TIME

(B) SAME PROPERTIES AS A, BUT IN 312
DOWN FROM SPLIT @ TOWER RD

SOUTH

RSFOE00 3-31-94

ABOVE 211 or 212 also RTP00



A 120' wide 1' deep n = .035 S ≈ 20/540 = .037

B 10' bottom 3H:1V 3' deep n = .030 S = .001

C asphalt channel (.67, .5, 1.1, 3, 6.53, 3.5) S = .005 n = .017

D pipe – 24" RCP n = .013 S ≈ .0015

– USE 2 MINUTE DELAY (1 TIME STEP) TO SIMULATE INSTEAD OF ACTUALLY ROUTING PIPE

A6: AHYMO FILES

RSFAIR00 REVISED FAIR SHARE, 100-YEAR STORM
ESTABLISH ALLOWABLE RUNOFF RATES

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =03/19/1994
INPUT FILE = RSFAIR00 USER NO.= RYALS_NM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
*S FILE RSFAIR00 = Revised Sunrise Fair share for currently undeveloped 100-yr										
*S INCLUDES BASIN 314 POSSIBLY TO SNOW VISTA POND, USE PER SNOW VISTA DESIGN										
*S NO SEDIMENT BULKING, ALL LAND TREATMENTS B=LANDSCAPE OR D=IMPERVIOUS										
*S										
*S START WITH ALL CURRENTLY UNDEVELOPED BASINS TO BE DEVELOPED IN FUTURE TO										
*S TO 50%B & 50%D, EXCEPT BASIN 308 (80 AC) AS "COMMERCIAL" AT 20%B & 80%D.										
*S THE ACTUAL LOCATION OF COMMERCIAL DEVELOPMENT WILL PROBABLY BE DIFFERENT.										
*S VARY %B THE SAME FRACTION FOR ALL UNDEVELOPED BASINS BY TRIAL & ERROR UNTIL										
*S Qpeak-100 BELOW JUNCTION WITH EXISTING CHANNEL INLET (I.E. AP 10) MATCHES+-										
*S THAT IDENTIFIED ON THE SNOW VISTA CHANNEL AS-BUILT DRAWINGS (774 CFS).										
*S										
*S TOWER RD FLOW DIVIDES AT SANDERLING: UP TO 23 CFS FALLS BACK INTO SUNRISE										
*S TERRACE & THE REMAINDER FLOWS TO DROP INLETS IN TOWER AT SNOW VISTA CHANNEL										
*S										
*S BASINS 101-108 PLAN = BASINS 151-158 IN THIS AHYMO FILE										
*S REVISED 3-16-94 FOR BASIN 305 BECOMES 351 - 355										
*S RAINFALL HUNDRED YR TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.87										
*S RAIN SIX=2.20 RAIN DAY=2.68 DT=.033333 HR										
RAINFALL TYPE= 1										RAIN6= 2.200
COMPUTE NM HYD	308.00	-	1	.12500	287.77	10.282	1.54229	1.500	3.597	PER IMP= 67.40
ROUTE	100.00	1	2	.12500	246.74	10.282	1.54229	1.567	3.084	
COMPUTE NM HYD	309.00	-	3	.07575	119.17	3.666	.90752	1.500	2.458	PER IMP= 18.50
*S HYD 102 = (309+ROUTED 308) CROSSING 106TH BTW EUCARIZ & SUNSET GARDEN										
*S HYD 102 = AP 4										
ADD HYD	102.00	2& 3	1	.20075	358.25	13.948	1.30277	1.533	2.788	
ROUTE	104.00	1	4	.20075	342.73	13.948	1.30277	1.567	2.668	
ROUTE	106.00	4	2	.20075	344.75	13.948	1.30277	1.600	2.683	
COMPUTE NM HYD	314.00	-	4	.05469	85.90	2.647	.90752	1.500	2.454	PER IMP= 18.50
COMPUTE NM HYD	310.00	-	3	.02922	45.90	1.414	.90752	1.500	2.455	PER IMP= 18.50
*S HYD 117 = 310+314 (THE "EXTRA" 35 AC), BOTH EAST OF 106TH, TO DESILT BASIN										
ADD HYD	117.00	3& 4	1	.08391	131.81	4.061	.90752	1.500	2.454	
ADD HYD	118.00	1& 2	7	.28466	449.91	18.010	1.18626	1.567	2.470	
*S START NEW BRANCH										
COMPUTE NM HYD	306.00	-	2	.03969	62.35	1.921	.90752	1.500	2.454	PER IMP= 18.50
ROUTE	110.00	2	3	.03969	45.78	1.921	.90753	1.600	1.802	
COMPUTE NM HYD	307.00	-	4	.04547	71.42	2.201	.90752	1.500	2.454	PER IMP= 18.50
ADD HYD	112.00	3& 4	2	.08516	110.05	4.122	.90752	1.533	2.019	
COMPUTE NM HYD	352.00	-	1	.03141	49.34	1.520	.90752	1.500	2.455	PER IMP= 18.50
ROUTE	111.00	1	3	.03141	48.81	1.520	.90753	1.533	2.428	
ADD HYD	113.00	2& 3	4	.11657	158.86	5.642	.90752	1.533	2.129	
COMPUTE NM HYD	353.00	-	1	.00172	2.72	.083	.90752	1.500	2.468	PER IMP= 18.50
*S HYD 114 = AP 3 AT 106th ST										
ADD HYD	114.00	1& 4	3	.11829	161.53	5.725	.90752	1.533	2.134	
ROUTE	116.00	3	4	.11829	161.06	5.725	.90752	1.567	2.128	
ADD HYD	119.10	4& 7	3	.40295	610.97	23.735	1.10443	1.567	2.369	
COMPUTE NM HYD	315.00	-	1	.01234	19.40	.597	.90752	1.500	2.456	PER IMP= 18.50
*S HYD 119 = COMBINED FLOW INTO SNOW VISTA DESILT BASIN										
*S HYD 119 = AP 5 IN										
ADD HYD	119.00	1& 3	5	.41529	628.19	24.332	1.09858	1.567	2.364	
*S HYD 501 = ROUTED OUFLOW FROM SNOW VISTA DESILTING BASIN										
*S HYD 501 = AP 5 OUT										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE RESERVOIR	501.00	5	3	.41529	434.75	24.332	1.09858	1.700	1.636	AC-FT= 6.423
*S START SNOW VISTA CHANNEL										
ROUTE	121.00	3	2	.41529	432.74	24.332	1.09858	1.733	1.628	
COMPUTE NM HYD	311.00	-	3	.03813	59.90	1.846	.90752	1.500	2.454	PER IMP= 18.50
ADD HYD	122.00	2& 3	4	.45342	457.91	26.178	1.08251	1.700	1.578	
COMPUTE NM HYD	312.00	-	1	.01188	18.67	.575	.90752	1.500	2.456	PER IMP= 18.50
ADD HYD	123.00	1& 4	7	.46530	466.43	26.753	1.07804	1.700	1.566	
*S START NEW BRANCH, TO TOWER RD										
COMPUTE NM HYD	354.00	-	1	.00531	8.35	.257	.90752	1.500	2.458	PER IMP= 18.50
COMPUTE NM HYD	355.00	-	2	.00266	4.19	.129	.90752	1.500	2.463	PER IMP= 18.50
ADD HYD	103.00	1& 2	3	.00797	12.55	.386	.90745	1.500	2.460	
COMPUTE NM HYD	403.00	-	1	.00688	14.08	.483	1.31642	1.500	3.198	PER IMP= 50.00
*S HYD 105 = COMBINED FLOW AT TOWER-TANAGER-106th INTERSECTION										
ADD HYD	105.00	1& 3	4	.01485	26.63	.869	1.09691	1.500	2.802	
COMPUTE NM HYD	401.00	-	1	.01016	20.78	.713	1.31642	1.500	3.196	PER IMP= 50.00
ADD HYD	107.00	1& 4	3	.02501	47.41	1.582	1.18607	1.500	2.962	
*S SAY <= 23 FROM TOWER TO SANDERLING; EXCESS IN STREET TO SNOW VISTA										
*S HOLD 401.2 (UNDERFLOW, ID=8) TO ADD TO 402 LATER										
DIVIDE HYD	401.20	3	8	.02002	23.00	1.266	1.18607	1.433	1.795	
	401.10	AND	2	.00499	24.41	.316	1.18607	1.500	7.641	
ROUTE	109.00	2	4	.00499	21.64	.316	1.18711	1.533	6.773	
*S HYD 124 = SNOW VISTA JUST DOWNSTREAM FROM TOWER										
*S HYD 124 = AP 6										
ADD HYD	124.00	4& 7	3	.47029	469.84	27.069	1.07920	1.700	1.561	
ROUTE	128.00	3	4	.47029	467.41	27.069	1.07920	1.733	1.553	
COMPUTE NM HYD	313.00	-	2	.01016	15.97	.492	.90752	1.500	2.456	PER IMP= 18.50
ADD HYD	130.00	2& 4	3	.48045	473.55	27.560	1.07557	1.733	1.540	
*S HYD 132 = SNOW VISTA JUST ABOVE JUNCTION WITH SECTION LINE CHANNEL STUB										
*S HYD 132 = AP 9										
ROUTE	132.00	3	6	.48045	474.46	27.560	1.07557	1.733	1.543	
*S										
*S START SUNRISE TERRACE INTERIOR										
COMPUTE NM HYD	151.00	-	1	.01049	16.49	.508	.90752	1.500	2.456	PER IMP= 18.50
COMPUTE NM HYD	152.00	-	2	.00631	9.92	.305	.90752	1.500	2.458	PER IMP= 18.50
ADD HYD	210.00	1& 2	3	.01680	26.42	.813	.90749	1.500	2.457	
COMPUTE NM HYD	153.00	-	1	.00713	11.22	.345	.90752	1.500	2.457	PER IMP= 18.50
*S HYD 220 = 151+152+153 (BASINS 101, 102, & 103) @ HACKAMORE & SANDERLING										
ADD HYD	220.00	1& 3	5	.02394	37.64	1.158	.90749	1.500	2.457	
*S 401.2 (ID 8) = 'UNDERFLOW' (+-21 CFS MAX) FROM TOWER @ SANDERLING ABOVE										
*S DELAY 401.2 2 MIN (1 TIME STEP) TO SIMULATE ROUTING IN 2 SEGMENTS OF ROAD										
MODIFY TIME	401.20	8	8	.02002	23.00	1.266	1.18607	1.467	1.795	
*S BASIN 402 = EXISTING DEVELOPMENT @ 50%=B=LANDSCAPE, 50%=D=IMPERV										
COMPUTE NM HYD	402.00	-	1	.01547	31.64	1.086	1.31642	1.500	3.196	PER IMP= 50.00
ADD HYD	242.00	1& 8	4	.03549	54.64	2.352	1.24288	1.500	2.406	
COMPUTE NM HYD	154.00	-	2	.00754	11.86	.365	.90752	1.500	2.457	PER IMP= 18.50
*S HYD 244 = 402+154 IN SANDPIPER AT CONNEMARA (HYD 154=BASIN 104)										
ADD HYD	244.00	2& 4	3	.04303	66.49	2.717	1.18412	1.500	2.415	
*S HYD 240 = COMBINED FLOW @ HACKAMORE & SANDERLING										
ADD HYD	240.00	3& 5	2	.06696	104.13	3.876	1.08524	1.500	2.430	
COMPUTE NM HYD	155.00	-	1	.00420	6.61	.203	.90752	1.500	2.460	PER IMP= 18.50
*S HYD 250 = COMBINED FLOW IN HACKAMORE AT HALTER										
ADD HYD	250.00	1& 2	3	.07116	110.74	4.079	1.07475	1.500	2.432	
COMPUTE NM HYD	156.00	-	1	.01414	22.22	.684	.90752	1.500	2.456	PER IMP= 18.50
ADD HYD	260.00	1& 3	2	.08530	132.96	4.763	1.04703	1.500	2.436	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	157.00	-	1	.01736	27.28	.840	.90753	1.500	2.455	PER IMP= 18.50
*S HYD 224 = TOTAL FLOW TO POND LOCATION										
*S HYD 224 = AP 7 IN										
ADD HYD	224.00	1& 2	3	.10266	160.24	5.603	1.02343	1.500	2.439	
*S REPLACE POND WITH PIPE IN FAIR SHARE ANALYSIS - KEEP "RESERVOIR" HYD NO.										
ROUTE	503.00	3	4	.10266	158.85	5.603	1.02344	1.500	2.418	
ROUTE	266.00	4	3	.10266	153.45	5.603	1.02344	1.533	2.336	
*S HYD 158 = BASIN 108, ALL ANDALUSIAN, NOT TO POND										
COMPUTE NM HYD	158.00	-	1	.01902	29.89	.921	.90752	1.500	2.455	PER IMP= 18.50
*S HYD 270 = ALL SUNRISE ONSITE INC EXISTING 402 & 401.2 (=401 UNDERFLOW)										
*S BUT NOT OFFSITE VIA DUNLIN (SOUTHMOST STREET) PIPE										
ADD HYD	270.00	1& 3	7	.12168	182.92	6.524	1.00531	1.533	2.349	
*S										
*S OFFSITE WEST OF SUNRISE: PER SCANLON LAYOUT EXCEPT PIPE NOT SECT LINE CHAN										
COMPUTE NM HYD	351.00	-	1	.01500	23.57	.726	.90752	1.500	2.455	PER IMP= 18.50
*S USE L FROM MID POINT OF BASIN TO MIDPOINT OF NEXT										
ROUTE	202.00	1	2	.01500	17.33	.726	.90754	1.567	1.805	
COMPUTE NM HYD	304.00	-	3	.02938	46.16	1.422	.90752	1.500	2.455	PER IMP= 18.50
ADD HYD	203.00	2& 3	1	.04438	62.03	2.148	.90751	1.533	2.184	
*S HYD 206 = INTO TANAGER POND *LOCATION* FROM NORTH										
ROUTE	204.00	1	4	.04438	53.94	2.148	.90752	1.567	1.899	
COMPUTE NM HYD	303.00	-	3	.06688	105.11	3.237	.90752	1.500	2.456	PER IMP= 18.50
*S HYD 299=COA SATELLITE: ASSUME 10 CFS CLEAN & NON-ERSOIVE; REAL 1993 0.5+-										
STORE HYD	299.00	-	2	.07516	10.00	7.300	1.82122	1.333	.208	
*S HYD 205 = INTO TANAGER POND LOCATION FROM WEST (303+299 (COA SATELLITE))										
ADD HYD	205.00	2& 3	1	.14204	115.11	10.482	1.38370	1.500	1.266	
*S HYD 206 = AP 2 IN FOR FAIR SHARE AND PROPOSED										
ADD HYD	206.00	1& 4	3	.18642	166.79	12.630	1.27033	1.533	1.398	
