REFERENCE 6

"Technical Drainage Study for Las Ventanas at Summerlin"
Approved on August 29, 2002

DRAINAGE STUDY

HTE #

01-31361

PROJECT NAME

Las Ventanas Ph 1

SECTION-TOWNSHIP-RANGE

1-21-59

CROSS STREETS

Town Center / Charleston

NEW ASSESSOR'S PARCEL NUMBER

164-01-510-008

ACREAGE:

16.7 ±

SUBMITTAL DATE:

9/28/01

DRAWER #

489

Department of Comprehensive Planning

500 S Grand Central Pky • Ste 3012 • PO Box 551741 • Las Vegas NV 89155-1741
(702) 455-4181 • Fax (702) 385-8940

John L. Schlegel, Director • *Alan Pinkerton, Assistant Director*

August 29, 2002

Stantec Consulting, Inc.
7251 W. Charleston Boulevard
Las Vegas, NV 89117

SUBJECT: WILLDAN / Clark County Development Services Dept. Plan Review Contract
Major Projects Division
Technical Drainage Study for Las Ventanas at Summerlin **(3608)**
Study Dated: September 28, 2001
Addendum Dated: December 14, 2001
Addendum Dated: January 14, 2002
Addendum Dated: August 6, 2002
Location: SEC of Town Center Drive and Charleston Boulevard
(Sec.01, T. 21 S., R. 59 E.)
HTE #01 - 31361

The referenced **Technical Drainage Study** has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards.

1. As noted in the addendum dated August 6, 2002, the study and plans have been revised from earlier submittals to address the proposed Phase I construction which includes Building A, the Fitness Center/Café, Common Building, adjacent parking lots, three site entrances, and interim grading within the future Phase 2 area. Development within the Phase 2 area will require an update to this technical drainage study;

2. The site shall be graded with respect to drainage as shown on "Las Ventanas at Summerlin, Phase I," sheets C10 through C17 signed and sealed by Carl W. High, P.E., on August 6, 2002;

3. The following drainage facilities shall be constructed:

   a. An 8-foot wide concrete valley gutter crossing the site entrance from Charleston Boulevard

b. An 8-foot wide concrete valley gutter crossing the site entrance from Town Center Drive

c. An 8-foot wide concrete valley gutter crossing the site entrance from Griffith Peak Drive

d. 3-foot wide concrete valley gutters near the Charleston Boulevard entrance as shown on sheet C11

e. 18-inch concrete flume as shown on sheet C11

f. A minimum 1-foot high berm between Building A and the Fitness Center directing flows northward, away from the pool area

g. Approximately 87 lf of 24 inch HDPE storm drain pipe beneath the Independent Living Commons building as shown on sheet C11

h. Erosion protection at the outlet of the above mentioned storm drain pipe 3(e) to include 10 lf of 3-feet wide concrete valley gutter with rip rap on the side (d_{50} = 6", thickness = 12", and width = 1.5')

i. A 10-foot x 14.5-foot concrete apron with a 2–foot cutoff wall at the inlet of the above mentioned storm drain pipe 3(e)

j. A grade to drain v-ditch (depth = 2 feet, side slopes = 3H:1V) at the outlet of the above mentioned erosion protection 3(f), as shown in section L/C16

k. A minimum 1-foot high berm at the northeast corner of the proposed Phase I boundary as shown on sheet C11

l. An onsite Jensen Precast 48-inch by 48-inch grated drop inlet with 15 lf of 24 - inch HDPE stubbed to the west, located north of the future east site entrance as shown on sheet C15

m. A storm water overflow erosion protection area (width = 12 feet minimum, d_{50} = 6 inches, thickness = 12 inches) located at the outlet of the drop inlet mentioned above in 3(i)

n. An onsite Jensen Precast 48 – inch by 48-inch grated drop inlet with approximately 27 lf of 24-inch RCP, located at the southeast corner of the site entrance as shown on sheet C14

