06-09-BC 64 P

GREEN VALLEY 45 STORM DRAIN
CONDITIONAL LETTER OF MAP REVISION

5533.1905

May 2005

Prepared for:

Pardee Homes of Nevada
650 White Drive, Suite #100
Las Vegas, Nevada 89119
Phone: (702) 614-1461
Fax: (702) 873-6881

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

G. C. WALLACE, INC.
Engineers • Planners • Surveyors

LETTER OF TRANSMITTAL

To: Clark County
Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106

ATTN: Andrew Trelease, P.E.

Date: May 5, 2005

Project No.: 5533.1905

Subject: ***Conditional Letter of Map Revision for Green Valley 45***

☒ Herein *VIA*	☒ Hand Delivery	☐ Federal Express	☐ First Class Mail
☐ Returned	☐ Other _____	☐ UPS	☐ MDS

1. One (1) Copy CLOMR Forms

These items are submitted:

☐ At your request	☐ For your action
☐ For your approval	☐ For your files
☒ For your review and comments	☐ For your information

Acknowledgment of receipt:

	Received by: _____
☐ Not required	Date: _____
☒ Acknowledgment required	Time: _____

Remarks:

Very truly yours,

G. C. WALLACE, INC.

By: _____

William J. Meyer, P.E.
Flood Control Division

Copies to: Ryan Belsick, GCW

1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89146 • TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
SUMMERLIN OFFICE FAX: (702) 804-2295 • HENDERSON OFFICE FAX: (702) 804-2296

FEMA Forms

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☒ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
32003	City of Henderson	NV	32003C	2930E	09/27/02

2. Flooding Source: Unnamed Wash tributary to Pittman Wash

3. Project Name/Identifier: Pardee Homes of Nevada

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change ☒ Improved Methodology/Data

☐ Regulatory Floodway Revision ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☒ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included?	☒ Yes ☐ No, Attach Explanation	Fee amount: $4,000

Please see the FEMA Web site at http://www.fema.gov/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Kelly Steelhammer	Company: Pardee Homes of Nevada	
Mailing Address: 650 White Drive Ste. 100 Las Vegas, Nevada 89119	Daytime Telephone No.: (702) 641-1461	Fax No.: (702) 873-6881
	E-Mail Address: kelly.steelhammer@pardeehomes.com	
Signature of Requester (required): Kelly Steelhammer		Date: 4/13/05

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Curt Chandler, PE - Land Development Manager		Telephone No.: (702) 267-3020
Community Name: City of Henderson	Community Official's Signature (required): Curt Chandler	Date: 4-20-05

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: William J. Meyer, PE	License No.: 15745	Expiration Date: 12/31/05
Company Name: G. C. Wallace, Inc.	Telephone No.: (702) 804-2026	Fax No.: (702) 804-2296
Signature: William J. Meyer		Date: 4/20/05

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

PROFESSIONAL ENGINEER — STATE OF NEVADA — WILLIAM J. MEYER — Exp: 12/31/05 — CIVIL — No. 15745 — 4/20/05

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Unnamed wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☐ Alternative methodology ☒ Proposed Conditions (CLOMR) ☒ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)
Entrance to Site	1.35	191	1338
Exit of Site	1.67	1179	1567
Exit of Culvert	3.05	1179	2079

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	Horizon Ridge Parkway	14+18	2293.16	2289.9
	Culvert Exit	0+31	2288.89	2290.0
Upstream Limit	Southern property line	1+98	2316.16	2314.1

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS & WSPG [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☒ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name: N/A	Floodway File Name: N/A
Corrected Effective Model*	Natural File Name: N/A	Floodway File Name: N/A
Existing or Pre-Project Conditions Model	Natural File Name: 1905existing.prj	Floodway File Name: N/A
Revised or Post-Project Conditions Model	Natural File Name: N/A	Floodway File Name: rcb-clomr.WSW
Other - (attach description)	Natural File Name: outlet5.prj	Floodway File Name: tran6.prj

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FORM 2 ATTATCHMENT

Form 2	(A (5))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.
	(B (3))	The CHECK-RAS review program does not support Version 3.1.2 of HEC-RAS. Therefore, the CHECK-RAS review could not be performed.
	(B (4))	Outlet5.prj is a hydraulic model of the flows exiting the site through the culvert in Horizon Ridge Parkway. Tran6.prj is a hydraulic model of the flows entering the site through a riprap lined channel.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Unnamed wash
Note: *Fill out one form for each flooding source studied*

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

1. **Name of Structure: (1) 12' x 8' *Reinforced Concrete* Box**

   Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Southern boundary of the property line to Horizon Ridge Parkway

   Downstream Limit/Cross Section: 1+98.24

   Upstream Limit/Cross Section: 14+18.99

2. **Name of Structure: (2) 18' x 9' Reinforced Concrete Box**

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Horizon Ridge Parkway

   Downstream Limit/Cross Section: 0+25

   Upstream Limit/Cross Section: 14+18.99

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Unnamed wash

Name of Structure: (1) 12' x 8' Reinforced Concrete Box

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☒ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry 1383 (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Unnamed wash

Name of Structure: (2) 18' x 9' Reinforced Concrete Box Culvert

1. This revision reflects (check one):

- ☒ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): WSPG & HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☒ Distances Between Cross Sections
- ☒ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☒ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency

   ☐ Private organization Name of the agency or organization:

3. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

4. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

6. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:

2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:

3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:

4. A layout detail for the embankment protection measures. Sheet Numbers:

5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	*Loading Conditions*	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

    b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? ☐ Yes ☐ No

    c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? ☐ Yes ☐ No

    If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

    a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
    If No, please attach supporting documentation.

12. Operations and Maintenance Plan

    Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

FORM 3 ATTATCHMENT

Form 3	(A (2))	The culvert sizing and design were previously preformed by PBS&J with the Horizon Ridge Parkway Project. The culvert has been included with this submittal because the proposed onsite closed conduit will connect to this existing structure at the downstream end.
	(B (4))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.
	(C (2))	The computer program *Water Surface and Pressure Gradient Hydraulic Analysis System* (WSPG) as written for use by the Los Angeles County Flood Control District was utilized to evaluate the water surface profile through the proposed storm drain system. The WSPG computer program was selected to evaluate the storm drain system in lieu of HEC-RAS because its modeling approach for storm drain systems is more relevant.
	(C (4))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name: Henderson, Nevada

Project Identifier: Pardee Homes of Nevada - Green Valley 45 Storm Drain

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO ONE OF TWO POST OFFICE BOXES (SEE BELOW) OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

MT-1 application fee
MT-2 application fee } (Insert **3173** as the P.O. Box number in the address below)

External Data Requests (EDRs) (Insert **398** as the P.O. Box number in the address below)

Federal Emergency Management Agency
Revisions Fee-Collection System Administrator
P.O. Box 3173
Merrifield, Virginia 22116
Fax: (703) 849-0282

Request No.: (if known) Amount: $4,000.00

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☒ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

EXP. DATE

1 2 3 4 — 5 6 7 8 — 9 10 11 12 — 13 14 15 16 Month — Year

CARD NUMBER

Date _____ Signature

NAME *(AS IT APPEARS ON CARD)*:
(please print or type)

ADDRESS:
(for your credit card receipt-please print or type)

DAYTIME PHONE:

PardeeHomes

10880 WILSHIRE BLVD.
SUITE 1900
LOS ANGELES, CA 90024
310-475-3525

PNC Bank, National Association
JEANNETTE, PA

60-162
433

NOT NEGOTIABLE AFTER 90 DAYS FROM DATE OF CHECK

CHECK DATE	CHECK NUMBER
4/07/2005	NO. 2404142
CHECK AMOUNT	
$4,000.00	

PAY EXACTLY *******4,000DOLLARS AND 00/00

TO THE ORDER OF
NATIONAL FLOOD INSURANCE PROGRAM
P.O. BOX 3173
MERRIFIELD, VA 22116

⑈2404142⑈ ⑆043301627⑆ 1006119381⑈ ⑈0000400000

PardeeHomes

VENDOR 04589 NO. 2404142

JOB NO.	REFERENCE	INVOICE NUMBER	INVOICE DATE	GROSS	DISCOUNT	RETENTION	NET
317085	040511384	GV 45	4/04/05	4000.00			4000.00
				4000.00			4000.00

G. C. WALLACE, INC.
Engineers • Planners • Surveyors

LETTER OF TRANSMITTAL

To: Sacha Tohme, CFM
Revisions Coordinator - Nevada
FEMA Depot
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA, 22304

Date: May 4, 2005

Project No.: 5533.1905

Subject: ***Green Valley 45 Storm Drain Conditional Letter of Map Revision***

☒ Herein *VIA*	☐ Hand Delivery	☒ Federal Express	☐ First Class Mail
☐ Returned	☐ Other _____	☐ UPS	☐ MDS

1(One) copy of CLOMR study

These items are submitted:

☐ At your request	☒ For your action
☒ For your approval	☐ For your files
☐ For your review and comments	☐ For your information

Acknowledgment of receipt:

	Received by:_____
☐ Not required	Date: _____
☒ Acknowledgment required	Time: _____

Remarks:

Very truly yours,

G. C. WALLACE, INC.

By: _____

William J. Meyer, P.E.
Project Manager
Flood Control Division

Copies to: Andrew Trealease, CCRFCD
Al Jankowiak, GOH
Ira Wallace, GCW
Ryan Belsick, GCW
Pam Willenberg, GCW

GREEN VALLEY 45 STORM DRAIN
CONDITIONAL LETTER OF MAP REVISION

5533.1905

May 2005

Prepared for:

Pardee Homes of Nevada
650 White Drive, Suite #100
Las Vegas, Nevada 89119
Phone: (702) 614-1461
Fax: (702) 873-6881

G. C. WALLACE, INC.
Engineers • Planners • Surveyors

G. C. WALLACE, PE/SE, PLS
JAMES A. DUDDLESTEN, PE
MICHAEL D. ROSS, PE
CHRISTOPHER W. ANDERSON, PE
CALVIN L. BLACK, PE, PLS
E. ROBERT PETERSON
SCOTT R. PLUMMER, PE
BENJAMIN C. SMITH, PE
EUGENE W. WRIGHT, PE

THOMAS P. DYSON, PE
DOUGLAS M. HANKEL
J. P. HIGGINS, PLS, WRS
BERT A. HUGHES, PE
RICKEY D. HUNSAKER, PE, LC
NOEL C. LAUGHLIN, PE
MARVIN W. MAIZE
TIMOTHY A. McCOY, PE, PTOE
DANNY S. McFADDEN, PE
S. WILLIAM NEIGHBORS, PE
FREDERICK W. ORBAN, PLS
JERRY E. PRUITT, PE
BRIAN L. SCHMIDT, PE
JEFF W. STAYTON, PE
JOHN R. TOBIN, PE, PTOE
HOWARD K. VANDER MEER, PE, WRS
G. IRA WALLACE, PE

JIM B. BAKKEDAHL, PE
JOSEPH A. BODROG, PLS
ROY D. CLARK, PE
HEIDI A. DEXHEIMER, PE
ERIC J. GALVAN
RANDALL K. GREMLICH, PE
KEITH HATTON, PE
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DONALD L. HOTCHKISS JR., PE
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ROSS LOUDEN, PE
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FRED A. SELLE
SAUNDRA L. VANCE, CCS, CCCA

FAYSAL ARIDI, PE
RYAN R. BELSICK, PE
JOHN T. BROWN, PE
PATRICK S. BYRD, PE
MARY A. CARR, PE
RICHARD G. CLARKE
IAIN DOLEMAN
JOHN FITCH, PE
NICHOLAS G. GOLZ, PE
TODD C. HAYNE, PE
GERALD L. HOLTON, PLS, WRS
RUSSELL D. JAMISON, PLS
JOSH JOHNSON, PE
KAYANN JONGSMA, PE
TODD N. KELLEY, PE
DENNIS R. KETTERMAN
FRED KHANBOLOUKI, PE
JAMES LELAND, PE
PAUL R. LOHMAN, PE
RICHARD A. LOZANO, PE
JOHN T. LUDWIG, PE
MICHAEL J. LUDWIG, PE
CHRISTOPHER M. LUQUETTE, PE, CFM
MATTHEW D. MEYER, PE
WILLIAM J. MEYER, PE
RIMAH I. NAZZAL, PE/SE
GIA D. NGUYEN, PE
JERRY E. PASCOE, PLS
CHRISTOPHER W. PLUTTE, PE
RICK J. READ, PE
BRADFORD G. ROCKWELL, PE
CHRISTOPHER B. SMITH, PE
DONNA J. STRALOW, PLS
S. TRACY STRATTON
GRANT Y. TOKUMI, PE
KEVIN L. TOMLINSON, PE
JERRY TSUNETA
F. EDUARDO VILLALOBOS, PE/SE
PAUL J. VILLALUZ, PE
KEVIN W. WALLACE, PLS
STEPHEN L. WEATHERMAN, PE
MANSON W. WONG, PE, PTOE
DEBRA M. YAMACHIKA, PE
DERICK D.J. YORO, PE

AFFILIATE OFFICE IN
SACRAMENTO, CA

5533.1905

May 2, 2005

FEMA Depot
FEMA Map Coordination Contractor
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Subject: CLOMR for the Unnamed Wash Tributary to Pittman Wash at Green Valley 45

Attention: CLOMR Depot

G. C. Wallace, Inc. (GCW) has been contracted by Pardee Homes of Nevada to complete a Conditional Letter of Map Revision (CLOMR) for a portion of an Unnamed Wash Tributary to Pittman Wash located within the Green Valley 45 Property in Henderson, Nevada. The purpose of this CLOMR is to lay the groundwork for a Letter of Map Revision (LOMR) in order to clarify and/or correct the existing Community Panel to reflect the proposed developed condition within the watershed.

The current FIRM panel indicates a portion of the subject property to be located within a Zone A Special Flood Hazard Area (SFHA). Zone A SFHA's are floodplains determined by approximate methods which do not have base flood elevations determined. The affected Community Panel is Number 32003C 2930E, dated September 27, 2002. See Figures 1 and 2 for the project vicinity and location and Figure 3 for the effective FIRM map.

The following information supporting this request for a CLOMR is enclosed. This request is based on the proposed improvements consisting of installation of a storm drain facility that will convey flow from the wash through the site.

- A copy of the check in the amount of $4,000.00 payable to the National Flood Insurance Program has been included with this submittal. The actual check has been sent to the FEMA Revisions Fee (NFP) – Collection System Administrator.
- FEMA MT-2 Forms: 1, 2, and 3.
- Figure 1 - Vicinity Map.

- Figure 2 - Location Map.
- Figure 3 - Effective FIRM.
- Figure 4 - Proposed FIRM Revisions.
- Figure 5 - Annotated FIRM.
- Exhibit A – Existing Conditions Drainage Map.
- Exhibit B – Developed Conditions Drainage Map.
- Exhibit C – Existing Conditions HEC-RAS Model.
- Exhibit D – Developed Conditions WSPGW/HEC-RAS Model.
- Exhibit E – Flood Protection Plan.

Proposed Improvements

Note that all channel improvements modeling and mapping in support of this CLOMR are based on the NAVD88 Datum. See Exhibit D for the location of the storm drain improvements.

Hydrologic Modeling

The hydrology for the project area was addressed in the Flood Insurance Restudy for Pittman Wash in June of 1995 (hereinafter referred to as the FIS). The project site is located within Subbasin A10 (191 cfs) combining at NA6 (1179 cfs) on Figure S-5 from the FIS. Relevant figures and models have been included in the Appendix for reference.

Due to extensive development within the City of Henderson during the past ten years, information from the FIS is virtually obsolete; therefore, new existing and developed condition hydrologic analyses were performed to determine peak flow rates for use in establishing the limits of the revised Zone A Special Flood Hazard Area (SFHA). The methodology utilized for the hydrologic analysis is in compliance with the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (hereinafter referred to as the Manual).

The watersheds were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers (USACOE) HEC-1 Flood Hydrograph Package. Rainfall depths for the project site were calculated utilizing GIS data distributed by the Clark County GISMO (Geographic Information Systems Management Office). The GIS rainfall depths were

extracted from the NOAA Rainfall Atlas and have been adjusted according to the approach outlined in Section 500 of the Manual. The adjusted point precipitation values for the Green Valley 45 Drainage Basins range from 2.77 to 2.79 for the 100-year storm event for onsite and 2.79 to 2.92 for the 100-year storm event offsite. These values were used in the HEC-1 models. Since the drainage area for the project is less than 8 square miles, an SDN 3 design storm was selected for use in the HEC-1 computer model. Relevant figures and tables are included in the Appendix for reference.

The Green Valley 45 Project Site is predominantly undeveloped desert land with sparse vegetation. The topography of the site slopes from the south to the north with a large wash passing through the center of the site. Directly adjacent to the channel is undeveloped land. The existing Coronado High School and Coronado Meetinghouse border the east side of the site. Hillcrest, Avalon at Seven Hills, and some undeveloped land border the south end of the site. The City of Henderson owns the undeveloped land north of the site.

This project assumes that Horizon Ridge Parkway (directly north of the project site), including the double 18-foot-wide by 9-foot-high RCB culverts, has been developed and is existing. All flows from offsite existing developments tributary to the project site have been included in the HEC-1 analysis. The proposed developed onsite subbasin flow patterns and slopes were determined from grading plans for the Pardee Homes of Nevada Project. The soils information for the project watershed was referenced from the GIS soils data coverage. A portion of the soils map containing the project site and offsite drainage basins is included on an exhibit in the Appendix. The exhibit delineates families of soil types and the hydrologic soil group (HSG) of each family.

In the existing condition, the surrounding area is completely developed, except the land immediately south of the project site. At present, the natural ground within the project boundary slopes towards the wash in the center of the site. The wash flows from the south to the north at approximately 1.5 percent. The existing offsite areas and onsite areas currently enter the wash and exit the site at the northern boundary of the site.

The flow that is in the existing wash as it enters the project site was evaluated in the 2002 MPU Study. The 2002 MPU Study references a flow of 1901 cfs. During existing conditions, a calculated peak flow rate of 1337 cfs enters the wash at the southern boundary of the site and is conveyed through the project site collecting various onsite and offsite flows for a total of 1527 cfs exiting the site at the northern boundary (Horizon Ridge Parkway) through the existing double 18-foot-wide by 9-foot-high RCB's. Please note that flows were increased for the model at Combination Point CP3 from 1527 cfs to 2039 cfs due to an inflow of 512 cfs from Horizon Ridge Parkway to the culvert outletting to the north.

The flow of 512 cfs discharging into the existing culvert within Horizon Ridge Parkway has been referenced from the Horizon Ridge Improvement Plans which are included in the Appendix for reference. It includes 178 cfs, 323 cfs and 11 cfs discharging through an existing 42-inch, 60-inch and 18-inch RCP respectively. These flows were conservatively

added peak to peak to the previously mentioned 1527 cfs for the total flowrate. The supporting existing condition lag time, curve number, and HEC-1 analyses, as well as the drainage map have been included in the Appendix for reference.

In the developed condition, the offsite subbasins are identical to those evaluated in the existing condition. However, under developed conditions, the fully improved Green Valley 45 Site was incorporated into the analysis. Additionally, the land southeast of the project site is assumed to be developed for the analysis. During developed conditions, a peak flow rate of 1338 cfs enters the proposed channel improvement at the southern boundary of the site and is conveyed through the project site collecting various onsite and offsite flows for a total of 1383 cfs exiting the site at the northern boundary (Horizon Ridge Parkway) through the existing west cell of the double 18-foot-wide by 9-foot-high RCB's.

Flows from the Coronado High School previously discharging to the onsite channel will be conveyed through a 66-inch RCP along Buena Vida Avenue and Horizon Ridge Parkway collecting various onsite and offsite flows for a total of 458 cfs exiting the site at the northern boundary (Horizon Ridge Parkway) through the existing east cell of the double 18-foot-wide by 9-foot-high RCB. For the developed conditions HEC-1 model, these flows are combined at Combination Point CP6B for a total flow of 1570 cfs. Please note that flows were increased downstream of Combination Point CP6B from 1570 cfs to 2082 cfs due to an inflow of 512 cfs from Horizon Ridge Parkway to the culvert outletting to the north.

The flow of 512 cfs discharging into the existing culvert within Horizon Ridge Parkway has been referenced from the Horizon Ridge Improvement Plans, which are included in the Appendix for reference. It includes 178 cfs, 323 cfs and 11 cfs discharging through an existing 42-inch, 60-inch, and 18-inch RCP respectively. These flows were conservatively added peak to peak to the previously mentioned 1570 cfs for the total flowrate. The starting flowrate of 1338 cfs was used for the developed conditions onsite hydraulic analysis for the single 12-foot-wide by 8-foot-high RCB.

The developed condition drainage maps included in the Appendix identify the areas of re-directed flow. The supporting developed condition lag time, curve number and HEC-1 analyses, as well as the drainage maps have been included in the Appendix for reference.

Hydraulic Modeling

The limit of the hydraulic modeling begins approximately 200 feet downstream of Horizon Ridge Parkway at Station 00+10 and extends approximately 400 feet upstream of the project boundary to Station 11+00. The U.S. Army Corps of Engineers HEC-RAS computer program was used for the existing condition hydraulic analyses of the Unnamed Wash Tributary to the Pittman Wash. Since no effective FEMA hydraulic analysis of the Unnamed Wash exists, the base cross-section geometry used in the hydraulic modeling was determined from existing topography with 1-foot contour intervals. The starting water

surface elevation at Station 00+10 was determined based on normal depth as computed by the HEC-RAS computer program. A "mixed flow" regime was used for the analysis of the wash. Existing and developed conditions cross-section location exhibits have been included in the Appendix for reference. See Exhibit EX-C.

The proposed onsite improvements along the Unnamed Wash are between Station 14+18.99 and Station 2+10.25. The improvements consist of a single 12-foot-wide by 8-foot-high reinforced concrete box storm drain. Inlet protection will be a concrete cut-off wall and a 100-foot-long grouted riprap-lined channel. The intention of the proposed design is to accept offsite runoff within the existing Unnamed Wash as it enters the site and route the flow via storm drain through the center of the site to Station 14+18.99 to the west barrel of the existing double 18-foot-wide by 9-foot-high RCB.

The Water Surface and Pressure Gradient Hydraulic Analysis System (WSPG) as written for use by the Los Angeles Flood Control District was utilized to evaluate the water surface profile through the proposed storm drain system. The WSPG computer program was selected to evaluate the storm sewer system in lieu of HEC-RAS because its modeling approach for storm drain systems is more relevant. The WSPG program shows that the velocity of the flow is 15.3 fps at the inlet of the structure assuming a ponded condition upstream. Supporting WSPG hydraulic models and figures are included in the Appendix.

The double 18-foot-wide by 9-foot-high RCB has essentially been split into two separate flood control facilities. Those flows conveyed in the 12-foot-wide by 8-foot-high RCB will be routed to the west barrel of the double RCB, and flows that have been conveyed in the 66-inch RCP in Horizon Ridge will be routed to the east barrel of the double RCB. Note that the flowrates used for the design of these facilities are the peak flowrates and that the individual peaks for the east and west barrels occur at different times. The peak-to-peak addition of flowrates provides for a conservative analysis of the existing facility. Flowrates used for the design of this facility are generally consistent with those used in the design of the double 18-foot-wide by 9-foot-high RCB designed with the Horizon Ridge Parkway Project. Supporting HEC-RAS hydraulic models and figures are included in the Appendix.

Table 1 compares the water surface elevation (WSE) difference between the existing conditions and developed conditions models. The proposed project will not increase the WSE's above 1.00 foot, except at Cross Section 40, which is 2.96 feet above the existing WSE. Note that this increase occurs onsite, and this WSE is still below the soffit of the proposed 12-foot by 8-foot RCB.

TABLE 1

EXISTING CONDITIONS BOSS RMS HEC-RAS MODEL			DEVELOPED CONDITIONS WSPG/HEC-RAS MODELS				WSE Difference Developed WSE – Existing WSE
Section	EX Q (cfs)	EX WSE	Station	Q Total (cfs)	HGL (ft)	Referenced Model	(ft)
1100	1329	2322.58	-	-	-	-	-
1050	1329	2320.64	-	-	-	-	-
1000	1329	2319.61	-	-	-	-	-
950	1329	2319.34	-	-	-	-	-
900	1329	2319.15	-	-	-	-	-
850	1337	2318.10	0.00	1338	2318.6	Inlet	0.52
800	1337	2317.09	-98.24	1338	2316.7	Inlet	-0.35
750	1337	2316.16	-198.24	1338	2314.1	Inlet	-2.10
700	1337	2314.88	-225.49	1338	2309.3	Mainline	-5.55
650	1337	2314.03	-326.46	1338	2307.1	Mainline	-6.97
600	1337	2311.83	-400.00	1354	2306.0	Mainline	-5.84
550	1337	2311.04	-500.00	1354	2304.4	Mainline	-6.67
500	1337	2310.36	-563.96	1354	2303.4	Mainline	-6.95
450	1339	2308.65	-600.00	1354	2302.9	Mainline	-5.79
400	1339	2307.21	-729.55	1354	2301.0	Mainline	-6.21
350	1339	2306.06	-800.00	1359	2300.0	Mainline	-6.01
300	1339	2303.87	-963.94	1359	2297.8	Mainline	-6.09
250	1339	2302.36	-1100.00	1359	2295.9	Mainline	-6.45
200	1339	2300.30	-1200.00	1359	2294.6	Mainline	-5.74
100	1527	2297.95	-1266.08	1359	2293.7	Mainline	-4.28
50	1527	2296.18	-1307.90	1382	2293.2	Mainline	-2.93
40	1527	2288.82	-1414.61	1383	2291.8	Mainline	2.96
39	1527	2289.12	-1418.99	1383	2289.9	Mainline	0.82
31	2039	2290.37	31.00	2082	2288.4	Outlet	-1.98
30	2039	2288.86	30.00	2082	2287.9	Outlet	-0.99
25	2039	2287.35	25.00	2082	2287.4	Outlet	0.04
20	2039	2286.87	20.00	2082	2286.9	Outlet	0.05
10	2039	2285.21	10.00	2082	2285.2	Outlet	-0.04

Mapping

The Effective FIRM is shown on Figure 3. The proposed revisions to the Effective FIRM take into account the proposed improvements along the Unnamed Wash and within the Green Valley 45 Project. The improvements affect a Zone A area only. The proposed FIRM revisions are shown on Figure 4.
The downstream tie-in to the Effective FIRM Zone A is located at the property line in the Unnamed Wash at the northern property line of the project. The downstream tie-in was based on a smooth transition from the proposed floodplain width to the effective floodplain width. The upstream tie-in to the Effective FIRM Zone A is located at the southern property line. The upstream tie-in was based on a smooth transition from the proposed floodplain width to the effective floodplain width. The tie-in locations are shown on Figure 4.

GCW trusts that this submittal will provide all of the information needed to support a CLOMR for the subject project.

If you have any questions or require additional information, please do not hesitate to call us at (702) 804-2000.

Very truly yours,

G. C. WALLACE, INC.

William J. Meyer, P.E.
Project Manager
Flood Control Division

WJM:mjj

Encl.

cc: Albert Jankowiak, City of Henderson
Jerry Pruitt, GCW
Ryan Belsick, GCW

APPENDIX

SUPPORTING DOCUMENTATION FOR CLOMR

1. **FIGURES AND AFFECTED FIRM PANEL**
   - Figure 1: Vicinity Map
   - Figure 2: Location Map
   - Figure 3: Effective FIRM
   - Figure 4: Proposed FIRM Revisions
   - Figure 5: Annotated FIRM Panel
   - Copy of Affected Effective FIRM Panel 32003C2930E

2. **FEMA FORMS**
   - MT-2 Form 1: Overview & Concurrence Form
   - MT-2 Form 2: Riverine Hydrology & Hydraulics Form
   - MT-2 Form 3: Riverine Structures Form
   - Copy of Payment Information Form Sent Directly to FEMA

3. **HYDROLOGIC MODELING COMPUTATIONS**
   - Precipitation Data, Soils Information and Curve Number Computations
   - Existing Condition: Exhibit A, Lag Time and HEC-1 Analysis
   - Developed Condition: Exhibit B, Lag Time and HEC-1 Analysis

4. **HYDRAULIC MODELING COMPUTATIONS**
   - Existing Condition: Exhibit C and HEC-RAS Analysis
   - Developed Condition: Exhibit D, WSPG Mainline Analysis, HEC-RAS U.S. Inlet Analysis and HEC-RAS D.S. Outlet Analysis

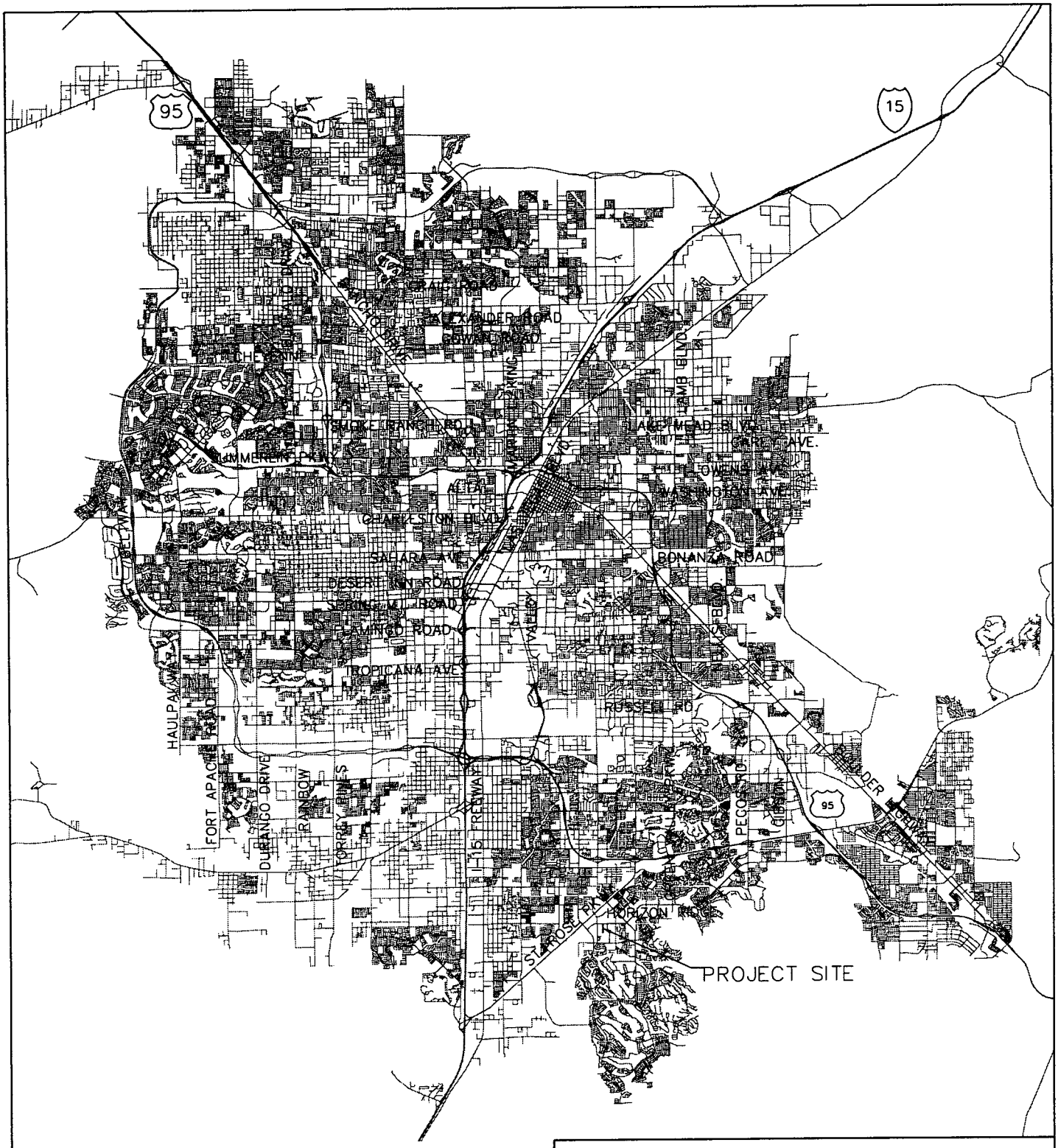
5. **PROJECT DRAINAGE STUDY REFERENCE MATERIAL**
   - Copy of City of Henderson Approval Letter
   - CCRFCD Master Plan Update Flood Control Facilities Figure F-25
   - Horizon Ridge Parkway Grading Plans for Culvert
   - Flood Insurance Restudy for Pittman Wash

6. **SITE PHOTOGRAPHS**

7. **FLOOD PROTECTION PLAN, PROJECT GRADING PLANS, PROFILES & DETAILS**

8. **ELECTRONIC FILES**
   - HEC-1 Analysis: Existing & Developed Conditions
   - HEC-RAS Analysis: Existing & Developed Conditions
   - WSPG Analysis: Developed Condition
   - Figure 3 – Effective FIRM
   - Figure 4 – Proposed FIRM Revisions

Affected FIRM Panel



NORTH

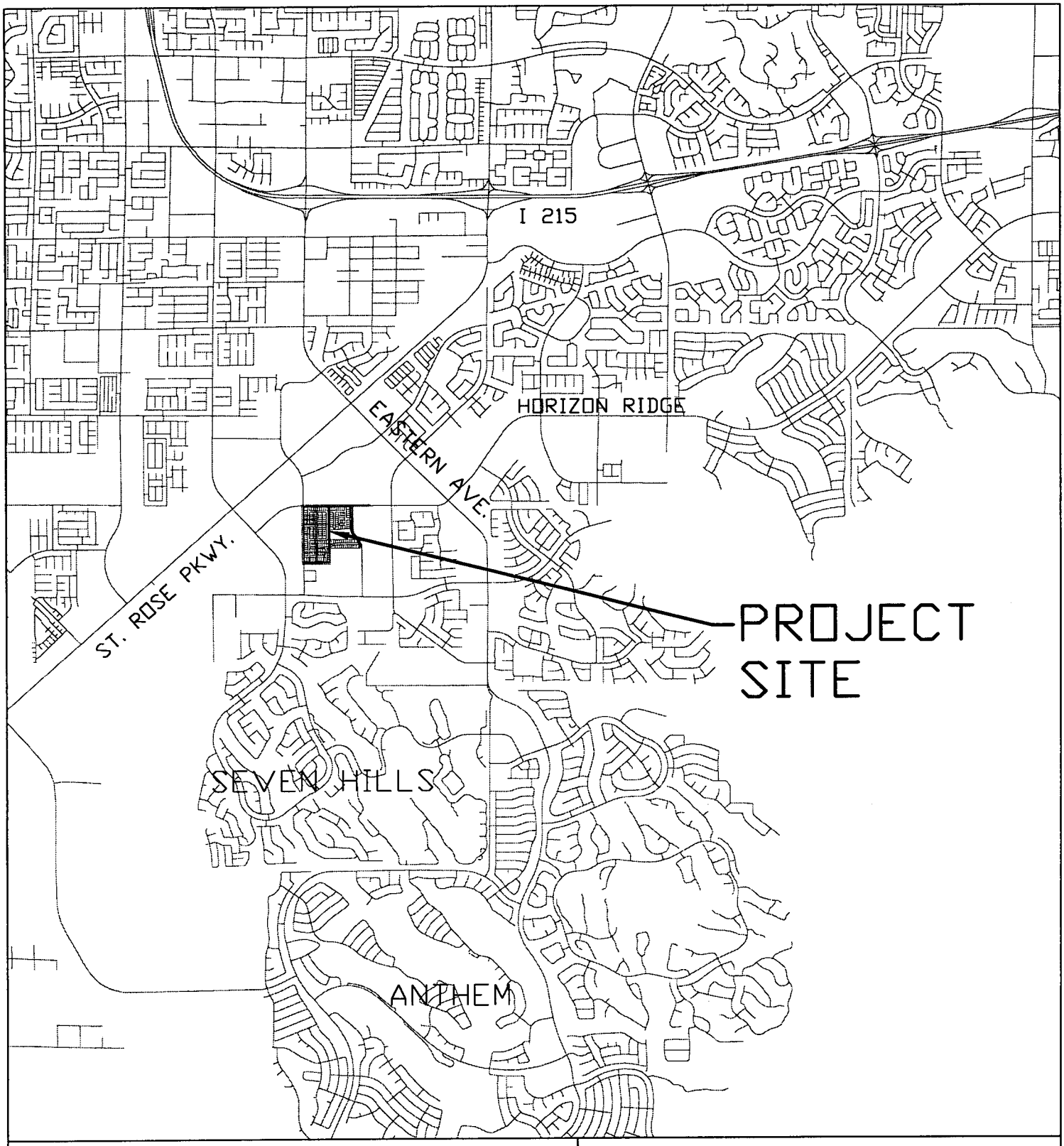
1" = 20000'

GREEN VALLEY 45
PARDEE HOMES OF NEVADA

FIGURE 1

VICINITY MAP

G.C. WALLACE, INC.
Engineers/Planners/Surveyors



NORTH

GRAPHIC SCALE

4000 0 2000 4000

(IN FEET)

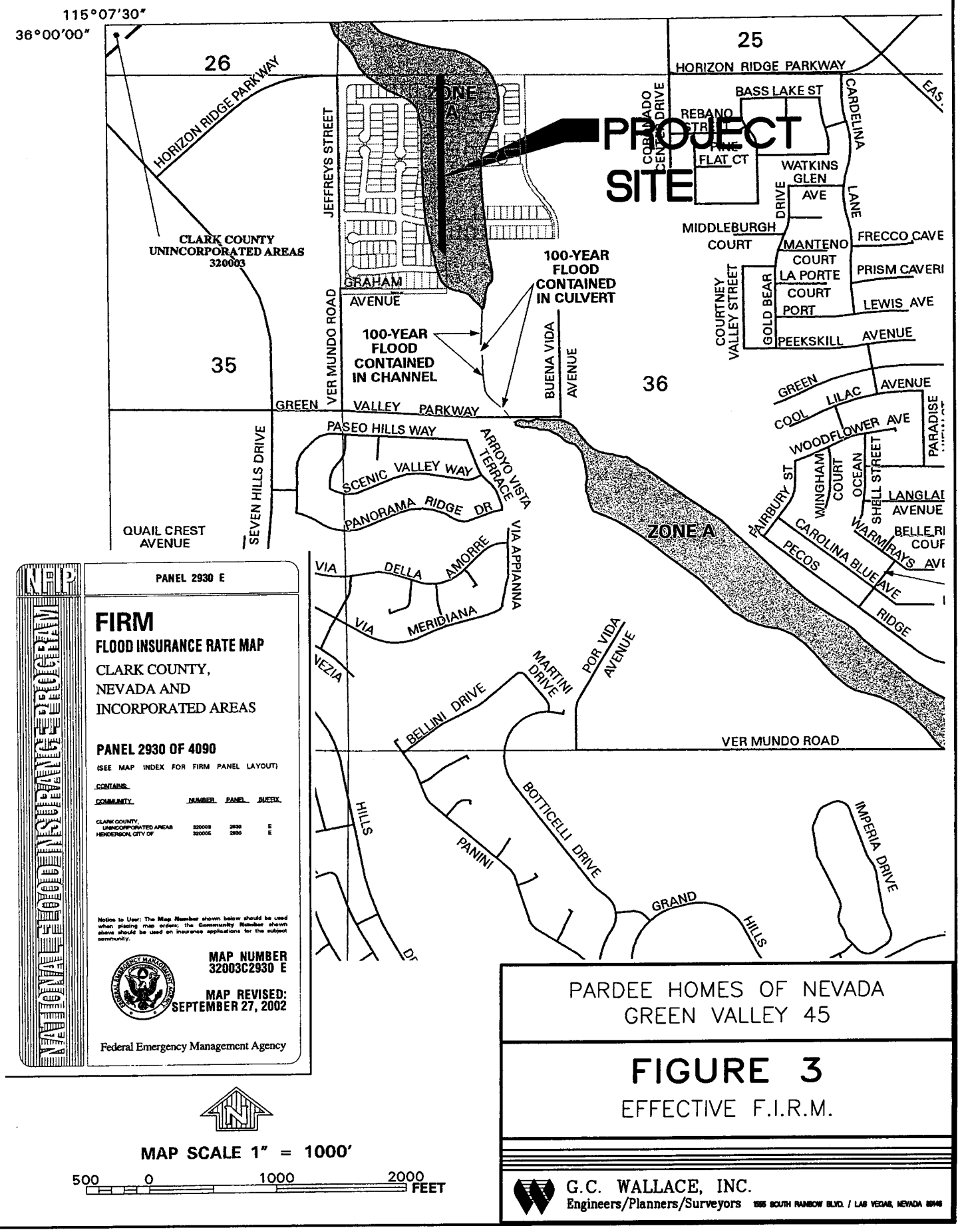
1 inch = 4000 ft.