ROUTE	207.00	3	2	.18642	153.00	12.630	1.27036	1.533	1.282	
COMPUTE NM HYD	302.20	-	1	.07109	111.79	3.441	.90752	1.500	2.457	PER IMP= 18.50
ADD HYD	209.00	1& 2	4	.25751	263.21	16.071	1.17019	1.533	1.597	
ROUTE	211.00	4	2	.25751	233.89	16.071	1.17019	1.567	1.419	
COMPUTE NM HYD	302.10	-	3	.01031	16.21	.499	.90752	1.500	2.456	PER IMP= 18.50
*S HYD 212 = COMBINED INTO DUNLIN/ANDALUSIAN PIPE @ TANAGER										
*S HYD 212 = AP 1										
ADD HYD	212.00	2& 3	1	.26782	248.28	16.570	1.16008	1.567	1.448	
ROUTE	214.00	1	2	.26782	249.80	16.570	1.16008	1.567	1.457	
ROUTE	216.00	2	3	.26782	248.95	16.570	1.16008	1.567	1.452	
ROUTE	218.00	3	5	.26782	248.50	16.570	1.16008	1.567	1.450	
*S										
*S HYD 226 ALL THROUGH SUNRISE, BUT NOT ROUTED IN STUB CHANNEL										
ADD HYD	226.00	5& 7	8	.38950	421.99	23.094	1.11173	1.567	1.693	
*S HYD 228 = SUNRISE + OFFSITE CONTRIB @ JUNCT W SNOW VISTA POST ROUTE STUB										
*S HYD 228 = AP 8										
ROUTE	228.00	8	5	.38950	423.67	23.094	1.11173	1.567	1.700	
*S HYD 230 = TOTAL COMBINED W SNOW VISTA										
*S HYD 230 = AP 10: TO BE <= ALLOWED PER SNOW VISTA DESIGN										
ADD HYD	230.00	5& 6	1	.86995	773.04	50.655	1.09176	1.667	1.388	
FINISH										

```
START               TIME=0.0   PUNCH CODE=0   PRINT LINES=58
                    CONTROL CODES AT START = 027 015 0 0 0
                    0 0 0 0 0   0 0 0 0 0   0 0 0 0 0
                    CONTROL CODES AT END = 0 0 0 0 0
                    0 0 0 0 0   0 0 0 0 0   0 0 0 0 0
* START               TIME=0.0   PUNCH CODE=0   PRINT LINES=56
*                    CONTROL CODES AT START = 027 042 048
*                    027 091 0 0   0 0 0 0 0   0 0 0 0 0 0 0 0
*                    CONTROL CODES AT END =  027 093 0 0 0
*                    0 0 0 0 0   0 0 0 0 0   0 0 0 0 0
*S FILE RSFAIR00 = Revised Sunrise Fair share for currently undeveloped 100-yr
*S INCLUDES BASIN 314 POSSIBLY TO SNOW VISTA POND, USE PER SNOW VISTA DESIGN
*S NO SEDIMENT BULKING. ALL LAND TREATMENTS B=LANDSCAPE OR D=IMPERVIOUS
*S
*S START WITH ALL CURRENTLY UNDEVELOPED BASINS TO BE DEVELOPED IN FUTURE TO
*S TO 50%B & 50%D, EXCEPT BASIN 308 (80 AC) AS "COMMERCIAL" AT 20%B & 80%D.
*S THE ACTUAL LOCATION OF COMMERCIAL DEVELOPMENT WILL PROBABLY BE DIFFERENT.
*S VARY %B THE SAME FRACTION FOR ALL UNDEVELOPED BASINS BY TRIAL & ERROR UNTIL
*S Qpeak-100 BELOW JUNCTION WITH EXISTING CHANNEL INLET (I.E. AP 10) MATCHES+-
*S THAT IDENTIFIED ON THE SNOW VISTA CHANNEL AS-BUILT DRAWINGS (774 CFS).
*S
*S TOWER RD FLOW DIVIDES AT SANDERLING: UP TO 23 CFS FALLS BACK INTO SUNRISE
*S TERRACE & THE REMAINDER FLOWS TO DROP INLETS IN TOWER AT SNOW VISTA CHANNEL
*S
*S BASINS 101-108 PLAN = BASINS 151-158 IN THIS AHYMO FILE
*S REVISED 3-16-94 FOR BASIN 305 BECOMES 351 - 355
* TUCKER GREEN  2/94, 3/94
*****************************************************************************
* SUNRISE TERRACE RAINFALL PER ALBUQUERQUE NM DPM, MAP L-8
* RAINFALL            TWO YR      TYPE=1 RAIN QUARTER=0.0  RAIN ONE=0.73
*                     RAIN SIX=0.95      RAIN DAY=1.16      DT=.033333 HR
* RAINFALL            TEN YR      TYPE=1 RAIN QUARTER=0.0  RAIN ONE=1.24
*                     RAIN SIX=1.47      RAIN DAY=1.79      DT=.033333 HR
*S RAINFALL            HUNDRED YR  TYPE=1 RAIN QUARTER=0.0  RAIN ONE=1.87
*S                     RAIN SIX=2.20      RAIN DAY=2.68      DT=.033333 HR
RAINFALL            HUNDRED YR  TYPE=1 RAIN QUARTER=0.0  RAIN ONE=1.87
                    RAIN SIX=2.20      RAIN DAY=2.68      DT=.033333 HR
*****************************************************************************
COMPUTE NM HYD      ID=1 HYD NO=308 DA=0.12500 SQ MI
                    PER A=0  B=32.6 C=0  D=67.4  TP=-0.13333 HRS  RAIN=-1
PRINT HYD           ID=1 CODE=1
* CODES: 0=ALL; 1=TOTALS ONLY; 2=EVERY 2ND + TOTALS; SIMILARLY 3, 5, 10, 20
COMPUTE RATING CURVE CID=-1  VS NO=35  NO SEGS=3
                    MIN EL=0    FT   MAX EL=2    FT
                    CH SLP=.0256     FP SLP= .0256
                    MANNING N   END DIST
                      .040         6     .030 26    .040  32
                    DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                    0     2       6     0       26    0       32    2
COMPUTE TRAVEL TIME  ID=2     REACH=35  NO VS=1
                    L= 2500    ft      SLP=0.02560 ft per ft
ROUTE               ID=2     HYD=100     INFLOW HYD ID=1   DT=.033333 hr
PRINT HYD           ID=2 CODE=1
*****************************************************************************
COMPUTE NM HYD      ID=3   HYD=309 DA=.07575 SQ MI
                    PER A=0   B=81.5 C=0   D=18.5 TP=0.13333 HRS    RAIN=-1
PRINT HYD           ID=3   CODE=1
*S HYD 102 = (309+ROUTED 308) CROSSING 106TH BTW EUCARIZ & SUNSET GARDEN
*S HYD 102 = AP 4
*                    NEW      NEW        IN1          IN2
ADD HYD             ID=1   HYD=102    ID I=2      ID II=3
PRINT HYD           ID=1   CODE=2
```

```
PLOT HYD             ID=1
COMPUTE RATING CURVE CID=-1  VS NO=36  NO SEGS=1
                     MIN EL=0    FT   MAX EL=1    FT
                     CH SLP= .02558   FP SLP=.02558  FT PER FT
                       N   END X
                     .035   122
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     1       1     0       121   0       122   1
COMPUTE TRAVEL TIME  ID=4     REACH=36 NO VS=1
                     L=860    ft       SLP=.02558  ft/ft
ROUTE                ID=4     HYD=104     INFLOW HYD ID=1   DT=.03333
COMPUTE RATING CURVE CID=-1  VS NO=37  NO SEGS=3
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.02432    FP SLP=.02432   FT PER FT
                       N   END X
                     .040    15     .025  20    .040  50
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       15    0       30    0       50    5
COMPUTE TRAVEL TIME  ID=2     REACH=1  NO VS=1
                     L=740    ft       SLP=.02432  ft/ft
ROUTE                ID=2     HYD=106     INFLOW HYD ID=4   DT=.033333
******************************************************************************
COMPUTE NM HYD       ID=4   HYD=314   DA=0.05469  SQ MI
                     PER A=0  B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=4   CODE=1
******************************************************************************
COMPUTE NM HYD       ID=3   HYD=310   DA=0.02922  SQ MI
                     PER A=0  B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=3   CODE=1
*S HYD 117 = 310+314 (THE "EXTRA" 35 AC), BOTH EAST OF 106TH, TO DESILT BASIN
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=1   HYD=117    ID I=3       ID II=4
ADD HYD              ID=7   HYD=118    ID I=1       ID II=2
*S START NEW BRANCH
******************************************************************************
COMPUTE NM HYD       ID=2   HYD=306   DA=0.03969  SQ MI
                     PER A=0  B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=2   CODE=1
COMPUTE RATING CURVE CID=-1  VS NO=34  NO SEGS=3
                     MIN EL=0    FT   MAX EL=6    FT
                     CH SLP=.0310     FP SLP=.0310    FT PER FT
                       N   END X
                     .04     18    .03   32      .04   50
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     6       18    0       32    0       50    6
COMPUTE TRAVEL TIME  ID=3     REACH=1  NO VS= 1
                     L= 2320  ft       SLP=.0310   ft/ft
ROUTE                ID=3     HYD=110     INFLOW HYD ID=2   DT=.033333
******************************************************************************
COMPUTE NM HYD       ID=4   HYD=307   DA=0.04547  SQ MI
                     PER A=0  B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=4   CODE=1
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=2   HYD=112    ID I=3       ID II=4
******************************************************************************
COMPUTE NM HYD       ID=1   HYD=352   DA=0.03141  SQ MI
                     PER A=0  B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=1   CODE=1
COMPUTE RATING CURVE CID=-1  VS NO=38   NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP= .028     FP SLP=.028     FT PER FT
                       N   END X
                     .015   30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
COMPUTE TRAVEL TIME  ID=3     REACH=2  NO VS=1
```

```
                     L=1100   ft        SLP=.028    ft/ft
 ROUTE               ID=3     HYD=111     INFLOW HYD ID=1   DT=.033333
 ADD HYD             ID=4   HYD=113    ID I=2      ID II=3
********************************************************************************
 COMPUTE NM HYD      ID=1   HYD=353   DA=0.00172  SQ MI
                     PER A=0   B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
 PRINT HYD           ID=1   CODE=1

 *S HYD 114 = AP 3 AT 106th ST
 *                     NEW      NEW        IN1          IN2
 ADD HYD             ID=3   HYD=114      ID I=1      ID II=4
 PRINT HYD           ID=3   CODE=2
 PLOT HYD            ID=3
 COMPUTE RATING CURVE CID=-1  VS NO=38  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.0250     FP SLP=.0250     FT PER FT
                       N   END X
                     .015    30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
 COMPUTE TRAVEL TIME  ID=4     REACH=38 NO VS=1
                     L=1200   ft       SLP=.0250   ft/ft
 ROUTE               ID=4     HYD=116     INFLOW HYD ID=3   DT=.033333
 ADD HYD             ID=3   HYD=119.1  ID I=4      ID II=7