o. Approximately 62 lf of 18-inch HDPE storm drain beneath the south access road, with rip rap (d_{50} = 6 inches, thickness = 12 inches) erosion protection at each end as shown on sheet C14

p. An onsite storm drain system beneath the south access road near Griffith Peak Drive consisting of approximately 150 lf of 24-inch HDPE storm drain pipe, one 48-inch Type 1 manhole, rip rap protection at the inlet (d_{50} = 6 inches, thickness = 12 inches, width = 18 inches) and rip rap protection at the outlet (d_{50} = 1.5 feet, thickness = 3 feet, width = 4 feet) as shown on sheet C14

q. Graded swales along the east and south sides of the site as shown on sheets C12, C13, C14, and C15, and in sections B, C, D, E, F and J on sheet C16

r. Rip rap erosion protection (d_{50} = 18 inches, thickness = 3 feet, width = 7 feet, length = 75 feet) west of the drop inlet mentioned in 3(k)

s. Rip rap erosion protection (d_{50} = 6 inches, thickness = 12 inches, width = 7 feet, length = 60 feet) west of the rip rap mentioned in 3(o)

t. Rip rap erosion protection (d_{50} = 6 inches, thickness = 12 inches, width = 6 feet, length = 55 feet) northwest of the rip rap mentioned in 3(o)

4. A bond estimate must be submitted to Clark County Civil Engineering Division for the above-mentioned storm water management facilities;

5. The minimum finished floor elevations for the proposed structures shall be constructed as shown on the above-mentioned grading plans;

6. Section 2 of the Clark County Building Office Operations Division Drainage Compliance Report must be completed by the engineer for the facilities listed in Item 3 above;

7. As a condition of final approval, a waiver to allow the finished floor elevations of the buildings to be set below the current Clark County criteria must be approved;

8. The subject site is located within Zone X, as shown on FIRM Community Panel Number 32003C2150D, revised August 16, 1995. Zone X is determined to be outside the 500-year flood plain;

9. Mylars of the grading plan must be submitted to the Clark County Civil Engineering Division Plan Check for approval signatures prior to permit issuance;

10. The grading plan will be reviewed by the Building Office Operations Division to ensure compliance with the handicap access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code;

12. Nevada Department of Transportation (NDOT) concurrence is required for the work proposed within NDOT right – of - way;

13. At the request of Clark County Development Services Department, drainage/grading plans for the proposed development have been reviewed for compliance to the requirements set forth in the "Minimum Drainage Study Criteria Checklist," "Drainage Plan Information," dated July 15, 1997. **As a condition of final approval, the drainage/grading plans submitted for this project require the following modifications to meet the minimum standards outlined in the above-referenced regulation:**

    a. Provide a detail of the berm between Building A and the Fitness Center

    b. Additional redlines as shown on the plans

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

CARLA J. PEARSON
ASSISTANT DIRECTOR, CIVIL ENGINEERING DIVISION

BY: ______________________________
Marc A. Bolduc, P.E.
Senior Engineer, Major Projects Division

MB/CS/bk/bgw

cc: Westport/Greystone Communities
Development File

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ADDENDUM #2 TO THE

TECHNICAL DRAINAGE STUDY

FOR

LAS VENTANAS

(SUMMERLIN VILLAGE 13 EAST PARCELS A AND B)

January 2002

Prepared for

Greystone Development Co., LLC
222 W. Las Colinas Blvd., Ste. 2100
Irving, TX 75039
Phone: (972) 402-3700
Fax: (972) 402-3724

Project No.: 0264.0002

Prepared by

PENTACORE

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

PENTACORE
Civil Engineering • Construction Management
Land Surveying • Planning • ADA Consulting
6763 W. Charleston Blvd. • Las Vegas, NV 89102
Telephone (702)258-0115 • Fax (702)258-0865