GREEN VALLEY 45
PARDEE HOMES OF NEVADA

FIGURE 2

LOCATION MAP

G.C. WALLACE, INC.
Engineers/Planners/Surveyors



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2930 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2930 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2930	E
HENDERSON, CITY OF	320005	2930	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2930 E

MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

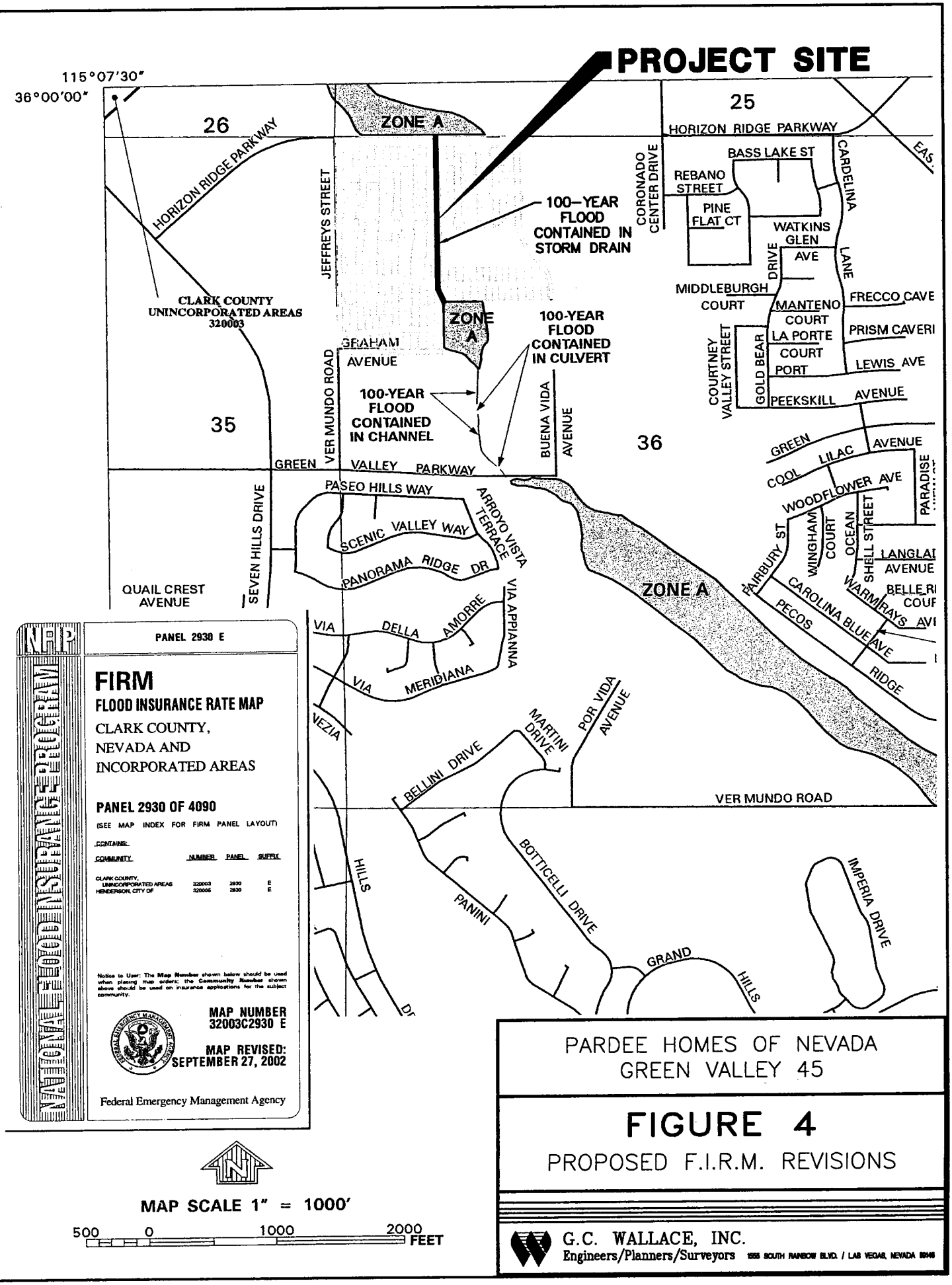
PARDEE HOMES OF NEVADA
GREEN VALLEY 45

FIGURE 3

EFFECTIVE F.I.R.M.

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89146

F:\5533-1905\calc\Hydro\CLOMR\Figures\Fig3.dwg 04-25-05 08:42:18 rdennis



PARDEE HOMES OF NEVADA
GREEN VALLEY 45

FIGURE 4

PROPOSED F.I.R.M. REVISIONS

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89146

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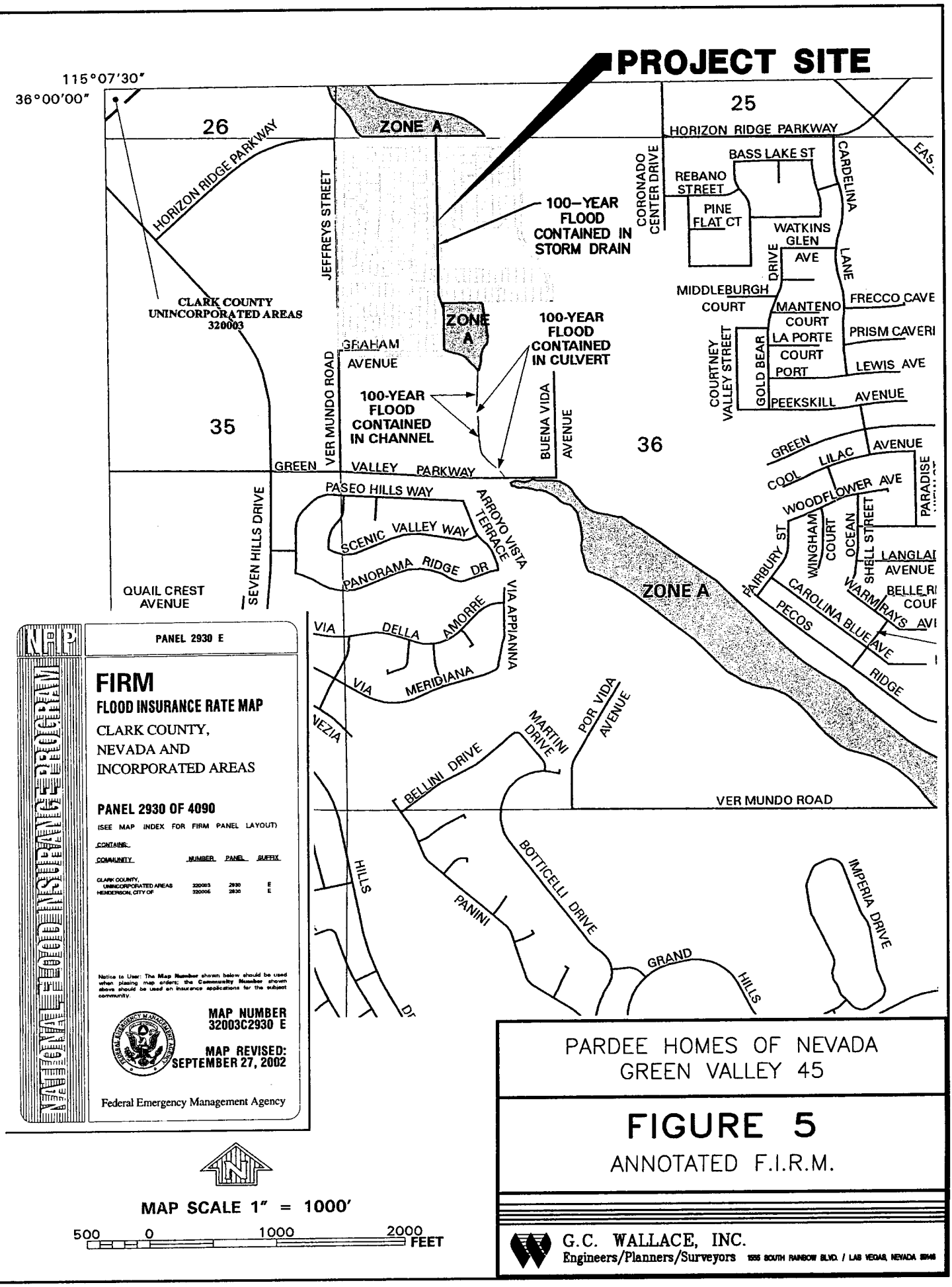

PARDEE HOMES OF NEVADA
GREEN VALLEY 45

FIGURE 5

ANNOTATED F.I.R.M.

G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89146

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NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation (BFEs) and/or floodways have been determined**, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) Zone 11. The **horizontal** datum is NAD83 GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Clark County Regional Flood Control District. This information was converted using Orthophotography, dated 1999 or newer, and GBF/DIME data. Segments were digitized off of the orthophotography based on center of pavement.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA;

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

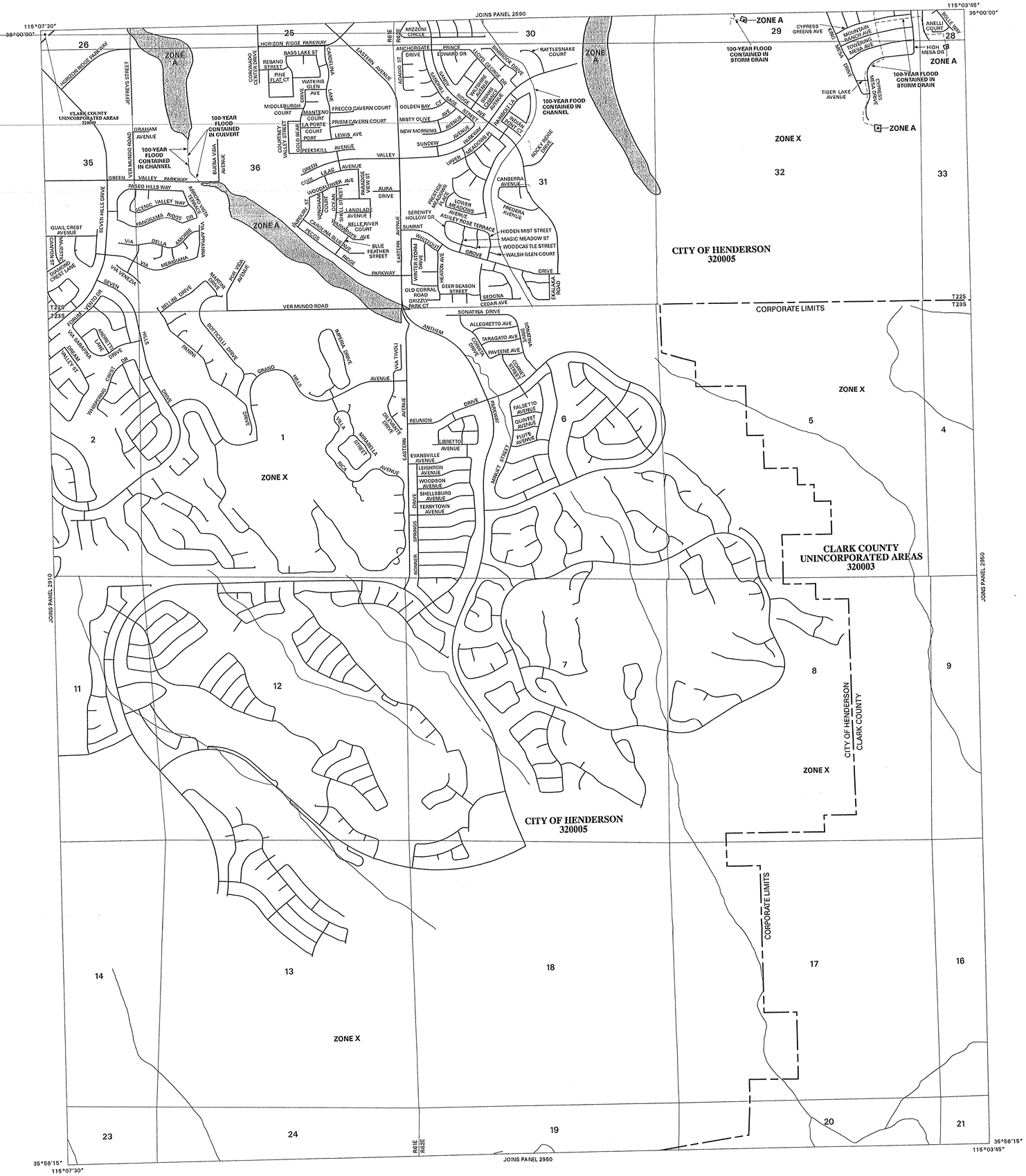
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

This Digital Flood Insurance Rate Map (DFIRM) was produced through a unique partnership between Clark County and the Federal Emergency Management Agency (FEMA). Clark County has developed a long-term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the Clark County commitment to share and maintain floodplain layers within their Geographic Information System Management Office (GISMO).

This DFIRM reflects several innovative features. These include:
+ Southern Nevada GIS -- Cooperation among local governmental agencies throughout Clark County. The foundation of cooperation is the GIS Interlocal Agreements formed between fourteen regional participants. In part, the agreements specify that the Clark County GIS Management Office (GISMO) will be responsible for maintaining a GIS data warehouse and associated Southern Nevada GIS Metadata.

+ The GISMO's responsibilities go beyond maintaining the GIS data warehouse. GISMO also maintains the Street Centerline Database used by 911 dispatch services. This centerline database serves as the base map for this DFIRM.

DIGITAL DATA AVAILABILITY: http://www.co.clark.nv.us/ceit/gismo/gismo.htm



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain Boundary
	Floodway Boundary
	Zone D Boundary
	Coastal Barrier Boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross Section Line
23 — 23	Transect Line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4276000M	1000-meter Universal Transverse Mercator grid values, zone 11
600000 FT	5000-foot grid ticks
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel).
M1.5	River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
AUGUST 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

September 27, 2002: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to delete special flood hazard areas, to change zone designations, to add roads and road names, to incorporate previously issued letters of map revision, to incorporate previously issued letters of map amendment, and to change floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2930 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2930 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2930	E
HENDERSON, CITY OF	320005	2930	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C2930 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

FEMA Forms

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☒ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
32003	City of Henderson	NV	32003C	2930E	09/27/02

2. Flooding Source: Unnamed Wash tributary to Pittman Wash

3. Project Name/Identifier: Pardee Homes of Nevada

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data

   ☐ Regulatory Floodway Revision ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

   b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☒ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,000

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Kelly Steelhammer	Company: Pardee Homes of Nevada	
Mailing Address: 650 White Drive Ste. 100 Las Vegas, Nevada 89119	Daytime Telephone No.: (702) 641-1461	Fax No.: (702) 873-6881
	E-Mail Address: kelly.steelhammer@pardeehomes.com	
Signature of Requester (required): Kelly Steelhammer		Date: 4/13/05

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Curt Chandler, PE - Land Development Manager		Telephone No.: (702) 267-3020
Community Name: City of Henderson	Community Official's Signature (required): Curt Chandler	Date: 4-20-05

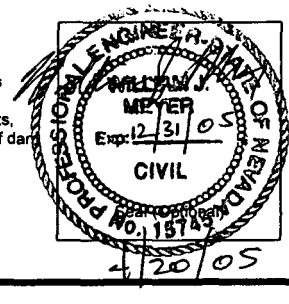
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: William J. Meyer, PE	License No.: 15745	Expiration Date: 12/31/05
Company Name: G. C. Wallace, Inc.	Telephone No.: (702) 804-2026	Fax No.: (702) 804-2296
Signature: William J. Meyer		Date: 4/20/05

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans



PardeeHomes

10880 WILSHIRE BLVD.
SUITE 1900
LOS ANGELES, CA 90024
310-475-3525

PNC Bank, National Association
JEANNETTE, PA

60-162
433

NOT NEGOTIABLE AFTER 90 DAYS FROM DATE OF CHECK

CHECK DATE	CHECK NUMBER
4/07/2005	NO. 2404142
CHECK AMOUNT	
$4,000.00	

PAY EXACTLY *******4,000DOLLARS AND 00/00

TO THE ORDER OF
NATIONAL FLOOD INSURANCE PROGRAM
P.O. BOX 3173
MERRIFIELD, VA 22116

⑈2404142⑈ ⑆043301627⑆ 1006119381⑈ ⑈0000400000⑈

PardeeHomes

VENDOR 04589 NO. 2404142

JOB NO.	REFERENCE	INVOICE NUMBER	INVOICE DATE	GROSS	DISCOUNT	RETENTION	NET
3170850	40511384	GV 45	4/04/05	4000.00			4000.00
				4000.00			4000.00

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Unnamed wash
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☐ Alternative methodology ☒ Proposed Conditions (CLOMR) ☒ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)
Entrance to Site	1.35	191	1338
Exit of Site	1.67	1179	1567
Exit of Culvert	3.05	1179	2079

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☐ *Other (please attach description)*

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit	Horizon Ridge Parkway	14+18	2293.16	2289.9
	Culvert Exit	0+31	2288.89	2290.0
Upstream Limit	Southern property line	1+98	2316.16	2314.1

2. Hydraulic Method Used

Hydraulic Analysis HEC-RAS & WSPG [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☐ Yes ☒ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name: N/A	Floodway File Name: N/A
Corrected Effective Model*	Natural File Name: N/A	Floodway File Name: N/A
Existing or Pre-Project Conditions Model	Natural File Name: 1905existing.prj	Floodway File Name: N/A
Revised or Post-Project Conditions Model	Natural File Name: N/A	Floodway File Name: rcb-clomr.WSW
Other - (attach description)	Natural File Name: outlet5.prj	Floodway File Name: tran6.prj

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A ***certified topographic map*** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

FORM 2 ATTATCHMENT

Form 2	(A (5))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.
	(B (3))	The CHECK-RAS review program does not support Version 3.1.2 of HEC-RAS. Therefore, the CHECK-RAS review could not be performed.
	(B (4))	Outlet5.prj is a hydraulic model of the flows exiting the site through the culvert in Horizon Ridge Parkway. Tran6.prj is a hydraulic model of the flows entering the site through a riprap lined channel.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Unnamed wash
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

1. **Name of Structure: (1) 12' x 8' Reinforced Concrete Box**

   Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Southern boundary of the property line to Horizon Ridge Parkway

   Downstream Limit/Cross Section: 1+98.24

   Upstream Limit/Cross Section: 14+18.99

2. **Name of Structure: (2) 18' x 9' Reinforced Concrete Box**

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Horizon Ridge Parkway

   Downstream Limit/Cross Section: 0+25

   Upstream Limit/Cross Section: 14+18.99

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: Unnamed wash

Name of Structure: (1) 12' x 8' Reinforced Concrete Box

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☐ Other (Describe):
- ☐ Drop structures
- ☒ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry 1383 (cfs) and/or the 100-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Unnamed wash

Name of Structure: (2) 18' x 9' Reinforced Concrete Box Culvert

1. This revision reflects (check one):

- ☒ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): WSPG & HEC-RAS
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☒ Distances Between Cross Sections
- ☒ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☒ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☒ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency

   ☐ Private organization Name of the agency or organization:

3. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

4. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.

5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

6. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ *reinforced concrete masonry block*
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. *Operations and Maintenance Plan*

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

FORM 3 ATTATCHMENT

Form 3	(A (2))	The culvert sizing and design were previously preformed by PBS&J with the Horizon Ridge Parkway Project. The culvert has been included with this submittal because the proposed onsite closed conduit will connect to this existing structure at the downstream end.
	(B (4))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.
	(C (2))	The computer program *Water Surface and Pressure Gradient Hydraulic Analysis System* (WSPG) as written for use by the Los Angeles County Flood Control District was utilized to evaluate the water surface profile through the proposed storm drain system. The WSPG computer program was selected to evaluate the storm drain system in lieu of HEC-RAS because its modeling approach for storm drain systems is more relevant.
	(C (4))	The design is a closed conduit designed to connect to an existing conduit. Because there is no opportunity for sediment to build up inside the conduits, sedimentation was not considered when designing this project.

FEDERAL EMERGENCY MANAGEMENT AGENCY

PAYMENT INFORMATION FORM

Community Name: Henderson, Nevada

Project Identifier: Pardee Homes of Nevada - Green Valley 45 Storm Drain

THIS FORM MUST BE MAILED, ALONG WITH THE APPROPRIATE FEE, TO ONE OF TWO POST OFFICE BOXES (SEE BELOW) OR FAXED TO THE FAX NUMBER BELOW.

Type of Request:

MT-1 application fee
MT-2 application fee } (Insert **3173** as the P.O. Box number in the address below)

External Data Requests (EDRs) (Insert **398** as the P.O. Box number in the address below)

Federal Emergency Management Agency
Revisions Fee-Collection System Administrator
P.O. Box 3173
Merrifield, Virginia 22116
Fax: (703) 849-0282

Request No.: (if known) Amount: $4,000.00

☐ INITIAL FEE* ☒ FINAL FEE ☐ FEE BALANCE** ☐ MASTER CARD ☐ VISA ☒ CHECK ☐ MONEY ORDER

*Note: Check only for EDR and/or Alluvial Fan requests (as appropriate).

**Note: Check only if submitting a corrected fee for an ongoing request.

COMPLETE THIS SECTION ONLY IF PAYING BY CREDIT CARD

EXP. DATE

1 2 3 4 — 5 6 7 8 — 9 10 11 12 — 13 14 15 16 Month — Year

CARD NUMBER

Date _____ Signature

NAME *(AS IT APPEARS ON CARD)*:
(please print or type)

ADDRESS:
(for your credit card receipt-please print or type)

DAYTIME PHONE:

Hydrologic Modeling Computations

Precipitation Data, Soils Information and Curve Number Computations

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.

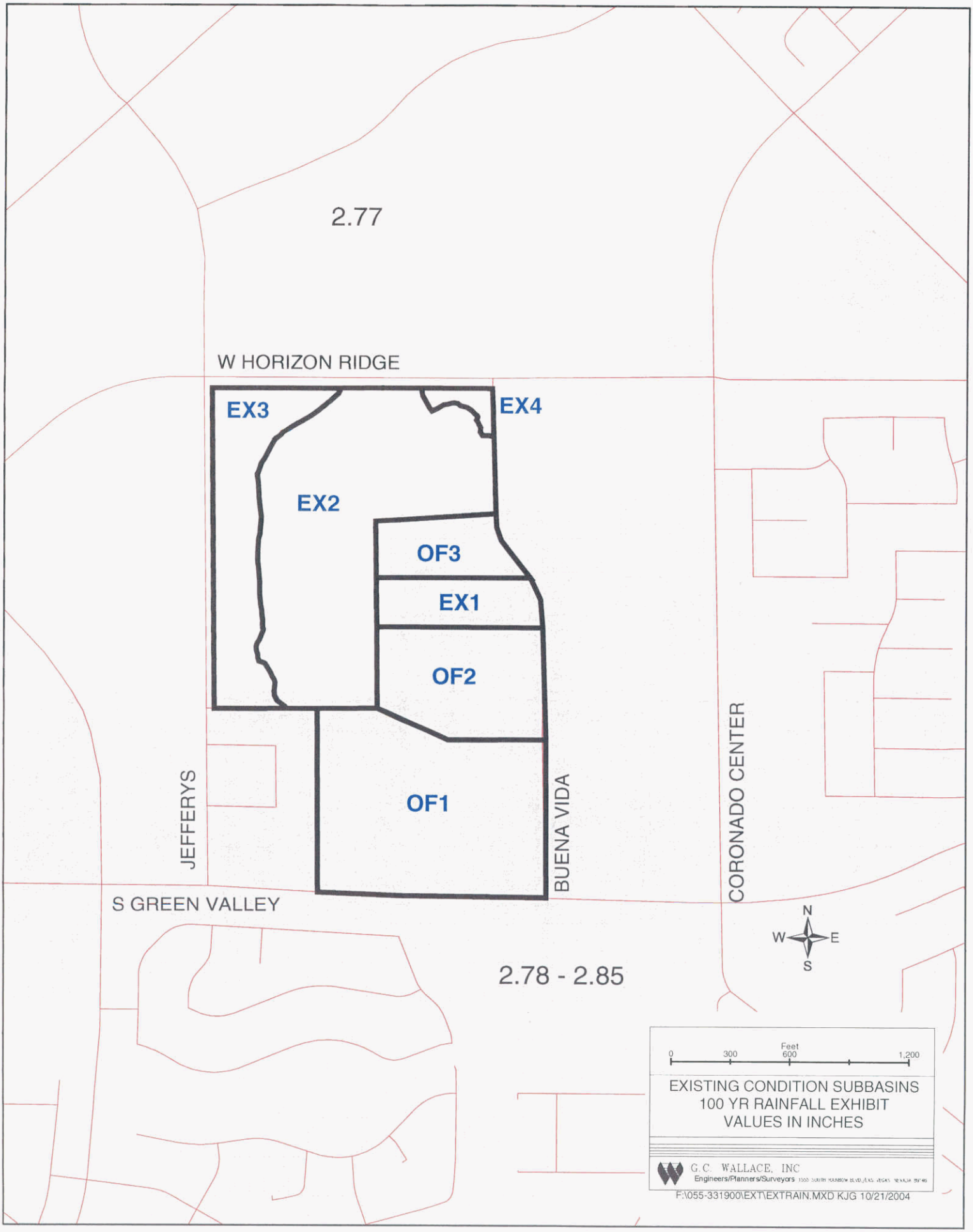
2 Actual percent impervious value should be compared to selected land use type.

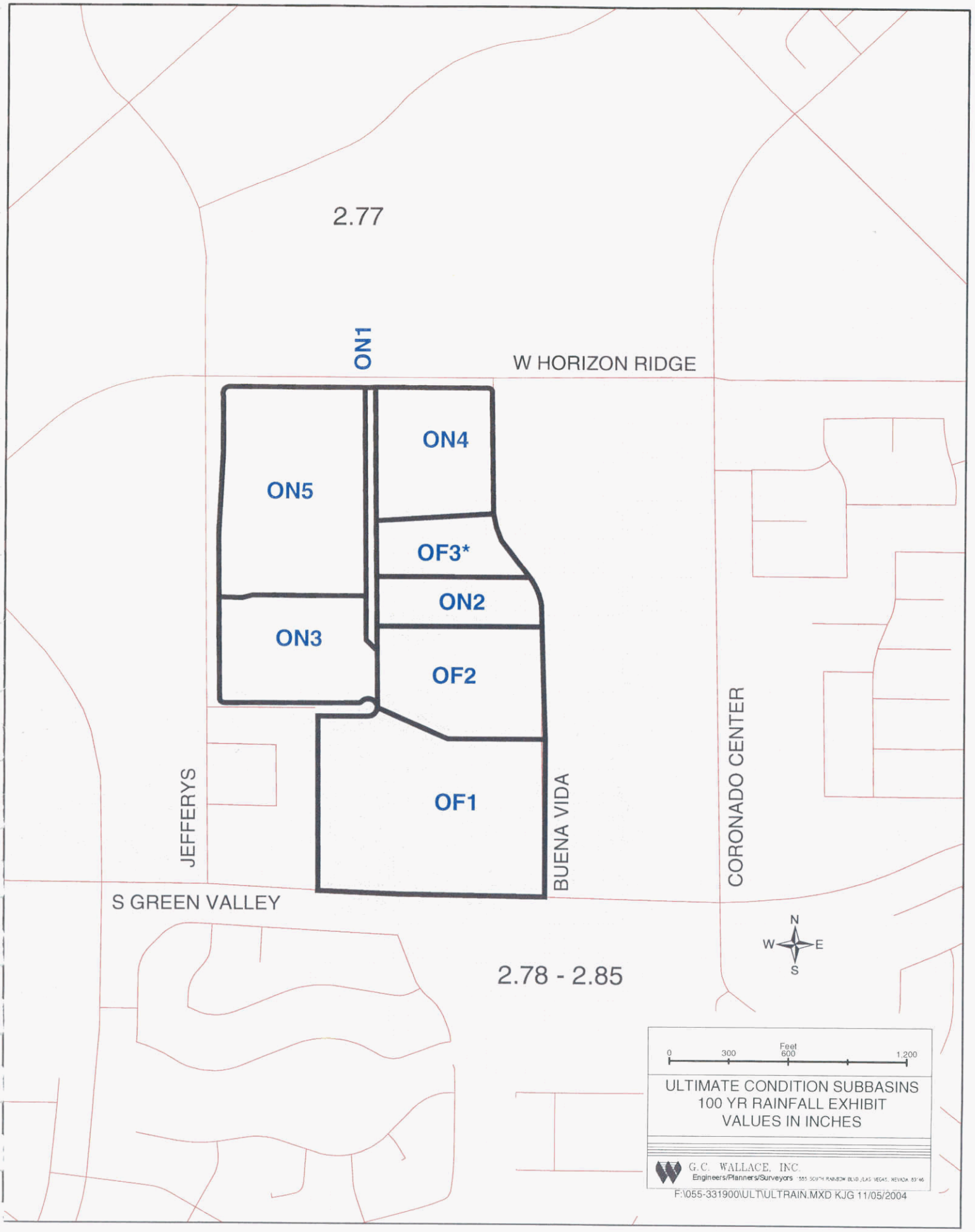
3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

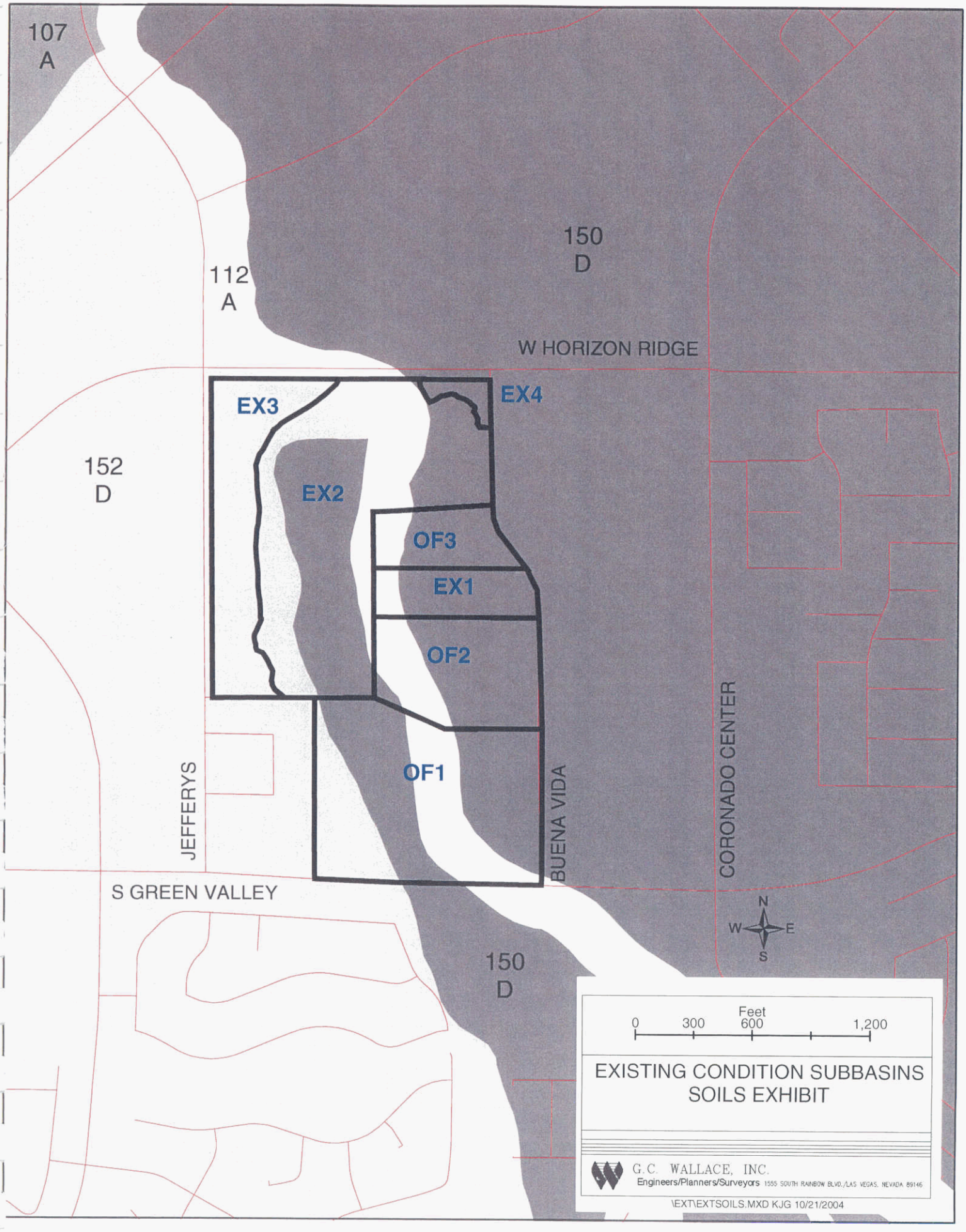
Revision	Date

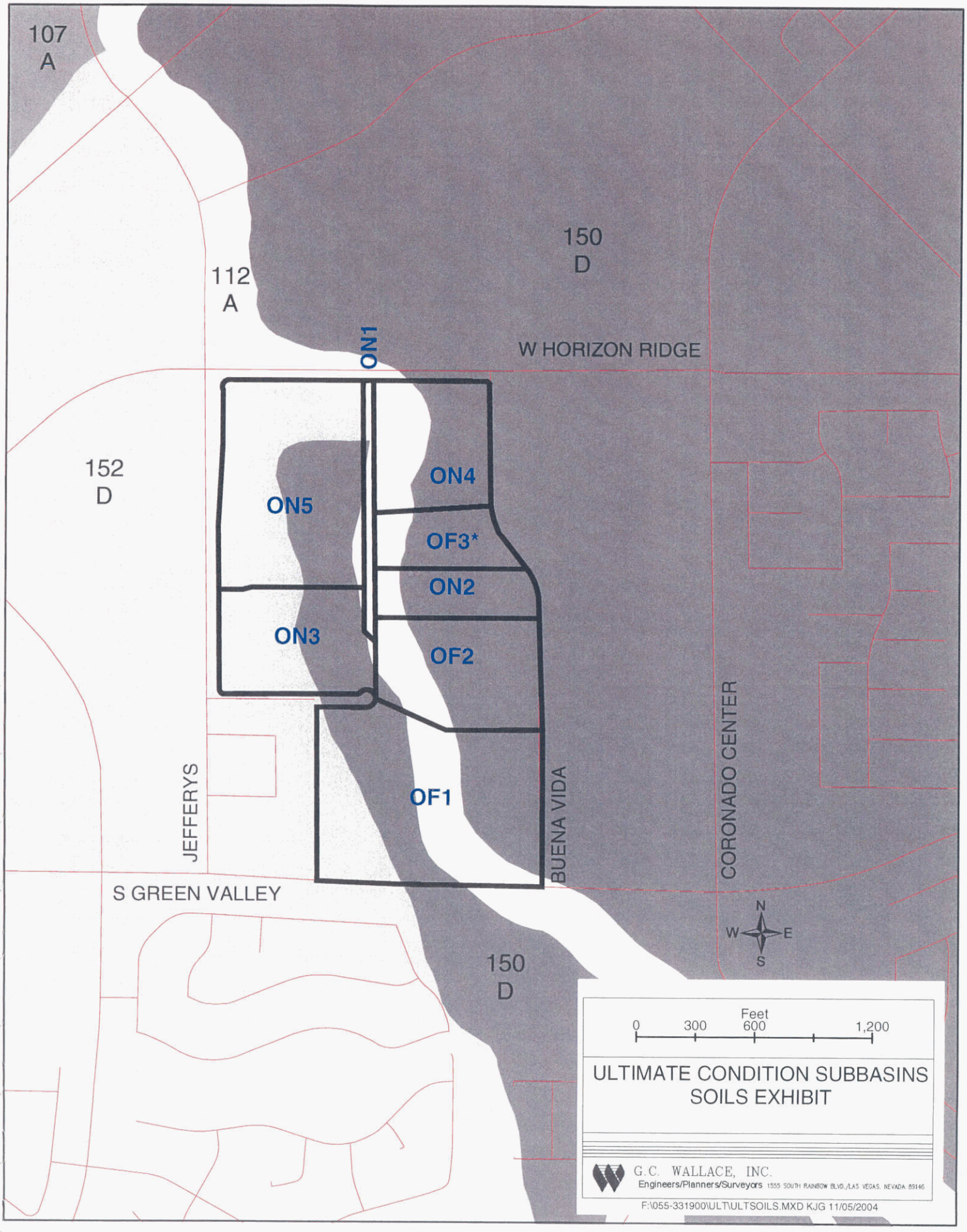
REFERENCE:

TABLE 602A


2.77
W HORIZON RIDGE
EX3
EX4
EX2
OF3
EX1
OF2
OF1
JEFFERYS
BUENA VIDA
CORONADO CENTER
S GREEN VALLEY
2.78 - 2.85
N
W
E
S
Feet
0
300
600
1,200
EXISTING CONDITION SUBBASINS
100 YR RAINFALL EXHIBIT
VALUES IN INCHES
G.C. WALLACE, INC
Engineers/Planners/Surveyors
F:\055-331900\EXT\EXTRAIN.MXD KJG 10/21/2004