********************************************************************************
 COMPUTE NM HYD      ID=1   HYD=315   DA=0.01234  SQ MI
                     PER A=0   B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
 PRINT HYD           ID=1   CODE=1
 *S HYD 119 = COMBINED FLOW INTO SNOW VISTA DESILT BASIN
 *S HYD 119 = AP 5 IN
 *                     NEW      NEW        IN1          IN2
 ADD HYD             ID=5   HYD=119    ID I=1      ID II=3
 PRINT HYD           ID=5   CODE=2
********************************************************************************
 *S HYD 501 = ROUTED OUFLOW FROM SNOW VISTA DESILTING BASIN
 *S HYD 501 = AP 5 OUT
 ROUTE RESERVOIR     ID=3   HYD=501   INFLOW ID=5   CODE=2
                     CFS OUT    VOL AC-FT   ELEV FT
                     0.         0.          11.05
                     14.35      0.6598      11.55
                     41.46      1.3245      12.05
                     122.4      2.6904      13.05
                     234.7      4.1343      14.05
                     365.8      5.6928      15.05
                     527.6      7.4074      16.05
                     715.0      9.3198      17.05
 * PLOT HYD AP 5 IN & OUT
 PLOT HYD            ID=5   ID=3
 *S START SNOW VISTA CHANNEL
 COMPUTE RATING CURVE CID=-1  VS NO=1   NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP= .0109    FP SLP=.0109    FT PER FT
                       N   END X
                     .015    30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
 COMPUTE TRAVEL TIME  ID=2     REACH=1  NO VS=1
                     L=1200   ft       SLP=.0109   ft/ft
 ROUTE               ID=2     HYD=121     INFLOW HYD ID=3   DT=.033333
********************************************************************************
 COMPUTE NM HYD      ID=3   HYD=311   DA=0.03813  SQ MI
                     PER A=0   B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
 PRINT HYD           ID=3   CODE=1
 *                     NEW      NEW        IN1          IN2
 ADD HYD             ID=4   HYD=122    ID I=2      ID II=3
********************************************************************************
```

```
COMPUTE NM HYD       ID=1  HYD=312   DA=0.01188  SQ MI
                     PER A=0   B=81.5 C=0   D=18.5 TP=0.1333 HRS   RAIN=-1
PRINT HYD            ID=1  CODE=1
*                     NEW      NEW        IN1          IN2
ADD HYD              ID=7  HYD=123    ID I=1      ID II=4
*S START NEW BRANCH, TO TOWER RD
*****************************************************************************
COMPUTE NM HYD       ID=1  HYD=354   DA=0.00531  SQ MI
                     PER A=0   B=81.5C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*****************************************************************************
COMPUTE NM HYD       ID=2  HYD=355   DA=0.00266  SQ MI
                     PER A=0   B=81.5 C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=2  CODE=1
ADD HYD              ID=3  HYD=103    ID I=1      ID II=2
*****************************************************************************
COMPUTE NM HYD       ID=1  HYD=403   DA=0.00688  SQ MI
                     PER A=0  B=50   C=0    D=50    TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*S HYD 105 = COMBINED FLOW AT TOWER-TANAGER-106th INTERSECTION
ADD HYD              ID=4  HYD=105    ID I=1      ID II=3
PRINT HYD            ID=4  CODE=2
*****************************************************************************
COMPUTE NM HYD       ID=1  HYD=401   DA=0.01016  SQ MI
                     PER A=0  B=50   C=0    D=50    TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
ADD HYD              ID=3  HYD=107    ID I=1      ID II=4
*S SAY <= 23 FROM TOWER TO SANDERLING; EXCESS IN STREET TO SNOW VISTA
*S HOLD 401.2 (UNDERFLOW, ID=8) TO ADD TO 402 LATER
DIVIDE HYD           ID=3  Q=23.0  ID=8  HYD=401.2     ID=2  HYD=401.1
PRINT HYD            ID=8   CODE=1
PRINT HYD            ID=2   CODE=1
COMPUTE RATING CURVE CID=-1  VS NO=78  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.025      FP SLP=.025   FT PER FT=EST EFFECTIVE
                       N   END X
                     .015    60
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     .92     9.99  .59      10    0       30    .40
                     50    0       50.01  .59     60    .92
COMPUTE TRAVEL TIME  ID=4     REACH=38 NO VS=1     L=L TO CATCH BASIN
                     L=550    ft       SLP=.025    ft/ft
ROUTE                ID=4  HYD=109     INFLOW HYD ID=2   DT=.033333
PRINT HYD            ID=4   CODE=2
*S HYD 124 = SNOW VISTA JUST DOWNSTREAM FROM TOWER
*S HYD 124 = AP 6
ADD HYD              ID=3  HYD=124    ID I=4    ID II=7
PRINT HYD            ID=3   CODE=2
PLOT HYD             ID=3
* FOR ROUTING EST AVG SLOPE=.01+-: 450'@.014, 500'@.004, 400'@.0126
COMPUTE RATING CURVE CID=-1  VS NO=2   NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP= .010     FP SLP=.010     FT PER FT
                       N   END X
                     .015   30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
COMPUTE TRAVEL TIME  ID=4     REACH=2  NO VS=1
                     L=1350    ft       SLP=.010     ft/ft
ROUTE                ID=4     HYD=128     INFLOW HYD ID=3   DT=.033333
PRINT HYD            ID=4  CODE=1
*****************************************************************************
COMPUTE NM HYD       ID=2  HYD=313   DA=0.01016  SQ MI
                     PER A=0   B=81.5 C=0    D=18.5 T=0.1333 HRS   RAIN=-1
PRINT HYD            ID=2  CODE=1
*                     NEW      NEW        IN1          IN2
```

```
ADD HYD              ID=3   HYD=130    ID I=2      ID II=4
PRINT HYD            ID=3  CODE=1
* FOR ROUTE EST AVG SLOPE AS .012
COMPUTE RATING CURVE CID=-1  VS NO=3   NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP= .012     FP SLP=.012     FT PER FT
                       N   END X
                     .015   30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
COMPUTE TRAVEL TIME  ID=6     REACH=3  NO VS=1
                     L=550   ft       SLP=.012    ft/ft
*S HYD 132 = SNOW VISTA JUST ABOVE JUNCTION WITH SECTION LINE CHANNEL STUB
*S HYD 132 = AP 9
ROUTE                ID=6     HYD=132     INFLOW HYD ID=3   DT=.033333
PRINT HYD            ID=6  CODE=2
PLOT HYD             ID=6
*****************************************************************************
*S
*S START SUNRISE TERRACE INTERIOR
*
*****************************************************************************
COMPUTE NM HYD       ID=1   HYD=151   DA=0.010492 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*****************************************************************************
COMPUTE NM HYD       ID=2   HYD=152   DA=0.006309 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=2  CODE=1
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=3   HYD=210    ID I=1      ID II=2
PRINT HYD            ID=3  CODE=1
*****************************************************************************
COMPUTE NM HYD       ID=1   HYD=153   DA=0.007134 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*S HYD 220 = 151+152+153 (BASINS 101, 102, & 103) @ HACKAMORE & SANDERLING
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=5   HYD=220    ID I=1      ID II=3
*****************************************************************************
*S 401.2 (ID 8) = 'UNDERFLOW' (+-21 CFS MAX) FROM TOWER @ SANDERLING ABOVE
*S DELAY 401.2  2 MIN (1 TIME STEP) TO SIMULATE ROUTING IN 2 SEGMENTS OF ROAD
MODIFY TIME          ID=8   TIME SHIFT=0.033333 HRS   CODE=-1
PRINT HYD            ID=8  CODE=1
*S BASIN 402 = EXISTING DEVELOPMENT @ 50%=B=LANDSCAPE, 50%=D=IMPERV
*****************************************************************************
COMPUTE NM HYD       ID=1   HYD=402   DA=0.015469  SQ MI
                     PER A=0  B=50   C=0    D=50    TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
ADD HYD              ID=4   HYD=242    ID I=1      ID II=8
*****************************************************************************
COMPUTE NM HYD       ID=2   HYD=154   DA=0.007539 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=2  CODE=1
*S HYD 244 = 402+154 IN SANDPIPER AT CONNEMARA (HYD 154=BASIN 104)
ADD HYD              ID=3   HYD=244    ID I=2      ID II=4
*                      NEW      NEW        IN1          IN2
PRINT HYD            ID=3  CODE=1
*S HYD 240 = COMBINED FLOW @ HACKAMORE & SANDERLING
ADD HYD              ID=2   HYD=240    ID I=3      ID II=5
PRINT HYD            ID=2  CODE=1
*****************************************************************************
COMPUTE NM HYD       ID=1   HYD=155   DA=0.004197 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5 TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*S HYD 250 = COMBINED FLOW IN HACKAMORE AT HALTER
```

```
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=3   HYD=250    ID I=1      ID II=2
PRINT HYD            ID=3   CODE=1
***************************************************************************
COMPUTE NM HYD       ID=1   HYD=156   DA=0.014138 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=2   HYD=260    ID I=1      ID II=3
***************************************************************************
COMPUTE NM HYD       ID=1   HYD=157   DA=0.017363 SQ MI
                     PER A=0   B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*S HYD 224 = TOTAL FLOW TO POND LOCATION
*S HYD 224 = AP 7 IN
*                      NEW      NEW        IN1          IN2