PROJECT NO. : 0264.0002
FILE : 0264sf4ADD2.xls
DEVELOPMENT : Las Ventanas
CALCULATED BY: Tara Taylor
DATE : 1/10/02

Sub-Basin Data					Initial/Overland Time (Ti)			Travel Time (Tt)					Tc	Tc Check (Urbanized Basins)		Final Tc	Tlag	Remarks
DESIG (1)	CN (2)	K (3)	AREA (acres) (4)	AREA (mi^2) (5)	LENGTH (ft) (6)	SLOPE (%) (7)	Ti (min) (8)	LENGTH (ft) (9)	SLOPE (%) (10)	V1 (fps) (11)	V2 (fps) (12)	Tt (min) (13)	Tc=Ti+Tt (min) (14)	TOTAL (ft) (15)	Tc (min) (16)	Tc (min) (17)	Tlag (hrs) (18)	Remarks (19)
EXISTING CONDITION																		
EX-1	88	0.772	7.6	0.0119	240	2.5	6.7	320	2.5	2.34	N/A	2.3	9.0	560.0	13.1	9.0	0.090	
EX-2	88	0.772	9.1	0.0143	280	2.5	7.3	360	2.5	2.34	N/A	2.6	9.9	640.0	13.6	9.9	0.099	
FUTURE CONDITION																		
FUT-1	93	0.838	1.1	0.0018	100	5.0	2.8	340	2.0	2.86	N/A	2.0	4.7	440.0	12.4	4.7	0.047	
FUT-2	93	0.838	1.4	0.0022	30	2.5	1.9	320	3.0	3.50	N/A	1.5	3.4	350.0	11.9	3.4	0.034	
FUT-3	93	0.838	2.3	0.0036	30	1.0	2.6	700	1.7	2.63	3.99	4.0	6.6	730.0	14.1	6.6	0.066	
FUT-3A	93	0.838	1.4	0.0022	100	5.0	2.8	440	2.0	2.86	N/A	2.6	5.3	540.0	13.0	5.3	0.053	
FUT-4	93	0.838	2.0	0.0030	30	2.0	2.1	430	1.2	2.21	N/A	3.2	5.3	460.0	12.6	5.3	0.053	
FUT-5	93	0.838	0.9	0.0013	30	1.0	2.6	170	2.0	2.86	N/A	1.0	3.6	200.0	11.1	3.6	0.036	
FUT-6	93	0.838	0.6	0.0010	40	1.0	3.0	100	2.0	2.86	N/A	0.6	3.6	140.0	10.8	3.6	0.036	
FUT-7	93	0.838	0.7	0.0011	30	2.0	2.1	200	0.5	1.43	N/A	2.3	4.4	230.0	11.3	4.4	0.044	
FUT-8	93	0.838	3.5	0.0055	30	2.0	2.1	560	0.5	1.43	2.16	6.3	8.3	590.0	13.3	8.3	0.083	
FUT-9	93	0.838	2.2	0.0034	30	2.0	2.1	430	1.0	2.02	N/A	3.5	5.6	460.0	12.6	5.6	0.056	
FUT-10	93	0.838	0.8	0.0013	40	30.0	1.0	220	2.5	3.19	N/A	1.1	2.1	260.0	11.4	2.1	0.021	
FUT-11	93	0.838	0.1	0.0002	10	1.0	1.5	90	3.5	3.78	N/A	0.4	1.9	100.0	10.6	1.9	0.019	

Ti=(1.8(1.1-K)L^(1/2))/(S^1/3)
Tc= Ti+Tt
K=0.0132(CN)-.39
Tlag = 0.6Tc

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing
V1 = 14.8*(S/100)^1/2
V2 = 29.4*(S/100)^1/2

Developed
V1 = 20.2*(S/100)^1/2
V2 = 30.6*(S/100)^1/2

are calculated by the equation
Tlag=20Kn(L*Lc/S^0.5)^0.33
and denoted by shaded gray
(See Worksheet).