2.77
ON1
W HORIZON RIDGE
ON4
ON5
OF3*
ON2
ON3
OF2
OF1
JEFFERYS
BUENA VIDA
CORONADO CENTER
S GREEN VALLEY
N
W
E
S
2.78 - 2.85
Feet
0
300
600
1,200
ULTIMATE CONDITION SUBBASINS
100 YR RAINFALL EXHIBIT
VALUES IN INCHES
G.C. WALLACE, INC.
Engineers/Planners/Surveyors
F:\055-331900\ULT\ULTRAIN.MXD KJG 11/05/2004


107
A
150
D
112
A
W HORIZON RIDGE
EX3
EX4
152
D
EX2
OF3
EX1
OF2
OF1
JEFFERYS
BUENA VIDA
CORONADO CENTER
S GREEN VALLEY
150
D
N
W
E
S
Feet
0
300
600
1,200
EXISTING CONDITION SUBBASINS
SOILS EXHIBIT
G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
\EXT\EXTSOILS.MXD KJG 10/21/2004


107
A
150
D
112
A
ON1
W HORIZON RIDGE
152
D
ON4
ON5
OF3*
ON2
ON3
OF2
OF1
JEFFERYS
BUENA VIDA
CORONADO CENTER
S GREEN VALLEY
150
D
N
W
E
S
Feet
0
300
600
1,200
ULTIMATE CONDITION SUBBASINS
SOILS EXHIBIT
G.C. WALLACE, INC.
Engineers/Planners/Surveyors 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
F:\055-331900\ULT\ULTSOILS.MXD KJG 11/05/2004

GREEN VALLEY 45
Composite Curve Number Calculations

G.C. Wallace, Inc.
Date: 8/10/04
File:5533-1900-CNcalcs.wb3
By: rrd

Hydrologic Soil Group	Desert Shrub (Poor Condition)	Newly Graded Areas	Seven Hills Parcel A "Avalon" (Apt/Condos)**	Green Valley 45 Residential (7,000 sq-ft)**
A	63.0	77.0	81.0	76.0
B	77.0	86.0	88.0	84.0
C	85.0	91.0	91.0	89.0
D	88.0	94.0	93.0	91.0
ROCK	92.0	92.0	92.0	92.0

** - CN Values were referenced from Table 602A in the CCRFCD HCDDM

SOIL 112 Arizo (very gravelly loamy sand)

Description	Type	%	Desert Shrub (Poor Condition)	Newly Graded Areas	Seven Hills Parcel A "Avalon" (Apt/Condos)**	Green Valley 45 Residential (7,000 sq-ft)**
Arizo	A	85	63.0	77.0	81.0	76.0
Nickel	B	5	77.0	86.0	88.0	84.0
Aztec	B	3	77.0	86.0	88.0	84.0
McCarran	B	2	77.0	86.0	88.0	84.0
Cave	D	5	88.0	94.0	93.0	91.0
Composite CN		100	65.7	78.8	82.3	77.6

SOIL 152 Cave (gravelly fine sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Newly Graded Areas	Seven Hills Parcel A "Avalon" (Apt/Condos)**	Green Valley 45 Residential (7,000 sq-ft)**
Arizo	A	5	63.0	77.0	81.0	76.0
Canulto	B	5	77.0	86.0	88.0	84.0
Grapevine	B	5	77.0	86.0	88.0	84.0
Cave	D	85	88.0	94.0	93.0	91.0
Composite CN		100	85.7	92.4	91.9	89.6

SOIL 150 Cave (very stony sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Newly Graded Areas	Seven Hills Parcel A "Avalon" (Apt/Condos)**	Green Valley 45 Residential (7,000 sq-ft)**
Arizo	A	5	63.0	77.0	81.0	76.0
Caliza	B	5	77.0	86.0	88.0	84.0
Cave	D	90	88.0	94.0	93.0	91.0
Composite CN		100	86.2	92.8	92.2	89.9

DATE 8/12/04

CLIENT PARDEE HOMES OF NEVADA JOB NO 5533.1900 CALC BY RRD

DESCRIPTION EXISTING CONDITIONS CN CALCS - GV45 CHECKED BY

OF1

Developed 0.25(112) + 0.55(150) + 0.20(152) "D"

(0.25)(82.3) + (0.55)(92.2) + (0.20)(91.9) → **89.7**

OF2

Existing 0.20(112) + 0.80(150) "E"

(0.20)(65.7) + (0.80)(86.2) → **82.1**

EX1

Existing 0.20(112) + 0.80(150) "E"

(0.20)(65.7) + (0.80)(86.2) → **82.1**

OF3

Developed Commercial "D" Referenced from Meeting House Study → **89.9**

EX2

Existing 0.70(150) + 0.10(112) + 0.20(152) "E"

(0.70)(86.2) + (0.10)(65.7) + (0.20)(85.7) → **84.1**

EX3

Existing "E" (152) → **85.7**

EX4

Existing "E" (150) → **86.2**

EN-3-N
3/66

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

SHEET ____ OF ____

DATE 11/4/04

CLIENT PARDEE HOMES OF NEVADA JOB NO 5533.1900 CALC BY RRD

DESCRIPTION ULTIMATE CONDITIONS CN CALCS - GV45 CHECKED BY

OF1

Developed 0.25(112) + 0.55(150) + 0.20(152) "D"
(0.25)(82.3) + (0.55)(92.2) + (0.20)(91.9) → 89.7

OF2

Developed 0.20(112) + 0.80(150) "D"
(0.20)(77.6) + (0.80)(89.9) → 87.4

OF3

Developed Commercial "D" Referenced from Meetinghouse Study → 89.9

ON1

Rough Grade "E" (112) → 78.8

ON2

Developed 0.20(112) + 0.80(150) "D"
(0.20)(77.6) + (0.80)(89.9) → 87.4

ON3

Developed 0.50(152) + 0.45(150) + 0.05(112)
(0.50)(89.6) + (0.45)(89.9) + (0.05)(77.6) → 89.1

ON4

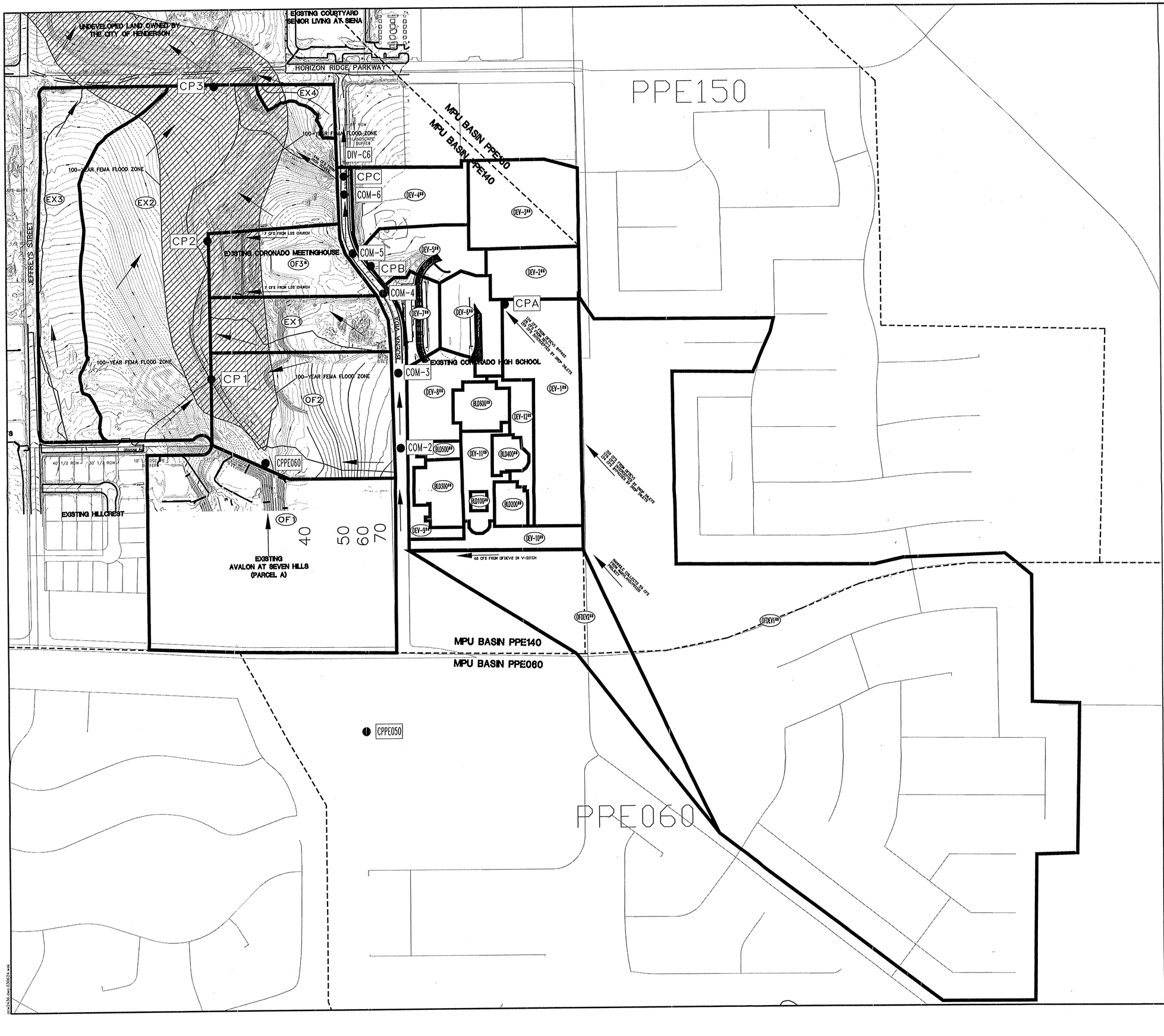
Developed 0.30(112) + 0.70(150) "D"
(0.30)(77.6) + (0.70)(89.9) → 86.2

ON5

Developed 0.60(152) + 0.35(150) + (0.05)(112)
(0.60)(89.6) + (0.35)(89.9) + (0.05)(77.6) → 89.1

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146

Existing Condition



NORTH

GRAPHIC SCALE
200 0 100 200
(IN FEET)
1 inch = 200 ft.

LEGEND

- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- MPU BASIN BOUNDARY
- FLOW DIRECTION

SUMMARY OF EXISTING CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
PPE030***	121.6	238	101
PPE040***	164.5	336	152
CPPE040***	-	546	241
PPE050***	279.7	398	147
CPPE050***	-	919	378
PPE060***	263.0	535	231
OF1	22.6	58	25
CPPE060***	-	1329	578
OF2	10.6	18	6
CP1	-	1337	575
EX1	4.8	8	3
OF3*	4.0	14	6
CP2	-	1339	567
CPA	-	394	203
CPB	-	409	212
CPC	-	446	227
EX2	28.1	49	17
EX3	9.5	18	7
EX4	0.9	2	1
CP3	-	1527	658

*Referenced from the TDS for the Coronado Meetinghouse.
**Referenced from the TDS for the Maryland/Buena Vida High School.
***Referenced from the 2002 MPU.

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-25-05
PLOT TIME: 12:56:23

REV	DATE	DESCRIPTION	DATE AGEN. APP	DATE GOVT. APP	DATE:

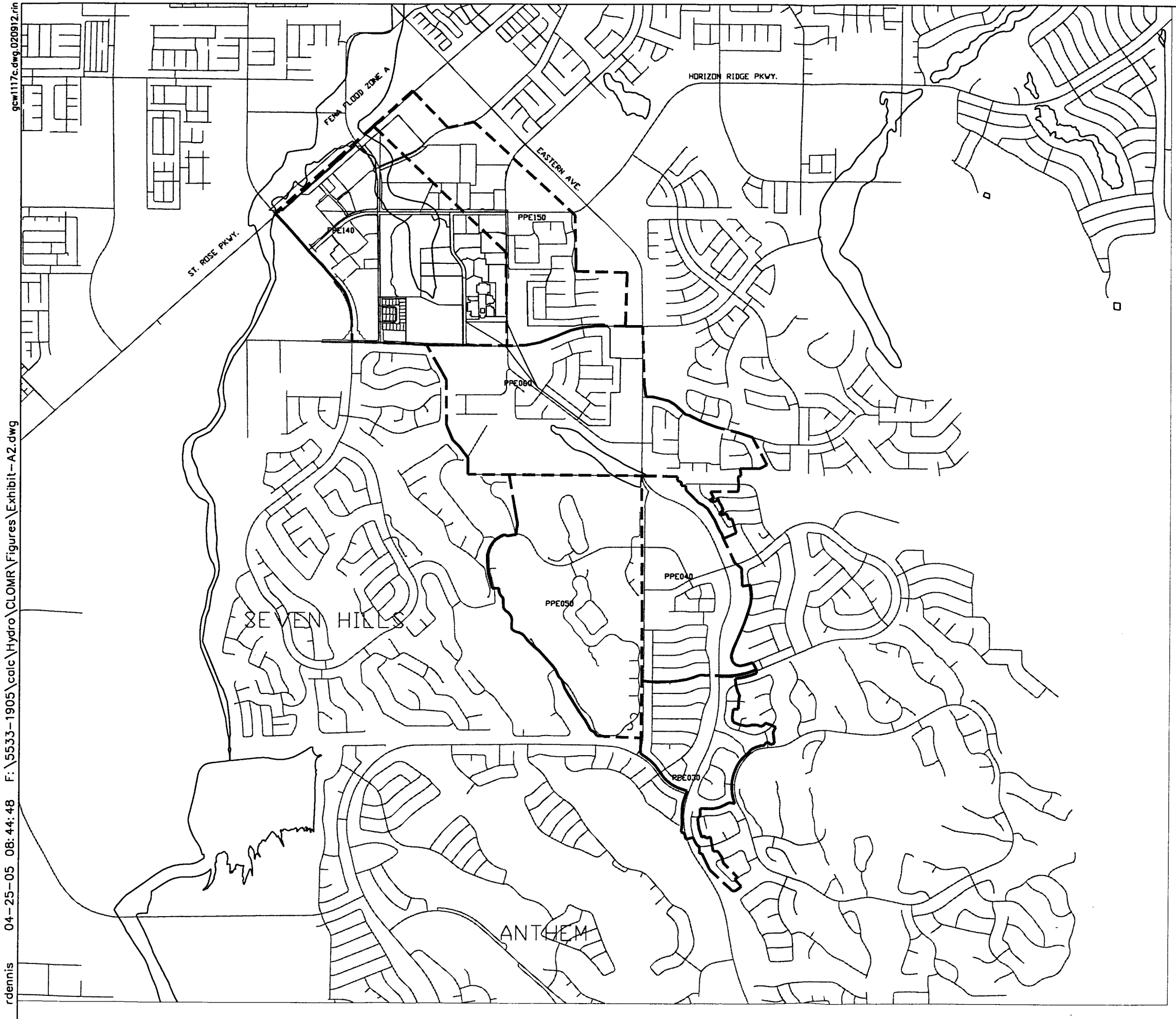
G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
F:\5533-1905\Civil\Hydro\XLCIVIL\Figures\Exhibit-A.dwg

PARDEE HOMES OF NEVADA

GREEN VALLEY 45 STORM DRAIN EXHIBIT A

EXISTING CONDITIONS DRAINAGE MAP

DRAWING
EX-A
SHT OF SHTS



NORTH

GRAPHIC SCALE

2000 0 1000 2000

(IN FEET)

1 inch = 2000 ft.

LEGEND

SUBBASIN BOUNDARY

MPU BASIN BOUNDARY

SUMMARY OF EXISTING CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	10 YR (CFS)
PPE030***	121.6	238	101
PPE040***	164.5	336	152
CPPE040***	-	546	241
PPE050***	279.7	398	147
CPPE050***	-	919	378
PPE060***	263.0	535	231
OF1	22.6	58	25
CPPE060***	-	1329	578
OF2	10.6	18	6
CP1	-	1337	575
EX1	4.8	8	3
OF3*	4.0	14	6
CP2	-	1339	567
CPA	-	394	203
CPB	-	409	212
CPC	-	446	227
EX2	28.1	49	17
CP3	-	1513	651
EX3	9.5	18	7
EX4	0.9	2	1
PPE140***	161.3	294	138
CPPE140***	-	1819	784
PPE150***	165.8	288	140
CPPE150***	-	2012	924

*Referenced from the TDS for the Coronado Meetinghouse.
**Referenced from the TDS for the Maryland/Buena Vida High School.
***Referenced from the 2002 MPU.

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

PARDEE HOMES OF NEVADA

GREEN VALLEY 45 OFFSITE DRAINAGE

EXHIBIT A2

EXISTING CONDITIONS DRAINAGE MAP

SHEET

EX-A2

OF SHTS

gcw1117c.dwg,020912.rin
rdennis 04-25-05 08:44:48 F:\5533-1905\calc\Hydro\CLOMR\Figures\Exhibit-A2.dwg

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

Green Valley 45 Channel
Existing Conditions

Project No: 5533.1900
Date: 29-Nov-04
Calculated by: rrd/aks

SUB-BASIN DATA						INITIAL / OVERLAND TIME (TI)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Rainfall Inches 100-year
EX1	E	82.1	0.6937	4.8	0.0075	500	6.8	8.6	355	3.7	2.8	5.7	2.1	855	N/A	10.7	0.107	2.79
EX2	E	84.1	0.7201	28.1	0.0439	475	12.0	6.5	1485	1.3	1.7	3.4	9.8	1960	N/A	16.3	0.163	2.78
EX3	E	85.7	0.7412	9.5	0.0148	500	3.6	9.4	1270	3.1	2.6	5.2	5.7	1770	N/A	15.1	0.151	2.78
EX4	E	86.2	0.7478	0.9	0.0014	170	3.5	5.4	200	4.0	3.0	5.9	1.1	370	N/A	6.6	0.100	2.77
OF1	D	89.7	0.7940	22.6	0.0353	100	1.9	4.4	1105	3.1	3.6	5.4	4.2	1205	16.7	8.7	0.087	2.79
OF2	E	82.1	0.6937	10.6	0.0166	500	7.6	8.3	560	3.8	2.9	5.7	3.1	1060	N/A	11.4	0.114	2.79
PPE140	D	91.9	0.8231	7.5	0.0117	100	1.0	5.0	2695	1.7	2.6	4.0	12.3	2795	25.5	17.3	0.173	2.80

Tc = Ti + Tt Tlag = 0.6 Tc

Ti = 1.8 (1.1 - K) $L^{1/2}$ / $S^{1/3}$

K = 0.0132 (CN) - 0.39

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: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   25APR05  TIME  12:38:50   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X        XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

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


```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
                    *DIAGRAM
*** FREE ***
               1    ID   ************************************************************
               2    ID   * ..................................................... *
               3    ID   * :                                                   : *
               4    ID   * :             PARDEE HOMES OF NEVADA                : *
               5    ID   * :             GREEN VALLEY 45 CHANNEL CLOMR         : *
               6    ID   * :             EXISTING CONDITIONS                   : *
               7    ID   * :.................................................: *
               8    ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR   : *
               9    ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3      : *
              10    ID   * :              PROJECT NO_ _ _ _ _ 5533.1900        : *
              11    ID   * :              FILENAME_ _ _ _ _ _ GV45Chnl-EX2.h1   : *
              12    ID   * :              DATE MODELED_ _ _ _ 04/25/05         : *
              13    ID   * :              MODELED BY_ _ _ _ _ RRD/WJM          : *
              14    ID   * :.................................................: *
              15    ID   * :                                                   : *
              16    ID   * :...................................................: *
              17    ID   ************************************************************
              18    ID
              19    ID
              20    ID
              21    ID     JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
              22    ID
              23    ID     AREA (SQUARE MILES)    DARF
              24    ID
              25    ID     0-0.5  .99
              26    ID     0.5-1 .975
              27    ID     1-2    .95
              28    ID     2-3   .925
              29    ID
              30    IT       5       0       0     300
              31    IO       5       0       0
              32    IN       5       0       0
              33    JR    PREC    1.00    0.99   0.975    0.95   0.925    0.57
                    *
              34    KK  PPE030
              35    KM   REFERENCED FROM THE 2002 MPU
              36    BA  0.190
              37    PB   2.92
              38    PC  0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              39    PC  0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              40    PC  0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              41    PC  0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              42    PC  0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              43    PC  0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              44    PC  0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
              45    PC  0.998   0.999       1
              46    LS      0    88.0
              47    UD  0.208
                    *
```



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

```
KK RPPE030
KM   ROUTE PPE030 TO CPPE040
KM   ANTHEM PARKWAY
KM   REFERENCED FROM THE 2002 MPU
KM     LEN    SLOPE       N      N/A    SHAPE       BW       SS
RD    4770     0.03    0.016        0     TRAP        0       50
*

KK  PPE040
KM   REFERENCED FROM THE 2002 MPU
BA   0.257
PB    2.88
LS       0     90.5
UD   0.238
*

KK CPPE040
KM   COMBINE PPE030 AND PPE040
KM   REFERENCED FROM THE 2002 MPU
HC       2
*

KKRCPPE040
KM   ROUTE CPPE040 TO CPPE050
KM   FACILITY = PITTMAN ANTHEM PARKWAY
KM   FACILITY#= PTAP 0132
KM   LINING = CONCRETE
KM   REFERENCED FROM THE 2002 MPU
KM     LEN    SLOPE       N      N/A    SHAPE       BW       SS
RD    2870    0.025    0.015        0     TRAP       12        2
*

KK  PPE050
KM   REFERENCED FROM THE 2002 MPU
BA   0.437
PB    2.86
LS       0     84.8
UD   0.311
*

KK RPPE050
KM   ROUTE PPE050 TO CPPE050
KM   ASSUMED CONCRETE TRAPEZOIDAL CHANNEL
KM   REFERENCED FROM THE 2002 MPU
KM     LEN    SLOPE       N      N/A    SHAPE       BW       SS
RD    1300    0.032    0.015        0     TRAP       12        2
*

KK CPPE050
KM   COMBINE PPE050 AND CPPE040
KM   REFERENCED FROM THE 2002 MPU
HC       2
*
```



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

KKRCPPE050
KM   ROUTE CPPE050 TO CPPE060
KM   FACILITY = PITTMAN ANTHEM PARKWAY
KM   FACILITY#= PTAP 0099
KM   LINING = RCB
KM   REFERENCED FROM THE 2002 MPU
KM     LEN    SLOPE       N      N/A    SHAPE       BW       SS
RD    2600    0.017    0.015        0     TRAP       10        0
*

KK  PPE060
KM   AREA REVISED FROM THE 2002 MPU
KM   AREA =(TOTALAREA)-(Portion of OFDEV1)-(Portion of OFDEV2)
KM   OFDEV1 AND OFDEV2 REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
BA   0.411
PB    2.83
LS       0     89.5
UD   0.199
*

KK     OF1
KM   SUBBASIN OF1
KM             AREA    22.6 AC
PB    2.79
BA  0.0353
LS       0     89.7
UD    .087
*

KK CPPE060
KM   COMBINE CPPE050, PPE060 AND OF1
KM   REFERENCED FROM THE 2002 MPU
HC       3
*

KKRCPPE060
KM   ROUTE CPPE060 TO CP1
```

```
 117          KM   LINING = NATURAL WASH
 118          KM     LEN   SLOPE       N      N/A   SHAPE      BW       SS
 119          RD     625   0.013   0.035        0    TRAP      50        5
              *

 120          KK     OF2
 121          KM   SUBBASIN OF2
 122          KM            AREA    10.6 AC
 123          PB    2.79
 124          BA  0.0166
 125          LS       0    82.1
 126          UD    .114
              *
1                                        HEC-1 INPUT                                                    PAGE  4

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

 127          KK     CP1
 128          KM   COMBINE CPPE060 AND OF2
 129          HC       2
              *

 130          KK    RCP1
 131          KM   ROUTE CP1 TO CP2
 132          KM   FACILITY = PITTMAN ANTHEM PARKWAY
 133          KM   FACILITY#= PTAP 0048
 134          KM   LINING = NATURAL WASH
 135          KM     LEN   SLOPE       N      N/A   SHAPE      BW       SS
 136          RD     690   0.012   0.035        0    TRAP      50        5
              *

 137          KK     EX1
 138          KM   SUBBASIN EX1
 139          KM            AREA    4.80 AC
 140          PB    2.79
 141          BA  0.0075
 142          LS       0    82.1
 143          UD    .107
              *

 144          KK     OF3
 145          KM   REFERENCED SUBBASIN ONS FROM CORONADO MEETINGHOUSE STUDY
 146          PB    2.88
 147          BA  0.0078
 148          LS       0    89.9
 149          UD    .081
              *

 150          KK     CP2
 151          KM   COMBINE CP1, EX1 AND OF3
 152          HC       3
              *

 153          KK    RCP2
 154          KM   ROUTE CP2 TO CP3
 155          KM   FACILITY = PITTMAN ANTHEM PARKWAY
 156          KM   FACILITY#= PTAP 0048
 157          KM   LINING = NATURAL
 158          KM     LEN   SLOPE       N      N/A   SHAPE      BW       SS
 159          RD     795   0.013   0.035        0    TRAP      50        5
              *

 160          KK  OFDEV1
 161          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 162          PB    2.86
 163          BA  0.1714
 164          LS       0      94
 165          UD    .062
              *
1                                        HEC-1 INPUT                                                    PAGE  5

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

 166          KK   DEV-1
 167          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 168          PB    2.86
 169          BA  0.0113
 170          LS       0      98
 171          UD    .079
              *

 172          KK  DEV-11
 173          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 174          PB    2.86
 175          BA  0.0023
 176          LS       0      98
 177          UD    .036
              *

 178          KK  DEV-12
 179          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 180          PB    2.86
 181          BA  0.0002
```

```
 182          LS       0      98
 183          UD    .026
              *

 184          KK     CPA
 185          KM   COMBINE OFDEV1, DEV-1, DEV-11 AND DEV-12
 186          HC       4
              *

 187          KK  BLD100
 188          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 189          PB    2.86
 190          BA  0.0004
 191          LS       0      98
 192          UD    .042
              *

 193          KK  BLD200
 194          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 195          PB    2.86
 196          BA  0.0011
 197          LS       0      98
 198          UD    .045
              *

 199          KK  BLD300
 200          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 201          PB    2.86
 202          BA  0.0010
 203          LS       0      98
 204          UD    .078
              *
```

1 HEC-1 INPUT PAGE 6

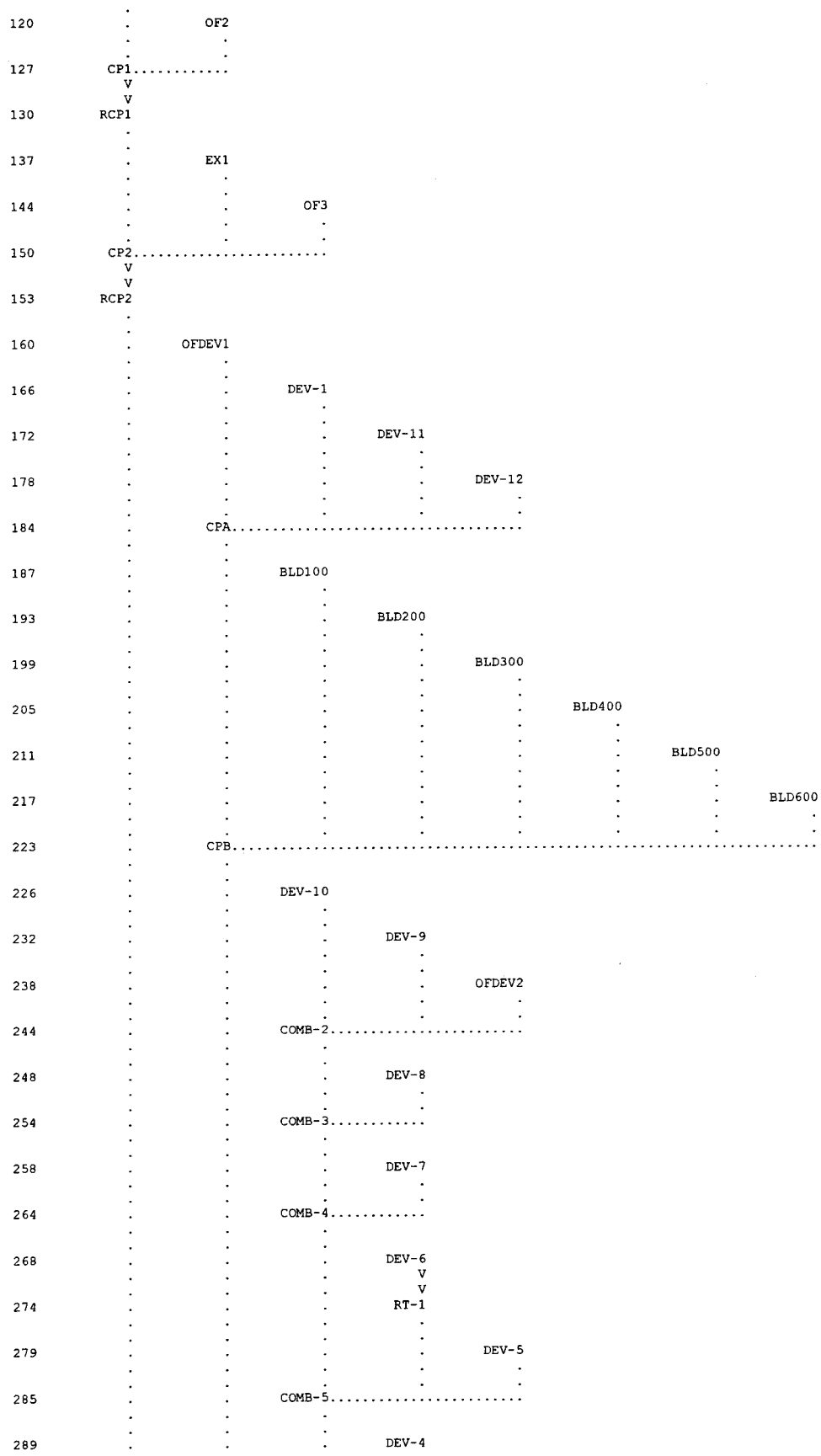
```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 205          KK  BLD400
 206          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 207          PB    2.86
 208          BA  0.0010
 209          LS       0      98
 210          UD    .029
              *

 211          KK  BLD500
 212          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 213          PB    2.86
 214          BA  0.0010
 215          LS       0      98
 216          UD    .052
              *

 217          KK  BLD600
 218          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 219          PB    2.86
 220          BA  0.0020
 221          LS       0      98
 222          UD    .020
              *

 223          KK     CPB
 224          KM   COMBINE CPA AND BLD100-600
 225          HC       7
              *

 226          KK  DEV-10
 227          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 228          PB    2.86
 229          BA  0.0028
 230          LS       0      98
 231          UD    .074
              *

 232          KK   DEV-9
 233          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 234          PB    2.86
 235          BA  0.0019
 236          LS       0      98
 237          UD    .049
              *

 238          KK  OFDEV2
 239          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 240          PB    2.86
 241          BA  0.0272
 242          LS       0      94
 243          UD    .054
              *
```

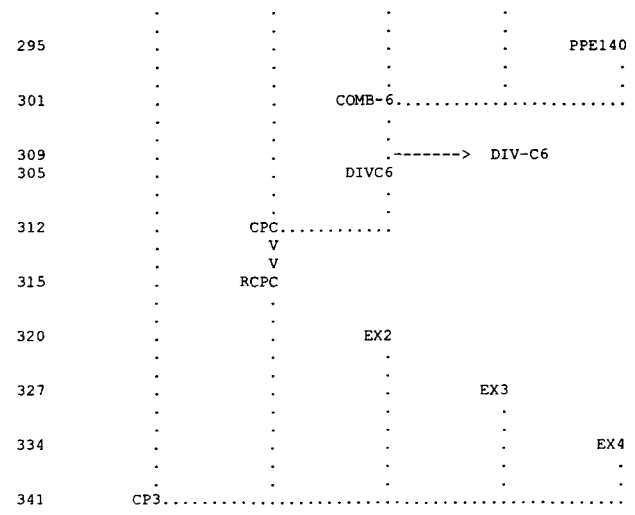
1 HEC-1 INPUT PAGE 7

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

 244          KK  COMB-2
```

```
245          KM   COMBINE DEV-10, DEV-9 AND OFDEV2
246          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
247          HC       3
             *

248          KK   DEV-8
249          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
250          PB    2.86
251          BA  0.0045
252          LS       0      92
253          UD    .072
             *

254          KK  COMB-3
255          KM   COMBINE DEV-8 AND COMB-2
256          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
257          HC       2
             *

258          KK   DEV-7
259          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
260          PB    2.86
261          BA  0.0028
262          LS       0      84
263          UD    .103
             *

264          KK  COMB-4
265          KM   COMBINE DEV-7 AND COMB-3
266          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
267          HC       2
             *

268          KK   DEV-6
269          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
270          PB    2.86
271          BA  0.0033
272          LS       0      84
273          UD    .111
             *

274          KK    RT-1
275          KM   ROUTE DEV-6 THROUGH DEV-5
276          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
277          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
278          RD     600    0.01   0.016       0    TRAP      15      10
             *
1                                        HEC-1 INPUT                                                    PAGE  8

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

279          KK   DEV-5
280          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
281          PB    2.86
282          BA  0.0043
283          LS       0      80
284          UD    .139
             *

285          KK  COMB-5
286          KM   COMBINE DEV-5 AND COMB-4
287          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
288          HC       3
             *

289          KK   DEV-4
290          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
291          PB    2.86
292          BA  0.0069
293          LS       0      80
294          UD    .136
             *

295          KK  PPE140
296          KM   AREA REVISED FROM THE 2002 MPU
297          BA  0.0117
298          PB    2.80
299          LS       0    91.9
300          UD   0.173
             *

301          KK  COMB-6
302          KM   COMBINE DEV-4 AND COMB-5
303          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
304          HC       3
             *

305          KK   DIVC6
306          KM   FLOWS WITHIN BUENA VIDA AVENUE TO HORIZON RIDGE PARKWAY
307          KM   REMAINING 37 CFS CAPTURED BY DROP INLET IN BUENA VIDA AVENUE
308          KM   DROP INLET REFERENCED FROM HIGH SCHOOL STUDY
309          DT  DIV-C6
310          DI       0      52     111
311          DQ       0      37      74
```

```
                    *
          312       KK     CPC
          313       KM   COMBINE DIVC1 AND CPB
          314       HC       2
                    *
1                                          HEC-1 INPUT                                          PAGE  9

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

          315       KK    RCPC
          316       KM   ROUTE CPC TO CP3
          317       KM   LINING = NATURAL
          318       KM     LEN   SLOPE       N     N/A   SHAPE      BW       SS
          319       RD     710   0.023   0.035       0    TRAP      15        2
                    *

          320       KK     EX2
          321       KM   SUBBASIN EX2
          322       KM            AREA    28.1 AC
          323       PB    2.78
          324       BA  0.0439
          325       LS       0    84.1
          326       UD    .163
                    *

          327       KK     EX3
          328       KM   SUBBASIN EX3
          329       KM            AREA    9.5 AC
          330       PB    2.78
          331       BA  0.0148
          332       LS       0    85.7
          333       UD    .151
                    *

          334       KK     EX4
          335       KM   SUBBASIN EX4
          336       KM            AREA    0.9 AC
          337       PB    2.77
          338       BA  0.0014
          339       LS       0    86.2
          340       UD    .100
                    *

          341       KK     CP3
          342       KM   COMBINE EX2, CP2 AND CPA
          343       HC       5
                    *
          344       ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    34       PPE030
             V
             V
    48      RPPE030
            .
            .
    54      .      PPE040
            .           .
            .           .
    60      CPPE040.....
             V
             V
    64     RCPPE040
            .
            .
    72      .      PPE050
            .          V
            .          V
    78      .     RPPE050
            .           .
            .           .
    84      CPPE050.....
             V
             V
    88     RCPPE050
            .
            .
    96      .      PPE060
            .           .
            .           .
   104      .           .         OF1
            .           .          .
            .           .          .
   111      CPPE060.....................
             V
             V
   115     RCPPE060
            .
```


120
OF2
127
CP1
130
RCP1
137
EX1
144
OF3
150
CP2
153
RCP2
160
OFDEV1
166
DEV-1
172
DEV-11
178
DEV-12
184
CPA
187
BLD100
193
BLD200
199
BLD300
205
BLD400
211
BLD500
217
BLD600
223
CPB
226
DEV-10
232
DEV-9
238
OFDEV2
244
COMB-2
248
DEV-8
254
COMB-3
258
DEV-7
264
COMB-4
268
DEV-6
274
RT-1
279
DEV-5
285
COMB-5
289
DEV-4



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN  1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   25APR05  TIME  12:38:50   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
```

```
************************************************************
* ........................................................ *
* :                                                      : *
* :             PARDEE HOMES OF NEVADA                   : *
* :             GREEN VALLEY 45 CHANNEL CLOMR            : *
* :             EXISTING CONDITIONS                      : *
* :......................................................: *
* :              RETURN PERIOD_ _ _ _100 & 10 -YEAR      : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3         : *
* :              PROJECT NO_ _ _ _ _ 5533.1900           : *
* :              FILENAME_ _ _ _ _ GV45Chn1-EX2.h1       : *
* :              DATE MODELED_ _ _ _ 04/25/05            : *
* :              MODELED BY_ _ _ _ _ RRD/WJM             : *
* :......................................................: *
* :                                                      : *
* :......................................................: *
************************************************************
```

JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:

AREA (SQUARE MILES)	DARF
0-0.5	.99
0.5-1	.975
1-2	.95
2-3	.925

```
  31 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
1.00 .99 .98 .95 .93 .57

1

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 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .95	RATIO 5 .93	RATIO 6 .57
HYDROGRAPH AT										
+	PPE030	.19	1	FLOW	241.	238.	233.	224.	216.	101.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO										
+	RPPE030	.19	1	FLOW	239.	235.	230.	231.	222.	102.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
HYDROGRAPH AT										
+	PPE040	.26	1	FLOW	340.	336.	329.	318.	307.	152.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT										
+	CPPE040	.45	1	FLOW	553.	546.	534.	523.	504.	241.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75
ROUTED TO										
+	RCPPE040	.45	1	FLOW	554.	543.	534.	523.	505.	234.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	PPE050	.44	1	FLOW	405.	398.	389.	373.	357.	147.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RPPE050	.44	1	FLOW	401.	395.	385.	369.	353.	144.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
2 COMBINED AT										
+	CPPE050	.88	1	FLOW	955.	938.	919.	893.	859.	378.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCPPE050	.88	1	FLOW	944.	927.	910.	881.	849.	375.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
HYDROGRAPH AT										
+	PPE060	.41	1	FLOW	543.	535.	524.	505.	487.	231.
				TIME	3.58	3.58	3.58	3.58	3.58	3.67
HYDROGRAPH AT										
+	OF1	.04	1	FLOW	58.	58.	57.	55.	53.	25.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	CPPE060	1.33	1	FLOW	1425.	1404.	1373.	1329.	1280.	578.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75
ROUTED TO										
+	RCPPE060	1.33	1	FLOW	1422.	1398.	1373.	1327.	1278.	571.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	OF2	.02	1	FLOW	18.	18.	18.	17.	16.	6.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT										
+	CP1	1.35	1	FLOW	1432.	1409.	1383.	1337.	1287.	575.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCP1	1.35	1	FLOW	1427.	1404.	1375.	1329.	1279.	563.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	EX1	.01	1	FLOW	8.	8.	8.	8.	7.	3.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	OF3	.01	1	FLOW	14.	14.	13.	13.	13.	6.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										

+	CP2	1.36	1	FLOW	1437.	1414.	1386.	1339.	1289.	567.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCP2	1.36	1	FLOW	1424.	1400.	1371.	1323.	1272.	563.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
HYDROGRAPH AT										
+	OFDEV1	.17	1	FLOW	368.	363.	357.	347.	336.	186.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-1	.01	1	FLOW	25.	24.	24.	23.	23.	14.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-11	.00	1	FLOW	6.	6.	6.	5.	5.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-12	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
4 COMBINED AT										
+	CPA	.19	1	FLOW	398.	394.	387.	376.	365.	203.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD100	.00	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD200	.00	1	FLOW	3.	3.	3.	3.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD300	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD400	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD500	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD600	.00	1	FLOW	5.	5.	5.	5.	5.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
7 COMBINED AT										
+	CPB	.19	1	FLOW	414.	409.	402.	391.	379.	212.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-10	.00	1	FLOW	6.	6.	6.	6.	6.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-9	.00	1	FLOW	5.	5.	4.	4.	4.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	OFDEV2	.03	1	FLOW	60.	59.	58.	57.	55.	30.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	COMB-2	.03	1	FLOW	71.	70.	69.	67.	65.	36.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-8	.00	1	FLOW	9.	9.	9.	8.	8.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	COMB-3	.04	1	FLOW	80.	79.	77.	75.	73.	41.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-7	.00	1	FLOW	4.	3.	3.	3.	3.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.58
2 COMBINED AT										
+	COMB-4	.04	1	FLOW	83.	82.	81.	78.	76.	42.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-6	.00	1	FLOW	4.	4.	4.	4.	4.	2.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO										
+	RT-1	.00	1	FLOW	4.	4.	4.	4.	4.	1.
				TIME	3.58	3.58	3.58	3.58	3.58	3.67

HYDROGRAPH AT										
+	DEV-5	.00	1	FLOW,	4.	4.	4.	4.	4.	1.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT										
+	COMB-5	.05	1	FLOW	90.	89.	87.	85.	82.	44.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-4	.01	1	FLOW	7.	7.	7.	6.	6.	2.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	PPE140	.01	1	FLOW	18.	18.	17.	17.	16.	8.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT										
+	COMB-6	.07	1	FLOW	112.	110.	108.	105.	101.	52.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
DIVERSION TO										
+	DIV-C6	.07	1	FLOW	74.	73.	72.	70.	68.	37.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DIVC6	.07	1	FLOW	37.	37.	36.	35.	33.	15.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CPC	.26	1	FLOW	451.	446.	438.	425.	412.	227.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO										
+	RCPC	.26	1	FLOW	432.	426.	419.	406.	394.	214.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	EX2	.04	1	FLOW	49.	48.	47.	45.	43.	17.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	EX3	.01	1	FLOW	18.	18.	18.	17.	16.	7.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	EX4	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
5 COMBINED AT										
+	CP3	1.68	1	FLOW	1641.	1615.	1582.	1527.	1470.	658.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75

1

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

Developed Condition

UNDEVELOPED LAND OWNED BY THE CITY OF HENDERSON

EXISTING COURTYARD SENIOR LIVING AT SIENA

EXISTING SIENA OFFICE PARK

EXISTING CITY OF HENDERSON FIRE STATION

HORIZON RIDGE PARKWAY

MPU BASIN PPE150
MPU BASIN PPE140

EXISTING WESTRIDGE COURT

EXISTING DESERT RADIOLOGISTS

EASTERN AVENUE

JEFFREYS STREET

SIENA VIDA

PPE150

CP6 CP5 CP4B CP4A CP3 CP2 CP1 CPC CPA CPB CPE060 CPPE050

ON1 ON2 ON3 ON4 ON5 ON6 ON7

OF1 OF2 OF3*

DIV-C6 COM-6 COM-5 COM-4 COM-3 COM-2

DEV-1** DEV-2** DEV-3** DEV-4** DEV-5** DEV-6** DEV-7** DEV-8** DEV-9** DEV-10** DEV-11** DEV-12**

BLD600** BLD500** BLD400** BLD300** BLD100** BLD200**

OFDEV1** OFDEV2**

GREEN VALLEY 45

EXISTING CORONADO MEETINGHOUSE

7 CFS FROM CORONADO MEETING HOUSE

EXISTING CORONADO HIGH SCHOOL

100-YEAR FEMA FLOOD ZONE

EXISTING HILLCREST

EXISTING AVALON AT SEVEN HILLS (PARCEL A)

60 CFS FROM OFDEV2 IN V-DITCH

MINIMUM COLLECTOR 25 CFS FROM DEVELOPMENT

50 CFS FROM DEVELOPED IN 10-YEAR FLOW ALONG EASEMENT AT 100-YEAR FLOW

NORTH

GRAPHIC SCALE
200 0 100 200
(IN FEET)
1 inch = 200 ft.