ADD HYD              ID=3   HYD=224    ID I=1      ID II=2
PRINT HYD            ID=3   CODE=2
PLOT HYD             ID=3
*S REPLACE POND WITH PIPE IN FAIR SHARE ANALYSIS - KEEP "RESERVOIR" HYD NO.
COMPUTE RATING CURVE CID=-1  VS NO=63  NO SEGS=-1 SLP=.002  D=6 FT  N=.013
COMPUTE TRAVEL TIME  ID=4     REACH=33 NO VS=1
                     L=100  ft       SLP=.002    ft/ft
ROUTE                ID=4     HYD=503     INFLOW HYD ID=3    DT=.033333
* ((( LINES BELOW STARTING WITH * ((( FOR USE WITH POND IN PROPOSED CONDITIONS
* ((( OUTFLOW BELOW (2.55-->83.00 FOR 42-IN PIPE W Kent=0.5)
* ((( S HYD 503 = AP 7 OUT
* ((( ROUTE RESERVOIR      ID=4  HYD=503  INFLOW ID=3     CODE=2
* (((                     OUTFLOW CFS    STORAGE AC-FT   ELEVATION FT
* (((                      0.00000        0.0000          88.33
* (((                       2.80          0.0203          89
* (((                      15.55          0.2013          90
* (((                      46.30          0.9056          92
* (((                      63.25          1.6948          94
* (((                      76.95          2.5737          96
* (((                      83.00          3.0551          97
* ((( *
* ((( * OUTFLOW BELOW (2.55-->60.05) FOR 36-IN PIPE W Kent=0.5
* ((( *ROUTE RESERVOIR      ID=4  HYD=503  INFLOW ID=3     CODE=2
* ((( *                   OUTFLOW CFS    STORAGE AC-FT   ELEVATION FT
* ((( *                    0.00000        0.0000          88.33
* ((( *                     2.55          0.0203          89
* ((( *                    14.00          0.2013          90
* ((( *                    35.05          0.9056          92
* ((( *                    46.50          1.6948          94
* ((( *                    55.58          2.5737          96
* ((( *                    60.05          3.0551          97
* ((( * PRINT HYD           ID=4   CODE=2
* ((( * *S PLOT HYD FOR AP 7 IN & OUT
* ((( * PLOT HYD            ID=3   ID=4
* D = 3 OR 3.5 PROPOSED, D = 6 FT FAIR SHARE FOR FREE OUTFALL
COMPUTE RATING CURVE CID=-1  VS NO=63  NO SEGS=-1 SLP=.002  D=6 FT  N=.013
COMPUTE TRAVEL TIME  ID=3     REACH=33 NO VS=1
                     L=744  ft       SLP=.002    ft/ft
ROUTE                ID=3     HYD=266     INFLOW HYD ID=4    DT=.033333
PRINT HYD            ID=3  CODE=1
***************************************************************************
*S HYD 158 = BASIN 108, ALL ANDALUSIAN, NOT TO POND
COMPUTE NM HYD       ID=1   HYD=158   DA=0.019023 SQ MI
                     PER A=0  B=81.5  C=0    D=18.5   TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
*S HYD 270 = ALL SUNRISE ONSITE INC EXISTING 402 & 401.2 (=401 UNDERFLOW)
*S BUT NOT OFFSITE VIA DUNLIN (SOUTHMOST STREET) PIPE
ADD HYD              ID=7   HYD=270    ID I=1      ID II=3
PRINT HYD            ID=7  CODE=1
PLOT HYD             ID=7
```

```
45
*S OFFSITE WEST OF SUNRISE: PER SCANLON LAYOUT EXCEPT PIPE NOT SECT LINE CHAN
*******************************************************************************
COMPUTE NM HYD       ID=1   HYD=351   DA=0.01500  SQ MI
                     PER A=0  B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1  CODE=1
COMPUTE RATING CURVE CID=1  VS NO=32  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.001      FP SLP=.001     FT PER FT
                      N  END FT
                     .030  40
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       15    0       25    0       40    5
*S USE L FROM MID POINT OF BASIN TO MIDPOINT OF NEXT
COMPUTE TRAVEL TIME  ID=2     REACH=32 NO VS=1
                     L=600    ft       SLP=.001    ft/ft
ROUTE                ID=2     HYD=202     INFLOW HYD ID=1   DT=.033333
*******************************************************************************
COMPUTE NM HYD       ID=3 HYD NO=304 DA=0.02938 SQ MI
                     PER A=0  B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=3   CODE=1
ADD HYD              ID=1   HYD=203    ID I=2      ID II=3
COMPUTE RATING CURVE CID=1  VS NO=32  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.001      FP SLP=.001     FT PER FT
                      N  END FT
                     .030  40
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       15    0       25    0       40    5
* USE  L FROM MID-POINT OF BASIN TO MID-POINT OF NEXT
COMPUTE TRAVEL TIME  ID=4     REACH=32 NO VS=1
                     L=400    ft       SLP=.001    ft/ft
*S HYD 206 = INTO TANAGER POND *LOCATION* FROM NORTH
ROUTE                ID=4     HYD=204     INFLOW HYD ID=1   DT=.033333
*******************************************************************************
COMPUTE NM HYD       ID=3   HYD=303   DA=0.06688  SQ MI
                     PER A=0  B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=3  CODE=1
*******************************************************************************
*S HYD 299=COA SATELLITE: ASSUME 10 CFS CLEAN & NON-ERSOIVE; REAL 1993 0.5+-
STORE HYD            ID=2   HYD NO=299  DT=0.16667 HR   DA=.07516  SQ MI
                     FLOW RATES CFS= (LEFT TO RIGHT, DOWN, LEFT TO RIGHT ...)
                     0      .00     .00     .00     .00     .00
                     .00    10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
                     10     10      10      10      10      10
*S HYD 205 = INTO TANAGER POND LOCATION FROM WEST (303+299 (COA SATELLITE))
*                     NEW      NEW       IN1          IN2
ADD HYD              ID=1   HYD=205    ID I=2      ID II=3
*                     NEW      NEW       IN1          IN2
*S  HYD 206 = AP 2 IN FOR FAIR SHARE AND PROPOSED
ADD HYD              ID=3   HYD=206    ID I=1      ID II=4
PLOT HYD             ID=3
COMPUTE RATING CURVE CID=-1  VS NO=33  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.001      FP SLP=.001     FT PER FT
                      N  END FT
                     .030  40
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       15    0       25    0       40    5
```

```
COMPUTE TRAVEL TIME  ID=2     REACH=33 NO VS=1
                     L=350  ft       SLP=.001    ft/ft
ROUTE                ID=2     HYD=207     INFLOW HYD ID=3   DT=.033333
****************************************************************************
COMPUTE NM HYD       ID=1   HYD=302.2  DA=.07109   SQ MI
                     PER A=0  B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=1   CODE=1
ADD HYD              ID=4   HYD=209    ID I=1      ID II=2
COMPUTE RATING CURVE CID=-1  VS NO=33  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP=.001      FP SLP=.001     FT PER FT
                      N  END FT
                     .030  40
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       15    0       25    0       40    5
COMPUTE TRAVEL TIME  ID=2     REACH=33 NO VS=1
                     L=500  ft       SLP=.001    ft/ft
ROUTE                ID=2     HYD=211     INFLOW HYD ID=4   DT=.033333
****************************************************************************
* 302.1 = SOUTH END OF BASIN 302
COMPUTE NM HYD       ID=3    HYD=302.1  DA=.01031   SQ MI
                     PER A=0  B=81.5  C=0    D=18.5  TP=0.1333 HRS RAIN=-1
PRINT HYD            ID=3    CODE=1
****************************************************************************
*S  HYD 212 = COMBINED INTO DUNLIN/ANDALUSIAN PIPE @ TANAGER
*S  HYD 212 = AP 1
*                     NEW      NEW        IN1          IN2
ADD HYD              ID=1   HYD=212    ID I=2      ID II=3
PRINT HYD            ID=1   CODE=2
PLOT HYD             ID=1
COMPUTE RATING CURVE CID=-1  VS NO=43  NO SEGS=-1 SLP=.0375  D=4 FT  N=.013
COMPUTE TRAVEL TIME  ID=2     REACH=43 NO VS=1
                     L=1330  ft       SLP=.0375   ft/ft
ROUTE                ID=2     HYD=214     INFLOW HYD ID=1   DT=.033333
COMPUTE RATING CURVE CID=-1  VS NO=44  NO SEGS=-1 SLP=.0110  D=5 FT  N=.013
COMPUTE TRAVEL TIME  ID=3     REACH=44 NO VS=1
                     L=650t       SLP=.0110    ft/ft
ROUTE                ID=3     HYD=216     INFLOW HYD ID=2   DT=.033333
COMPUTE RATING CURVE CID=-1  VS NO=44  NO SEGS=-1 SLP=.0120  D=5.5 FT  N=.013
COMPUTE TRAVEL TIME  ID=5     REACH=44 NO VS=1
                     L=160t       SLP=.0020    ft/ft
ROUTE                ID=5     HYD=218     INFLOW HYD ID=3   DT=.033333
PRINT HYD            ID=5   CODE=2
*S
*S HYD 226 ALL THROUGH SUNRISE, BUT NOT ROUTED IN STUB CHANNEL
*                     NEW      NEW        IN1          IN2
ADD HYD              ID=8   HYD=226    ID I=5      ID II=7
COMPUTE RATING CURVE CID=1  VS NO=45  NO SEGS=1
                     MIN EL=0    FT   MAX EL=5    FT
                     CH SLP= .0316    FP SLP=.0316    FT PER FT
                      N  END FT
                     .015   30
                     DIST  ELEV    DIST  ELEV    DIST  ELEV    DIST  ELEV
                     0     5       10    0       20    0       30    5
COMPUTE TRAVEL TIME  ID=5     REACH=45 NO VS=1
                     L=270     ft       SLP=.0316   ft/ft
*S HYD 228 = SUNRISE + OFFSITE CONTRIB @ JUNCT W SNOW VISTA POST ROUTE STUB
*S HYD 228 = AP 8
ROUTE                ID=5     HYD=228     INFLOW HYD ID=8   DT=.033333
PRINT HYD            ID=5     CODE=2
PLOT HYD             ID=5
*S HYD 230 = TOTAL COMBINED W SNOW VISTA
*S HYD 230 = AP 10: TO BE <= ALLOWED PER SNOW VISTA DESIGN
*                     NEW      NEW        IN1          IN2
ADD HYD              ID=1   HYD=230    ID I=5      ID II=6
PRINT HYD            ID=1   CODE=2
```