REFERENCE:

STANDARD FORM 4

Summary of HEC-1 Analysis

Results of HEC-1 Analysis

Location	Q_{10} (cfs)	Q_{100} (cfs)
FUT-1	2	4
FUT-2	3	5
CN-A	5	10
FUT-3A	3	5
FUT-3	4	8
CN-B	12	24
FUT-4	4	7
FUT-5	2	3
CN-C	17	34
FUT-6	1	2
FUT-7	1	3
FUT-8	6	12
CN-D	9	17
FUT-9	4	8
FUT-10	2	3
CN-E	6	11
CN-F	14	29
FUT-11	0	0
EX-1	9	22
EX-2	11	25

PENTACORE

Civil Engineering
Land Surveying
Global Positioning
Land Planning • GIS
Construction Administration
Program Management
ADA Consulting
Landscape Architecture
Measurement Technologies
Water Ventures International

0264.0002
January 14, 2001

Clark County Public Works
Department of Comprehensive Planning
500 South Grand Central Parkway
Las Vegas, Nevada 89155

ATTN: Marc Bolduc, P.E.

RE: Addendum #2 to the Technical Drainage Study for Las Ventanas (Original H.T.E. #01-31361)

Dear Mr. Bolduc:

Enclosed please find the response to review comments, dated December 28, 2001 regarding the above subject. The following items are addressed:

Comment 1: The elevation on the grading plan indicate that drop inlet D1#9 is in sump condition. The drop inlet calculation assumes a grate inlet on grade. If the grate inlet should be within a continuous grade, the depth at the grate must be input from the flow depth calculation at Section A. This must be addressed and revisions provided as necessary;

Response 1: The grading plan has been revised to reflect that DI#9 is on a continuous grade. The depth at the grate is shown to reflect the flow depth calculation at Section A. Please refer to the response for Clark County Comment 1 in the Appendix for the appropriate revisions.

Comment 2: The drop inlet calculation for D1#10 indicates a ponding depth of 0.70-feet. It is not clear from the plans if the buildings are protected or if that depth can be reached. Also, the engineer must address an overflow path if the drop inlet becomes 100% clogged;

Response 2: There is a 100-year WSEL (water surface elevation line) shown on Figure 4 for the ponding depth in that area. The ponding area shows that the storm water in the 100-year condition will not reach the building with the storm drain operating at a 50% clogging factor. In the case the drop inlet becomes 100% clogged, an overflow path has been provided along the adjacent sidewalk to the easterly parking area.

Comment 3: **It is not clear from the plans if the flow depth determined from the nomograph will be reached at the 24-inch storm drain inlet within basin FUT-1. Also, the engineer must address the flows if the pipe is to become 50% clogged and an overflow path. A detail and flow depth calculation of the swale upstream of the 24-inch storm drain inlet must be provided.**

Response 3: A detail of the flow depth in the swale upstream of the 24-inch storm drain is provided in the Appendix of this Addendum under Willdan Comment 3 – Section M. A revised nomograph is also included in the Appendix under Willdan Comment 3. The detail for the swale has been provided in the revised grading plan. According to the flow depth calculation, the depth of flow at this location is 0.65 ft. The swale will collect the 4 cfs flow generated by basin FUT-1 into the inlet area of the 24-inch storm drain, where it will pond to the headwater depth of 1.48-feet, as calculated in the revised nomograph. If the pipe is to become 100% clogged, an overflow path is established via a swale located around the adjacent building which will transmit flows north and around the building where the flows will be conveyed through FUT-3 and off the site.

Comment 4: **The nomograph for the 24-inch pipe within basin FUT-1 assumes a headwall. A detail of the pipe inlet must be provided. This must be addressed;**

Response 4: A detail of the pipe inlet has been provided in the Appendix of this Addendum under Willdan Comment 4.