LEGEND

- EX1 — DRAINAGE SUBBASIN
- CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- MPU BASIN BOUNDARY
- FLOW DIRECTION

SUMMARY OF DEVELOPED CONDITIONS HEC-1 MODEL

SUBBASIN	AREA (AC)	100 YR (CFS)	10 YR (CFS)
PPE030***	121.6	238	101
PPE040***	164.5	336	152
CPPE040***	-	546	241
PPE050***	279.7	398	147
CPPE050***	-	919	378
PPE060***	263.0	535	231
OF1	22.9	59	26
CPPE060***	-	1329	579
OF2	10.6	25	10
CP1	-	1338	578
ON2	4.5	8	2
ON3	1.3	3	1
CP2	-	1354	586
OF3*	4.0	14	6
CP3	-	1359	587
ON5	4.7	12	5
ON6	5.2	14	6
CP4A	-	1361	587
ON4	4.7	13	6
CP4B	-	1382	597
ON1	17.0	42	19
CP5	-	1383	598
CPA	-	394	203
CPB	-	409	212
CPC	-	446	227
ON7	4.2	12	5
CP6A	-	445	225
CP6B	-	1570	686

*Referenced from the TDS for the Coronado Meetinghouse.
**Referenced from the TDS for the Maryland/Buena Vida High School.
***Referenced from the 2002 MPU.

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-25-05
PLOT TIME: 13:17:41

REV	DATE	DESCRIPTION	DATE	AGEN. APP	DATE	CCW. APP	DATE

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
bmeaver
F:\25533-1905\Vcdd\Hydro\CLOMR\Figures\Exhibit-B.dwg

PARDEE HOMES OF NEVADA

GREEN VALLEY 45 STORM DRAIN EXHIBIT B

DEVELOPED CONDITIONS DRAINAGE MAP

DRAWING
EX-B
SHT OF SHTS

dex2436.dwg 030624.wsk

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

Green Valley 45 Channel
Developed Conditions

Project No: 5533.1900
Date: 4-Nov-04
Calculated by: rrd

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Rainfall Inches 100-year
ON1	E	78.8	0.6502	1.7	0.0027	28	1.0	4.3	1385	1.6	1.9	3.7	8.4	1413	N/A	12.7	0.127	2.77
ON2	D	87.4	0.7637	4.8	0.0075	100	1.0	6.1	750	1.0	2.0	3.1	5.5	850	14.7	11.5	0.115	2.79
ON3	D	89.1	0.7861	9.7	0.0152	100	1.0	5.6	1490	1.0	2.0	3.1	9.5	1590	18.8	15.2	0.152	2.78
ON4	D	86.2	0.7478	9.1	0.0142	100	1.0	6.3	870	1.0	2.0	3.1	6.1	970	15.4	12.5	0.125	2.78
ON5	D	89.1	0.7861	18.0	0.0281	100	1.0	5.6	1425	1.0	2.0	3.1	9.2	1525	18.5	14.8	0.148	2.77
OF1	D	89.7	0.7940	22.9	0.0357	100	1.9	4.4	1105	3.1	3.6	5.4	4.2	1205	16.7	8.7	0.087	2.79
OF2	D	87.4	0.7637	10.6	0.0166	500	7.6	6.9	560	3.8	3.9	6.0	2.3	1060	15.9	9.2	0.092	2.79
PPE140	D	91.9	0.8231	7.5	0.0117	100	1.0	5.0	2695	1.7	2.6	4.0	12.3	2795	25.5	17.3	0.173	2.80

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

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: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

REFERENCE:

STANDARD FORM 4

```
1*************************************
*                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998            *
*          VERSION 4.1              *
*                                   *
*  RUN DATE   25APR05  TIME  13:09:47   *
*                                   *
*************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS     *
*    HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET          *
*       DAVIS, CALIFORNIA 95616       *
*           (916) 756-1104            *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

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

1 HEC-1 INPUT PAGE 1

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

              *DIAGRAM
    1         ID   ************************************************************
    2         ID   * ..........................................................  *
    3         ID   * :                                                        :  *
    4         ID   * :             PARDEE HOMES OF NEVADA                     :  *
    5         ID   * :             GREEN VALLEY 45 OFFSITE DRAINAGE CLOMR     :  *
    6         ID   * :             DEVELOPED CONDITIONS                       :  *
    7         ID   * :.........................................................:  *
    8         ID   * :              RETURN PERIOD_ _ _ _100 & 10 -YEAR        :  *
    9         ID   * :              DISTRIBUTION_ _ _ _ _6-HOUR SDN3          :  *
   10         ID   * :              PROJECT NO_ _ _ _ _ _5533.1900            :  *
   11         ID   * :              FILENAME_ _ _ _ _ _ GV45Chn1-DEV2.h1      :  *
   12         ID   * :              DATE MODELED_ _ _ _ 4/25/05               :  *
   13         ID   * :              MODELED BY_ _ _ _ _ RRD/WJM               :  *
   14         ID   * :.........................................................:  *
   15         ID   * :                                                        :  *
   16         ID   * :........................................................:  *
   17         ID   ************************************************************
   18         ID
   19         ID
   20         ID
   21         ID     JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
   22         ID
   23         ID     AREA (SQUARE MILES)    DARF
   24         ID
   25         ID     0-0.5  .99
   26         ID     0.5-1 .975
   27         ID     1-2    .95
   28         ID     2-3   .925
   29         ID
   30         IT       5       0       0     300
   31         IO       5       0       0
   32         IN       5       0       0
   33         JR    PREC    1.00    0.99   0.975    0.95   0.925   0.570
              *

   34         KK  PPE030
   35         KM   REFERENCED FROM THE 2002 MPU
   36         BA   0.190
   37         PB    2.92
   38         PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   39         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   40         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   41         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   42         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   43         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   44         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   45         PC   0.998   0.999       1
   46         LS       0    88.0
   47         UD   0.208
              *
```

1 HEC-1 INPUT PAGE 2

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

   48         KK  RPPE030
```

```
 49          KM   ROUTE PPE030 TO CPPE040
 50          KM   ANTHEM PARKWAY
 51          KM   REFERENCED FROM THE 2002 MPU
 52          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
 53          RD    4770    0.03   0.016       0    TRAP       0      50
             *

 54          KK  PPE040
 55          KM   REFERENCED FROM THE 2002 MPU
 56          BA   0.257
 57          PB    2.88
 58          LS       0    90.5
 59          UD   0.238
             *

 60          KK  CPPE040
 61          KM   COMBINE PPE030 AND PPE040
 62          KM   REFERENCED FROM THE 2002 MPU
 63          HC       2
             *

 64          KK  RCPPE040
 65          KM   ROUTE CPPE040 TO CPPE050
 66          KM   FACILITY = PITTMAN ANTHEM PARKWAY
 67          KM   FACILITY#= PTAP 0132
 68          KM   LINING = CONCRETE
 69          KM   REFERENCED FROM THE 2002 MPU
 70          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
 71          RD    2870   0.025   0.015       0    TRAP      12       2
             *

 72          KK  PPE050
 73          KM   REFERENCED FROM THE 2002 MPU
 74          BA   0.437
 75          PB    2.86
 76          LS       0    84.8
 77          UD   0.311
             *

 78          KK  RPPE050
 79          KM   ROUTE PPE050 TO CPPE050
 80          KM   ASSUMED CONCRETE TRAPEZOIDAL CHANNEL
 81          KM   REFERENCED FROM THE 2002 MPU
 82          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
 83          RD    1300   0.032   0.015       0    TRAP      12       2
             *

 84          KK  CPPE050
 85          KM   COMBINE PPE050 AND CPPE040
 86          KM   REFERENCED FROM THE 2002 MPU
 87          HC       2
             *
```



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

 88          KK  RCPPE050
 89          KM   ROUTE CPPE050 TO CPPE060
 90          KM   FACILITY = PITTMAN ANTHEM PARKWAY
 91          KM   FACILITY#= PTAP 0099
 92          KM   LINING = RCB
 93          KM   REFERENCED FROM THE 2002 MPU
 94          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
 95          RD    2600   0.017   0.015       0    TRAP      10       0
             *

 96          KK  PPE060
 97          KM   AREA REVISED FROM THE 2002 MPU
 98          KM   AREA =(TOTALAREA)-(Portion of OFDEV1)-(Portion of OFDEV2)
 99          KM   OFDEV1 AND OFDEV2 REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
100          BA   0.411
101          PB    2.83
102          LS       0    89.5
103          UD   0.199
             *

104          KK    OF1
105          KM   SUBBASIN OF1
106          KM           AREA    22.9 AC
107          PB    2.79
108          BA  0.0357
109          LS       0    89.7
110          UD    .087
             *

111          KK  CPPE060
112          KM   COMBINE CPPE050, PPE060 AND OF1
113          KM   REFERENCED FROM THE 2002 MPU
114          HC       3
             *

115          KK  RCPPE060
116          KM   ROUTE CPPE060 TO CP1
117          KM   LINING = NATURAL WASH
```

```
118          KM     LEN   SLOPE       N     N/A   SHAPE       BW       SS
119          RD     625   0.013   0.039       0    TRAP       20        2
             *

120          KK     OF2
121          KM   SUBBASIN OF2
122          KM            AREA    10.6 AC
123          PB    2.79
124          BA  0.0166
125          LS       0    87.4
126          UD    .092
             *
```



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

127          KK     CP1
128          KM   COMBINE CPPE060 AND OF2
129          HC       2
             *

130          KK    ON5
131          KM   SUBBASIN ON5
132          KM   REVISED (ON2)
133          KM            AREA    4.7 AC
134          PB    2.79
135          BA  0.0074
136          LS       0      89
137          UD    .090
             *

138          KK     ON6
139          KM   SUBBASIN ON6
140          KM   REVISED (ON3)
141          KM            AREA    5.2 AC
142          PB    2.78
143          BA  0.0081
144          LS       0    90.7
145          UD    .091
             *

146          KK     ON4
147          KM   SUBBASIN ON4
148          KM   REVISED (ON3)
149          KM            AREA    4.7 AC
150          PB    2.77
151          BA  0.0073
152          LS       0    91.0
153          UD    .082
             *

154          KK     CP2
155          KM   COMBINE CP1, ON5, ON4 AND ON6
156          HC       4
             *

157          KK    RCP2
158          KM   ROUTE CP2 TO CP3
159          KM   FACILITY = PITTMAN ANTHEM PARKWAY
160          KM   FACILITY#= PTAP 0048
161          KM   LINING = CONCRETE
162          KM   12'x 9'RCB DESIGNED BY GCW
163          KM     LEN   SLOPE       N     N/A   SHAPE       W       SS
164          RD     403   .0132    .013       0    TRAP      12        0
             *
```



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

165          KK     OF3
166          KM   REFERENCED SUBBASIN ONS FROM CORONADO MEETINGHOUSE STUDY
167          PB    2.88
168          BA  0.0078
169          LS       0    89.9
170          UD    .081
             *

171          KK     CP3
172          KM   COMBINE CP2 AND OF3
173          HC       2
             *

174          KK    RCP3
175          KM   ROUTE CP3 TO CP4
176          KM   FACILITY = PITTMAN ANTHEM PARKWAY
177          KM   FACILITY#= PTAP 0048
178          KM   LINING = CONCRETE
179          KM   12'x 9'RCB DESIGNED BY GCW
180          KM     LEN   SLOPE       N     N/A   SHAPE       W       SS
181          RD     537   .0132   0.015       0    TRAP      12        0
             *

182          KK     ON2
```

```
 183          KM   SUBBASIN ON2
 184          KM   REVISED (ON4)
 185          KM            AREA    4.5 AC
 186          PB    2.78
 187          BA  0.0070
 188          LS       0    81.2
 189          UD    .099
              *

 190          KK    CP4A
 191          KM   COMBINE CP3, AND ON1
 192          HC       2
              *

 193          KK     ON1
 194          KM   SUBBASIN ON1
 195          KM   REVISED (ON5)
 196          KM            AREA    17.0 AC
 197          PB    2.77
 198          BA  0.0266
 199          LS       0    90.7
 200          UD    .109
              *

 201          KK    CP4B
 202          KM   COMBINE CP4A, AND ON2
 203          HC       2
              *
```



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

 204          KK     ON3
 205          KM   SUBBASIN ON3
 206          KM   REVISED (ON1)
 207          KM            AREA    1.3 AC
 208          PB    2.77
 209          BA  0.0020
 210          LS       0    85.8
 211          UD    .108
              *

 212          KK     CP5
 213          KM   COMBINE ON3 AND CP4B
 214          HC       2
              *

 215          KK  OFDEV1
 216          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 217          PB    2.86
 218          BA  0.1714
 219          LS       0      94
 220          UD    .062
              *

 221          KK   DEV-1
 222          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 223          PB    2.86
 224          BA  0.0113
 225          LS       0      98
 226          UD    .079
              *

 227          KK  DEV-11
 228          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 229          PB    2.86
 230          BA  0.0023
 231          LS       0      98
 232          UD    .036
              *

 233          KK  DEV-12
 234          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 235          PB    2.86
 236          BA  0.0002
 237          LS       0      98
 238          UD    .026
              *

 239          KK     CPA
 240          KM   COMBINE OFDEV1, DEV-1 AND DEV-11-12
 241          HC       4
              *
```



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

 242          KK  BLD100
 243          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 244          PB    2.86
 245          BA  0.0004
 246          LS       0      98
 247          UD    .042
```

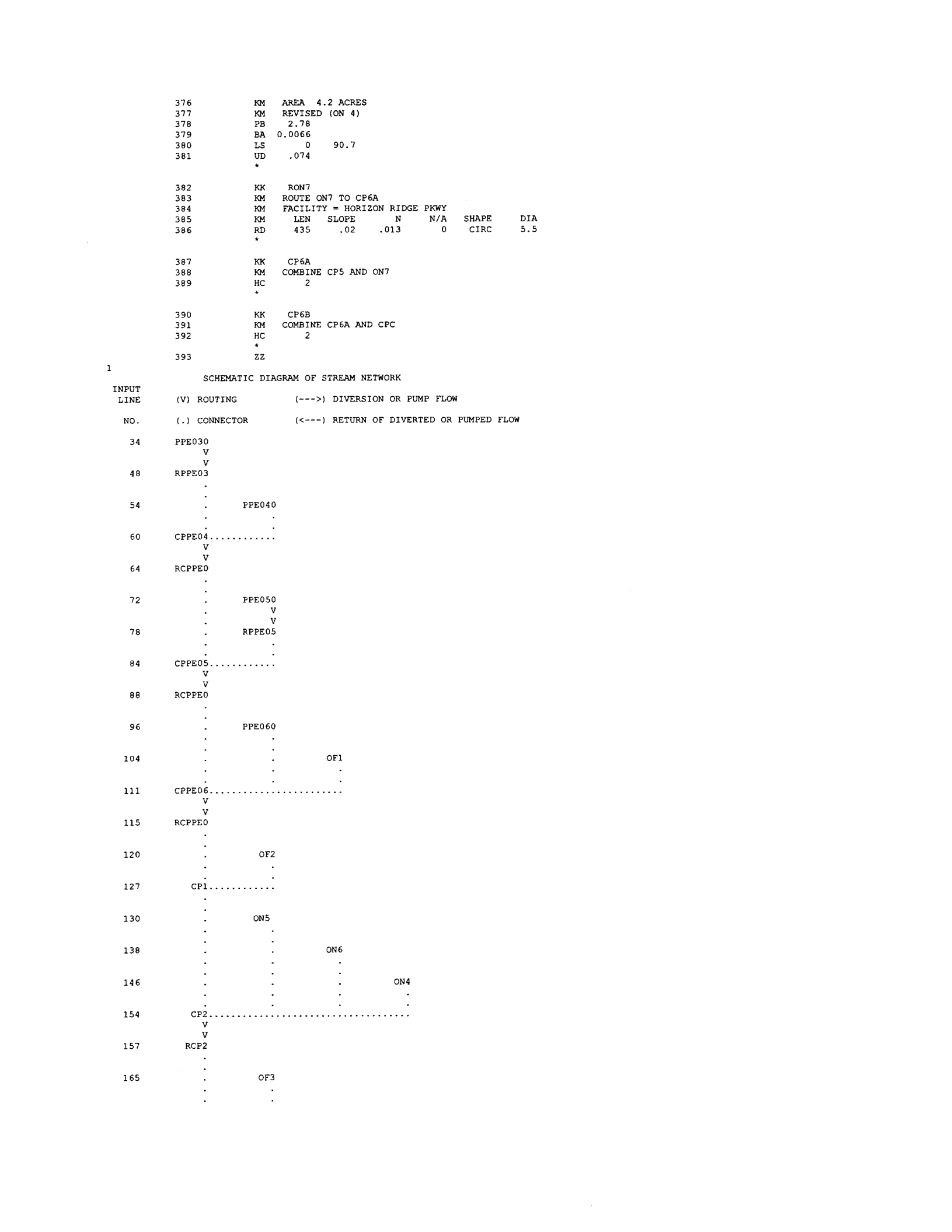
```
                *
 248            KK  BLD200
 249            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 250            PB    2.86
 251            BA  0.0011
 252            LS       0      98
 253            UD    .045
                *

 254            KK  BLD300
 255            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 256            PB    2.86
 257            BA  0.0010
 258            LS       0      98
 259            UD    .078
                *

 260            KK  BLD400
 261            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 262            PB    2.86
 263            BA  0.0010
 264            LS       0      98
 265            UD    .029
                *

 266            KK  BLD500
 267            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 268            PB    2.86
 269            BA  0.0010
 270            LS       0      98
 271            UD    .052
                *

 272            KK  BLD600
 273            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 274            PB    2.86
 275            BA  0.0020
 276            LS       0      98
 277            UD    .020
                *

 278            KK     CPB
 279            KM   COMBINE CPA AND BLD100-600
 280            HC       7
                *
1                                        HEC-1 INPUT                                        PAGE  8

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

 281            KK  DEV-10
 282            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 283            PB    2.86
 284            BA  0.0028
 285            LS       0      98
 286            UD    .074
                *

 287            KK  DEV-9
 288            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 289            PB    2.86
 290            BA  0.0019
 291            LS       0      98
 292            UD    .049
                *

 293            KK  OFDEV2
 294            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 295            PB    2.86
 296            BA  0.0272
 297            LS       0      94
 298            UD    .054
                *

 299            KK  COMB-2
 300            KM   COMBINE DEV-10, DEV-9 AND OFDEV2
 301            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 302            HC       3
                *

 303            KK   DEV-8
 304            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 305            PB    2.86
 306            BA  0.0045
 307            LS       0      92
 308            UD    .072
                *

 309            KK  COMB-3
 310            KM   COMBINE DEV-8 AND COMB-2
 311            KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 312            HC       2
                *
```

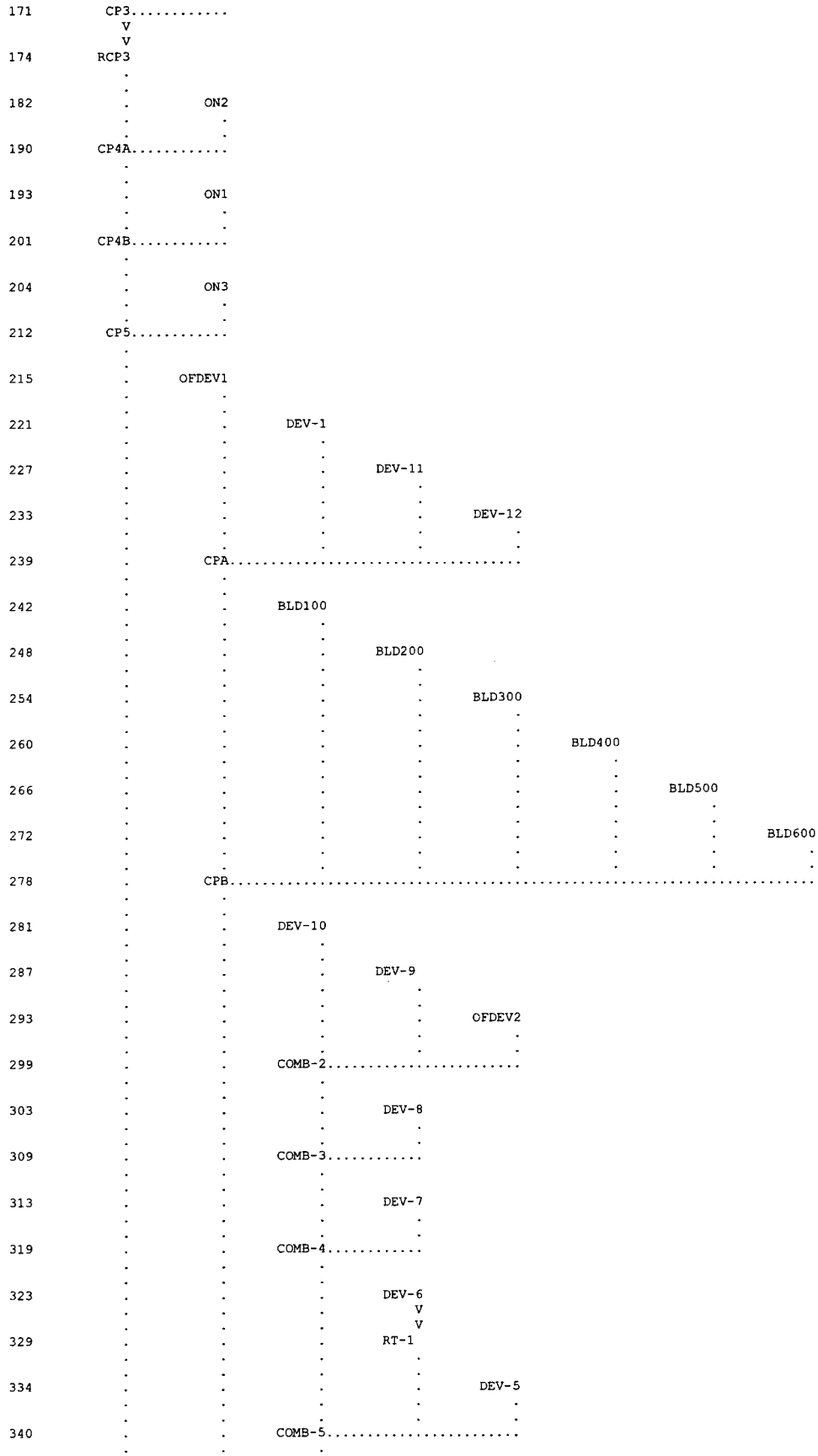
```
 313          KK   DEV-7
 314          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 315          PB    2.86
 316          BA  0.0028
 317          LS       0      84
 318          UD    .103
              *
1                                        HEC-1 INPUT                                                    PAGE  9

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


 319          KK  COMB-4
 320          KM   COMBINE DEV-7 AND COMB-3
 321          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 322          HC       2
              *

 323          KK   DEV-6
 324          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 325          PB    2.86
 326          BA  0.0033
 327          LS       0      84
 328          UD    .111
              *

 329          KK   RT-1
 330          KM   ROUTE DEV-6 THROUGH DEV-5
 331          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 332          KM     LEN   SLOPE       N     N/A   SHAPE      BW      SS
 333          RD     600    0.01   0.016       0    TRAP      15      10
              *

 334          KK   DEV-5
 335          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 336          PB    2.86
 337          BA  0.0043
 338          LS       0      80
 339          UD    .139
              *

 340          KK  COMB-5
 341          KM   COMBINE DEV-5 AND COMB-4
 342          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 343          HC       3
              *

 344          KK   DEV-4
 345          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 346          PB    2.86
 347          BA  0.0069
 348          LS       0      80
 349          UD    .136
              *

 350          KK  PPE140
 351          KM   AREA REVISED FROM THE 2002 MPU
 352          BA  0.0117
 353          PB    2.80
 354          LS       0    91.9
 355          UD   0.173
              *
1                                        HEC-1 INPUT                                                    PAGE 10

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


 356          KK  COMB-6
 357          KM   COMBINE DEV-4 AND COMB-5
 358          KM   REFERENCED FROM THE CORONADO HIGH SCHOOL STUDY
 359          HC       3
              *

 360          KK   DIVC6
 361          KM   FLOWS WITHIN BUENA VIDA AVENUE TO HORIZON RIDGE PARKWAY
 362          KM   REMAINING 37 CFS CAPTURED BY DROP INLET IN BUENA VIDA AVENUE
 363          KM   DROP INLET REFERENCED FROM HIGH SCHOOL STUDY
 364          DT  DIV-C6
 365          DI       0      52     111
 366          DQ       0      37      74
              *

 367          KK     CPC
 368          KM   COMBINE DIVC1 AND CPB
 369          HC       2
              *

 370          KK    RCPC
 371          KM   ROUTE CPC TO CP6A
 372          KM   FACILITY = HORIZON RIDGE PKWY
 373          KM     LEN   SLOPE       N     N/A   SHAPE     DIA
 374          RD    1000     .02    .013       0    CIRC     5.5
              *

 375          KK   ON7
```

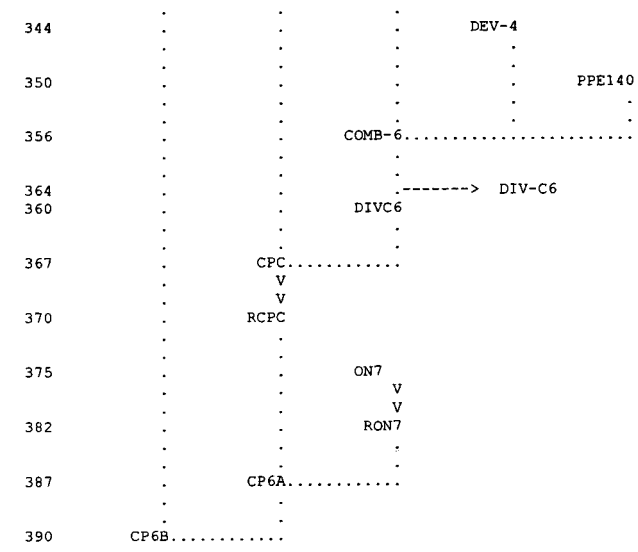
```
376           KM   AREA  4.2 ACRES
377           KM   REVISED (ON 4)
378           PB    2.78
379           BA  0.0066
380           LS       0    90.7
381           UD    .074
              *

382           KK    RON7
383           KM   ROUTE ON7 TO CP6A
384           KM   FACILITY = HORIZON RIDGE PKWY
385           KM     LEN   SLOPE       N     N/A   SHAPE     DIA
386           RD     435     .02    .013       0    CIRC     5.5
              *

387           KK    CP6A
388           KM   COMBINE CP5 AND ON7
389           HC       2
              *

390           KK    CP6B
391           KM   COMBINE CP6A AND CPC
392           HC       2
              *
393           ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK




171
CP3
174
RCP3
182
ON2
190
CP4A
193
ON1
201
CP4B
204
ON3
212
CP5
215
OFDEV1
221
DEV-1
227
DEV-11
233
DEV-12
239
CPA
242
BLD100
248
BLD200
254
BLD300
260
BLD400
266
BLD500
272
BLD600
278
CPB
281
DEV-10
287
DEV-9
293
OFDEV2
299
COMB-2
303
DEV-8
309
COMB-3
313
DEV-7
319
COMB-4
323
DEV-6
329
RT-1
334
DEV-5
340
COMB-5



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   25APR05  TIME  13:09:47   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
************************************************************
* ........................................................ *
* :                                                      : *
* :             PARDEE HOMES OF NEVADA                   : *
* :             GREEN VALLEY 45 OFFSITE DRAINAGE CLOMR   : *
* :             DEVELOPED CONDITIONS                     : *
* :......................................................: *
* :              RETURN PERIOD_ _ _ _100 & 10 -YEAR      : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3         : *
* :              PROJECT NO_ _ _ _ _ 5533.1900           : *
* :              FILENAME_ _ _ _ _ _ GV45Chn1-DEV2.h1    : *
* :              DATE MODELED_ _ _ _ 4/25/05             : *
* :              MODELED BY_ _ _ _ _ RRD/WJM             : *
* :......................................................: *
* :                                                      : *
* :......................................................: *
************************************************************
```

JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:

AREA (SQUARE MILES)	DARF
0-0.5	.99
0.5-1	.975
1-2	.95
2-3	.925

31 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
1.00 .99 .98 .95 .93 .57

1

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 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .95	RATIO 5 .93	RATIO 6 .57
HYDROGRAPH AT										
+	PPE030	.19	1	FLOW	241.	238.	233.	224.	216.	101.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO										
+	RPPE03	.19	1	FLOW	239.	235.	230.	231.	222.	102.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
HYDROGRAPH AT										
+	PPE040	.26	1	FLOW	340.	336.	329.	318.	307.	152.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT										
+	CPPE04	.45	1	FLOW	553.	546.	534.	523.	504.	241.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75
ROUTED TO										
+	RCPPE0	.45	1	FLOW	554.	543.	534.	523.	505.	234.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	PPE050	.44	1	FLOW	405.	398.	389.	373.	357.	147.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RPPE05	.44	1	FLOW	401.	395.	385.	369.	353.	144.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
2 COMBINED AT										
+	CPPE05	.88	1	FLOW	955.	938.	919.	893.	859.	378.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCPPE0	.88	1	FLOW	944.	927.	910.	881.	849.	375.
				TIME	3.75	3.75	3.75	3.75	3.75	3.83
HYDROGRAPH AT										
+	PPE060	.41	1	FLOW	543.	535.	524.	505.	487.	231.
				TIME	3.58	3.58	3.58	3.58	3.58	3.67
HYDROGRAPH AT										
+	OF1	.04	1	FLOW	59.	58.	57.	55.	53.	26.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	CPPE06	1.33	1	FLOW	1426.	1405.	1373.	1329.	1281.	579.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75
ROUTED TO										
+	RCPPE0	1.33	1	FLOW	1422.	1400.	1373.	1327.	1278.	573.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	OF2	.02	1	FLOW	25.	24.	24.	23.	22.	10.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CP1	1.35	1	FLOW	1434.	1411.	1384.	1338.	1289.	578.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	ON5	.01	1	FLOW	12.	12.	11.	11.	11.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	ON6	.01	1	FLOW	14.	13.	13.	13.	12.	6.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	ON4	.01	1	FLOW	13.	13.	12.	12.	12.	6.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50

4 COMBINED AT										
+	CP2	1.37	1	FLOW	1451.	1428.	1400.	1354.	1304.	586.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCP2	1.37	1	FLOW	1450.	1428.	1400.	1353.	1303.	585.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	OF3	.01	1	FLOW	14.	14.	13.	13.	13.	6.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CP3	1.38	1	FLOW	1456.	1434.	1405.	1359.	1309.	587.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO										
+	RCP3	1.38	1	FLOW	1455.	1433.	1404.	1357.	1308.	585.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	ON2	.01	1	FLOW	8.	7.	7.	7.	7.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.58
2 COMBINED AT										
+	CP4A	1.38	1	FLOW	1459.	1437.	1408.	1361.	1311.	587.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	ON1	.03	1	FLOW	42.	41.	40.	39.	37.	19.
				TIME	3.50	3.50	3.50	3.50	3.50	3.58
2 COMBINED AT										
+	CP4B	1.41	1	FLOW	1481.	1459.	1429.	1382.	1331.	597.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	ON3	.00	1	FLOW	3.	3.	2.	2.	2.	1.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT										
+	CP5	1.41	1	FLOW	1483.	1460.	1431.	1383.	1332.	598.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT										
+	OFDEV1	.17	1	FLOW	368.	363.	357.	347.	336.	186.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-1	.01	1	FLOW	25.	24.	24.	23.	23.	14.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-11	.00	1	FLOW	6.	6.	6.	5.	5.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-12	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
4 COMBINED AT										
+	CPA	.19	1	FLOW	398.	394.	387.	376.	365.	203.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD100	.00	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD200	.00	1	FLOW	3.	3.	3.	3.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD300	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD400	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD500	.00	1	FLOW	2.	2.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	BLD600	.00	1	FLOW	5.	5.	5.	5.	5.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
7 COMBINED AT										
+	CPB	.19	1	FLOW	414.	409.	402.	391.	379.	212.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-10	.00	1	FLOW	6.	6.	6.	6.	6.	3.

				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-9	.00	1	FLOW	5.	5.	4.	4.	4.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	OFDEV2	.03	1	FLOW	60.	59.	58.	57.	55.	30.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	COMB-2	.03	1	FLOW	71.	70.	69.	67.	65.	36.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-8	.00	1	FLOW	9.	9.	9.	8.	8.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	COMB-3	.04	1	FLOW	80.	79.	77.	75.	73.	41.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-7	.00	1	FLOW	4.	3.	3.	3.	3.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.58
2 COMBINED AT										
+	COMB-4	.04	1	FLOW	83.	82.	81.	78.	76.	42.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-6	.00	1	FLOW	4.	4.	4.	4.	4.	2.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO										
+	RT-1	.00	1	FLOW	4.	4.	4.	4.	4.	1.
				TIME	3.58	3.58	3.58	3.58	3.58	3.67
HYDROGRAPH AT										
+	DEV-5	.00	1	FLOW	4.	4.	4.	4.	4.	1.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT										
+	COMB-5	.05	1	FLOW	90.	89.	87.	85.	82.	44.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DEV-4	.01	1	FLOW	7.	7.	7.	6.	6.	2.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	PPE140	.01	1	FLOW	18.	18.	17.	17.	16.	8.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT										
+	COMB-6	.07	1	FLOW	112.	110.	108.	105.	101.	52.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
DIVERSION TO										
+	DIV-C6	.07	1	FLOW	74.	73.	72.	70.	68.	37.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DIVC6	.07	1	FLOW	37.	37.	36.	35.	33.	15.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CPC	.26	1	FLOW	451.	446.	438.	425.	412.	227.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO										
+	RCPC	.26	1	FLOW	439.	434.	426.	414.	401.	220.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	ON7	.01	1	FLOW	12.	12.	11.	11.	11.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO										
+	RON7	.01	1	FLOW	12.	11.	11.	11.	10.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CP6A	.26	1	FLOW	451.	445.	438.	424.	411.	225.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	CP6B	1.68	1	FLOW	1688.	1664.	1627.	1570.	1510.	686.
				TIME	3.67	3.67	3.67	3.67	3.67	3.75

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

Hydraulic Modeling Computations

NORTH

GRAPHIC SCALE

100 0 50 100

(IN FEET)

1 inch = 100 ft.