DRAINAGE BASIN MAP FOR SUNRISE TERRACE UNITS III, IV & V

100-YEAR PEAK FLOW RATES (CFS) FOR BASINS & ANALYSIS POINTS

BASIN OR ANALYSIS POINT	AREA ACRES	ALL OVER FAIR SHARE (2)	OFFSITE FAIR ONSITE FULL DEVELOPMENT	OFFSITE EXIST ONSITE FULL DEVELOPMENT
B 101 (1)	6.4	16.5	22.0	22.0
B 102	4.0	9.9	13.2	13.2
B 103	4.6	11.2	14.9	14.9
B 104	4.8	11.9	15.8	15.8
B 105	2.7	6.6	8.8	8.8
B 106	9.0	22.2	29.6	29.6
B 107	11.1	27.3	36.4	36.4
B 108	12.5	29.9	41.0	41.0
B 299	48.1	10.0	10.0	0.5
B 302.1	6.6	16.2	16.2	8.8
B 302.2	45.5	111.8	111.8	61.0
B 303	42.8	105.1	105.1	57.3
B 304	18.8	46.2	46.2	25.1
B 306	25.4	62.4	62.4	33.9
B 307	29.1	71.4	71.4	38.9
B 308	80.0	288.8	288.8	110.3
B 309	48.5	119.2	119.2	65.2
B 310	25.6	45.9	45.9	25
B 311	24.4	59.9	59.9	32.6
B 312	7.6	18.7	18.7	10.2
B 313	6.5	16.0	16.0	8.7
B 314	35.0	85.9	85.9	46.7
B 315	7.9	19.4	19.4	10.6
B 351	9.6	23.6	23.6	12.8
B 352	20.1	49.3	49.3	26.8
B 353	1.1	2.7	2.7	1.5
B 354	3.4	8.4	8.4	4.5
B 355	1.7	4.2	4.2	2.3
B 401	6.5	20.8	20.8	20.8
B 402	9.9	31.6	31.6	31.6
B 403	4.4	14.08	14.08	14.1
	AHYMO HYD NO.			
AP 1	212	248.3	248.3	27.5
AP 2 IN (4)	209	166.8	166.8	152.5
AP 2 OUT (5)	210	NA	NA	22.1
AP 3 (8)	114	161.5	161.5	55.8
AP 4	102	358.3	358.3	138.4
AP 5 IN	119	628.2	628.2	172.9
AP 5 OUT	501	434.8	434.8	40.6
AP 6	124	469.8	469.8	205.7
AP 7 IN (6)	224	160.2	156.9	156.9
HALTER POND OUT (7)	503	NA	6.7	6.7
AP 8	228	423.7	331.6	212.3
AP 9 (3)	132	474.5	474.5	207.7
AP 10 (3)	230	773.0	754.5	364.9

1. IN AHYMO RUNS, BASINS 101-108 ARE NUMBERED 151-158.
2. GENERALLY, "FAIR SHARE" REPRESENTS ALL CURRENTLY UNDEVELOPED AREAS DEVELOPED TO SAME LEVEL, TO APPROX SNOW VISTA DESIGN Qpeak=774 CFS @ AP10. BASED ON SCANLON (1986) CHANNEL LAYOUT EXCEPT SECTION LINE CHANNEL --> ANDALUSIAN PIPE
3. ADD HALTER POND OUT FLOW TO GET APPROX TOTAL FLOW
4. AP 2 HAS ADDITIONAL BASINS (302.2 & 352) FOR EXISTING OFFSITE CONDITIONS
5. 6.05 AC-FT POND, INCLUDING SEDIMENT STORAGE. 100-YR WS 5352.72 WITH SEMIMENT STORAGE BERM AT ELEV 5249.00
6. INCLUDES BASINS 105 & 106 IN FAIR SHARE ONLY
7. QUASI AP7 OUT. INFLOW = ALL FROM FROM BASINS 105 & 106. NOT IN FAIR SHARE
8. HYD 112 IN OFFSITE EXISTING ANALYSIS

file srtbl3.wq1 REVISED 6/94

ROBERT RYALS NEW MEXICO 9436 REGISTERED PROFESSIONAL ENGINEER

PLATE 1
FAIR SHARE / DEVELOPED

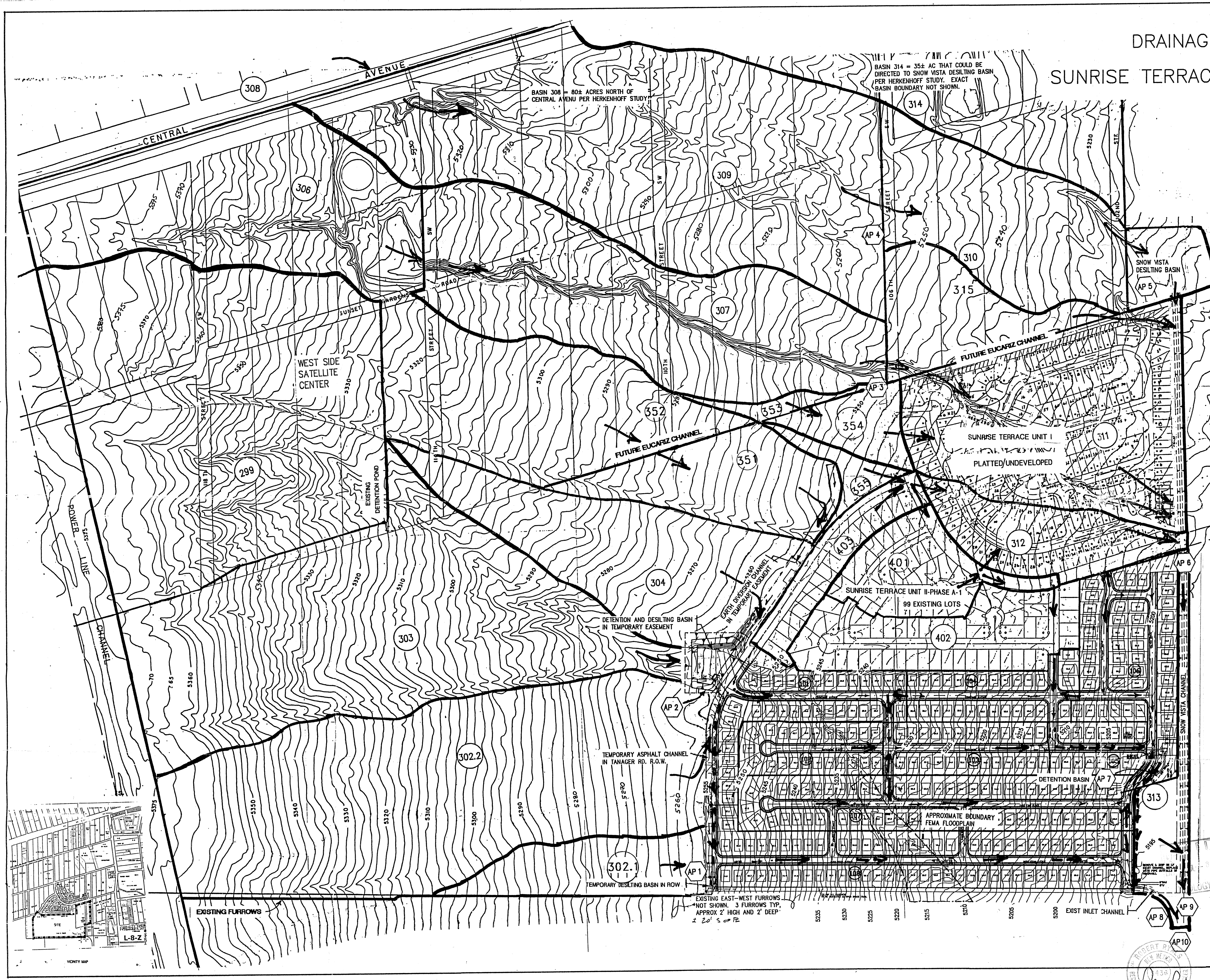
CONCEPTUAL MASTER DRAINAGE PLAN

SUNRISE TERRACE UNIT III, IV & V

RYALS engineering & construction services
1929 Idlewilde S.E. Albuquerque, NM 87108
(505) 265-8267 269-1142 mobile telephone