Comment 5: **It is not clear why the drop inlet D1#3 is calculated for 6cfs. It appears from the grading plan, all of the flow within basin FUT-9 will convey to that sump grate inlet. This must be addressed and revisions provided as necessary.**

Response 5: The calculations for drop inlet DI#3 have been revised and are now calculated for 8-cfs, which is the flow generated by basin FUT-9. Please refer to Clark County Comment 1 in the Appendix for the appropriate revisions.

Comment 6: **The flow depth calculation for section B indicates a depth of 0.41-feet. The drop inlet calculation for D1#8 must be revised assuming that depth to determine the amount of flow entering the inlet. Also, it is not clear how the flow of 8 cfs was determined for D1#8. This must be addressed;**

Response 6: The calculation for DI#8 has been revised assuming a depth calculation for section B. Please see the Appendix under Clark County Comment 1 for the appropriate revisions. A table labeled "Source of Flows for Section Depth Calculations" has been included to explain the source of all flows used in the drop inlet calculations.

Comment 7: **It is not clear how the flow of 10 cfs was determined for the drop inlet calculation for D1#7. This must be addressed and revisions provided if necessary;**

Response 7: An outline of all flow calculations has been provided in tabular form in the Appendix of this Addendum. Please refer to Clark County Comment 1 in the Appendix for the table labeled "Source of Flows for Drop Inlet Calculations".

Comment 8: **At the request of Clark County Public Works, drainage/grading plans for the proposed development have been reviewed for compliance to the requirements set forth in the "Minimum Drainage Study Criteria Checklist, "Drainage Plan Information," dated July 15, 1997. The plans submitted do not meet the minimum requirements and must be revised prior to Drainage Study approval, to address the following:**

a. **Details of the grate drop inlets must be provided**

b. **Details of the interior onsite swales as indicated on the red-lined plans must be provided**

c. **A detail of the onsite berms with dimensions labeled must be provided**

d. **The grate lengths/widths must be labeled for each grate inlet**

e. **The size of the storm drains on the profile "SD & D1 #5" must be labeled**

f. **Additional comments on the plans must be addressed**

Response 8:

a. Please refer to the Appendix under Clark County Comment 2 for the appropriate grate details, which indicate 80% open grates. The detail on the grading plan specifies 80% open.

b. Please refer to the revised grading plan for the appropriate revisions.

c. Please refer to the revised grading plan for the appropriate revisions.

d. The grate/lengths are shown on Figure 4 in the Table called "Drop Inlets for Storm Drain System".

e. Please refer to the revised grading plan for the appropriate revisions.

f. Please refer to the revised grading plan for the appropriate revisions.

CONCURRENCE BY CLARK COUNTY PUBLIC WORKS

Comment 1: **As commented in the 1st review memorandum and a meeting held with the consultant, FUT-1 may not drain to a low point and under the proposed building via culvert. Revise the hydrology, hydraulics, and grading design accordingly;**

Response 1: The hydrology, hydraulics, and grading design have been revised accordingly. As per correspondence with Scott Seifert of Stantec, FUT-1 drains 4 cfs to a low point under the proposed building via the culvert. The grading plan has been revised to direct the new basin FUT-3A's flow of 5 cfs around the proposed building to the northern side of the property. Due to these revisions, the following items were updated; Standard Form 4, HEC-1 analysis, Standard Form 6, street sections (A, B and K), Figure 4 (Storm Flow Summary, Proposed Conditions), and drop inlet analysis. Summaries of all street sections are included in the Appendix of this addendum; however, the calculations of the other sections were not altered and can be found in Addendum #1. A new cross section, Section L, was added in the new basin FUT-3A to get flow depth in that area, the cross section was constructed using the supplied details. Please refer to these revised documents in the Appendix under Clark County Comment 1.

Comment 2: **Provide appropriate details to verify bar sizes, spacing, and effective area of inlets. They have not been reviewed at this time. Correctly model the inlets for the given situation on the plans. All inlets are modeled as though there are located on L-curb;**

Response 2: The appropriate revisions have been made to all inlets that are not located on L-curb. Details have been provided in the Appendix under Clark County Comment 2 for the inlets to provide the appropriate effective opening area. All grates are Jensen Precast and are 80% open at high flow.