BOSS RMS HEC-RAS MODEL

Section	EX Q (cfs)	EX WSE	Velocity (ft/s)	Froude
1100	1329	2322.58	7.81	1.00
1050	1329	2320.64	9.10	1.25
1000	1329	2319.61	8.66	1.16
950	1329	2319.34	6.96	0.86
900	1329	2319.15	6.33	0.67
850	1337	2318.10	7.45	0.94
800	1337	2317.09	7.86	0.88
750	1337	2316.16	8.30	0.96
700	1337	2314.88	8.79	1.22
650	1337	2314.03	6.47	1.01
600	1337	2311.83	9.15	1.13
550	1337	2311.04	7.84	0.97
500	1337	2310.36	7.16	0.97
450	1339	2308.65	7.02	1.01
400	1339	2307.21	6.78	0.90
350	1339	2306.06	7.03	1.01
300	1339	2303.87	7.73	1.22
250	1339	2302.36	7.52	1.13
200	1339	2300.30	8.01	1.15
100	1527	2297.95	5.51	0.68
50	1527	2296.18	8.88	1.00
40	1527	2288.82	19.46	0.27
39	1527	2289.12	16.52	0.40
31	2039	2290.37	8.87	0.40
30	2039	2288.86	11.93	1.95
25	2039	2287.35	6.36	0.84
20	2039	2286.87	5.61	0.62
10	2039	2285.21	8.02	0.96

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-26-05
PLOT TIME: 10:39:30

REV	DATE	DESCRIPTION	DATE	AGEN. APP	DATE	CONV. APP	DATE:

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE (702) 804-2000 • FAX (702) 804-2345
F:\55533-1900\cadd\Vhance\Column\Vhance Vs-Bridge\1905existing.dwg jamyer

PARDEE HOMES OF NEVADA

GREEN VALLEY 45 OFFSITE DRAINAGE

EXISTING CONDITIONS HEC-RAS CROSS SECTION LOCATIONS

DRAWING
EX-C
OF SHTS

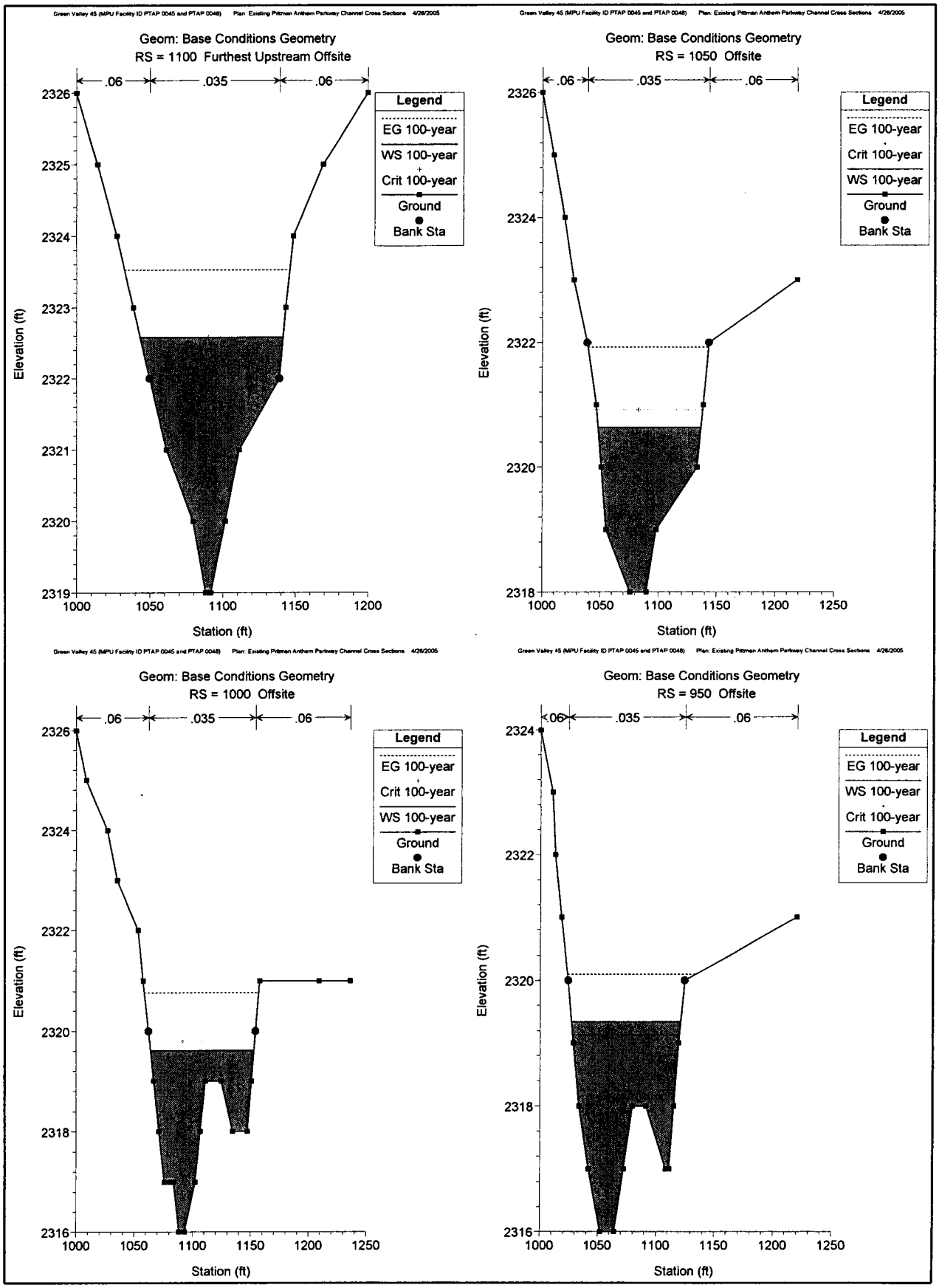
DWG NAME: dwg 05/05/21 ● wlk

HEC-RAS Analysis

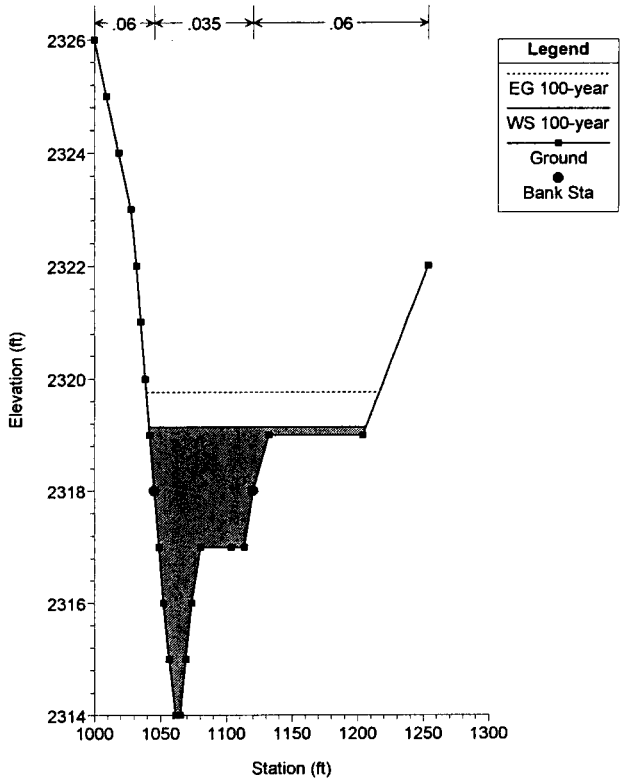
Existing Condition

HEC-RAS Plan: 5533-1900 River: Reach #1 Reach: Existing Pittman Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Existing Pittman	1100	100-year	1329.00	2319.00	2322.58	2322.58	2323.53	0.014381	7.81	172.25	97.96	1.00
Existing Pittman	1050	100-year	1329.00	2318.00	2320.64	2320.92	2321.93	0.023718	9.10	145.98	88.50	1.25
Existing Pittman	1000	100-year	1329.00	2316.00	2319.61	2319.80	2320.77	0.020263	8.66	153.48	88.54	1.16
Existing Pittman	950	100-year	1329.00	2316.00	2319.34	2319.13	2320.10	0.010552	6.96	190.92	94.00	0.86
Existing Pittman	900	100-year	1329.00	2314.00	2319.15		2319.76	0.005825	6.33	227.98	164.64	0.67
Existing Pittman	850	100-year	1337.00	2313.00	2318.10	2318.10	2318.96	0.013026	7.45	185.33	161.57	0.94
Existing Pittman	800	100-year	1337.00	2313.00	2317.09	2317.13	2318.00	0.010187	7.86	208.84	160.98	0.88
Existing Pittman	750	100-year	1337.00	2313.00	2316.16	2316.34	2317.12	0.012460	8.30	214.37	173.15	0.96
Existing Pittman	700	100-year	1337.00	2312.00	2314.88	2315.22	2316.08	0.022929	8.79	152.18	94.65	1.22
Existing Pittman	650	100-year	1337.00	2312.00	2314.03	2314.03	2314.68	0.017024	6.47	206.63	163.33	1.01
Existing Pittman	600	100-year	1337.00	2308.00	2311.83	2312.01	2313.13	0.018272	9.15	147.91	77.03	1.13
Existing Pittman	550	100-year	1337.00	2307.00	2311.04	2310.99	2311.99	0.013475	7.84	170.51	84.43	0.97
Existing Pittman	500	100-year	1337.00	2307.00	2310.36	2310.33	2311.16	0.014184	7.16	187.85	117.26	0.97
Existing Pittman	450	100-year	1339.00	2306.00	2308.65	2308.65	2309.42	0.016227	7.02	190.78	128.15	1.01
Existing Pittman	400	100-year	1339.00	2304.00	2307.21	2307.08	2307.93	0.011983	6.78	197.81	114.52	0.90
Existing Pittman	350	100-year	1339.00	2304.00	2306.06	2306.06	2306.82	0.015830	7.03	190.49	125.76	1.01
Existing Pittman	300	100-year	1339.00	2300.00	2303.87	2304.05	2304.79	0.025055	7.73	173.32	139.79	1.22
Existing Pittman	250	100-year	1339.00	2300.00	2302.36	2302.47	2303.24	0.020644	7.52	178.08	129.88	1.13
Existing Pittman	200	100-year	1339.00	2297.00	2300.30	2300.45	2301.29	0.020971	8.01	167.83	116.36	1.15
Existing Pittman	100	100-year	1527.00	2295.00	2297.95	2297.49	2298.42	0.006520	5.51	285.27	156.10	0.68
Existing Pittman	50	100-year	1527.00	2292.50	2296.18	2296.18	2297.40	0.013569	8.88	172.03	70.97	1.00
Existing Pittman	40	100-year	1527.00	2287.30	2288.82	2290.28	2294.70	0.181537	19.46	78.48	57.14	2.93
Existing Pittman	39	100-year	1527.00	2287.00	2289.12	2290.38	2293.36	0.007668	16.52	92.46	58.51	2.00
Existing Pittman	35		Bridge									
Existing Pittman	31	100-year	1527.00	2286.00	2290.37	2289.62	2291.59	0.007970	8.87	172.19	75.12	0.75
Existing Pittman	30	100-year	2039.00	2285.55	2288.86	2289.34	2291.07	0.025614	11.93	170.85	58.55	1.23
Existing Pittman	25	100-year	2039.00	2285.00	2287.35	2287.14	2287.97	0.010307	6.36	322.94	182.99	0.84
Existing Pittman	20	100-year	2039.00	2282.00	2286.87	2286.06	2287.36	0.005099	5.61	363.17	142.76	0.62
Existing Pittman	10	100-year	2039.00	2282.00	2285.21	2285.15	2286.21	0.012875	8.02	254.11	117.85	0.96

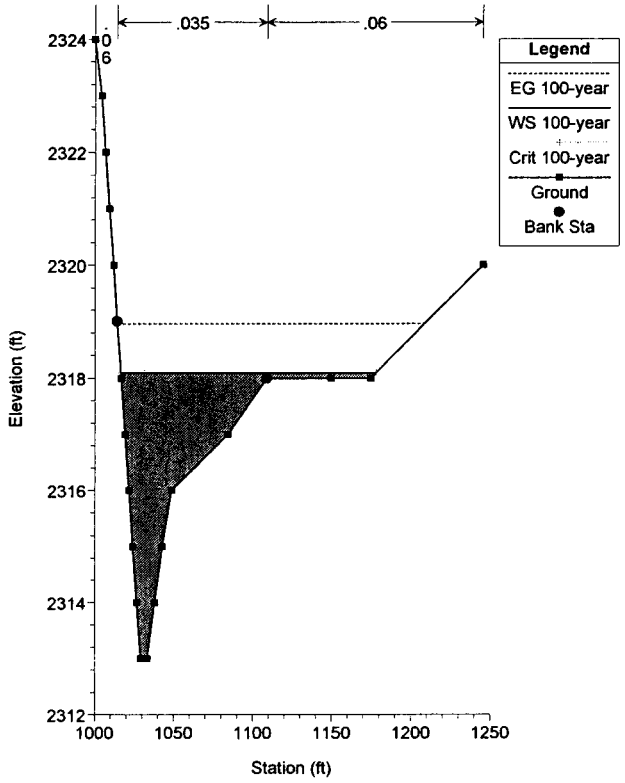

Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 1100 Furthest Upstream Offsite
.06
.035
.06
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Geom: Base Conditions Geometry
RS = 1050 Offsite
Geom: Base Conditions Geometry
RS = 1000 Offsite
Geom: Base Conditions Geometry
RS = 950 Offsite

Geom: Base Conditions Geometry
RS = 900 Offsite



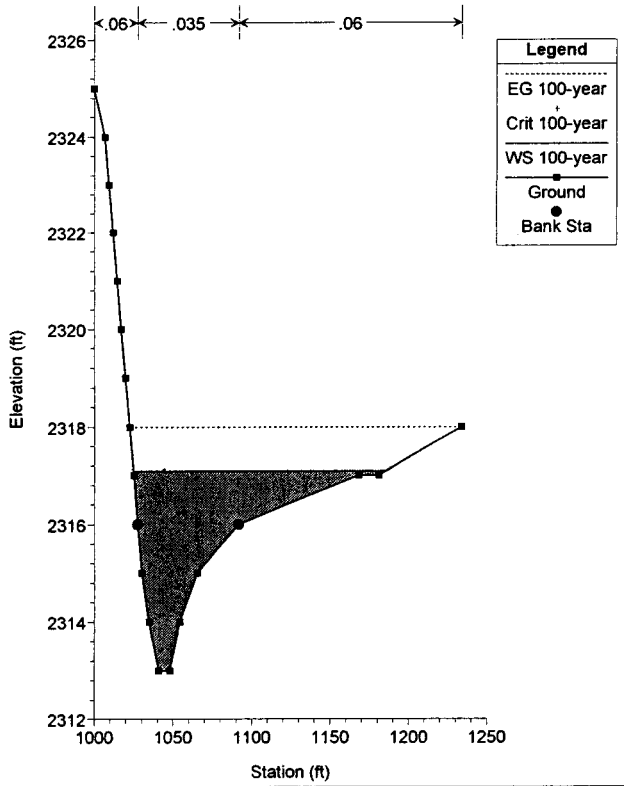
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/28/2005

Geom: Base Conditions Geometry
RS = 850 Offsite



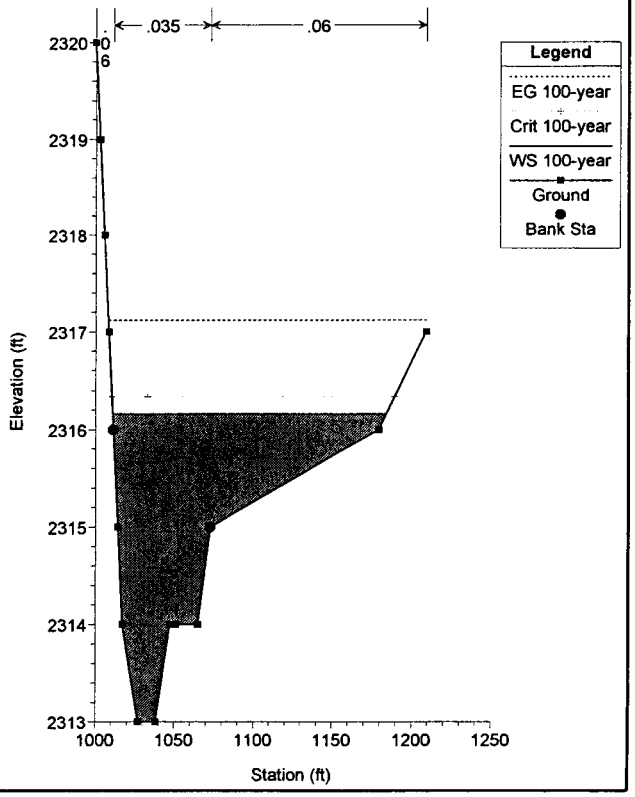
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/28/2005

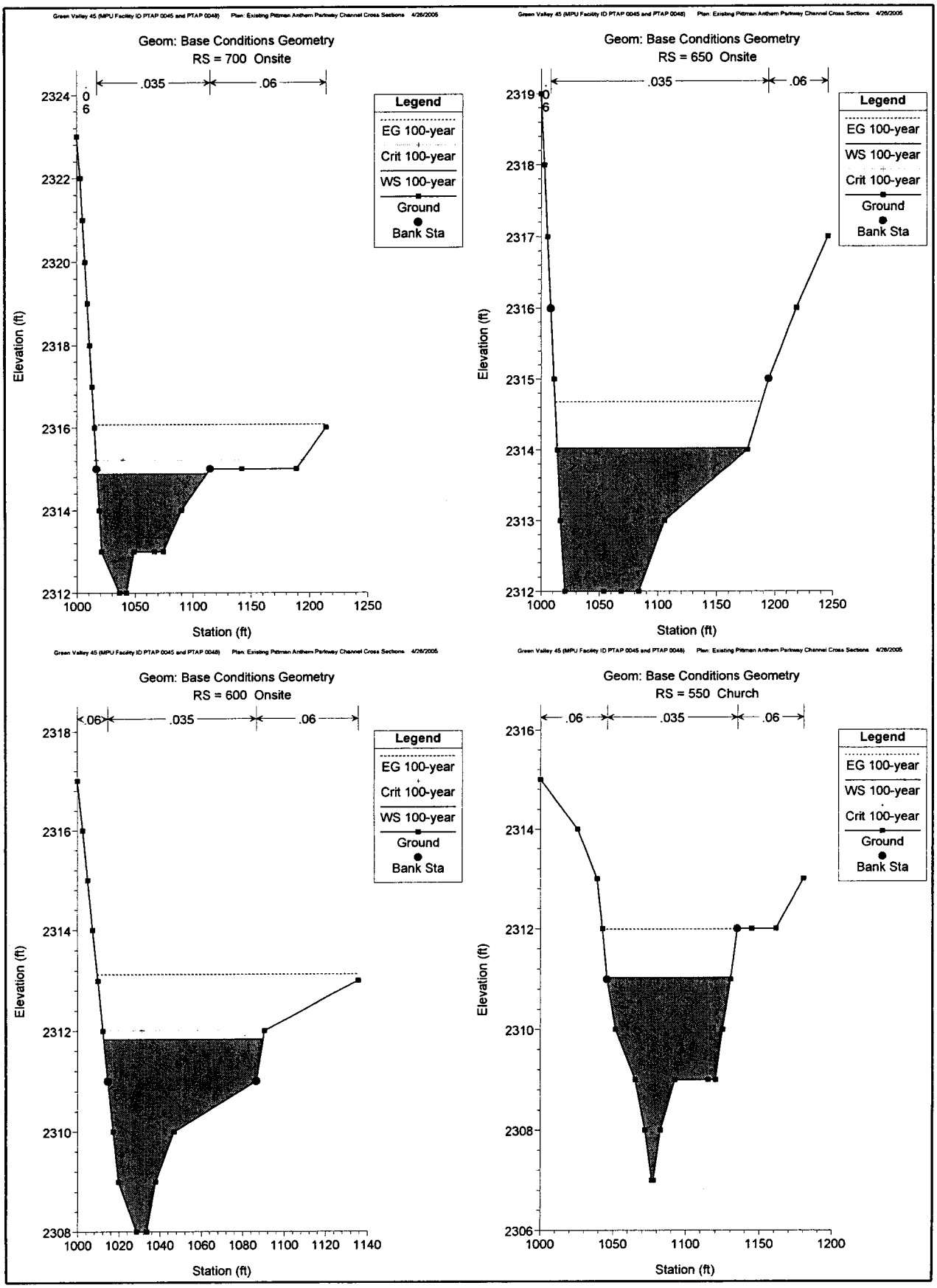
Geom: Base Conditions Geometry
RS = 800 Site Entrance



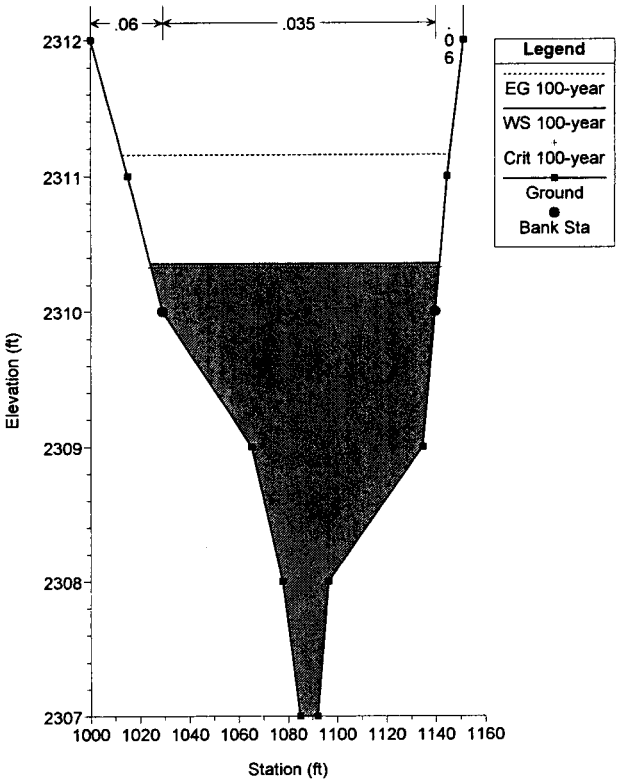
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/28/2005

Geom: Base Conditions Geometry
RS = 750 Onsite



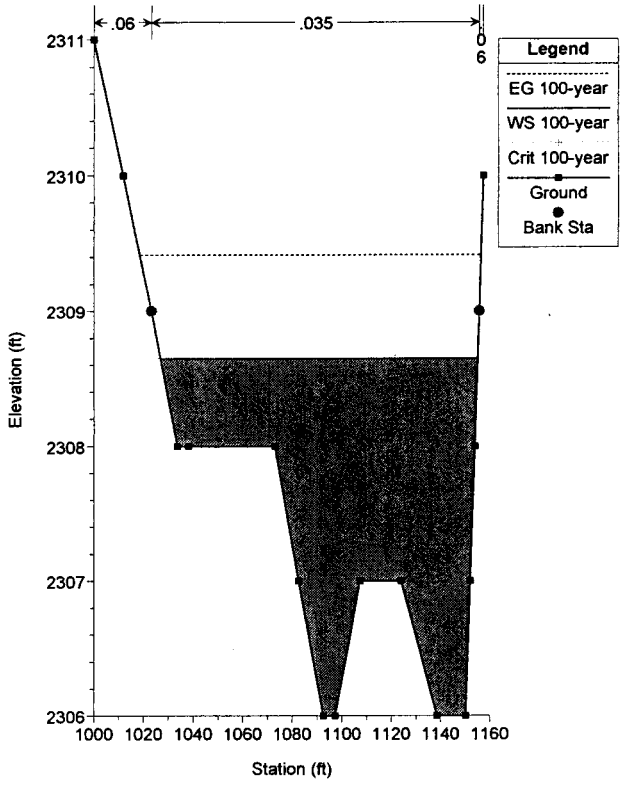

Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 700 Onsite
.035
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Geom: Base Conditions Geometry
RS = 650 Onsite
Geom: Base Conditions Geometry
RS = 600 Onsite
.06
Geom: Base Conditions Geometry
RS = 550 Church

Geom: Base Conditions Geometry
RS = 500 Church



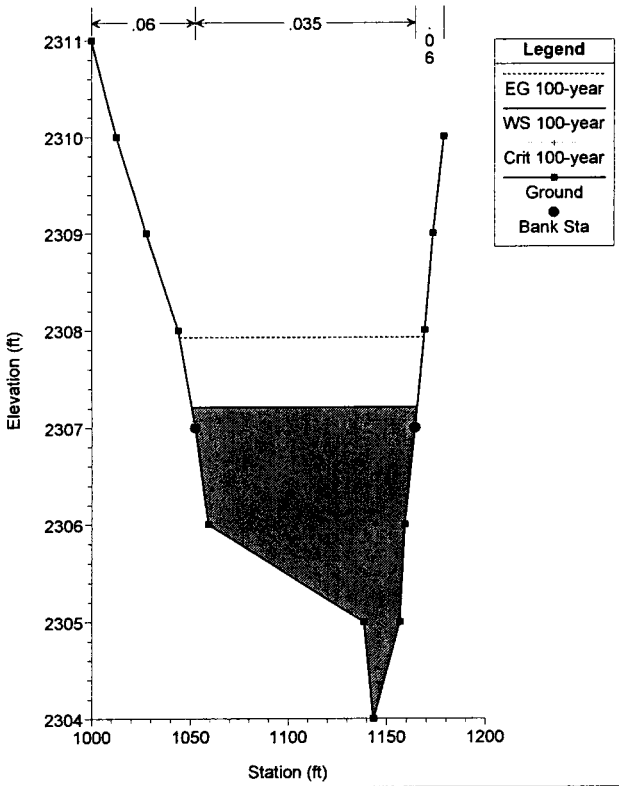
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005

Geom: Base Conditions Geometry
RS = 450 Church



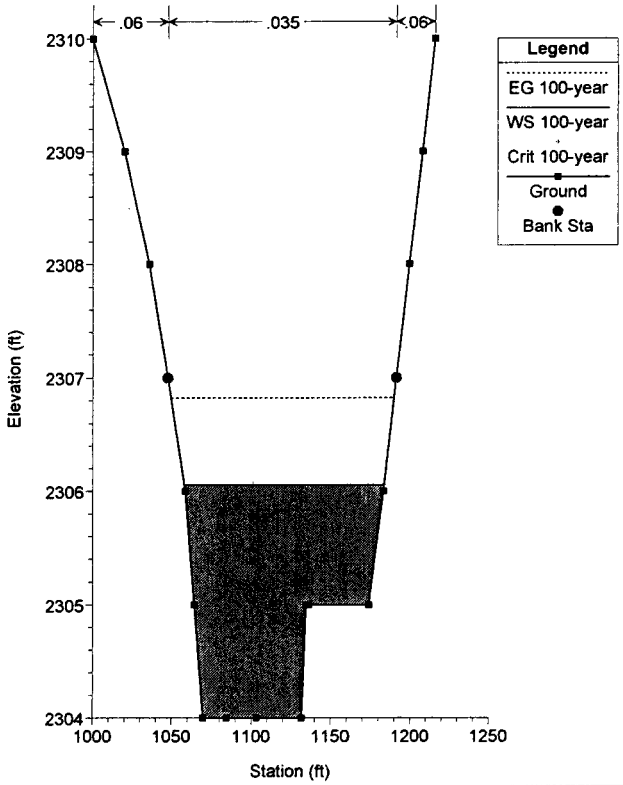
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005

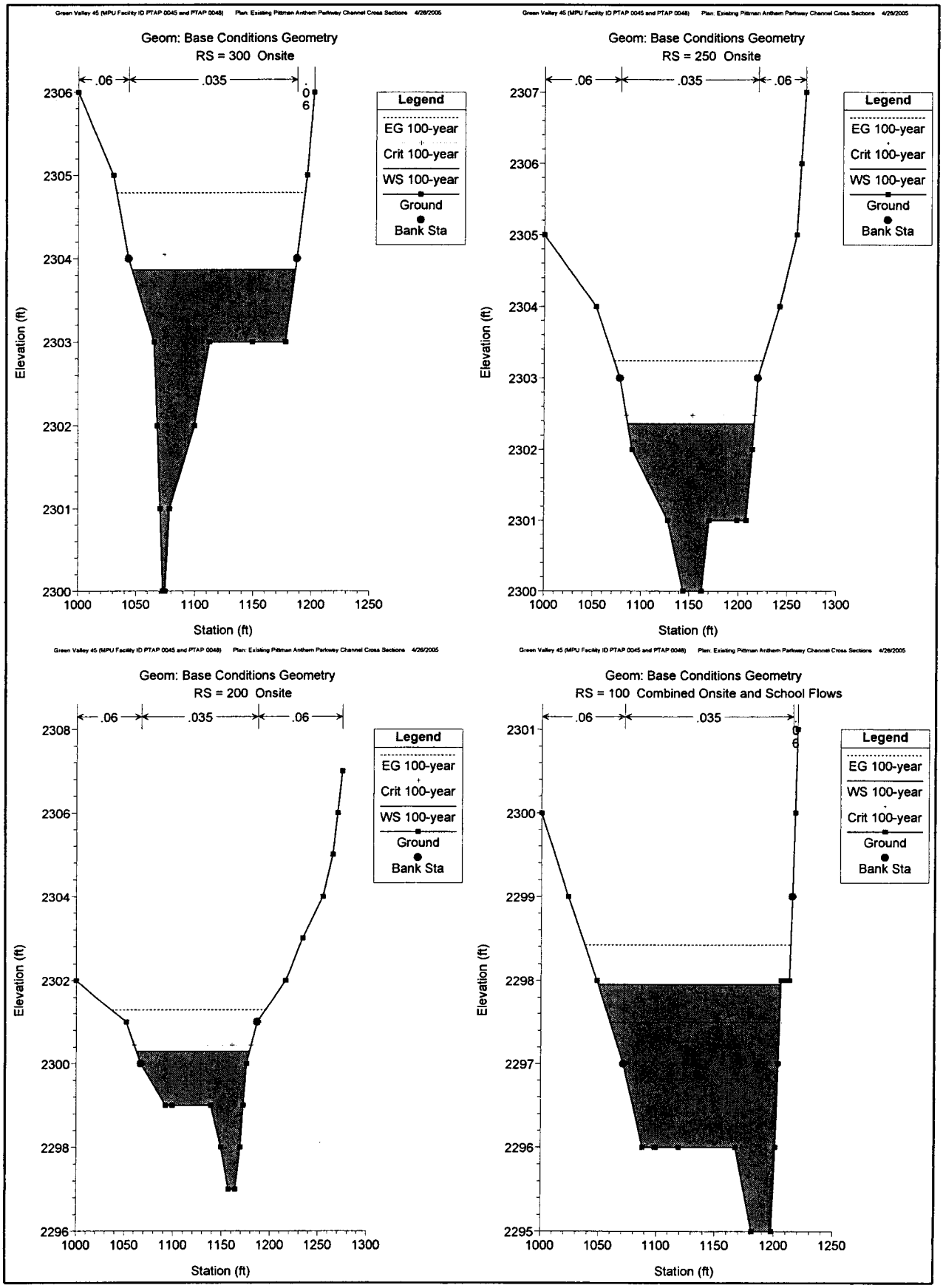
Geom: Base Conditions Geometry
RS = 400 Church

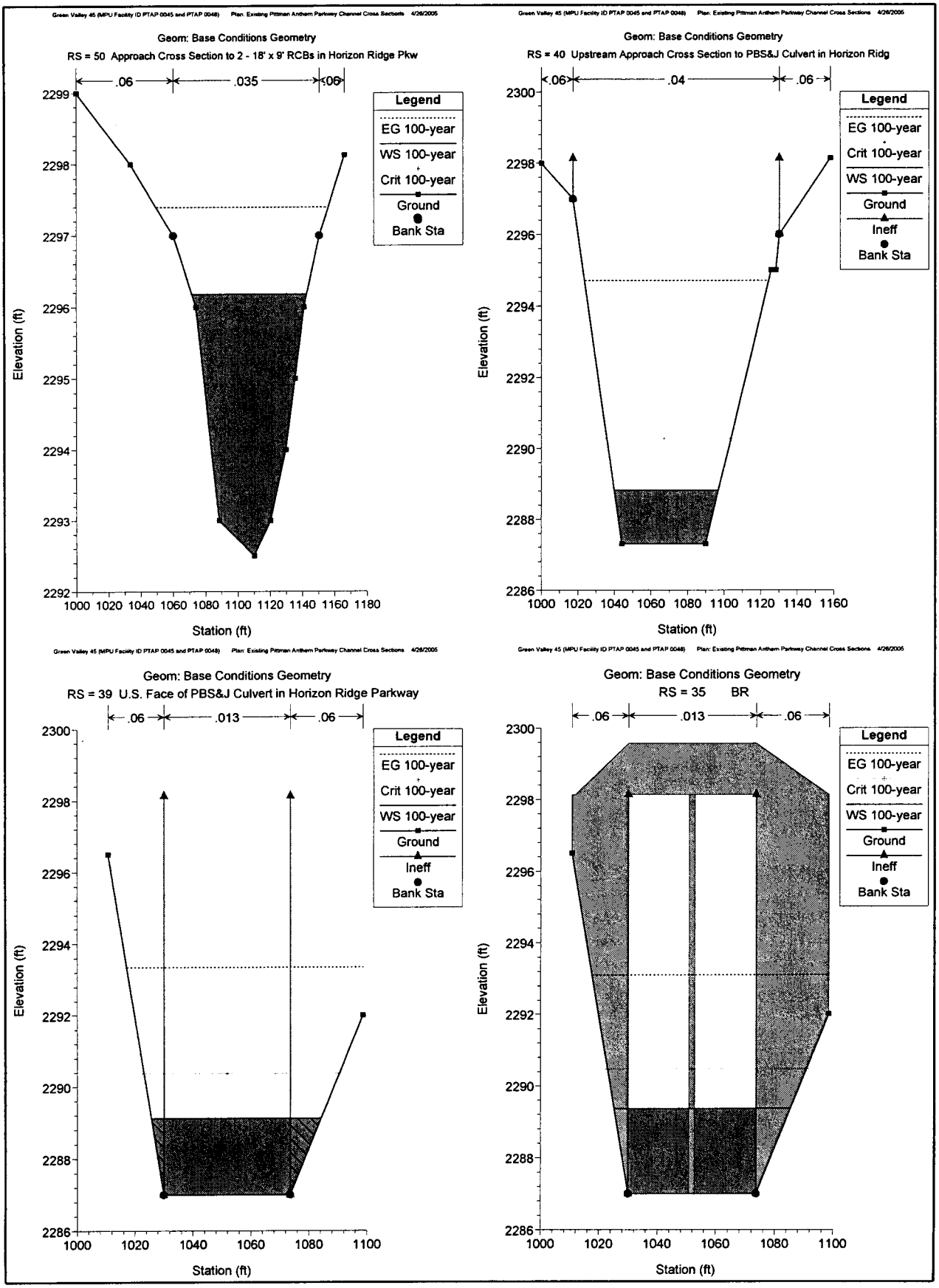


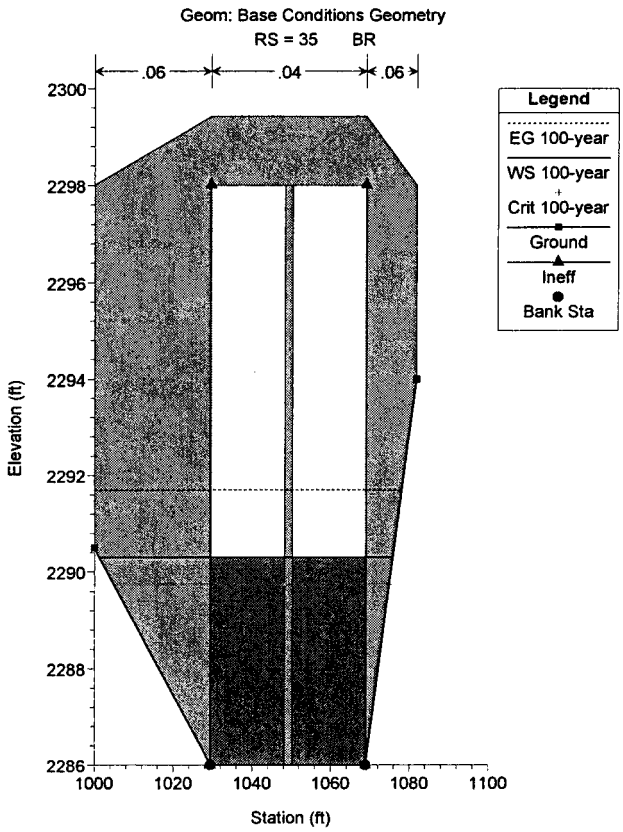
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005

Geom: Base Conditions Geometry
RS = 350 Onsite

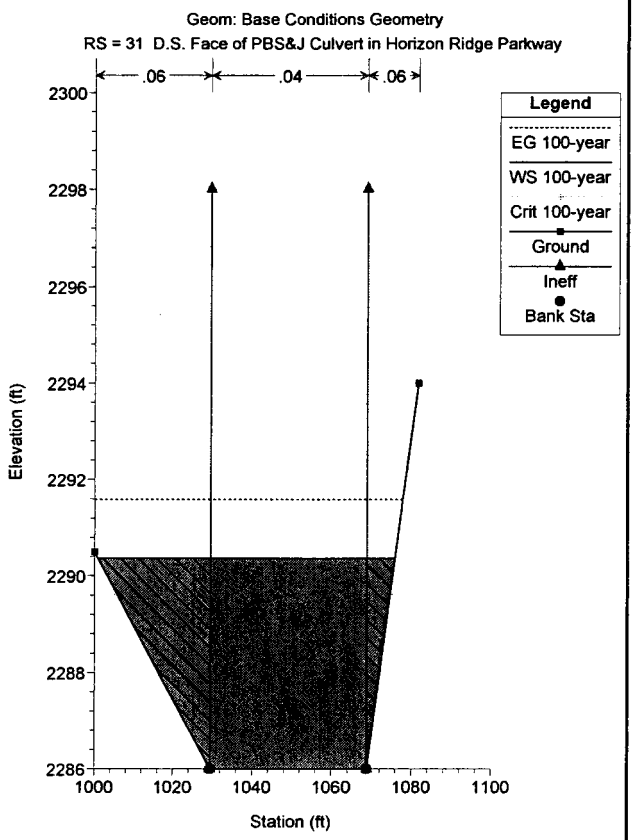



Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pitman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 300 Onsite
.06
.035
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pitman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 250 Onsite
.06
.035
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pitman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 200 Onsite
.06
.035
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pitman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 100 Combined Onsite and School Flows
.06
.035
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)