SHEET NO. OF

DRAINAGE BASIN MAP FOR SUNRISE TERRACE UNITS III, IV & V



100-YEAR PEAK FLOW RATES (CFS) FOR BASINS & ANALYSIS POINTS

BASIN OR ANALYSIS POINT	AREA ACRES	ALL OVER FAIR SHARE (2)	OFFSITE FAIR ONSITE FULL DEVELOPMENT	OFFSITE EXIST ONSITE FULL DEVELOPMENT
B 101 (1)	6.4	16.5	22.0	22.0
B 102	4.0	9.9	13.2	13.2
B 103	4.6	11.2	14.9	14.9
B 104	4.8	11.9	15.8	15.8
B 105	2.7	6.6	8.8	8.8
B 106	9.0	22.2	29.6	29.6
B 107	11.1	27.3	36.4	36.4
B 108	12.5	29.9	41.0	41.0
B 299	48.1	10.0	10.0	0.5
B 302.1	6.6	16.2	16.2	8.8
B 302.2	45.5	111.8	111.8	61.0
B 303	42.8	105.1	105.1	57.3
B 304	18.8	46.2	46.2	25.1
B 306	25.4	62.4	62.4	33.9
B 307	29.1	71.4	71.4	38.9
B 308	80.0	288.8	288.8	110.3
B 309	48.5	119.2	119.2	65.2
B 310	25.6	45.9	45.9	25
B 311	24.4	59.9	59.9	32.6
B 312	7.6	18.7	18.7	10.2
B 313	6.5	16.0	16.0	8.7
B 314	35.0	85.9	85.9	46.7
B 315	7.9	19.4	19.4	10.6
B 351	9.6	23.6	23.6	12.8
B 352	20.1	49.3	49.3	26.8
B 353	1.1	2.7	2.7	1.5
B 354	3.4	8.4	8.4	4.5
B 355	1.7	4.2	4.2	2.3
B 401	6.5	20.8	20.8	20.8
B 402	9.9	31.6	31.6	31.6
B 403	4.4	14.08	14.08	14.1
	AHYMO HYD NO.			
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AP 6	124	469.8	469.8	205.7
AP 7 IN (6)	224	160.2	156.9	156.9
HALTER POND OUT (7)	503	NA	6.7	6.7
AP 8	228	423.7	331.6	212.3
AP 9 (3)	132	474.5	474.5	207.7
AP 10 (3)	230	773.0	754.5	364.9

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3. ADD HALTER POND OUT FLOW TO GET APPROX TOTAL FLOW
4. AP 2 HAS ADDITIONAL BASINS (302.2 & 352) FOR EXISTING OFFSITE CONDITIONS
5. 6.05 AC-FT POND, INCLUDING SEDIMENT STORAGE. 100-YR WS 5352.72 WITH SEMIMENT STORAGE BERM AT ELEV 5249.00
6. INCLUDES BASINS 105 & 106 IN FAIR SHARE ONLY
7. QUASI AP7 OUT. INFLOW = ALL FROM FROM BASINS 105 & 106. NOT IN FAIR SHARE
8. HYD 112 IN OFFSITE EXISTING ANALYSIS

file srtbl3.wq1 REVISED 6/94

RECEIVED 1994 HYDROLOGY DIVISION

PLATE 2

OFFSITE EXISTING

CONCEPTUAL MASTER DRAINAGE PLAN

SUNRISE TERRACE UNIT III, IV & V

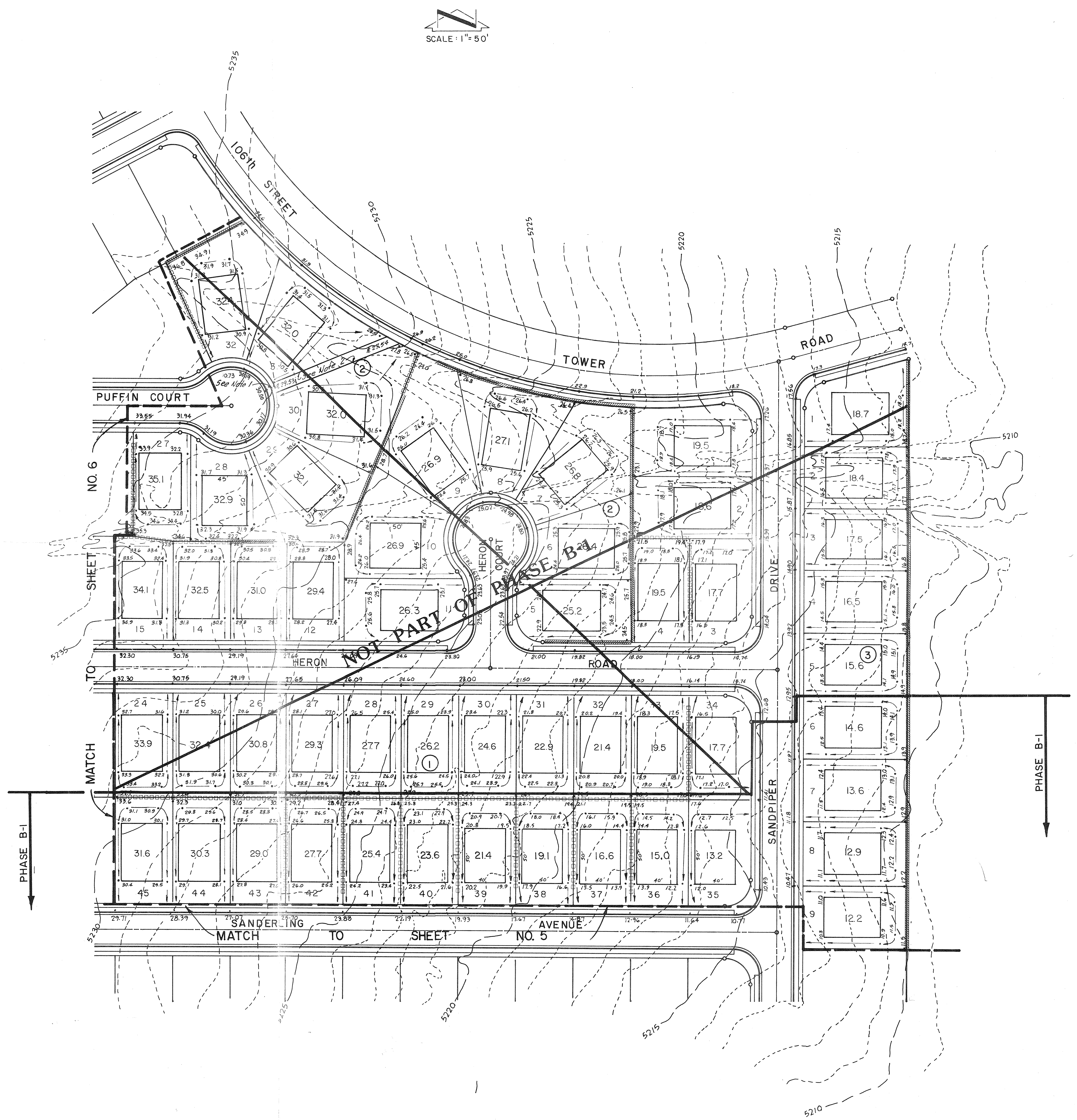
RYALS engineering & construction services
4929 Idlewilde S.E. Albuquerque, NM 87108
(505) 265-8267 269-1142 mobile telephone