If you should have any questions or require additional information, please do not hesitate to contact our office at 258-0115.

Sincerely,

PENTACORE ENGINEERING, INC/ STANTEC CONSULTING

PROFESSIONAL ENGINEER - STATE OF NEVADA
CARL W. HIGH
1/17/02
CIVIL
No. 10794

Tara L. Taylor, E.I.
Hydrologist

Carl High, P.E.
Project Manager

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

PENTACORE
Civil Engineering • Construction Management
Land Surveying • Planning • ADA Consulting
6763 W. Charleston Blvd. • Las Vegas, NV 89102
Telephone (702)258-0115 • Fax (702)258-0865

PROJECT NO. : 0264.0002 **DEVELOPMENT : Las Ventanas**

FILE : 0264sf4ADD2.xls **CALCULATED BY: Tara Taylor** **DATE : 1/10/02**

Sub-Basin Data					Initial/Overland Time (Ti)			Travel Time (Tt)					Tc	Tc Check (Urbanized Basins)		Final Tc	Tlag	Remarks
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FUT-3	93	0.838	2.3	0.0036	30	1.0	2.6	700	1.7	2.63	3.99	4.0	6.6	730.0	14.1	6.6	0.066	
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V2 applies to the remaining travel distance.

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Developed
V1 = 20.2*(S/100)^1/2
V2 = 30.6*(S/100)^1/2

are calculated by the equation
Tlag=20Kn(L*Lc/S^0.5)^0.33
and denoted by shaded gray
(See Worksheet).

REFERENCE: **STANDARD FORM 4**

HEC-1 Model

Summary of HEC-1 Analysis

Results of HEC-1 Analysis

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FUT-1	2	4
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CN-A	5	10
FUT-3A	3	5
FUT-3	4	8
CN-B	12	24
FUT-4	4	7
FUT-5	2	3
CN-C	17	34
FUT-6	1	2
FUT-7	1	3
FUT-8	6	12
CN-D	9	17
FUT-9	4	8
FUT-10	2	3
CN-E	6	11
CN-F	14	29
FUT-11	0	0
EX-1	9	22
EX-2	11	25

FLOW @ CN-C
IMPACTS THE
FAITH LUTHERAN
HIGH SCHOOL THRU
THE 6X 36" SD
ACROSS INDIGO DRIVE

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HEC1 S/N: 1333000362        HMVersion: 6.40    Data File: 0264add2.hc1

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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                           *
U.S. ARMY CORPS OF ENGINEERS     *
*          SEPTEMBER 1990               *                                           *
HYDROLOGIC ENGINEERING CENTER    *
*             VERSION 4.0               *                                           *
609 SECOND STREET        *
*                                       *                                           *
DAVIS, CALIFORNIA 95616        *
*  RUN DATE  01/10/2002  TIME  08:36:33 *                                           *
(916) 756-1104           *
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                                    X     X  X        X     X        XX
                                    X     X  X        X               X
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                                    X     X  XXXXXXX   XXXXX         XXX


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                                 :::  Full Microcomputer Implementation  :::
                                 :::                 by                  :::
                                 :::          Haestad Methods, Inc.      :::
                                 :::                                     :::
                                 :::::::::::::::::::::::::::::::::::::::::::
                                 :::::::::::::::::::::::::::::::::::::::::::

                          37 Brookside Road * Waterbury, Connecticut  06708 * (203)
                          755-1666


THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS,
HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE
1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS
IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE
STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT
INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM
```

HEC-1 INPUT
PAGE 1