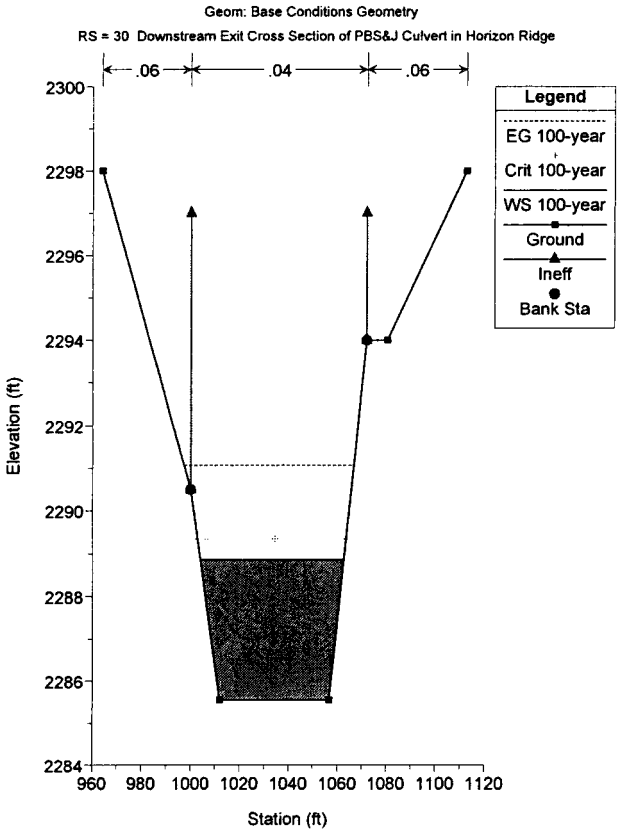

Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 50 Approach Cross Section to 2 - 18' x 9' RCBs in Horizon Ridge Pkw
.06
.035
.06
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 40 Upstream Approach Cross Section to PBS&J Culvert in Horizon Ridg
.06
.04
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 39 U.S. Face of PBS&J Culvert in Horizon Ridge Parkway
.06
.013
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005
Geom: Base Conditions Geometry
RS = 35 BR
.06
.013
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)



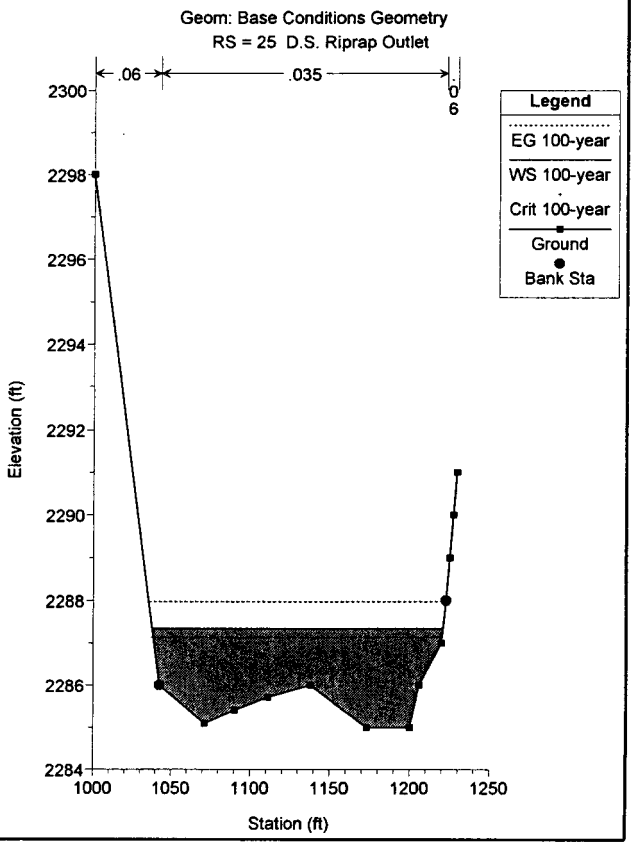
Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005



Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005

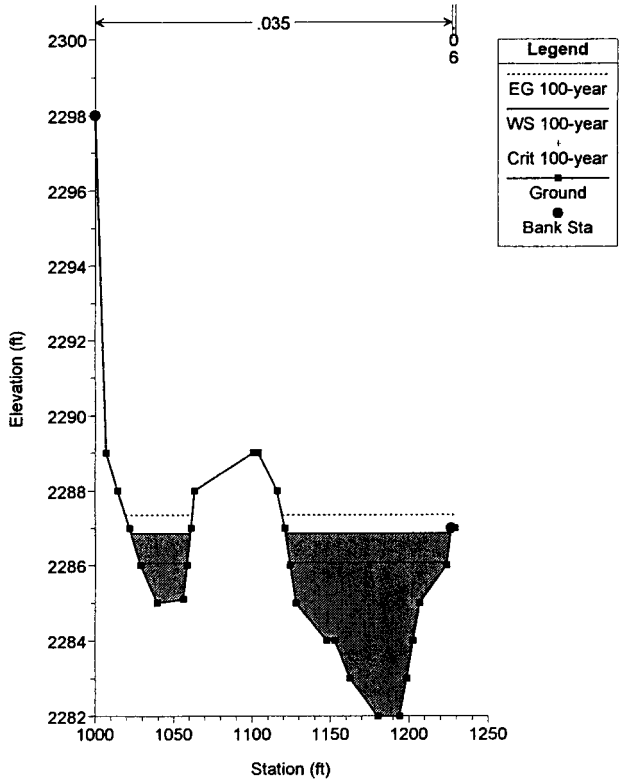


Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/26/2005



Geom: Base Conditions Geometry

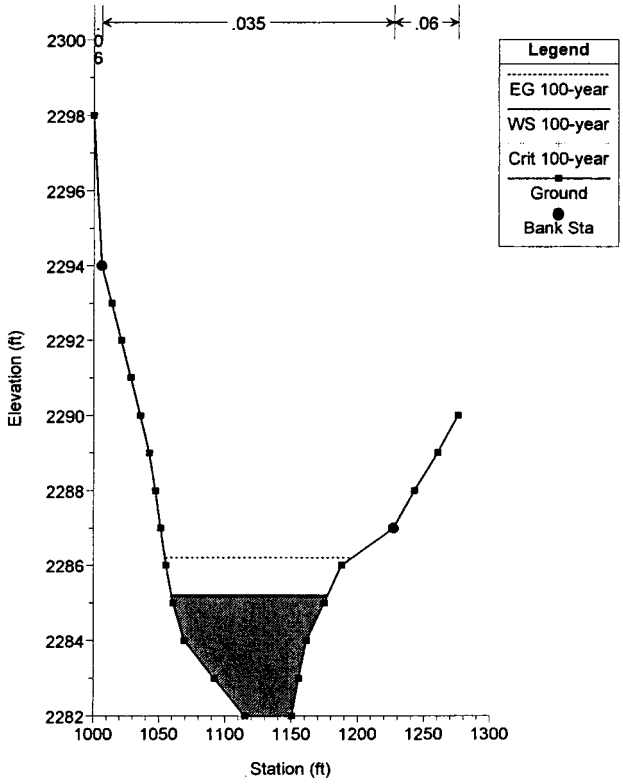
RS = 20 Exit Cross Section for PBS&J Culvert in Horizon Ridge Pkwy



Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048) Plan: Existing Pittman Anthem Parkway Channel Cross Sections 4/28/2005

Geom: Base Conditions Geometry

RS = 10 Farthest Downstream Cross Section



Errors Warnings and Notes for Plan : 5533-1900

Location:	River: Reach #1 Reach: Existing Pittman RS: 1100 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 1050 Profile: 100-year
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 1000 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 950 Profile: 100-year
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 900 Profile: 100-year
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 850 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 800 Profile: 100-year
Note:	Program found supercritical flow starting at this cross section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 700 Profile: 100-year
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 650 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 600 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 550 Profile: 100-year
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 500 Profile: 100-year
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

Errors Warnings and Notes for Plan : 5533-1900 (Continued)

	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 450 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 400 Profile: 100-year
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 350 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 300 Profile: 100-year
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Program found supercritical flow starting at this cross section,
Location:	River: Reach #1 Reach: Existing Pittman RS: 250 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 200 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	selected the water surface that had the least amount of error between computed and assumed
	values.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Existing Pittman RS: 100 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 50 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	used critical depth for the water surface and continued on with the calculations.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.

Errors Warnings and Notes for Plan : 5533-1900 (Continued)

Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Existing Pittman RS: 40 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Note:	Program found supercritical flow starting at this cross section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 39 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Reach #1 Reach: Existing Pittman RS: 35 Profile: 100-year
Warning:	Pier drag coefficient of 2.0 assumed for Class B flow.
Note:	Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The
	momentum answer has been disregarded.
Location:	River: Reach #1 Reach: Existing Pittman RS: 35 Profile: 100-year Upstream
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Reach #1 Reach: Existing Pittman RS: 35 Profile: 100-year Downstream
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	used critical depth for the water surface and continued on with the calculations.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Reach #1 Reach: Existing Pittman RS: 31 Profile: 100-year
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy
	was used.
Location:	River: Reach #1 Reach: Existing Pittman RS: 30 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Reach #1 Reach: Existing Pittman RS: 25 Profile: 100-year
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Reach #1 Reach: Existing Pittman RS: 20 Profile: 100-year

Errors Warnings and Notes for Plan : 5533-1900 (Continued)

Warning:	Divided flow computed for this cross-section.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.

HEC-RAS Version 3.1.2 April 2004
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X       X
X     X  X        X    X       X   X    X    X       X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Green Valley 45 (MPU Facility ID PTAP 0045 and PTAP 0048)
Project File : 1905EXISTING.prj
Run Date and Time: 4/25/2005 3:28:31 PM

Project in English units

Project Description:
Existing Pittman Anthem Parkway Channel Cross Sections

PLAN DATA

Plan Title: Existing Pittman Anthem Parkway Channel Cross Sections
Plan File : f:\5533-1905\calc\Hydro\CLOMR\RMS\ex-bridge\1905EXISTING.P01

Geometry Title: Base Conditions Geometry
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\RMS\ex-bridge\1905EXISTING.G01

Flow Title : 1 Flow Profiles
Flow File : f:\5533-1905\calc\Hydro\CLOMR\RMS\ex-bridge\1905EXISTING.F01

Plan Summary Information:
Number of: Cross Sections = 28 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 1 Flow Profiles
Flow File : f:\5533-1905\calc\Hydro\CLOMR\RMS\ex-bridge\1905EXISTING.F01

Flow Data (cfs)

River	Reach	RS	100-year
Reach #1	Existing Pittman	1100	1329
Reach #1	Existing Pittman	850	1337
Reach #1	Existing Pittman	450	1339
Reach #1	Existing Pittman	100	1527
Reach #1	Existing Pittman	31	2039

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Existing Pittman	100-year	Normal S = 0.011606	Known WS = 2285.21

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\RMS\ex-bridge\1905EXISTING.G01

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 1100

INPUT
Description: Furthest Upstream Offsite
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2326	1014.44	2325	1027.45	2324	1038.72	2323	1050.05	2322
1061.51	2321	1079.62	2320	1088.33	2319	1091.9	2319	1101.58	2320
1111.32	2321	1139.01	2322	1143.19	2323	1148.45	2324	1169.02	2325
1199.7	2326								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1050.05	.035	1139.01	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1050.05	1139.01	86.16	86.16	86.16	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 1050

INPUT
Description: Offsite
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2326	1009.91	2325	1019.32	2324	1027.11	2323	1038.89	2322
1046.55	2321	1050.87	2320	1055.05	2319	1075.86	2318	1089.91	2318
1098.12	2319	1133.33	2320	1138.45	2321	1143.5	2322	1218.87	2323

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1038.89	.035	1143.5	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1038.89	1143.5	69.07	69.07	69.07	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 1000

INPUT
Description: Offsite
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2326	1008.71	2325	1026.86	2324	1035.45	2323	1053.11	2322
1057.7	2321	1062.3	2320	1066.91	2319	1071.46	2318	1076.07	2317
1080.99	2317	1083.86	2317	1088.62	2316	1093.26	2316	1102.2	2317
1106.66	2318	1111.01	2319	1124.53	2319	1134.59	2318	1147.14	2318
1150.54	2319	1154	2320	1157.46	2321	1209.07	2321	1235.94	2321

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1062.3	.035	1154	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1062.3	1154	37.52	37.52	37.52	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 950

INPUT
Description: Offsite
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2324	1010.55	2323	1013.13	2322	1018.45	2321	1024.26	2320
1028.85	2319	1033.63	2318	1041.86	2317	1052.07	2316	1064.3	2316
1072.29	2317	1079.8	2318	1091.51	2318	1108.35	2317	1111.22	2317
1115.39	2318	1119.53	2319	1124.61	2320	1220.28	2321		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1024.26	.035	1124.61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1024.26	1124.61	38.25	38.25	38.25	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 900

INPUT
Description: Offsite
Station Elevation Data num= 23

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2326 1009.01    2325 1018.72    2324 1027.82    2323 1031.84    2322
 1035.21    2321 1038.58    2320 1041.94    2319 1045.34    2318 1048.85    2317
 1052.41    2316 1056.74    2315 1061.46    2314 1065.03    2314 1069.34    2315
  1073.7    2316 1080.52    2317 1103.55    2317 1113.59    2317 1120.44    2318
 1132.21    2319 1203.65    2319 1253.65    2322

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1045.34    .035 1120.44     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1045.34 1120.44             93.31   93.31   93.31            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 850

INPUT
Description: Offsite
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2324 1004.33    2323 1006.82    2322 1009.25    2321 1011.78    2320
 1014.21    2319 1016.72    2318 1019.21    2317  1021.7    2316 1024.19    2315
 1026.69    2314 1029.24    2313 1033.26    2313 1038.11    2314 1042.69    2315
 1048.68    2316 1084.26    2317 1108.96    2318 1149.61    2318 1174.67    2318
 1245.42    2320

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1014.21    .035 1108.96     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1014.21 1108.96             82.69   82.69   82.69            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 800

INPUT
Description: Site Entrance
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2325 1006.75    2324 1009.37    2323    1012    2322 1014.64    2321
 1017.21    2320 1019.82    2319 1022.44    2318 1025.07    2317 1027.66    2316
 1030.27    2315 1034.78    2314 1040.92    2313  1048.1    2313 1054.26    2314
 1065.52    2315 1091.71    2316 1168.23    2317 1180.86    2317 1233.45    2318

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1027.66    .035 1091.71     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1027.66 1091.71             77.81   77.81   77.81            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 750

INPUT
Description: Onsite
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2320 1002.88    2319 1005.76    2318 1008.63    2317 1011.47    2316
  1014.3    2315 1017.13    2314 1027.13    2313 1038.19    2313  1047.2    2314
 1050.87    2314 1064.93    2314 1072.93    2315  1179.4    2316 1209.16    2317

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1011.47    .035 1072.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1011.47 1072.93             61.64   61.64   61.64            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 700

INPUT
Description: Onsite
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2323 1002.83    2322 1004.84    2321 1006.87    2320 1008.91    2319
 1010.95    2318    1013    2317 1015.04    2316 1017.08    2315 1019.13    2314
 1021.17    2313 1036.69    2312 1042.73    2312 1049.06    2313 1066.75    2313
 1074.63    2313 1090.07    2314 1114.91    2315 1142.08    2315 1188.78    2315
  1214.4    2316
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1017.08    .035 1114.91     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1017.08 1114.91             92.43   92.43   92.43            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 650

INPUT
Description: Onsite
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2319 1002.81    2318 1005.59    2317 1008.33    2316 1011.07    2315
 1013.87    2314 1016.62    2313 1020.49    2312 1053.84    2312 1068.78    2312
 1083.58    2312 1105.79    2313 1176.62    2314 1194.74    2315 1218.93    2316
 1246.05    2317

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1008.33    .035 1194.74     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1008.33 1194.74             84.53   84.53   84.53            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 600

INPUT
Description: Onsite
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2317 1002.51    2316 1004.94    2315 1007.37    2314 1009.81    2313
 1012.29    2312 1014.69    2311 1017.18    2310 1019.77    2309 1028.69    2308
 1033.54    2308 1037.76    2309 1046.83    2310 1086.48    2311 1090.37    2312
 1135.54    2313

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1014.69    .035 1086.48     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1014.69 1086.48              64.5    64.5    64.5            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 550

INPUT
Description: Church
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2315 1025.57    2314 1038.92    2313 1042.51    2312  1045.9    2311
 1051.78    2310 1065.17    2309  1071.8    2308 1076.58    2307 1077.53    2307
 1082.45    2308 1092.54    2309 1115.29    2309 1120.08    2309 1124.81    2310
 1130.03    2311 1134.64    2312 1144.49    2312 1161.14    2312 1180.37    2313

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06  1045.9    .035 1134.64     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        1045.9 1134.64             57.03   57.03   57.03            .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 500

INPUT
Description: Church
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2312 1015.02    2311 1029.08    2310 1065.19    2309 1077.78    2308
 1084.99    2307 1092.14    2307  1096.5    2308 1134.44    2309 1139.53    2310
 1144.34    2311 1150.88    2312

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1029.08    .035 1139.53     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1029.08 1139.53            114.11  114.11  114.11            .1      .3
```

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 450

INPUT
Description: Church
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2311	1011.8	2310	1023.35	2309	1033.77	2308	1038.25	2308
1073.09	2308	1082.56	2307	1092.63	2306	1097.45	2306	1107.38	2307
1123.83	2307	1138.6	2306	1150.27	2306	1152.09	2307	1153.93	2308
1155.78	2309	1157.56	2310						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1023.35	.035	1155.78	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1023.35	1155.78	90.5	90.5	90.5	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 400

INPUT
Description: Church
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2311	1012.66	2310	1027.88	2309	1043.81	2308	1052.7	2307
1059.26	2306	1138.52	2305	1143.41	2304	1143.59	2304	1156.56	2305
1159.12	2306	1164.31	2307	1169.1	2308	1173.28	2309	1178.78	2310

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1052.7	.035	1164.31	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1052.7	1164.31	80.15	80.15	80.15	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 350

INPUT
Description: Onsite
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2310	1020.12	2309	1035.9	2308	1047.57	2307	1058.46	2306
1064.15	2305	1069.83	2304	1084.48	2304	1103.25	2304	1132.04	2304
1134.55	2305	1136.23	2305	1174.11	2305	1183.18	2306	1191.38	2307
1199.57	2308	1207.83	2309	1215.92	2310				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1047.57	.035	1191.38	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1047.57	1191.38	102.42	102.42	102.42	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 300

INPUT
Description: Onsite
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2306	1030.55	2305	1043.66	2304	1065.16	2303	1068.09	2302
1070.54	2301	1073.03	2300	1074.89	2300	1078.49	2301	1099.6	2302
1112.31	2303	1149.13	2303	1177.72	2303	1187.64	2304	1196.28	2305
1202.2	2306								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1043.66	.035	1187.64	.06

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
1043.66	1187.64	82.13	82.13	82.13	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Existing Pittman RS: 250

INPUT
Description: Onsite

```
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2305 1053.35    2304 1078.06    2303 1090.95    2302 1128.16    2301
 1144.05    2300 1162.92    2300 1170.74    2301 1198.75    2301  1208.3    2301
 1214.23    2302 1219.65    2303 1241.81    2304 1259.16    2305 1263.72    2306
 1268.29    2307

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1078.06    .035 1219.65     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1078.06 1219.65           118.14  118.14  118.14             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 200

INPUT
Description: Onsite
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2302 1052.14    2301 1066.92    2300 1092.41    2299  1099.2    2299
 1138.77    2299 1149.21    2298  1157.1    2297 1164.11    2297 1169.15    2298
 1172.19    2299 1175.62    2300 1186.61    2301  1216.1    2302  1233.8    2303
 1254.56    2304 1264.67    2305 1269.44    2306 1274.26    2307

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1066.92    .035 1186.61     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1066.92 1186.61           197.16  197.16  197.16             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 100

INPUT
Description: Combined Onsite and School Flows
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2300 1023.31    2299 1048.26    2298 1071.14    2297 1087.77    2296
 1098.47    2296 1099.45    2296 1118.98    2296  1167.2    2296 1181.19    2295
 1197.92    2295 1200.96    2296 1203.42    2297 1205.56    2298  1210.2    2298
 1212.83    2298 1214.96    2299    1217    2300 1218.86    2301

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1071.14    .035 1214.96     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1071.14 1214.96           103.83  103.83  103.83             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 50

INPUT
Description: Approach Cross Section to 2 - 18' x 9' RCBs in Horizon Ridge Pkwy
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2299 1033.65    2298 1059.99    2297 1074.15    2296 1088.51    2293
 1110.14  2292.5 1120.32    2293 1129.72    2294 1135.57    2295 1140.98    2296
 1150.33    2297 1165.87 2298.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1059.99    .035 1150.33     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1059.99 1150.33            66.81   66.81   66.81             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 40

INPUT
Description: Upstream Approach Cross Section to PBS&J Culvert in Horizon Ridge
             Pkwy
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2298 1017.32    2297 1044.09  2287.3 1089.94  2287.3 1125.74    2295
 1128.25    2295 1130.09    2296 1158.22 2298.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
    1000     .06 1017.32     .04 1130.09     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1017.32 1130.09              25      25      25             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1000 1017.32 2298.13       F
 1130.09 1158.22 2298.13       F

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 39

INPUT
Description: U.S. Face of PBS&J Culvert in Horizon Ridge Parkway
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1010.76  2296.5 1030.01    2287 1073.63    2287 1098.63    2292

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1010.76     .06 1030.01    .013 1073.63     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1030.01 1073.63           112.9   112.9   112.9             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1010.76 1030.01 2298.13       F
 1073.63 1098.63 2298.13       F

BRIDGE


RIVER: Reach #1
REACH: Existing Pittman   RS: 35

INPUT
Description:
Distance from Upstream XS =       .5
Deck/Roadway Width        =    110.1
Weir Coefficient          =      2.5
Upstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 1010.76 2298.13         1011.77 2298.13         1030.01 2299.57 2298.13
 1073.63 2299.57 2298.13 1098.63 2298.13

Upstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 1010.76  2296.5 1030.01    2287 1073.63    2287 1098.63    2292

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 1010.76     .06 1030.01    .013 1073.63     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1030.01 1073.63             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 1010.76 1030.01 2298.13       F
 1073.63 1098.63 2298.13       F

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    1000 2298.01         1029.55 2299.43    2298 1068.93 2299.43    2298
 1081.78 2298.01

Downstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  2290.5 1029.55    2286 1068.93    2286 1081.78    2294

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1029.55     .04 1068.93     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1029.55 1068.93             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1000 1029.55 2298.01       F
 1068.93 1081.78 2298.01       F

Upstream Embankment side slope             =         horiz. to 1.0 vertical
Downstream Embankment side slope           =         horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        = 2298.01
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested
```

```
Number of Piers =  1

Pier Data
Pier Station     Upstream= 1051.82    Downstream= 1049.24
Upstream      num=        2
    Width   Elev    Width   Elev
        2    2286        2 2298.13
Downstream      num=        2
    Width   Elev    Width   Elev
        2    2286        2 2298.13

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =      .5
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 31

INPUT
Description: D.S. Face of PBS&J Culvert in Horizon Ridge Parkway
Station Elevation Data    num=        4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  2290.5 1029.55    2286 1068.93    2286 1081.78    2294

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1029.55     .04 1068.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1029.55 1068.93             16.2    16.2    16.2             .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
    1000 1029.55 2298.01       F
 1068.93 1081.78 2298.01       F

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 30

INPUT
Description: Downstream Exit Cross Section of PBS&J Culvert in Horizon Ridge
             Pkwy
Station Elevation Data    num=        7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  964.05 2298.01    1000  2290.5    1012 2285.55 1056.63 2285.55 1071.65    2294
 1080.23    2294 1112.22    2298

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  964.05     .06    1000     .04 1071.65     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000 1071.65           140.11  140.11  140.11             .3       .5
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
  964.05    1000    2297       F
 1071.65 1112.22    2297       F

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 25

INPUT
Description: D.S. Riprap Outlet
Station Elevation Data    num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 2298.01 1042.48    2286 1071.29  2285.1 1090.25 2285.41 1111.18 2285.71
 1137.84    2286 1173.04    2285 1199.99    2285  1205.9    2286 1219.69    2287
 1222.61    2288  1224.9    2289 1227.15    2290 1229.39    2291

Manning's n Values        num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1042.48    .035 1222.61     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1042.48 1222.61             82.08   82.08   82.08             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 20

INPUT
Description: Exit Cross Section for PBS&J Culvert in Horizon Ridge Pkwy
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 2298.01 1007.25    2289 1014.51    2288 1021.82    2287 1029.09    2286
 1039.58    2285 1056.24  2285.1 1058.66    2286 1061.07    2287 1063.52    2288
 1100.69    2289 1103.83    2289 1115.92    2288 1120.93    2287 1124.45    2286
 1128.11    2285 1147.67    2284 1152.79    2284 1162.68    2283 1180.42    2282
 1194.14    2282 1198.59    2283 1202.54    2284 1206.76    2285 1223.73    2286
 1226.59    2287 1228.93    2287

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06    1000    .035 1226.59     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000 1226.59           142.48  142.48  142.48             .1      .3

CROSS SECTION


RIVER: Reach #1
REACH: Existing Pittman   RS: 10

INPUT
Description: Farthest Downstream Cross Section

Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 2298.01 1006.44    2294 1013.72    2293 1021.17    2292 1028.48    2291
 1035.84    2290 1042.79    2289 1047.34    2288 1051.19    2287 1055.49    2286
 1060.91    2285  1069.5    2284 1092.18    2283 1115.22    2282 1150.48    2282
 1155.61    2283 1161.24    2284 1174.86    2285 1188.01    2286 1227.05    2287
 1242.91    2288 1260.54    2289 1275.91    2290

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1006.44    .035 1227.05     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
       1006.44 1227.05             .1      .3


SUMMARY OF MANNING'S N VALUES

River:Reach #1

      Reach          River Sta.       n1        n2        n3

 Existing Pittman     1100              .06      .035      .06
 Existing Pittman     1050              .06      .035      .06
 Existing Pittman     1000              .06      .035      .06
 Existing Pittman     950               .06      .035      .06
 Existing Pittman     900               .06      .035      .06
 Existing Pittman     850               .06      .035      .06
 Existing Pittman     800               .06      .035      .06
 Existing Pittman     750               .06      .035      .06
 Existing Pittman     700               .06      .035      .06
 Existing Pittman     650               .06      .035      .06
 Existing Pittman     600               .06      .035      .06
 Existing Pittman     550               .06      .035      .06
 Existing Pittman     500               .06      .035      .06
 Existing Pittman     450               .06      .035      .06
 Existing Pittman     400               .06      .035      .06
 Existing Pittman     350               .06      .035      .06
 Existing Pittman     300               .06      .035      .06
 Existing Pittman     250               .06      .035      .06
 Existing Pittman     200               .06      .035      .06
 Existing Pittman     100               .06      .035      .06
 Existing Pittman     50                .06      .035      .06
 Existing Pittman     40                .06       .04      .06
 Existing Pittman     39                .06      .013      .06
 Existing Pittman     35             Bridge
 Existing Pittman     31                .06       .04      .06
 Existing Pittman     30                .06       .04      .06
 Existing Pittman     25                .06      .035      .06
```

Existing Pittman	20	.06	.035	.06
Existing Pittman	10	.06	.035	.06

SUMMARY OF REACH LENGTHS

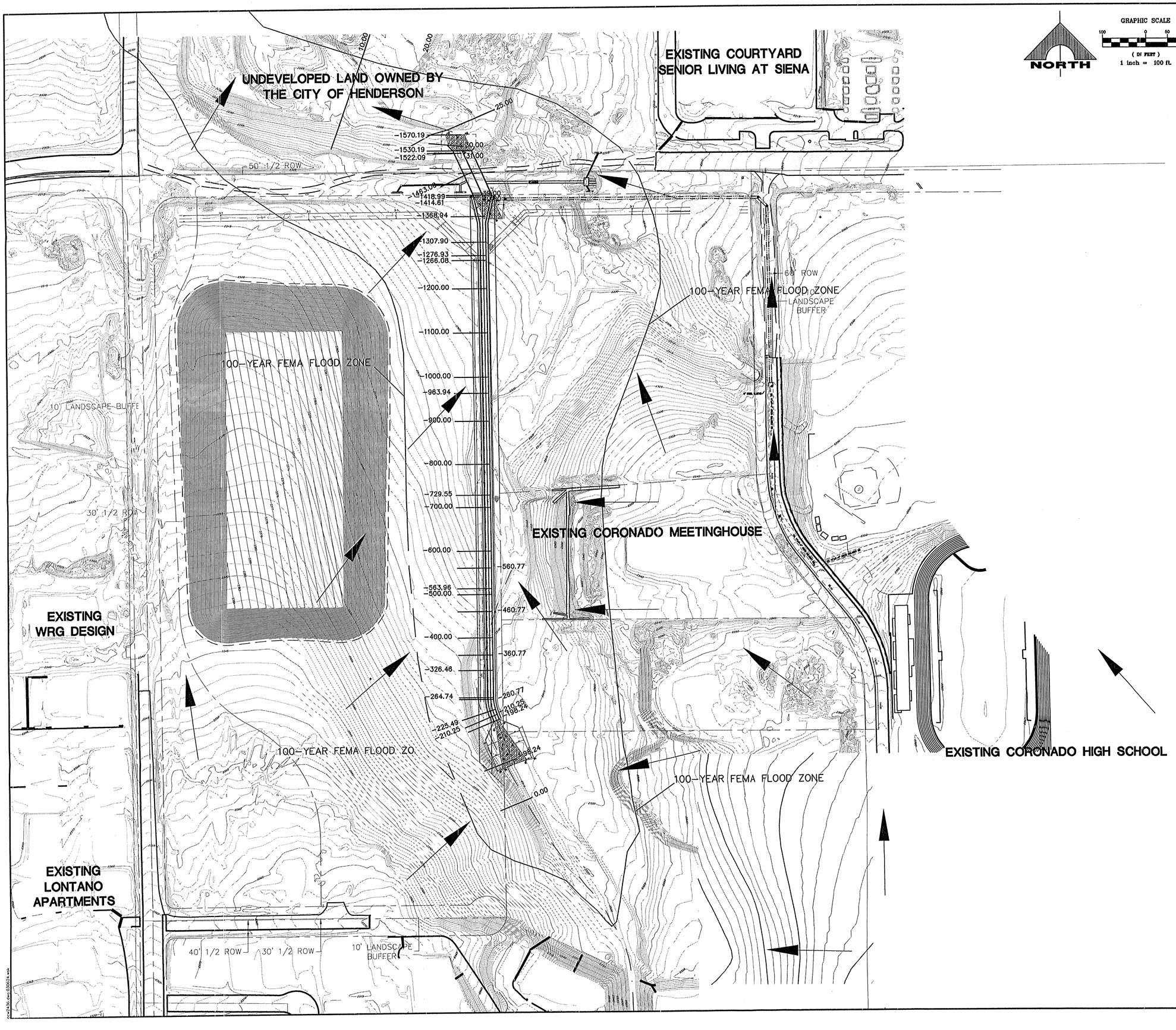
River: Reach #1

Reach	River Sta.	Left	Channel	Right
Existing Pittman	1100	86.16	86.16	86.16
Existing Pittman	1050	69.07	69.07	69.07
Existing Pittman	1000	37.52	37.52	37.52
Existing Pittman	950	38.25	38.25	38.25
Existing Pittman	900	93.31	93.31	93.31
Existing Pittman	850	82.69	82.69	82.69
Existing Pittman	800	77.81	77.81	77.81
Existing Pittman	750	61.64	61.64	61.64
Existing Pittman	700	92.43	92.43	92.43
Existing Pittman	650	84.53	84.53	84.53
Existing Pittman	600	64.5	64.5	64.5
Existing Pittman	550	57.03	57.03	57.03
Existing Pittman	500	114.11	114.11	114.11
Existing Pittman	450	90.5	90.5	90.5
Existing Pittman	400	80.15	80.15	80.15
Existing Pittman	350	102.42	102.42	102.42
Existing Pittman	300	82.13	82.13	82.13
Existing Pittman	250	118.14	118.14	118.14
Existing Pittman	200	197.16	197.16	197.16
Existing Pittman	100	103.83	103.83	103.83
Existing Pittman	50	66.81	66.81	66.81
Existing Pittman	40	25	25	25
Existing Pittman	39	112.9	112.9	112.9
Existing Pittman	35	Bridge		
Existing Pittman	31	16.2	16.2	16.2
Existing Pittman	30	140.11	140.11	140.11
Existing Pittman	25	82.08	82.08	82.08
Existing Pittman	20	142.48	142.48	142.48
Existing Pittman	10			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Existing Pittman	1100	.1	.3
Existing Pittman	1050	.1	.3
Existing Pittman	1000	.1	.3
Existing Pittman	950	.1	.3
Existing Pittman	900	.1	.3
Existing Pittman	850	.1	.3
Existing Pittman	800	.1	.3
Existing Pittman	750	.1	.3
Existing Pittman	700	.1	.3
Existing Pittman	650	.1	.3
Existing Pittman	600	.1	.3
Existing Pittman	550	.1	.3
Existing Pittman	500	.1	.3
Existing Pittman	450	.1	.3
Existing Pittman	400	.1	.3
Existing Pittman	350	.1	.3
Existing Pittman	300	.1	.3
Existing Pittman	250	.1	.3
Existing Pittman	200	.1	.3
Existing Pittman	100	.1	.3
Existing Pittman	50	.1	.3
Existing Pittman	40	.3	.5
Existing Pittman	39	.3	.5
Existing Pittman	35	Bridge	
Existing Pittman	31	.3	.5
Existing Pittman	30	.3	.5
Existing Pittman	25	.1	.3
Existing Pittman	20	.1	.3
Existing Pittman	10	.1	.3

Developed Condition



LEGEND

- DRAINAGE SUBBASIN
- CONCENTRATION POINT
- SUBBASIN BOUNDARY
- MPU BASIN BOUNDARY
- PRORATED SUBBASIN
- FLOW DIRECTION
- 1000 HYDRAULIC MODEL STATIONING

HEC-RAS MODEL INLET			
Station	Q Total (cfs)	HGL (ft)	Vel. Chnl (ft/s)
0.00	1338	2318.6	5.3
-98.24	1338	2316.7	8.6
-198.24	1338	2314.1	4.2
-210.25	1338	2310.3	15.4
-260.77	1338	2309.6	15.4
-360.77	1338	2306.7	19.6
-460.77	1338	2305.0	21.0
-560.77	1338	2303.4	21.9

WSPG MODEL Mainline RCB			
Station	Q Total (cfs)	HGL (ft)	Vel. Chnl (ft/s)
-1570.19	1572	2288.0	14.3
-1530.19	1572	2287.7	22.5
-1522.09	1561	2290.2	20.8
-1463.00	1383	2289.6	25.6
-1418.99	1383	2289.9	26.1
-1414.61	1383	2291.8	24.3
-1368.94	1383	2292.4	24.2
-1307.90	1382	2293.2	24.1
-1276.93	1361	2293.5	24.3
-1266.08	1359	2293.7	24.4
-1200.00	1359	2294.6	24.3
-1100.00	1359	2295.9	24.1
-1000.00	1359	2297.3	23.9
-963.94	1359	2297.8	23.8
-900.00	1359	2298.7	23.7
-800.00	1359	2300.0	23.3
-729.55	1354	2301.0	23.2
-700.00	1354	2301.4	23.0
-600.00	1354	2302.9	22.5
-563.96	1354	2303.4	22.2
-500.00	1354	2304.4	21.7
-400.00	1354	2306.0	20.5
-326.46	1338	2307.1	19.9
-264.74	1338	2308.3	18.6
-225.49	1338	2309.3	17.1
-210.25	1338	2310.3	15.3

HEC-RAS MODEL OUTLET			
Station	Q Total (cfs)	HGL (ft)	Vel. Chnl (ft/s)
40.00	1570	2295.1	16.2
39.00	2082	2293.3	18.5
31.00	2082	2288.4	22.6
30.00	2082	2287.9	18.1
25.00	2082	2287.4	6.3
20.00	2082	2286.9	5.6
10.00	2082	2285.3	8.2

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 05-02-05
PLOT TIME: 08:06:56

DESCRIPTION | DATE | REV | DATE AGEN. APP | DATE CCW APP | DATE:

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
P:\5533-1995\cad\Hydro\COLOMA\Figures\Exhibit-Dr.dwg bmeyer

PARDEE HOMES OF NEVADA
GREEN VALLEY 45 OFFSITE DRAINGAE
PROPOSED CONDITIONS DRAINAGE MAP

DRAWING
EX-D
SHT OF SHTS

dx=2436,dwg,030624,wds

WSPGW Analysis

Developed Condition