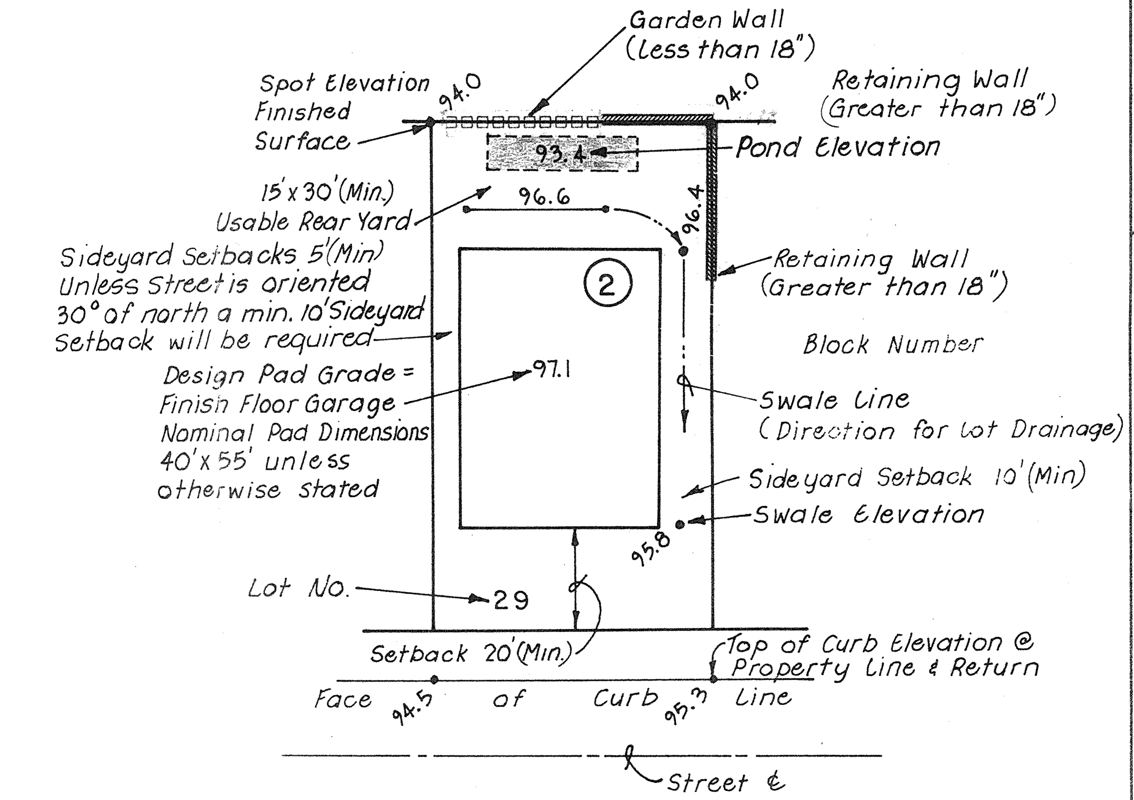
SHEET NO. OF

Robert Ryals 6-21-94


50' EASEMENT
NATURAL GRADE
EARTH CHANNEL 2' DEEP
COMPACT CHANNEL TO 90%
NOTE: IF UPHILL EXISTING GRADE IS BELOW PROPOSED TOP OF CHANNEL, USE EXISTING GRADE. COMPACT TO 90%.
NOTE: CHANNEL MAY BE SHIFTED FROM SIDE TO SIDE AS NEEDED TO STAY WITHIN EASEMENT.
EARTH CHANNEL WEST OF TANAGER
NORTH OF CONNEMARA
SCHEMATIC
N.T.S.
EXISTING 50' WIDE TEMPORARY DRAINAGE EASEMENT AND COVENANT RECORDED NOV. 12, 1986 BK MISC. 417A, P.P. 598-607
PROPOSED SUNRISE TERRACE UNIT I
SUNRISE TERRACE UNIT II - PHASE A-1
TOWER ROAD SW
FOYT DRIVE
UNIT IV 103 LOTS
UNIT III 68 LOTS
UNIT V 128 LOTS
CONNEMARA AVENUE
HACKAMORE PLACE
PASO FINO PLACE
ANDALUSIAN AVENUE
VAQUERO DRIVE
SANDPIPER DRIVE
STETSON DRIVE
HALTER DRIVE
CHAPS STREET
WRANGLER STREET
SADDLE STREET
TANAGER DRIVE NW
BASIN BNDY
101
102
103
104
105
106
107
108
PIPE 34.4 STRT 20.24
PIPE 49.2 STRT 21.24
PIPE 63.6 STRT 21.74
PIPE 40 STRT 25.2
PIPE 100.6 STRT 46.94
PIPE 141.0 STRT 17.14
Q 240.3
Q 282.9
N 0°17'55" E 732.98'
N 89°22'14" W 1966.37'
S 89°41'57" E 940.00'
EXISTING DETENTION POND TO BE REGRADED AS SHOWN
PROPOSED ASPHALT DIVERSION DITCH SEE DETAIL
48" STUB
PROPOSED INLET W/ 18" OUTLET TO SD
PROPOSED 8" W
CONNECT TO EXIST CHANNEL PER AMAFCA REQUIREMENTS
PROPOSED 54" ONSITE STORM DRAIN
PROPOSED JUNCTION BOX
TRACT A SUNRISE TERRACE UNIT II PHASE A RESERVED FOR PARKS, OPEN SPACE AND DRAINAGE
EXISTING SNOW VISTA CHANNEL 60' AMAFCA ROW
SCALE-1"=100'
0 25 50 100
LEGEND
EXISTING
PROPOSED
STORM DRAIN MANHOLE
CATCH BASIN
MAN HOLE
EXISTING CURB AND GUTTER
EXISTING ASPHALT CURB
EXISTING EASEMENT/COVENANT
NEW CURB AND GUTTER
NEW ASPHALT CURB
BASIN BOUNDRY
BASIN NUMBER
PERMINATE PAVING SEE SECTION
TEMP. PAVING
8" TEMPORARY ASPHALT CURB
2" ASPHALT PAVING, 1500# STABILITY
CLASS K NATIVE SEEDING ON EXP. SLOPES
NATURAL GRADE VARIES
PROPOSED GRADE SHALL MATCH EXIST. NATURAL GRADE AT PROPERTY LINE.
R.R. TIE RETAINING WALL AS REQUIRED
NATURAL EARTH
12" COMPACTED SUBGRADE (COMPACTED TO 95%).
TEMPORARY ASPHALT CHANNEL IN TANAGER R.O.W.
N.T.S.
PLATE 3
SUNRISE TERRACE UNIT III, IV, & V
MASTER CONCEPTUAL DRAINAGE PLAN
FINAL BASINS & FLOWPATHS
RYALS engineering & construction services
4929 Idlewilde S.E. Albuquerque, NM 87108
(505) 265-8267 269-1142 mobile telephone
SHEET NO.
OF
6-21-94


CONSTRUCTION NOTES:
1 GRADE RETENTION POND TO GRADES SHOWN ON SHEET 6.
2 REGRADE AND SHAPE EXISTING EARTH SWALE WEST OF TANAGER TO DESIGN SECTION AND LIMITS SHOWN. NO GRADING OR TRAFFIC IS ALLOWED OUTSIDE THE 50' EASEMENT. REVEGITATE DISTURBED AREAS PER C.O.A. SPECIFICATIONS.
3 LIMITS OF GRADING FOR UNIT III.
4 UNLESS OTHERWISE INDICATED, UPON COMPLETION OF STORM DRAIN INSTALLATION ALONG SANDPIPER, PASO FINO AND HALTER, REGRADE SURFACE TO APPOXIMATE PREVIOUS EXISTING GRADE AND REVEGITATE PER C.O.A. SPECIFICATIONS.
5 FOR LOT GRADING ADJACENT TO STREETS PAVED W/UNIT III CONSTRUCTION PROVIDE EROSIAN CONTROL BERMS PER DETAIL THIS SHEET.
PROPOSED SUNRISE TERRACE UNIT I
50' EASEMENT
EARTH CHANNEL 2' DEEP
NATURAL GRADE
COMPACT CHANNEL TO 90%
NOTE: IF UPHILL EXISTING GRADE IS BELOW PROPOSED TOP OF CHANNEL USE EXISTING GRADE. COMPACT TO 90%.
NOTE: CHANNEL MAY BE SHIFTED FROM SIDE TO SIDE AS NEEDED TO STAY WITHIN EASEMENT.
EARTH CHANNEL WEST OF TANAGER
NORTH OF CONNEMARA
SCHEMATIC N.T.S.
SCALE–1"=100'
0 25 50 100
NOTE: STORM DRAIN FLOWS SHOWN ARE FOR FULL DEVELOPMENT. INTERIM PIPE FLOWS ARE LOWER DOWNSTREAM OF HACKAMORE AND SLIGHTLY HIGHER UPSTREAM (POND AND STORM DRAIN DRY UP STREET IN INTERIM)
LEGEND
A RETAINING WALL RETAINING 18" OR LESS.
A RETAINING WALL RETAINING 18" OR MORE.
EXISTING RETAINING WALL 18" OR MORE
STORM DRAIN WITH UNIT III.
STORM DRAIN INLET WITH UNIT III
EXISTING CONTOURS
PROPOSED GRADE
H 5219.46 EXISTING GROUND
TEMPORARY EROSION CONTROL BERM COMPACT BERM TO 90% OF OPTIMUM USING PLACEMENT EQUIPMENT WHEELS AS REQUIRED
FINISH ROUGH GRADING
CURB & GUTTER
1'–0"
EROSION CONTROL BERM
TYPICAL SECTION THROUGH BERM NOT TO SCALE
EROSION CONTROL BERMS ARE TO BE INSTALLED ON ALL LOTS ADJACENT TO THE PROPOSED STREETS OF THIS PROJECT, AND FOR THE 1ST 25' BACK FROM THE CURB ON EVERY FIFTH LOT
HALTER PAVING, CURB, GUTTER AND UTILITIES FROM UNIT III/IV PHASE BOUNDARY TO SOUTH OF POND, TO BE CONSTRUCTED WITH UNIT III AS SHOWN.
TEMPORARY MAN HOLE INLET
NTS
SUNRISE TERRACE UNIT II – PHASE A-1
RECORDED 1-8-87 BK. C32 P.130
TOWER ROAD
FOYT DRIVE
CONNEMARA AVENUE
HACKAMORE PLACE
PASO FINO PLACE
ANDALUSIAN AVENUE
CHAPS STREET
SANDPIPER DRIVE
STETSON DRIVE
HALTER DRIVE
VAQUERO DRIVE
TANAGER DRIVE NW
UNIT IV 103 LOTS
UNIT III 68 LOTS
UNIT V 128 LOTS
SEE SHEETS 6-9 FOR DETAILED GRADING
POND BOTTOM 5230.0
EARTH CREST ELEV 5232.0
25' LIMIT OF GRADING
50' PUBLIC UTILITY EASEMENT
PLATE 4
HYDROLOGY DIVISION
SUNRISE TERRACE UNIT III, IV, & V
INTERIM DRAINAGE SOLUTIONS
RYALS engineering & construction services
4929 Idlewilde S.E. Albuquerque, NM 87108
(505) 265-8267 269-1142 mobile telephone
SHEET NO. OF





TYPICAL LOT DETAIL

Scale: 1" = 30'

Note: Existing Ground Contour Interval = one Foot

Fr > 2 roll wave
0.7 – Fr – 1.3
maintain minimum of 12 ft (22.3 pg 66)
thickness of base course 6 inch
lower 18" and bottom one 7" thick
22.8 pg 167

AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION	
RECORDED BY	DATE
NO.	

BENCH MARKS

ACS "3-L9" A 40 PENNY NAIL IN POWER POLE #61 LOCATED ON THE WEST SIDE OF 98TH STREET, S. W. AND 450 FEET SOUTH OF RYNO COURT S. W. ELEV. = 5,184.872

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

REFERENCES	
MAP NO.	
EST. NO.	W.O. NO.

REVISIONS			
NO.	DATE	REMARKS	BY

DESIGN	
DESIGNED BY J.K.Z.	DATE 4-85
DRAWN BY L.A.H.-P.J.R.	DATE 10-86
CHECKED BY	DATE

RECEIVED SEP 11 1987 HYDROLOGY SECTION

PLANS PREPARED UNDER THE DIRECTION OF

Scanlon & Associates, Inc. 9/29/87 JOB NO.