```
LINE
ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

                *DIAGRAM
   1            ID        SUMMERLIN SENIOR COMMUNITY
   2            ID        EXISTING & PROPOSED CONDITIONS  BY: TARA L. TAYLOR
   3            ID        DECEMBER 13, 2000        FILE: 0264ADD2.HC1
   4            ID
   5            IT       5       0       0     300
   6            IO       5       0
   7            IN       5       0       0
   8            JR    PREC     .57       1

   9            KK   FUT-1
  10            KM    PROOSED ONSITE BASIN FUT-1
  11            BA   .0018
  12            PC    .000    .020    .057    .070    .087    .108    .124    .130
  .130    .130
  13            PC    .130    .130    .130    .133    .140    .142    .148    .158
  .172    .181
  14            PC    .190    .197    .199    .200    .201    .204    .214    .229
  .241    .249
  15            PC    .251    .256    .270    .278    .281    .283    .295    .322
  .352    .409
  16            PC    .499    .590    .710    .744    .781    .812    .819    .835
  .851    .856
  17            PC    .860    .868    .876    .888    .910    .926    .937    .950
  .970    .976
  18            PC    .982    .985    .987    .989    .990    .993    .993    .994
  .995    .998
  19            PC    .998    .999    1.00
  20            PB    3.15
  21            LS       0      93
  22            UD    .047

  23            KK   FUT-2
  24            KM    PROPOSED ONSITE BASIN FUT-2
  25            BA   .0022
  26            LS       0      93
  27            UD    .034

  28            KK    CN-A  CONCENTRATION POINT CN-A
  29            HC       2

  30            KK  FUT-3A
  31            KM    PROPOSED ONSITE BASIN FUT-3A
  32            BA   .0022
  33            LS       0      93
  34            UD    .053

  35            KK   FUT-3
  36            KM    PROPOSED ONSITE BASIN FUT-3
  37            BA   .0036
  38            LS       0      93
  39            UD    .066

  40            KK    CN-B  CONCENTRATION POINT CN-B
  41            HC       3

  42            KK   FUT-4
  43            KM    PROPOSED ONSITE BASIN FUT-4
  44            BA   .0030
  45            LS       0      93
  46            UD    .053
```

HEC-1 INPUT
PAGE 2

```
LINE
ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 47       KK   FUT-5
 48       KM   PROPOSED ONSITE BASIN FUT-5
 49       BA   .0013
 50       LS       0       93
 51       UD    .036

 52       KK    CN-C  CONCENTRATION POINT CN-C
 53       HC       3

 54       KK   FUT-6
 55       KM   PROPOSED ONSITE BASIN FUT-6
 56       BA   .0010
 57       LS       0       93
 58       UD    .036

 59       KK   FUT-7
 60       KM   PROPOSED ONSITE BASIN FUT-7
 61       BA   .0011
 62       LS       0       93
 63       UD    .044

 64       KK   FUT-8
 65       KM   PROPOSED ONSITE BASIN FUT-8
 66       BA   .0055
 67       LS       0       93
 68       UD    .083

 69       KK    CN-D  CONCENTRATION POINT CN-D
 70       HC       3

 71       KK   FUT-9
 72       KM   PROPOSED ONSITE BASIN FUT-9
 73       BA   .0034
 74       LS       0       93
 75       UD    .056

 76       KK  FUT-10
 77       KM   PROPOSED ONSITE BASIN FUT-10
 78       BA   .0013
 79       LS       0       93
 80       UD    .021

 81       KK    CN-E  CONCENTRATION POINT CN-E
 82       HC       2

 83       KK    CN-F  CONCENTRATION POINT CN-F
 84       HC       2

 85       KK  FUT-11
 86       KM   PROPOSED ONSITE BASIN FUT-11
 87       BA   .0002
 88       LS       0       93
 89       UD    .019
```

HEC-1 INPUT
PAGE 3

```
LINE
ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 90           KK    EX-1
 91           KM   EXISTING ONSITE BASIN EX-1
 92           BA   .0119
 93           LS       0       88
 94           UD    .090