```
T1 Green Valley 45 Offsite Storm Drain 5533.1905
T2 Pardee Homes of Nevada
T3 MAINLINE.WSW (Main RCB)
SO  -1570.1902285.470  9
R   -1570.1902285.470  9      .040                                    .000    .000  0
R   -1530.1902286.000  9      .040                                    .000    .000  0
WX  -1530.1902286.000  1      .013
JX  -1522.0902286.063  1  8   .013   11.000         2291.880          90.0         .000
JX  -1463.0002286.601  1  2   .013  178.000         2289.000          90.0         .000
R   -1418.9902287.000  1      .013                                    .000    .000 1
WX  -1418.9902287.000  1      .013
TS  -1414.6102287.040  5      .013                                    .000    .000 0
R   -1368.9402287.663  5      .013                                  24.000    .000 1
JX  -1307.9002288.471  5  8   .013    1.000         2293.960         -45.0         .000
JX  -1276.9302288.880  5 10   .013   21.000         2292.870          45.0         .000
JX  -1266.0802289.025  5  8   .013    2.000         2294.51          -45.0         .000
R   -1200.0002289.897  5      .013                                    .000    .000 0
R   -1100.0002291.217  5      .013                                    .000    .000 0
R   -1000.0002292.537  5      .013                                    .000    .000 0
R    -963.9402293.025  5      .013                                    .000    .000 1
R    -900.0002293.869  5      .013                                    .000    .000 0
R    -800.0002295.189  5      .013                                    .000    .000 0
JX   -729.5502296.128  5  7   .013    5.000         2300.620         -45.0         .000
R    -700.0002296.518  5      .013                                    .000    .000 0
R    -600.0002297.838  5      .013                                    .000    .000 0
R    -563.9602298.321  5      .013                                    .000    .000 1
R    -500.0002299.165  5      .013                                    .000    .000 0
R    -400.0002300.485  5      .013                                    .000    .000 0
JX   -326.4602301.462  5  10 8.013   10.500    5.5002305.4602306.990 45.0-45.0    .000
R    -264.7402302.279  5      .013                                  .000    .000 0
R    -225.4902302.798  5      .013                                21.000    .000 1
R    -210.2502303.000  5      .013                                  .000    .000 0
SH   -210.2502303.000  5                          2316.810
CD   1  3   0    .000   9.000   18.000  .000  .000   .00
CD   2  4   0    .000   3.500     .000  .000  .000   .00
CD   3  4   0    .000   5.500     .000  .000  .000   .00
CD   4  4   0    .000   6.000     .000  .000  .000   .00
CD   5  3   0    .000   8.000   12.000  .000  .000   .00
CD   6  4   0    .000   2.000     .000  .000  .000   .00
CD   7  4   0    .000   2.500     .000  .000  .000   .00
CD   8  4   0    .000   1.500     .000  .000  .000   .00
CD   9  1   0    .000   5.000   39.000 2.000 2.000   .00
CD  10  4   0    .000   3.000     .000  .000  .000   .00
Q          1338.000   .0
```

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING Date: 4-25-2005 Time: 8:27:28

Green Valley 45 Offsite Storm Drain 5533.1905

Pardee Homes of Nevada

MAINLINE.WSW (Main RCB)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT or "N"	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp		X-Fall	ZR	Type Ch
-1570.190	2285.470	2.496	2287.967	1572.00	14.31	3.18	2291.15	.00	3.47	48.99	5.000	39.000	2.00	0 .0
2.391	.0133					.0541	.13	2.50	1.68	3.72	.040	.00	2.00	TRAP
-1567.799	2285.502	2.446	2287.948	1572.00	14.64	3.33	2291.28	.00	3.47	48.78	5.000	39.000	2.00	0 .0
4.879	.0133					.0604	.29	2.45	1.74	3.72	.040	.00	2.00	TRAP
-1562.920	2285.566	2.343	2287.909	1572.00	15.36	3.66	2291.57	.00	3.47	48.37	5.000	39.000	2.00	0 .0
4.714	.0133					.0700	.33	2.34	1.86	3.72	.040	.00	2.00	TRAP
-1558.206	2285.629	2.244	2287.873	1572.00	16.11	4.03	2291.90	.00	3.47	47.98	5.000	39.000	2.00	0 .0
4.540	.0133					.0811	.37	2.24	1.99	3.72	.040	.00	2.00	TRAP
-1553.665	2285.689	2.149	2287.838	1572.00	16.89	4.43	2292.27	.00	3.47	47.60	5.000	39.000	2.00	0 .0
4.361	.0133					.0939	.41	2.15	2.13	3.72	.040	.00	2.00	TRAP
-1549.304	2285.747	2.058	2287.804	1572.00	17.72	4.88	2292.68	.00	3.47	47.23	5.000	39.000	2.00	0 .0
4.180	.0133					.1089	.46	2.06	2.28	3.72	.040	.00	2.00	TRAP
-1545.124	2285.802	1.970	2287.772	1572.00	18.58	5.36	2293.14	.00	3.47	46.88	5.000	39.000	2.00	0 .0
3.999	.0133					.1263	.50	1.97	2.44	3.72	.040	.00	2.00	TRAP
-1541.126	2285.855	1.886	2287.741	1572.00	19.49	5.90	2293.64	.00	3.47	46.54	5.000	39.000	2.00	0 .0
3.820	.0133					.1465	.56	1.89	2.61	3.72	.040	.00	2.00	TRAP
-1537.306	2285.906	1.805	2287.710	1572.00	20.44	6.49	2294.20	.00	3.47	46.22	5.000	39.000	2.00	0 .0
3.644	.0133					.1700	.62	1.80	2.79	3.72	.040	.00	2.00	TRAP

Green Valley 45 Offsite Storm Drain 5533.1905
Pardee Homes of Nevada
MAINLINE.WSW (Main RCB)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-1533.662	2285.954	1.727	2287.681	1572.00	21.44	7.14	2294.82	.00	3.47	45.91	5.000	39.000	2.00	0 .0
3.472	.0133					.1973	.69	1.73	2.99	3.72	.040	.00	2.00	TRAP
-1530.190	2286.000	1.652	2287.653	1572.00	22.49	7.85	2295.50	.00	3.47	45.61	5.000	39.000	2.00	0 .0
WALL	EXIT													
-1530.190	2286.000	4.248	2290.248	1572.00	20.56	6.56	2296.81	.00	6.19	18.00	9.000	18.000	.00	0 .0
JUNCT STR	.0078					.0081	.07	4.25	1.76		.013	.00	.00	BOX
-1522.090	2286.063	4.161	2290.224	1561.00	20.84	6.75	2296.97	.00	6.16	18.00	9.000	18.000	.00	0 .0
JUNCT STR	.0091					.0126	.74	4.16	1.80		.013	.00	.00	BOX
-1463.000	2286.601	3.005	2289.606	1383.00	25.57	10.15	2299.76	.00	5.68	18.00	9.000	18.000	.00	0 .0
44.010	.0091					.0175	.77	3.01	2.60	3.71	.013	.00	.00	BOX
-1418.990	2287.000	2.942	2289.942	1383.00	26.11	10.59	2300.53	.00	5.68	18.00	9.000	18.000	.00	0 .0
WALL	EXIT													
-1418.990	2287.000	2.942	2289.942	1383.00	26.11	10.59	2300.53	.00	5.68	18.00	9.000	18.000	.00	0 .0
TRANS STR	.0091					.0152	.07	2.94	2.68		.013	.00	.00	BOX
-1414.610	2287.040	4.741	2291.781	1383.00	24.31	9.18	2300.96	2.02	7.45	12.00	8.000	12.000	.00	0 .0
45.670	.0136					.0123	.56	6.76	1.97	4.57	.013	.00	.00	BOX
-1368.940	2287.663	4.763	2292.426	1383.00	24.20	9.09	2301.52	.00	7.45	12.00	8.000	12.000	.00	0 .0
JUNCT STR	.0132					.0121	.74	6.76	1.95		.013	.00	.00	BOX

Green Valley 45 Offsite Storm Drain 5533.1905
Pardee Homes of Nevada
MAINLINE.WSW (Main RCB)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT or I.D.	Base Wt "N"	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp		X-Fall	ZR	Type Ch
-1307.900	2288.471	4.778	2293.249	1382.00	24.10	9.02	2302.27	.00	7.44	12.00	8.000	12.000	.00	0 .0
JUNCT STR	.0132					.0123	.38	4.78	1.94		.013	.00	.00	BOX
-1276.930	2288.880	4.664	2293.544	1361.00	24.32	9.18	2302.72	.00	7.36	12.00	8.000	12.000	.00	0 .0
JUNCT STR	.0134					.0125	.14	4.66	1.98		.013	.00	.00	BOX
-1266.080	2289.025	4.649	2293.674	1359.00	24.36	9.21	2302.89	.00	7.36	12.00	8.000	12.000	.00	0 .0
66.080	.0132					.0125	.83	4.65	1.99	4.57	.013	.00	.00	BOX
-1200.000	2289.897	4.663	2294.561	1359.00	24.28	9.16	2303.72	.00	7.36	12.00	8.000	12.000	.00	0 .0
100.000	.0132					.0124	1.24	4.66	1.98	4.57	.013	.00	.00	BOX
-1100.000	2291.217	4.692	2295.909	1359.00	24.14	9.05	2304.95	.00	7.36	12.00	8.000	12.000	.00	0 .0
100.000	.0132					.0121	1.21	4.69	1.96	4.57	.013	.00	.00	BOX
-1000.000	2292.537	4.730	2297.268	1359.00	23.94	8.90	2306.17	.00	7.36	12.00	8.000	12.000	.00	0 .0
36.060	.0135					.0119	.43	4.73	1.94	4.53	.013	.00	.00	BOX
-963.940	2293.025	4.751	2297.776	1359.00	23.83	8.82	2306.60	.00	7.36	12.00	8.000	12.000	.00	0 .0
63.940	.0132					.0117	.75	4.75	1.93	4.57	.013	.00	.00	BOX
-900.000	2293.869	4.787	2298.656	1359.00	23.66	8.69	2307.35	.00	7.36	12.00	8.000	12.000	.00	0 .0
100.000	.0132					.0114	1.14	4.79	1.91	4.57	.013	.00	.00	BOX
-800.000	2295.189	4.858	2300.047	1359.00	23.31	8.44	2308.49	.00	7.36	12.00	8.000	12.000	.00	0 .0
JUNCT STR	.0133					.0111	.78	4.86	1.86		.013	.00	.00	BOX

Green Valley 45 Offsite Storm Drain 5533.1905
Pardee Homes of Nevada
MAINLINE.WSW (Main RCB)

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-729.550	2296.128	4.873	2301.001	1354.00	23.16	8.33	2309.33	.00	7.34	12.00	8.000	12.000	.00	0 .0
29.550	.0132					.0109	.32	4.87	1.85	4.56	.013	.00	.00	BOX
-700.000	2296.518	4.901	2301.419	1354.00	23.02	8.23	2309.65	.00	7.34	12.00	8.000	12.000	.00	0 .0
100.000	.0132					.0104	1.04	4.90	1.83	4.56	.013	.00	.00	BOX
-600.000	2297.838	5.024	2302.862	1354.00	22.46	7.83	2310.70	.00	7.34	12.00	8.000	12.000	.00	0 .0
36.040	.0134					.0099	.36	5.02	1.77	4.53	.013	.00	.00	BOX
-563.960	2298.321	5.084	2303.405	1354.00	22.19	7.65	2311.05	.00	7.34	12.00	8.000	12.000	.00	0 .0
63.960	.0132					.0095	.61	5.08	1.73	4.56	.013	.00	.00	BOX
-500.000	2299.165	5.209	2304.374	1354.00	21.66	7.29	2311.66	.00	7.34	12.00	8.000	12.000	.00	0 .0
17.206	.0132					.0091	.16	5.21	1.67	4.56	.013	.00	.00	BOX
-482.794	2299.392	5.250	2304.642	1354.00	21.49	7.17	2311.82	.00	7.34	12.00	8.000	12.000	.00	0 .0
82.794	.0132					.0084	.70	5.25	1.65	4.56	.013	.00	.00	BOX
-400.000	2300.485	5.506	2305.991	1354.00	20.49	6.52	2312.51	.00	7.34	12.00	8.000	12.000	.00	0 .0
JUNCT STR	.0133					.0076	.56	5.51	1.54		.013	.00	.00	BOX
-326.460	2301.462	5.597	2307.059	1338.00	19.92	6.16	2313.22	.00	7.28	12.00	8.000	12.000	.00	0 .0
23.673	.0132					.0071	.17	5.60	1.48	4.51	.013	.00	.00	BOX
-302.787	2301.775	5.725	2307.500	1338.00	19.48	5.89	2313.39	.00	7.28	12.00	8.000	12.000	.00	0 .0
38.047	.0132					.0065	.25	5.73	1.43	4.51	.013	.00	.00	BOX

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-264.740	2302.279	6.004	2308.283	1338.00	18.57	5.35	2313.64	1.20	7.28	12.00	8.000	12.000	.00	0 .0
20.709	.0132					.0058	.12	7.20	1.34	4.51	.013	.00	.00	BOX
-244.031	2302.553	6.227	2308.780	1338.00	17.91	4.98	2313.76	1.12	7.28	12.00	8.000	12.000	.00	0 .0
18.541	.0132					.0052	.10	7.34	1.26	4.51	.013	.00	.00	BOX
-225.490	2302.798	6.531	2309.329	1338.00	17.07	4.53	2313.85	.00	7.28	12.00	8.000	12.000	.00	0 .0
3.704	.0132					.0048	.02	6.53	1.18	4.51	.013	.00	.00	BOX
-221.786	2302.847	6.618	2309.465	1338.00	16.85	4.41	2313.87	.00	7.28	12.00	8.000	12.000	.00	0 .0
8.809	.0132					.0044	.04	6.62	1.15	4.51	.013	.00	.00	BOX
-212.977	2302.964	6.941	2309.905	1338.00	16.06	4.01	2313.91	.00	7.28	12.00	8.000	12.000	.00	0 .0
2.727	.0132					.0039	.01	6.94	1.07	4.51	.013	.00	.00	BOX
-210.250	2303.000	7.281	2310.281	1338.00	15.31	3.64	2313.92	.00	7.28	12.00	8.000	12.000	.00	0 .0

HEC-RAS Analysis
Developed Condition

HEC-RAS Plan: Inlet River: Green Valley 45 Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1	0	PF 1	1338.00	2315.00	2318.62	2318.39	2319.06	0.010065	5.30	252.68	181.45	0.79
1	-98.24*	PF 1	1338.00	2314.00	2316.74	2316.74	2317.89	0.018279	8.59	155.72	68.57	1.00
1	-108.24*	PF 1	1338.00	2312.92	2315.44	2316.02	2317.52	0.043328	11.60	115.38	62.00	1.50
1	-118.24*	PF 1	1338.00	2311.84	2314.56	2315.28	2317.02	0.051903	12.58	106.35	57.86	1.64
1	-128.24*	PF 1	1338.00	2310.76	2313.71	2314.53	2316.45	0.057093	13.28	100.78	54.32	1.72
1	-138.24*	PF 1	1338.00	2309.68	2312.87	2313.74	2315.84	0.060360	13.83	96.73	51.15	1.77
1	-148.24*	PF 1	1338.00	2308.60	2312.01	2312.95	2315.21	0.062605	14.34	93.31	48.10	1.81
1	-158.24*	PF 1	1338.00	2307.53	2313.92	2312.17	2314.50	0.003929	6.09	219.86	48.08	0.50
1	-168.24*	PF 1	1338.00	2306.45	2313.99		2314.42	0.002427	5.31	252.05	45.42	0.40
1	-178.24*	PF 1	1338.00	2305.37	2314.02		2314.38	0.001686	4.80	279.00	42.55	0.33
1	-188.24*	PF 1	1338.00	2304.29	2314.04		2314.35	0.001275	4.44	301.47	39.53	0.28
1	-198.24	PF 1	1338.00	2303.21	2314.06		2314.33	0.000402	4.18	319.92	36.38	0.25
1	-210.25	PF 1	1338.00	2303.00	2310.32	2310.32	2313.98	0.003677	15.36	87.10	12.00	1.00
1	-235.51		Bridge									
1	-260.77	PF 1	1338.00	2302.33	2309.59	2309.59	2313.25	0.003699	15.36	87.10	12.00	1.00
1	-360.77	PF 1	1338.00	2301.00	2306.70	2308.26	2312.64	0.007001	19.55	68.43	12.00	1.44
1	-460.77	PF 1	1338.00	2299.67	2304.98	2306.93	2311.83	0.008482	21.00	63.72	12.00	1.61
1	-560.77	PF 1	1338.00	2298.34	2303.42	2305.60	2310.90	0.009554	21.94	60.99	12.00	1.71

HEC-RAS Version 3.1.2 April 2004
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X     X    X   X
XXXXXXX  XXXX     X       XXX  XXXX      XXXXXX    XXXX
X     X  X        X            X  X      X    X        X
X     X  X        X    X       X   X     X    X        X
X     X  XXXXXX    XXXX        X    X    X    X   XXXXX
```

PROJECT DATA
Project Title: Green Valley 45
Project File : Tran6.prj
Run Date and Time: 4/25/2005 1:59:47 PM

Project in English units

Project Description:
12 x 9 RCB Transition

PLAN DATA

Plan Title: Plan 01
Plan File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Tran6.p01

Geometry Title: Inlet Structure
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Tran6.g05

Flow Title : Flow 01
Flow File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Tran6.f01

Plan Summary Information:
Number of: Cross Sections = 17 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 1 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Flow 01
Flow File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Tran6.f01

Flow Data (cfs)

River	Reach	RS	PF 1
GV45	Transition	0	1338
GV45	Transition	-100	1338
Green Valley 45	1	0	1338
Green Valley 45	1	-98.24	1338

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Green Valley 45	1	PF 1	Critical	Normal S = 0.0133

GEOMETRY DATA

Geometry Title: Inlet Structure
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Tran6.g05

CROSS SECTION

```
RIVER: Green Valley 45
REACH: 1                    RS: 0

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2324 1004.33    2323 1006.82    2322 1009.25    2321 1011.78    2320
 1014.21    2319 1016.72    2318 1019.21    2317  1021.7    2316 1024.19    2315
 1026.69    2315 1029.24    2315 1033.26    2315 1038.11    2315 1042.69    2315
 1048.68    2316 1084.26    2317 1108.96    2318 1149.61    2318 1174.67    2318
 1245.42    2320

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .035    1000    .035 1245.42    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000 1245.42            82.69   82.69   82.69             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -98.24

INPUT
Description: Channel Station 1+00
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  104.29    2319  113.09  2314.6  143.09    2314  173.09  2314.6  181.89    2319

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  104.29     .04  104.29     .04  181.89     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        104.29  181.89              10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -108.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  103.86 2319.02  111.78 2314.09     140 2312.92   140.6 2312.92   141.2 2312.92
  169.42 2314.06  177.34 2319.02

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  103.86     .04  103.86     .04  128.48     .04   140.6     .04  152.72     .04
  177.34     .04  177.34     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        103.86  177.34              10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -118.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  103.43 2319.04  110.47 2313.58  136.91 2311.84  138.11 2311.84  139.31 2311.84
  165.75 2313.52  172.79 2319.04

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  103.43     .04  103.43     .04  126.67     .04  138.11     .04  149.55     .04
  172.79     .04  172.79     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        103.43  172.79              10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -128.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     103 2319.06  109.16 2313.07  133.82 2310.76  135.62 2310.76  137.42 2310.76
  162.08 2312.98  168.24 2319.06

Manning's n Values        num=       7
```

```
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     103     .04     103     .04  124.86     .04  135.62     .04  146.38     .04
  168.24     .04  168.24     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          103  168.24               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -138.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  102.57 2319.08  107.85 2312.56  130.73 2309.68  133.13 2309.68  135.53 2309.68
  158.41 2312.44  163.69 2319.08

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  102.57     .04  102.57     .04  123.05     .04  133.13     .04  143.21     .04
  163.69     .04  163.69     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.57  163.69               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -148.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  102.15  2319.1  106.54 2312.04  127.64  2308.6  130.64  2308.6  133.64  2308.6
  154.74 2311.91  159.14  2319.1

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  102.15     .04  102.15     .04  121.24     .04  130.64     .04  140.04     .04
  159.14     .04  159.14     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.15  159.14               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -158.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  101.72 2319.13  105.24 2311.53  124.55 2307.53  128.15 2307.53  131.75 2307.53
  151.06 2311.37  154.58 2319.13

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  101.72     .04  101.72     .04  119.43     .04  128.15     .04  136.87     .04
  154.58     .04  154.58     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        101.72  154.58               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -168.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  101.29 2319.15  103.93 2311.02  121.46 2306.45  125.66 2306.45  129.86 2306.45
  147.39 2310.83  150.03 2319.15

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  101.29     .04  101.29     .04  117.62     .04  125.66     .04  133.7      .04
  150.03     .04  150.03     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        101.29  150.03               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
```

```
REACH: 1                    RS: -178.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
  100.86 2319.17   102.62 2310.51   118.37 2305.37   123.17 2305.37   127.97 2305.37
  143.72 2310.29   145.48 2319.17

Manning's n Values        num=       7
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
  100.86     .04   100.86     .04   115.81     .04   123.17     .04   130.53     .04
  145.48     .04   145.48     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.86  145.48               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -188.24*

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
  100.43 2319.19   101.31    2310   115.28 2304.29   120.68 2304.29   126.08 2304.29
  140.05 2309.75   140.93 2319.19

Manning's n Values        num=       7
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
  100.43     .04   100.43     .04      114     .04   120.68     .04   127.36     .04
  140.93     .04   140.93     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.43  140.93               10      10      10             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -198.24

INPUT
Description: Channel Station 1+98.24
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     100 2319.21      100 2309.49   112.19 2303.21   118.19 2303.21   124.19 2303.21
  136.38 2309.21   136.38 2319.21

Manning's n Values        num=       7
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
     100     .04      100    .013   112.19    .013   118.19    .013   124.19     .04
  136.38     .04   136.38     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           100  136.38               17   12.01      17             .1      .3

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                    RS: -210.25

INPUT
Description: Channel Station 2+10.25 Bridge U/S
Station Elevation Data    num=       5
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     100    2312      100 2303.12      106    2303      112 2303.12      112    2312

Manning's n Values        num=       5
     Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val      Sta   n Val
     100     .04      100    .013      106    .013      112    .013      112     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           100     112            52.53   50.52   47.89             .1      .3

BRIDGE


RIVER: Green Valley 45
REACH: 1                    RS: -235.51

INPUT
Description:
Distance from Upstream XS =      .02
Deck/Roadway Width        =    50.49
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     100    2322    2312     112    2322    2312

Upstream Bridge Cross Section Data
```

```
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100    2312     100 2303.12     106    2303     112 2303.12     112    2312

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     100     .04     100    .013     106    .013     112    .013     112     .04

Bank Sta: Left   Right    Coeff Contr.   Expan.
           100     112            .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     100 2321.33 2311.33     112 2321.33 2311.33

Downstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100 2311.33     100 2302.33     112 2302.33     112 2311.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .013     100    .013     112    .013

Bank Sta: Left   Right    Coeff Contr.   Expan.
           100     112           .05       .1

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
      Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
      Energy Only

Additional Bridge Parameters
      Add Friction component to Momentum
      Do not add Weight component to Momentum
      Class B flow critical depth computations use critical depth
          inside the bridge at the upstream end
      Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -260.77

INPUT
Description: Channel Station 2+60.77
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100 2311.33     100 2302.33     112 2302.33     112 2311.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .013     100    .013     112    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           100     112             100     100     100            .05       .1

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -360.77

INPUT
Description: Channel Station 3+60.77
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     100    2310     100    2301     112    2301     112    2310

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     100    .013     100    .013     112    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           100     112             100     100     100            .05       .1

CROSS SECTION


RIVER: Green Valley 45
REACH: 1                  RS: -460.77
```

INPUT
Description: Channel Station 4+60.77
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2308.67	100	2299.67	112	2299.67	112	2308.67

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.013	100	.013	112	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	112	100	100	100	.05	.1

CROSS SECTION

RIVER: Green Valley 45
REACH: 1 RS: -560.77

INPUT
Description: Channel Station 5+60.77
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	2307.34	100	2298.34	112	2298.34	112	2307.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
100	.013	100	.013	112	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	112	100	100	100	.05	.1

SUMMARY OF MANNING'S N VALUES

River:Green Valley 45

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7
1	0	.035	.035	.035				
1	-98.24	.04	.04	.04				
1	-108.24*	.04	.04	.04	.04	.04	.04	.04
1	-118.24*	.04	.04	.04	.04	.04	.04	.04
1	-128.24*	.04	.04	.04	.04	.04	.04	.04
1	-138.24*	.04	.04	.04	.04	.04	.04	.04
1	-148.24*	.04	.04	.04	.04	.04	.04	.04
1	-158.24*	.04	.04	.04	.04	.04	.04	.04
1	-168.24*	.04	.04	.04	.04	.04	.04	.04
1	-178.24*	.04	.04	.04	.04	.04	.04	.04
1	-188.24*	.04	.04	.04	.04	.04	.04	.04
1	-198.24	.04	.013	.013	.013	.04	.04	.04
1	-210.25	.04	.013	.013	.013	.04		
1	-235.51	Bridge						
1	-260.77	.013	.013	.013				
1	-360.77	.013	.013	.013				
1	-460.77	.013	.013	.013				
1	-560.77	.013	.013	.013				

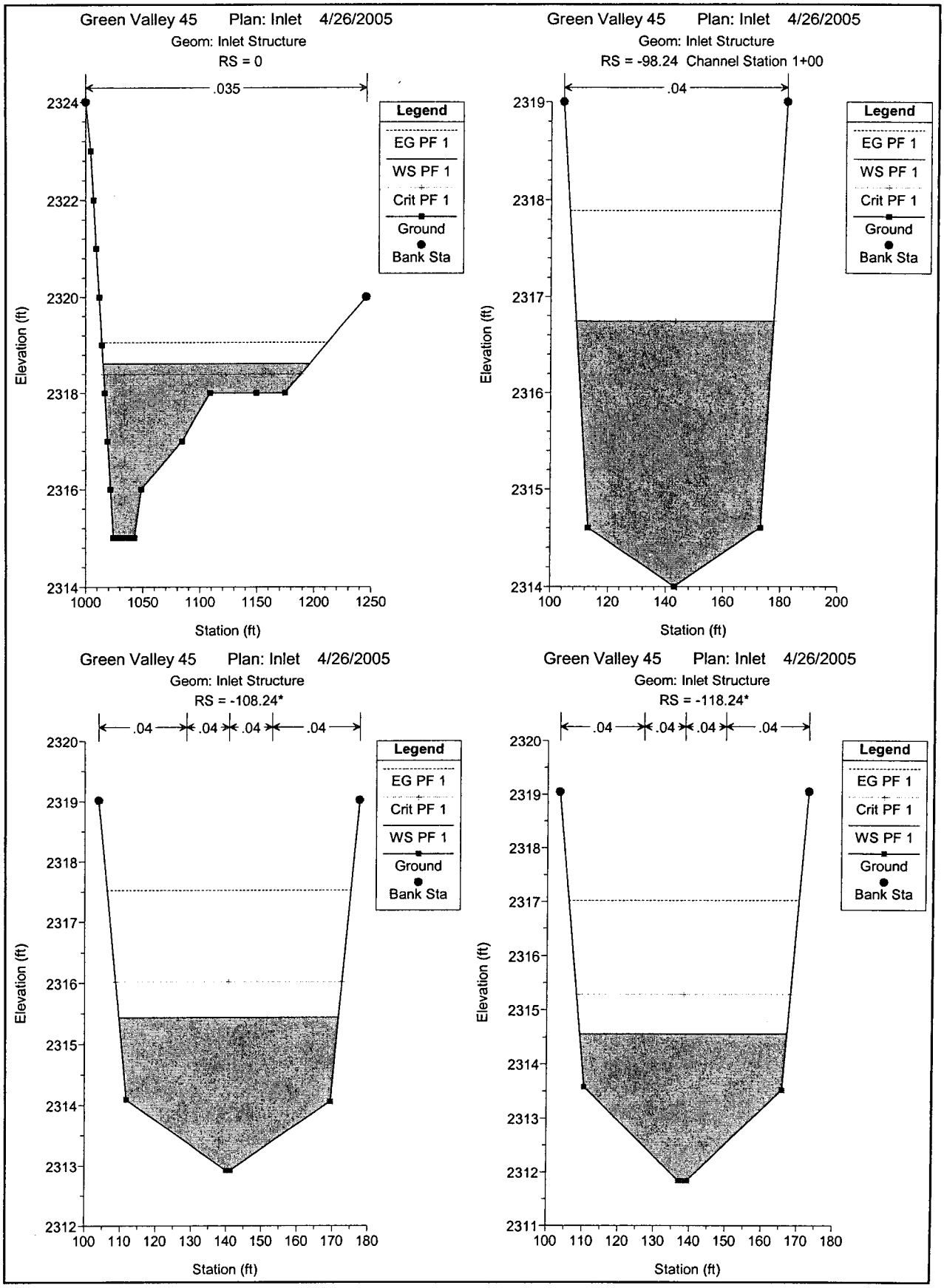
SUMMARY OF REACH LENGTHS

River: Green Valley 45

Reach	River Sta.	Left	Channel	Right
1	0	82.69	82.69	82.69
1	-98.24	10	10	10
1	-108.24*	10	10	10
1	-118.24*	10	10	10
1	-128.24*	10	10	10
1	-138.24*	10	10	10
1	-148.24*	10	10	10
1	-158.24*	10	10	10
1	-168.24*	10	10	10
1	-178.24*	10	10	10
1	-188.24*	10	10	10
1	-198.24	17	12.01	17
1	-210.25	52.53	50.52	47.89
1	-235.51	Bridge		
1	-260.77	100	100	100
1	-360.77	100	100	100
1	-460.77	100	100	100
1	-560.77	100	100	100

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Green Valley 45

Reach	River Sta.		Contr.	Expan.
1	0		.1	.3
1	-98.24		.1	.3
1	-108.24*		.1	.3
1	-118.24*		.1	.3
1	-128.24*		.1	.3
1	-138.24*		.1	.3
1	-148.24*		.1	.3
1	-158.24*		.1	.3
1	-168.24*		.1	.3
1	-178.24*		.1	.3
1	-188.24*		.1	.3
1	-198.24		.1	.3
1	-210.25		.1	.3
1	-235.51	Bridge		
1	-260.77		.05	.1
1	-360.77		.05	.1
1	-460.77		.05	.1
1	-560.77		.05	.1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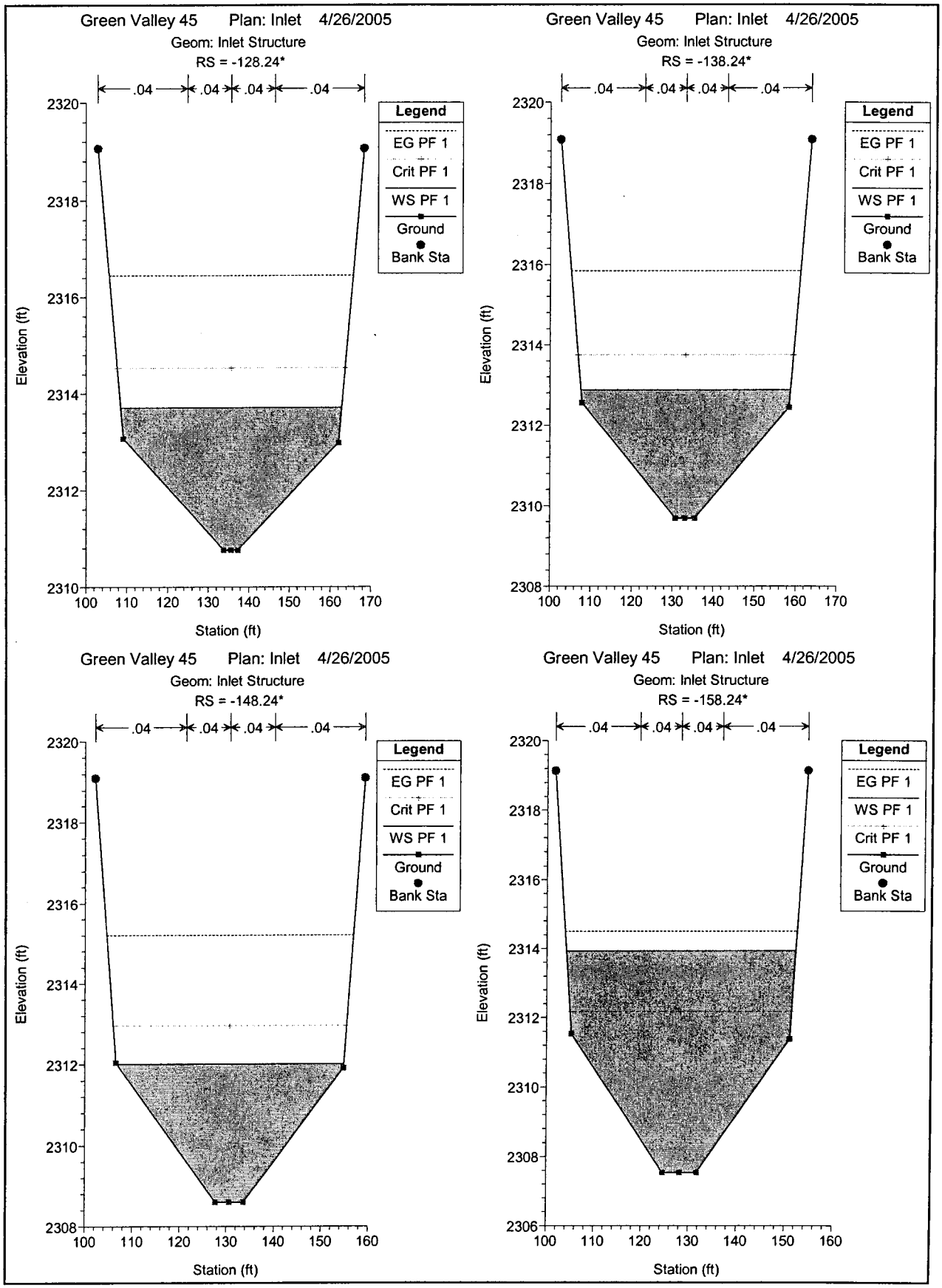
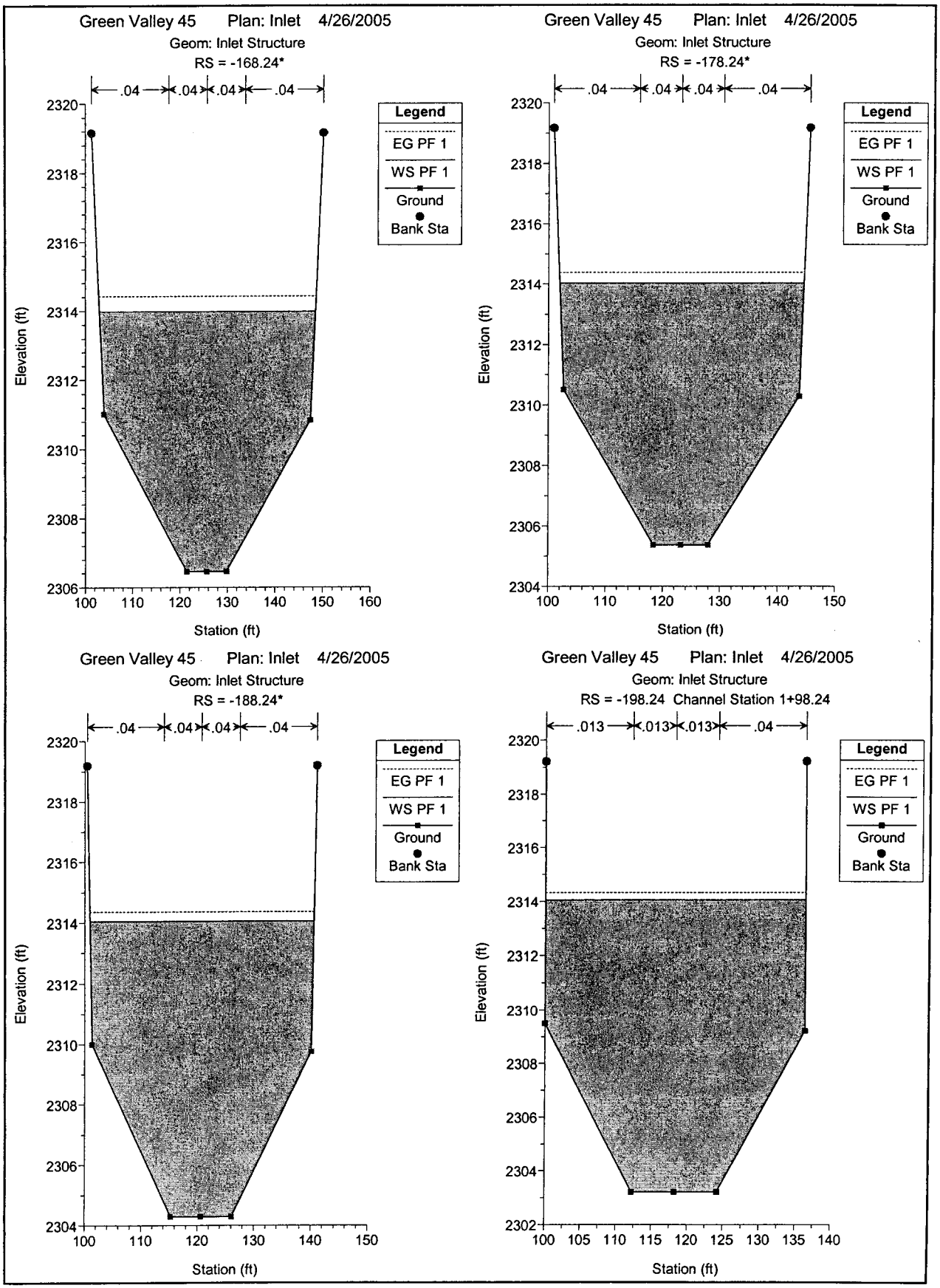
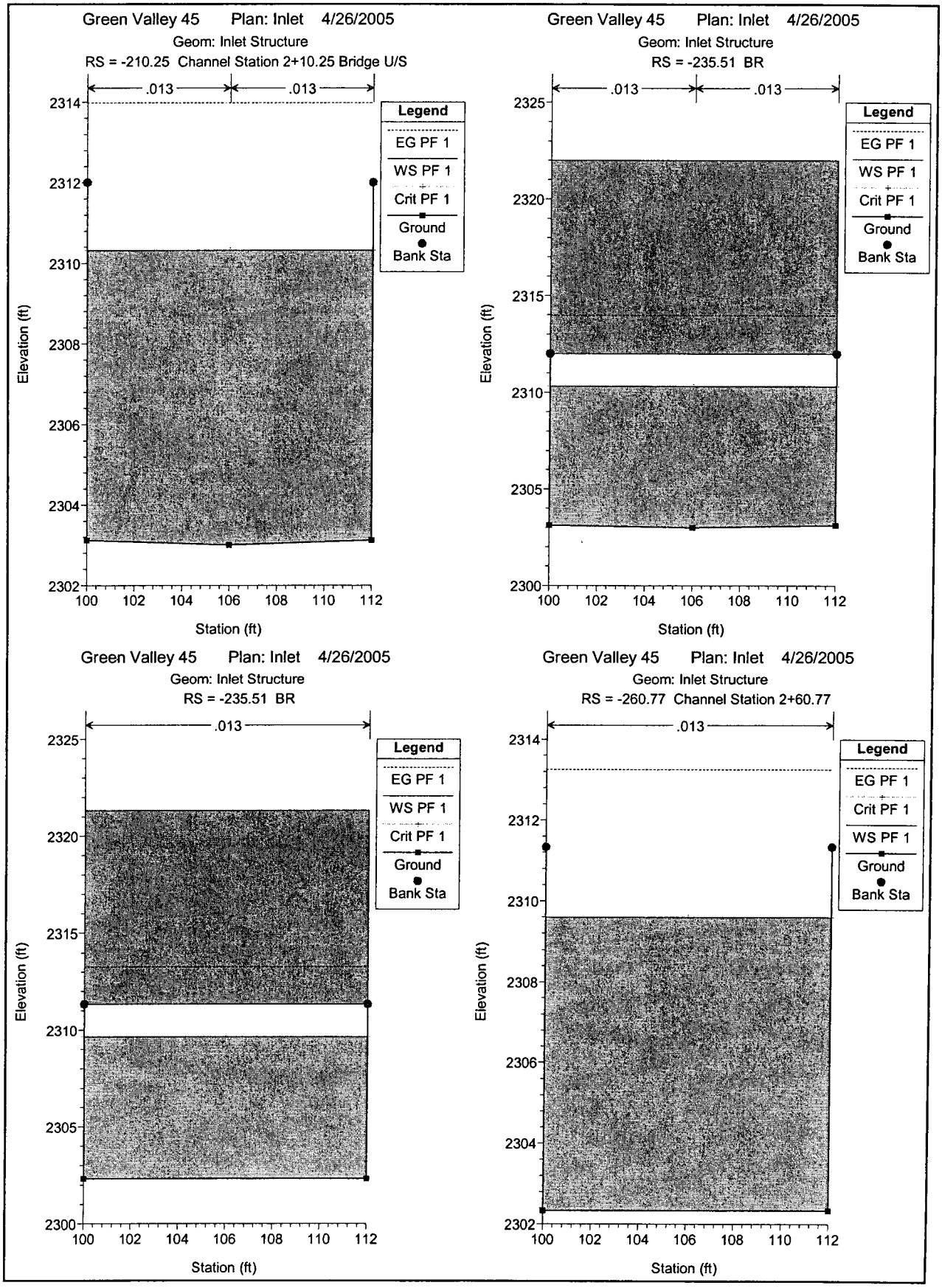
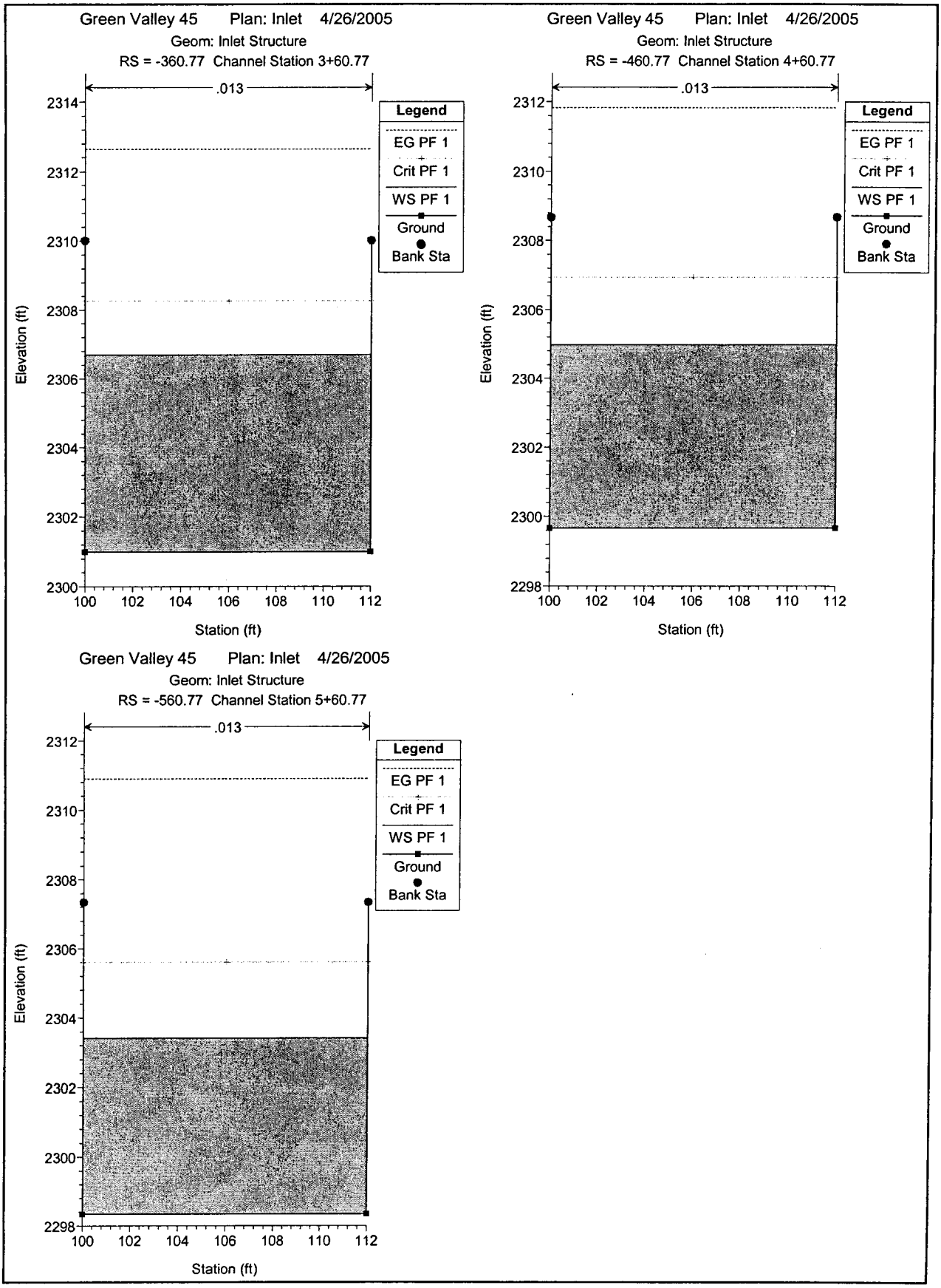
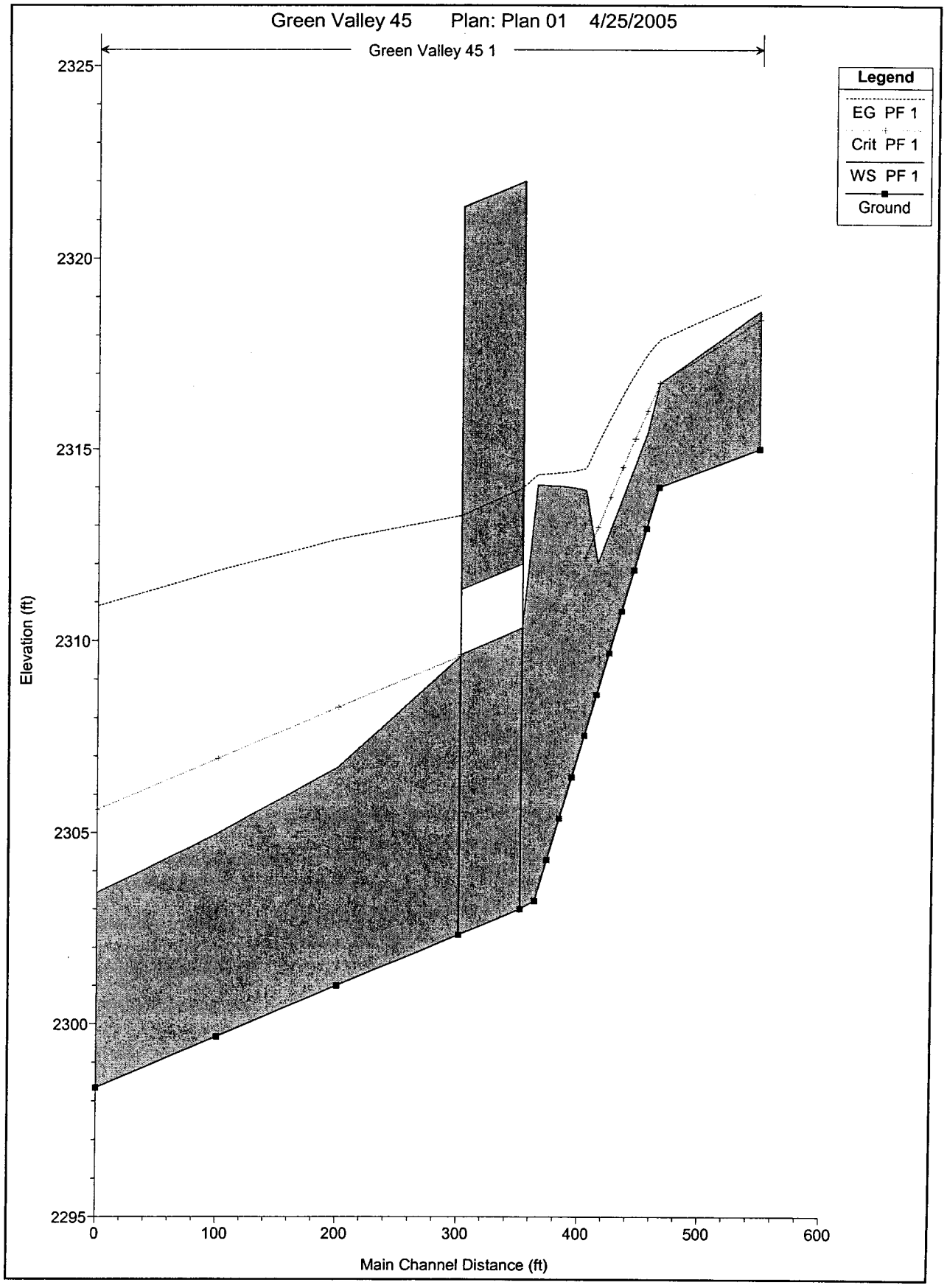
Geom: Inlet Structure
RS = 0
.035
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -98.24 Channel Station 1+00
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -108.24*
.04
.04
.04
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -118.24*
.04
.04
.04
.04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -128.24*
.04 .04 .04 .04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -138.24*
.04 .04 .04 .04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -148.24*
.04 .04 .04 .04
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -158.24*
.04 .04 .04 .04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -168.24*
.04 .04 .04 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -178.24*
.04 .04 .04 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -188.24*
.04 .04 .04 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -198.24 Channel Station 1+98.24
.013 .013 .013 .04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -210.25 Channel Station 2+10.25 Bridge U/S
.013
.013
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -235.51 BR
.013
.013
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -235.51 BR
.013
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -260.77 Channel Station 2+60.77
.013
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -360.77 Channel Station 3+60.77
.013
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -460.77 Channel Station 4+60.77
.013
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 Plan: Inlet 4/26/2005
Geom: Inlet Structure
RS = -560.77 Channel Station 5+60.77
.013
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 Plan: Plan 01 4/25/2005
Green Valley 45 1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
2325
2320
2315
2310
2305
2300
2295
0
100
200
300
400
500
600
Main Channel Distance (ft)