APPROVED FOR CONSTRUCTION

CITY ENGINEER DATE

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

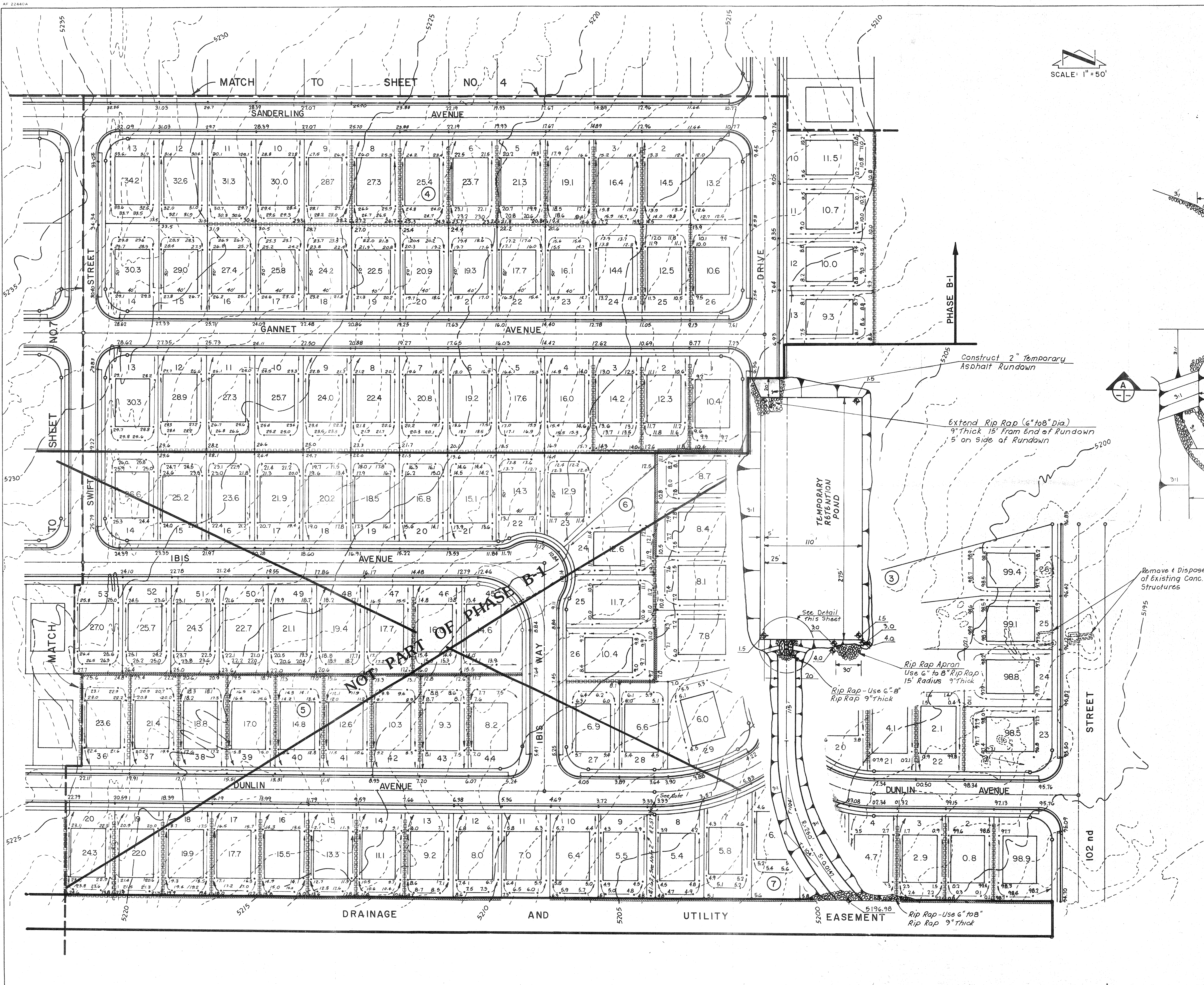
TITLE: SUNRISE TERRACE UNIT TWO PHASE B-1 GRADING PLAN

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

DRAWING NO.	MAP NO.	SHEET	OF
3212	L-8	4	34

Scanlon & Associates Job No 851033

SEP 24 1987



AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE — NO.

BENCH MARKS

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SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

REVISIONS			
NO.	DATE	REMARKS	BY

DESIGN
DESIGNED BY J.K.Z. DATE 4-85
DRAWN BY L.A.H. - P.S.R. DATE 10-86
CHECKED BY DATE

RECEIVED SEP 24 1987 HYDROLOGY SECTION

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: SUNRISE TERRACE UNIT TWO PHASE B-1 GRADING PLAN

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

DRAWING NO	MAP NO.	SHEET	OF
3212	L-8	5	34

Scanlon & Associates Job No. 851033

SEP 24 1987

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

BENCH MARKS

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AS BUILT INFORMATION

CONTRACTOR	
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INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

REFERENCES

MAP NO.
EST. NO.
W.O. NO.

REVISIONS

NO.	DATE	REMARKS	BY

DESIGN

DESIGNED BY J.K.Z. DATE 4-85
DRAWN BY L.A.H.-P.J.R. DATE 10-86
CHECKED BY DATE

PLANS PREPARED UNDER THE DIRECTION OF

CLIFFORD E. ANDERSON NEW MEXICO 5412 REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR
9/29/87

Scanlon & associates, inc. Engineers – Planners albuquerque artesia santa fe
JOB NO.

APPROVED FOR CONSTRUCTION

CITY ENGINEER DATE

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: SUNRISE TERRACE UNIT TWO PHASE B-1 GRADING PLAN

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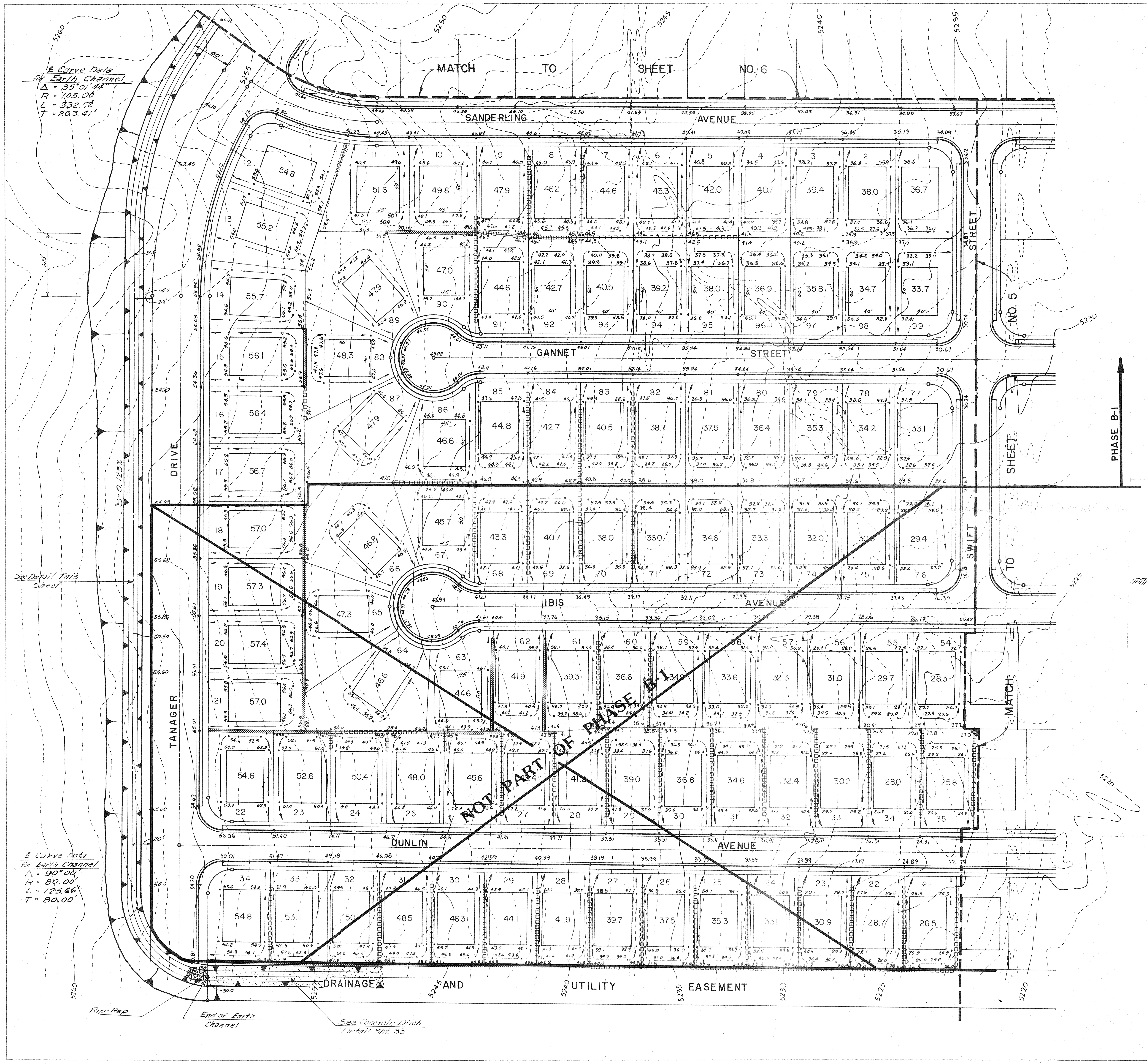
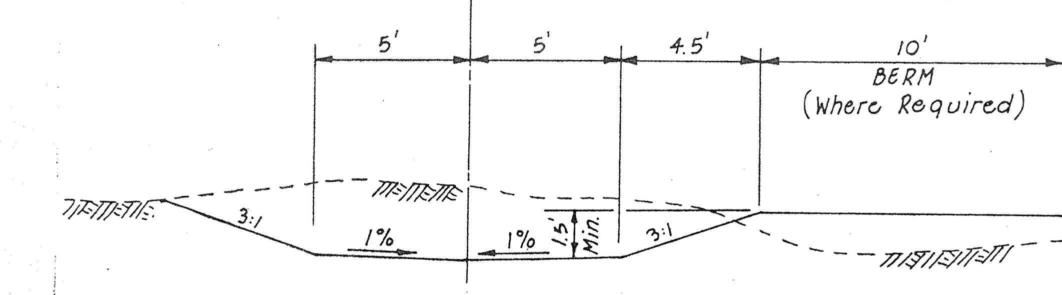
City Engineer			Liquid Waste		
A.C.E.-Design			Traffic		
A.C.E.-Hydrology			Water		

DRAWING NO. 3212 | MAP NO. L-8 | SHEET 6 OF 34

Scanlon & Associates Job No 85103.3

SEP 24 1987





EARTH CHANNEL WEST OF TANAGER DRIVE

Not to Scale

AS BUILT INFORMATION

CONTRACTOR / DATE
WORK STARTED BY / DATE
INSPECTOR'S ACCEPTANCE BY / DATE
FIELD VERIFICATION BY / DATE
DRAWINGS CORRECTED BY / DATE

MICRO-FILM INFORMATION

RECORDED BY / DATE
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FIELD NOTES: NO / BY / DATE

REFERENCES

MAP NO / EST NO / W O NO

REVISIONS

NO / DATE / REMARKS / BY

DESIGN

DESIGNED BY J.K.Z. DATE 4-85
DRAWN BY L.A.H. - P.J.R. DATE 10-86
CHECKED BY DATE

PLANS PREPARED UNDER THE DIRECTION OF

CLIFFORD E. ANDERSON, NEW MEXICO, 6492, REGISTERED PROFESSIONAL ENGINEER

9/29/87

Scanlon & Associates — JOB NO.

APPROVED FOR CONSTRUCTION

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3212	L-8	7	34

Scanlon & Associates Job No. 85103.3

SEP 24 1987