 95           KK    EX-2
 96           KM   EXISTING ONSITE BASIN EX-2
 97           BA   .0143
 98           LS       0       88
 99           UD    .099
100           ZZ
```

```
HEC1 S/N: 1333000362        HMVersion: 6.40    Data File: 0264add2.hc1

*****************************************
****************************************
*                                       *                                          *
*
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                          *
U.S. ARMY CORPS OF ENGINEERS     *
*             SEPTEMBER 1990            *                                          *
HYDROLOGIC ENGINEERING CENTER    *
*              VERSION 4.0              *                                          *
609 SECOND STREET       *
*                                       *                                          *
DAVIS, CALIFORNIA 95616       *
*  RUN DATE  01/10/2002  TIME  08:36:33 *                                          *
(916) 756-1104          *
*                                       *                                          *
*
*****************************************
****************************************


                              SUMMERLIN SENIOR COMMUNITY
                              EXISTING & PROPOSED CONDITIONS  BY: TARA L. TAYLOR
                              DECEMBER 13, 2000         FILE: 0264ADD2.HC1

  6 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT        HYDROGRAPH TIME DATA
                    NMIN           5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1    0  STARTING DATE
                   ITIME        0000  STARTING TIME
                      NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2    0  ENDING DATE
                  NDTIME        0055  ENDING TIME
                   ICENT          19  CENTURY MARK

              COMPUTATION INTERVAL      .08 HOURS
                   TOTAL TIME BASE    24.92 HOURS

       ENGLISH UNITS
            DRAINAGE AREA           SQUARE MILES
            PRECIPITATION DEPTH     INCHES
            LENGTH, ELEVATION       FEET
            FLOW                    CUBIC FEET PER SECOND
            STORAGE VOLUME          ACRE-FEET
            SURFACE AREA            ACRES
            TEMPERATURE             DEGREES FAHRENHEIT

   JP         MULTI-PLAN OPTION
                  NPLAN            1  NUMBER OF PLANS

   JR         MULTI-RATIO OPTION
                RATIOS OF PRECIPITATION
                 .57      1.00
```

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT	FUT-1	.00	1	FLOW	2.	4.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-2	.00	1	FLOW	3.	5.
				TIME	3.50	3.50
2 COMBINED AT	CN-A	.00	1	FLOW	5.	10.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-3A	.00	1	FLOW	3.	5.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-3	.00	1	FLOW	4.	8.
				TIME	3.50	3.50
3 COMBINED AT	CN-B	.01	1	FLOW	12.	24.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-4	.00	1	FLOW	4.	7.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-5	.00	1	FLOW	2.	3.
				TIME	3.50	3.50
3 COMBINED AT	CN-C	.01	1	FLOW	17.	34.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-6	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-7	.00	1	FLOW	1.	3.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-8	.01	1	FLOW	6.	12.
				TIME	3.50	3.50
3 COMBINED AT	CN-D	.01	1	FLOW	9.	17.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-9	.00	1	FLOW	4.	8.
				TIME	3.50	3.50
HYDROGRAPH AT	FUT-10	.00	1	FLOW	2.	3.
				TIME	3.50	3.50
2 COMBINED AT	CN-E	.00	1	FLOW	6.	11.
				TIME	3.50	3.50
2 COMBINED AT	CN-F	.01	1	FLOW	14.	29.
				TIME	3.50	3.50

Flows impacting the existing 36" SD in Indigo Drive but eventually discharges into the Faith Lutheran High School site.

```
HYDROGRAPH AT
                    FUT-11       .00      1    FLOW          0.       0.
                                               TIME       3.50     3.50

HYDROGRAPH AT
                    EX-1         .01      1    FLOW          9.      22.
                                               TIME       3.50     3.50

HYDROGRAPH AT
                    EX-2         .01      1    FLOW         11.      25.
                                               TIME       3.50     3.50


*** NORMAL END OF HEC-1 ***
NORMAL END OF HEC-1
```