Errors Warnings and Notes for Plan : Plan 01

Location:	River: Green Valley 45 Reach: 1 RS: 0 Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Location:	River: Green Valley 45 Reach: 1 RS: -98.24 Profile: PF 1
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	used critical depth for the water surface and continued on with the calculations.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Green Valley 45 Reach: 1 RS: -108.24* Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Note:	Program found supercritical flow starting at this cross section.
Location:	River: Green Valley 45 Reach: 1 RS: -118.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -128.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -138.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -148.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -158.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Green Valley 45 Reach: 1 RS: -168.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -178.24* Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -188.24* Profile: PF 1
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or

Errors Warnings and Notes for Plan : Plan 01 (Continued)

	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -198.24 Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -210.25 Profile: PF 1
Warning:	The composite Mannings n value for the channel was larger than the largest entered n value or
	smaller than the smallest entered n value.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -235.51 Profile: PF 1
Warning:	Momentum balance could not converge within 100 trials during bridge computations. The program
	used the trial with the minimum error.
Note:	The momentum method has computed a class B profile.
Location:	River: Green Valley 45 Reach: 1 RS: -235.51 Profile: PF 1 Upstream
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	used critical depth for the water surface and continued on with the calculations.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Note:	Manning's n values were composited to a single value in the main channel.
Location:	River: Green Valley 45 Reach: 1 RS: -235.51 Profile: PF 1 Downstream
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Note:	The energy method has computed a class B profile.
Location:	River: Green Valley 45 Reach: 1 RS: -260.77 Profile: PF 1
Note:	The energy method has computed a class B profile.
Location:	River: Green Valley 45 Reach: 1 RS: -360.77 Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Location:	River: Green Valley 45 Reach: 1 RS: -460.77 Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Location:	River: Green Valley 45 Reach: 1 RS: -560.77 Profile: PF 1
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.

HEC-RAS Plan: 5533-1905 River: Reach #1 Reach: Outlet Profile: 100-year

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Outlet	40	100-year	1570.00	2287.00	2295.09	2295.09	2299.15	0.036445	16.18	97.06	12.00	1.00
Outlet	38	100-year	2082.00	2287.00	2293.27	2294.46	2298.56	0.004562	18.45	112.83	18.00	1.30
Outlet	31	100-year	2082.00	2286.05	2288.39	2290.49	2296.34	0.119892	22.64	91.96	58.66	2.61
Outlet	30	100-year	2082.00	2285.55	2287.87	2289.37	2292.97	0.089954	18.11	114.95	54.39	2.20
Outlet	25	100-year	2082.00	2285.00	2287.39	2287.16	2288.01	0.009955	6.34	330.63	183.26	0.83
Outlet	20	100-year	2082.00	2282.00	2286.92	2286.09	2287.41	0.004985	5.61	371.21	143.66	0.61
Outlet	10	100-year	2082.00	2282.00	2285.20	2285.17	2286.25	0.013604	8.23	252.93	117.66	0.99

HEC-RAS Version 3.1.2 April 2004
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX         XXXX        XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Green Valley 45 (MPU Facility ID PTAP 00
Project File : Outlet7.prj
Run Date and Time: 4/25/2005 5:20:37 PM

Project in English units

Project Description:
Ultimate Conditions Outlet Flows

PLAN DATA

Plan Title: Outlet
Plan File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Outlet7.P01

Geometry Title: Oulet Flows
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Outlet7.G01

Flow Title : Flow Profiles
Flow File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Outlet7.F01

Plan Summary Information:
Number of: Cross Sections = 7 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Flow Profiles
Flow File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Outlet7.F01

Flow Data (cfs)

River	Reach	RS	100-year
Reach #1	Outlet	40	1570
Reach #1	Outlet	39	2082

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Reach #1	Outlet	100-year	Normal S = 0.0091	Known WS = 2285.2

GEOMETRY DATA

Geometry Title: Oulet Flows
Geometry File : f:\5533-1905\calc\Hydro\CLOMR\HEC-RAS\Outlet7.G01

CROSS SECTION

RIVER: Reach #1
REACH: Outlet RS: 40

```
INPUT
Description: Upstream Approach Cross Section to PBS&J Culvert in Horizon Ridge
             Pkwy
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2296    1000    2287    1012    2287    1012    2296

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06    1000     .04    1012     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1012              25      25      25             .3       .5

CROSS SECTION


RIVER: Reach #1
REACH: Outlet             RS: 39

INPUT
Description: U.S. Face of PBS&J Culvert in Horizon Ridge Parkway
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000    2296    1000    2287    1018    2287    1018    2296

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000    .013    1000    .013    1018    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000    1018            110.2   110.2   110.2             .3       .5

CROSS SECTION


RIVER: Reach #1
REACH: Outlet             RS: 31

INPUT
Description: D.S. Face of PBS&J Culvert in Horizon Ridge Parkway
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000  2290.5 1029.55 2286.05 1068.93 2286.05 1081.78    2294

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    1000     .06 1029.55     .04 1068.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       1029.55 1068.93             18.9    18.9    18.9             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    1000 1029.55 2298.01       F
 1068.93 1081.78 2298.01       F

CROSS SECTION


RIVER: Reach #1
REACH: Outlet             RS: 30

INPUT
Description: Downstream Exit Cross Section of PBS&J Culvert in Horizon Ridge
             Pkwy
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  964.05 2298.01    1000  2290.5    1012 2285.55 1056.63 2285.55 1071.65    2294
 1080.23    2294 1112.22    2298

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  964.05     .06    1000     .04 1071.65     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1000 1071.65            140.11  140.11  140.11             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  964.05    1000    2297       F
 1071.65 1112.22    2297       F

CROSS SECTION


RIVER: Reach #1
REACH: Outlet             RS: 25

INPUT
Description: D.S. Riprap Outlet
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    1000 2298.01 1042.48    2286 1071.29  2285.1 1090.25 2285.41 1111.18 2285.71
 1137.84    2286 1173.04    2285 1199.99    2285  1205.9    2286 1219.69    2287
 1222.61    2288  1224.9    2289 1227.15    2290 1229.39    2291
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1042.48	.035	1222.61	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1042.48	1222.61	82.08	82.08	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Outlet RS: 20

INPUT
Description: Exit Cross Section for PBS&J Culvert in Horizon Ridge Pkwy
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2298.01	1007.25	2289	1014.51	2288	1021.82	2287	1029.09	2286
1039.58	2285	1056.24	2285.1	1058.66	2286	1061.07	2287	1063.52	2288
1100.69	2289	1103.83	2289	1115.92	2288	1120.93	2287	1124.45	2286
1128.11	2285	1147.67	2284	1152.79	2284	1162.68	2283	1180.42	2282
1194.14	2282	1198.59	2283	1202.54	2284	1206.76	2285	1223.73	2286
1226.59	2287	1228.93	2287						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1000	.035	1226.59	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1000	1226.59	142.48	142.48	.1	.3

CROSS SECTION

RIVER: Reach #1
REACH: Outlet RS: 10

INPUT
Description: Farthest Downstream Cross Section

Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
1000	2298.01	1006.44	2294	1013.72	2293	1021.17	2292	1028.48	2291
1035.84	2290	1042.79	2289	1047.34	2288	1051.19	2287	1055.49	2286
1060.91	2285	1069.5	2284	1092.18	2283	1115.22	2282	1150.48	2282
1155.61	2283	1161.24	2284	1174.86	2285	1188.01	2286	1227.05	2287
1242.91	2288	1260.54	2289	1275.91	2290				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
1000	.06	1006.44	.035	1227.05	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
1006.44	1227.05	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Reach #1

Reach	River Sta.	n1	n2	n3
Outlet	40	.06	.04	.06
Outlet	39	.013	.013	.013
Outlet	31	.06	.04	.06
Outlet	30	.06	.04	.06
Outlet	25	.06	.035	.06
Outlet	20	.06	.035	.06
Outlet	10	.06	.035	.06

SUMMARY OF REACH LENGTHS

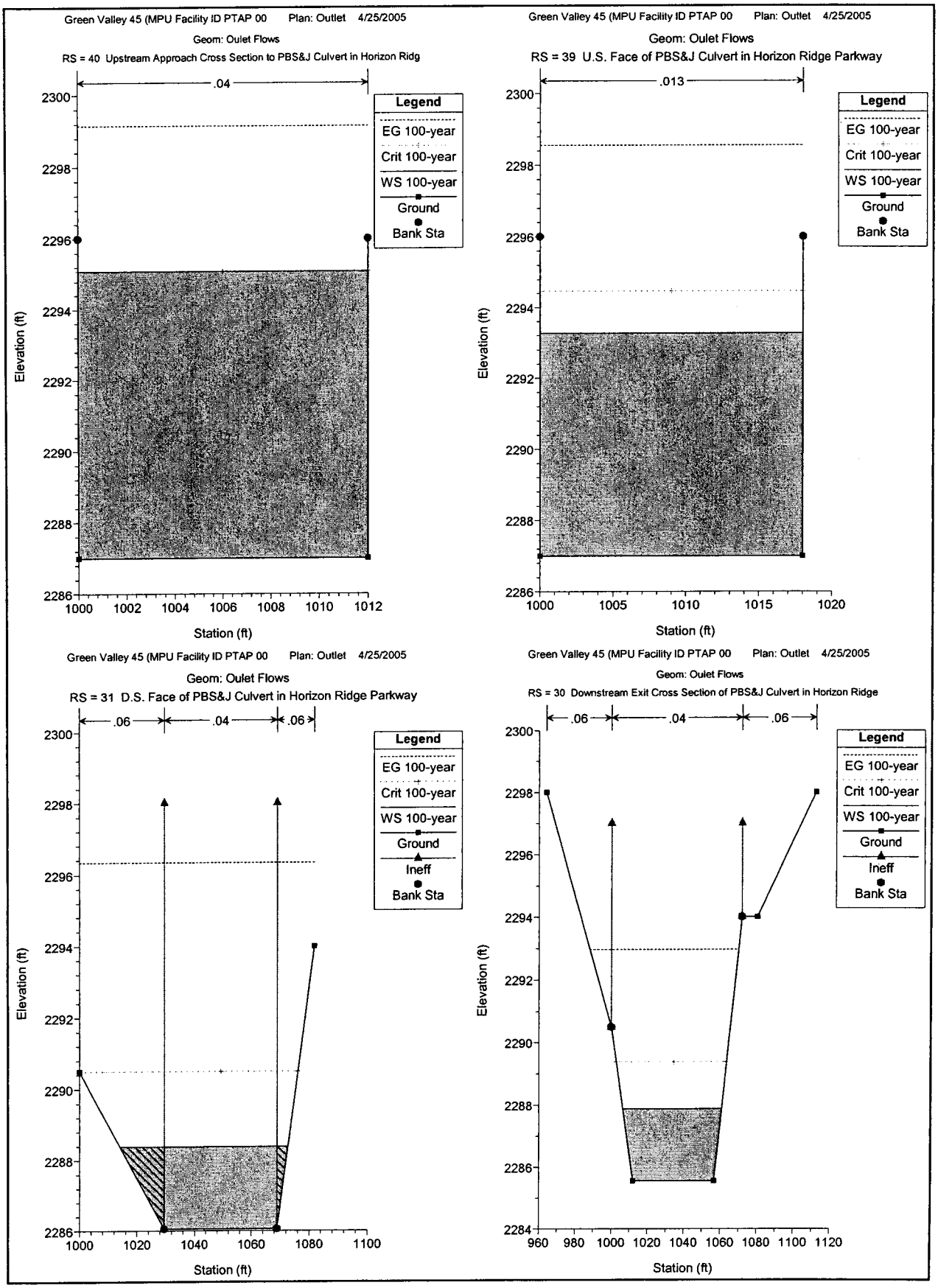
River: Reach #1

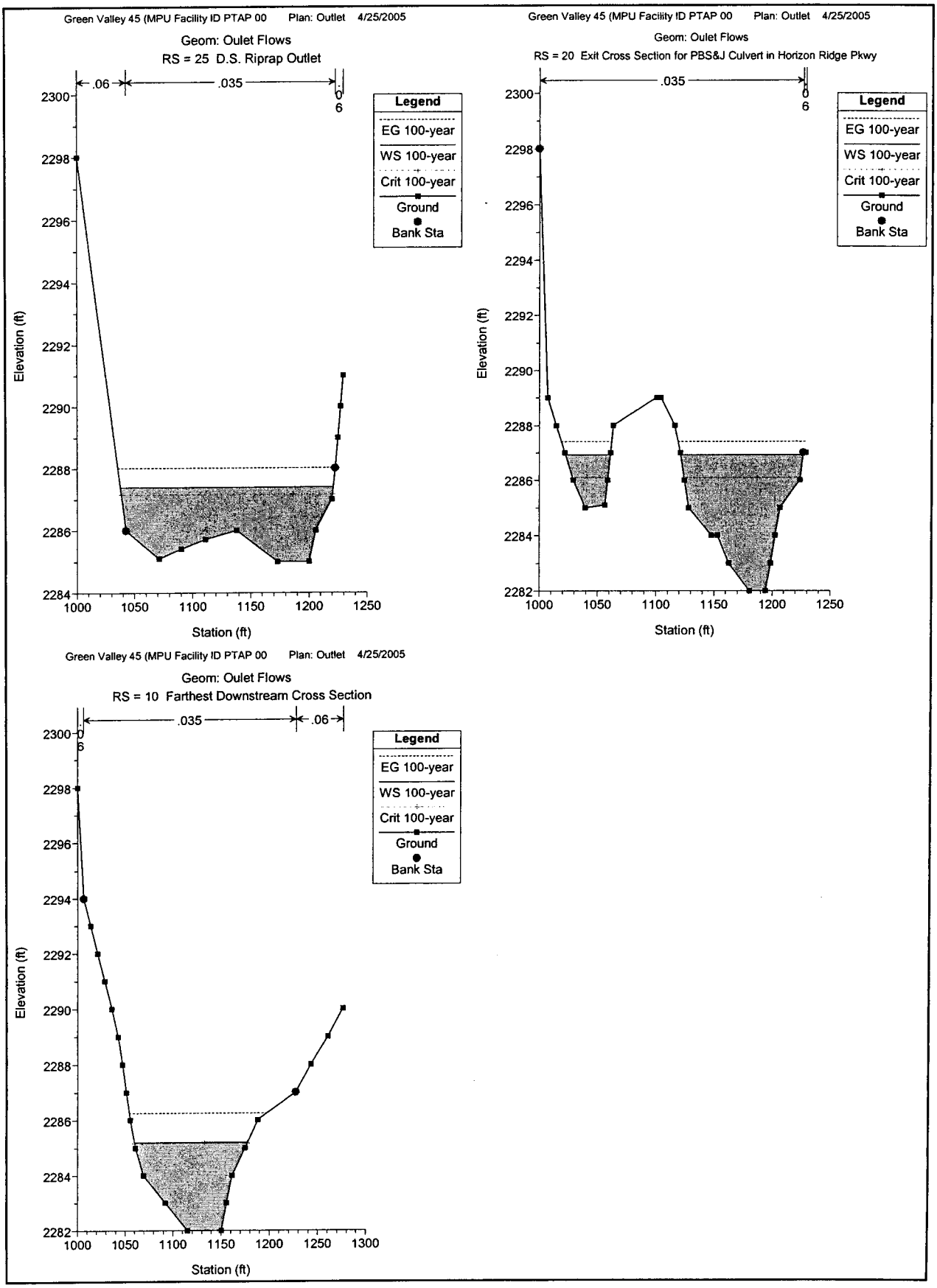
Reach	River Sta.	Left	Channel	Right
Outlet	40	25	25	25
Outlet	39	110.2	110.2	110.2
Outlet	31	18.9	18.9	18.9
Outlet	30	140.11	140.11	140.11
Outlet	25	82.08	82.08	82.08
Outlet	20	142.48	142.48	142.48

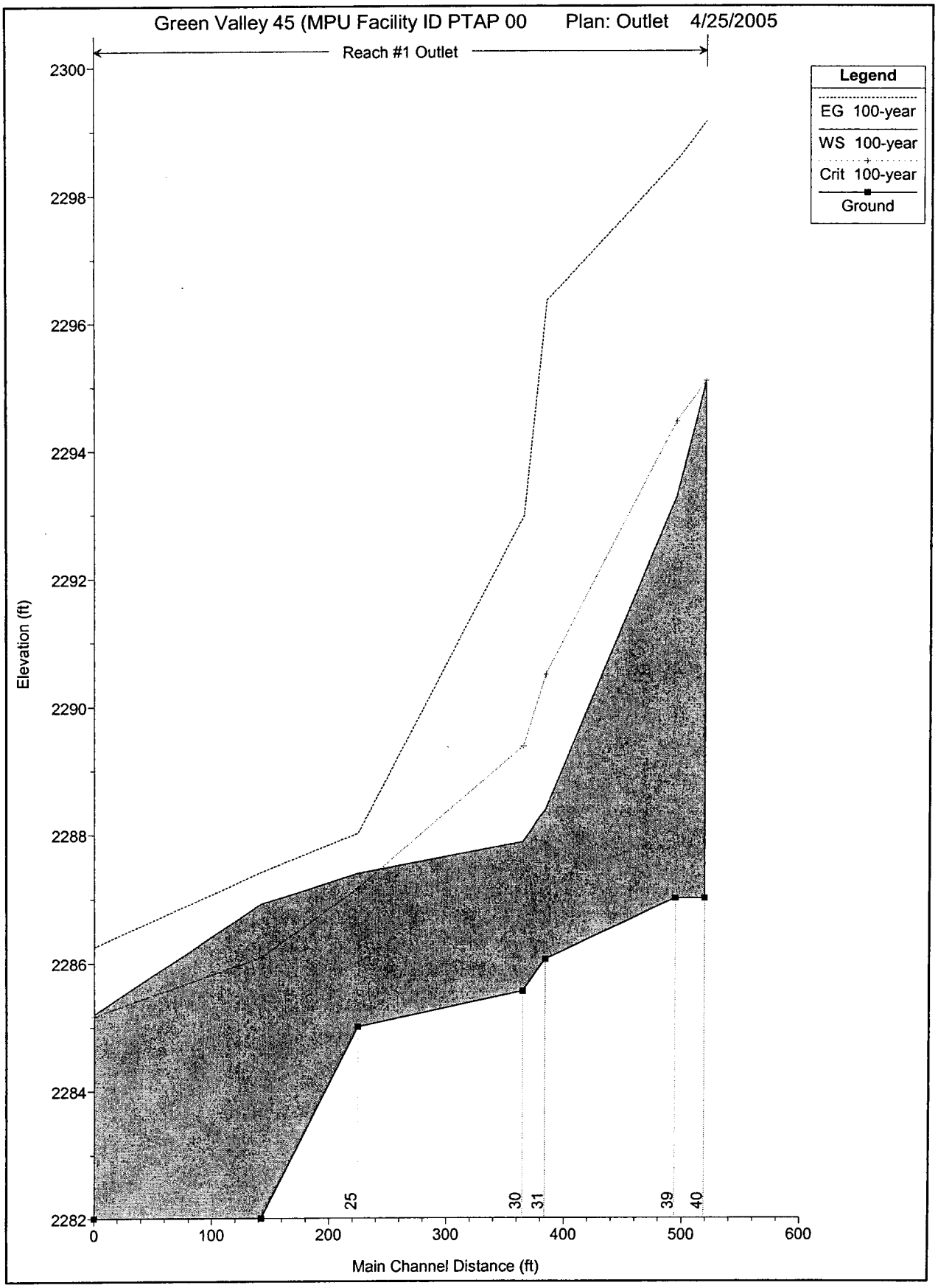
Outlet	10

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Reach #1

Reach	River Sta.	Contr.	Expan.
Outlet	40	.3	.5
Outlet	39	.3	.5
Outlet	31	.3	.5
Outlet	30	.3	.5
Outlet	25	.1	.3
Outlet	20	.1	.3
Outlet	10	.1	.3


Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 40 Upstream Approach Cross Section to PBS&J Culvert in Horizon Ridg
.04
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 39 U.S. Face of PBS&J Culvert in Horizon Ridge Parkway
.013
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 31 D.S. Face of PBS&J Culvert in Horizon Ridge Parkway
.06
.04
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 30 Downstream Exit Cross Section of PBS&J Culvert in Horizon Ridge
.06
.04
.06
Legend
EG 100-year
Crit 100-year
WS 100-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 25 D.S. Riprap Outlet
.06
.035
0
6
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 20 Exit Cross Section for PBS&J Culvert in Horizon Ridge Pkwy
.035
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Geom: Oulet Flows
RS = 10 Farthest Downstream Cross Section
.035
.06
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Bank Sta
Elevation (ft)
Station (ft)


Green Valley 45 (MPU Facility ID PTAP 00 Plan: Outlet 4/25/2005
Reach #1 Outlet
Legend
EG 100-year
WS 100-year
Crit 100-year
Ground
Elevation (ft)
2300
2298
2296
2294
2292
2290
2288
2286
2284
2282
0
100
200
300
400
500
600
Main Channel Distance (ft)
25
30
31
39
40

Errors Warnings and Notes for Plan : 5533-1905

Location:	River: Reach #1 Reach: Outlet RS: 40 Profile: 100-year
Warning:	The energy equation could not be balanced within the specified number of iterations. The program
	used critical depth for the water surface and continued on with the calculations.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	During the standard step iterations, when the assumed water surface was set equal to critical depth,
	the calculated water surface came back below critical depth. This indicates that there is not a valid
	subcritical answer. The program defaulted to critical depth.
Location:	River: Reach #1 Reach: Outlet RS: 39 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Location:	River: Reach #1 Reach: Outlet RS: 31 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Reach #1 Reach: Outlet RS: 30 Profile: 100-year
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.
Note:	Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
	surface was used.
Location:	River: Reach #1 Reach: Outlet RS: 25 Profile: 100-year
Note:	Hydraulic jump has occurred between this cross section and the previous upstream section.
Location:	River: Reach #1 Reach: Outlet RS: 20 Profile: 100-year
Warning:	Divided flow computed for this cross-section.
Warning:	The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for
	additional cross sections.
Warning:	The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7
	or greater than 1.4. This may indicate the need for additional cross sections.
Warning:	The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
	This may indicate the need for additional cross sections.

City of Henderson Approval Letter

CITY OF HENDERSON
240 Water Street
P.O. Box 95050
Henderson, NV 89009

March 8, 2005

Bill Meyer
804-2296

William Meyer, P.E.
G.C. Wallace, Inc.
1555 Anthem Village Parkway
Henderson, Nevada 89052

Re: 2nd Response to Comments for the
Technical Drainage Study for Green Valley 45 Offsite Drainage
PDG #05018-D, 950REV-3F (FR)
City of Henderson Permit Number 2004780214

Dear Mr. Meyer:

This letter provides comments on the above referenced study dated March 2, 2005. This study was reviewed by Poggemeyer Design Group and the City of Henderson. Based on the documents submitted, **the subject study is accepted.** The following comments and restrictions are noted:

1) The project crosses or is adjacent to a Clark County Regional Flood Control (CCRFCD) facility. Also, a portion of the site is located within a FEMA Special Flood Hazard Area Zone "A". Therefore, CCRFCD concurrence is required.

2) A portion of the site is located within a FEMA Special Hazard Area (SFHA) Zone "A". The study indicates that the intent is to design the onsite RCB and offsite connecting RCP storm drain system. Technical drainage studies will be required for additional improvements to the property. At the time of the technical drainage studies, the City of Henderson requires that a Conditional Letter of Map Revision must be obtained prior to shear and tie inspections. Also, a Letter of Map Revision must be submitted to FEMA prior to approval of the elevation certificate for lots or structures within the 100-year floodplain.

3) There does not appear to be sufficient freeboard according to FEMA's requirements to remove the area downstream of the riprap inlet structure from the SFHA. It is understood that the headwall may not be constructed if coordination with the upstream property developer continues as planned. However, in the event that the headwall is constructed, additional freeboard may be required to meet FEMA requirements for revision of the SFHA. Otherwise, any downstream improvements may have to have a finished floor elevation at least 18-inches above the HGL upstream of the headwall.

4) A coordination meeting was held on February 23, 2005 concerning the timing of construction for the regional facility crossing the Green Valley 45 and Buena Vida developments. It is the intent of GC Wallace and WRG Design to coordinate the timing of their respective site improvements so that the construction of the regional facility is concurrent. The Engineer must maintain coordination efforts with WRG Design, Inc., the engineer for the Buena Vida development, which is located upstream of the project site.

The following items must be completed before improvement plan approval will be given:

4) Additional grading is required to tie the top of the 6-ft wide bench on the northeast side of the riprap inlet structure into the existing contours. Review and revise accordingly.

Projects that disturb ONE acre of land or more or are next to a waterway must submit to the Nevada Division of Environmental Protection: A "Notice of Intent" to discharge, that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No, GNV0022241. For more information, please call (775) 687-9429 or see http://ndep.nv.gov/bwpc/storm01.htm.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, the information submitted by the above named engineering firm may be superseded. Compliance with the regulatory elements and design standards specified in the Uniform Regulations for the Control of Drainage does not imply a guarantee that properties will be free from flooding or flood damage. No liability is assumed by the City of Henderson, its officials, or employees for the information, data or conclusions presented by the consulting engineer. We therefore make no warranties, either expressed or implied, in conducting this review.

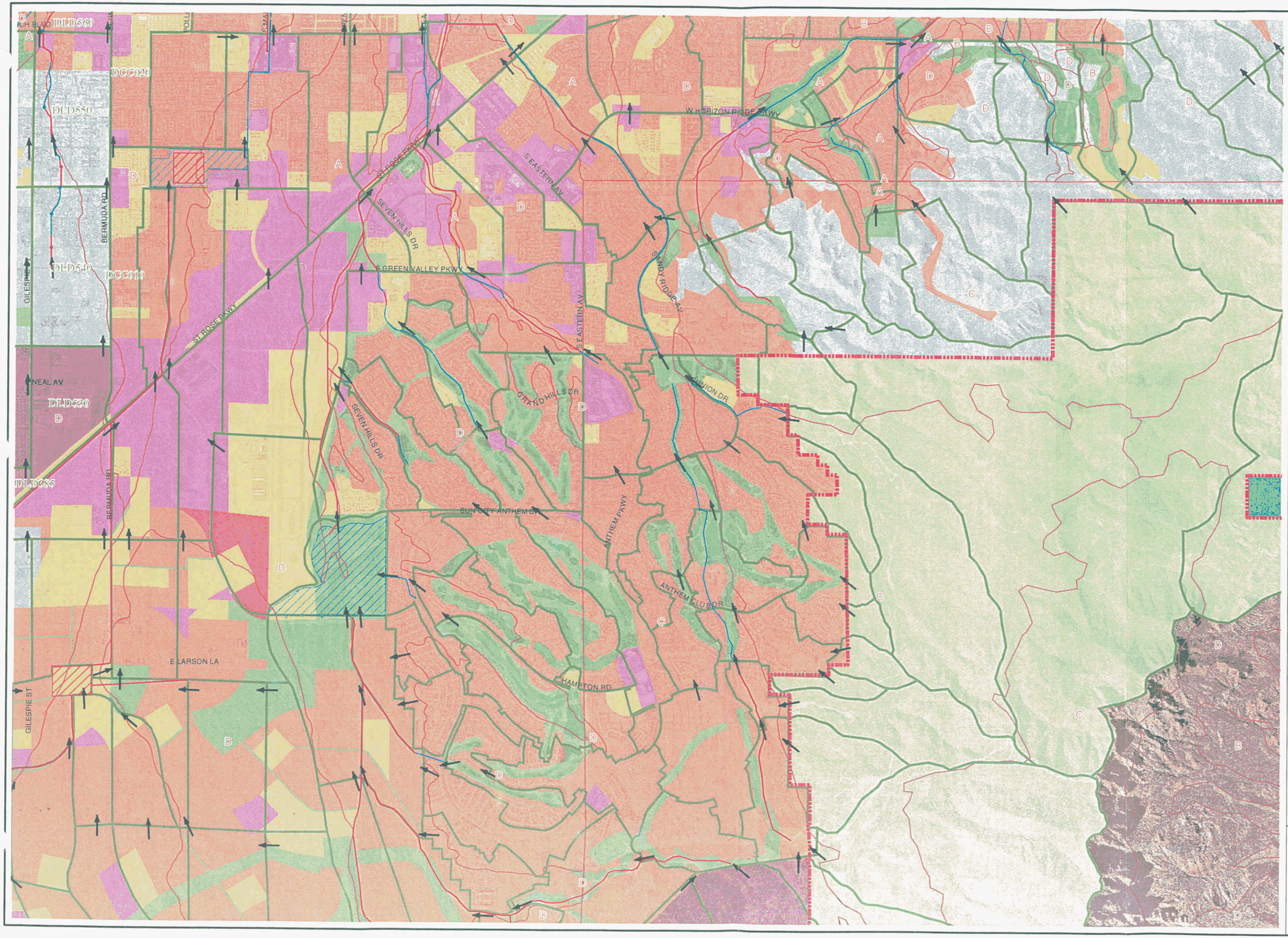
Please let me know if you have any questions concerning these comments.

Sincerely,

Albert J. Jankowiak, P.E.
Project Engineer II

cc: Curt Chandler, Janet Kapke, CCRFCD

CCRFCD MPU



REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- ID — Subarea Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Proposed Facilities

Type — Hydrologic Soil Groups

- A — Low Runoff Potential
- B — Moderately Low Runoff Potential
- C — Moderately High Runoff Potential
- D — High Runoff Potential

Typical Land Use

1. Undeveloped Land, Open Desert
2. Parks, Golf Courses
3. Rural
4. Low Density Residential
5. Medium Density Residential
6. High Density Residential
7. Public Facility, Multi Family
8. Commercial, Office, Retail, Casino
9. Light Industrial
10. Heavy Industrial
11. Schools
12. Lakes

N W E S

0 1,000 2,000 3,000 4,000 5,000
Feet

SCALE: 1 inch = 3000 feet

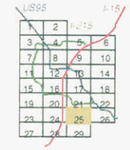
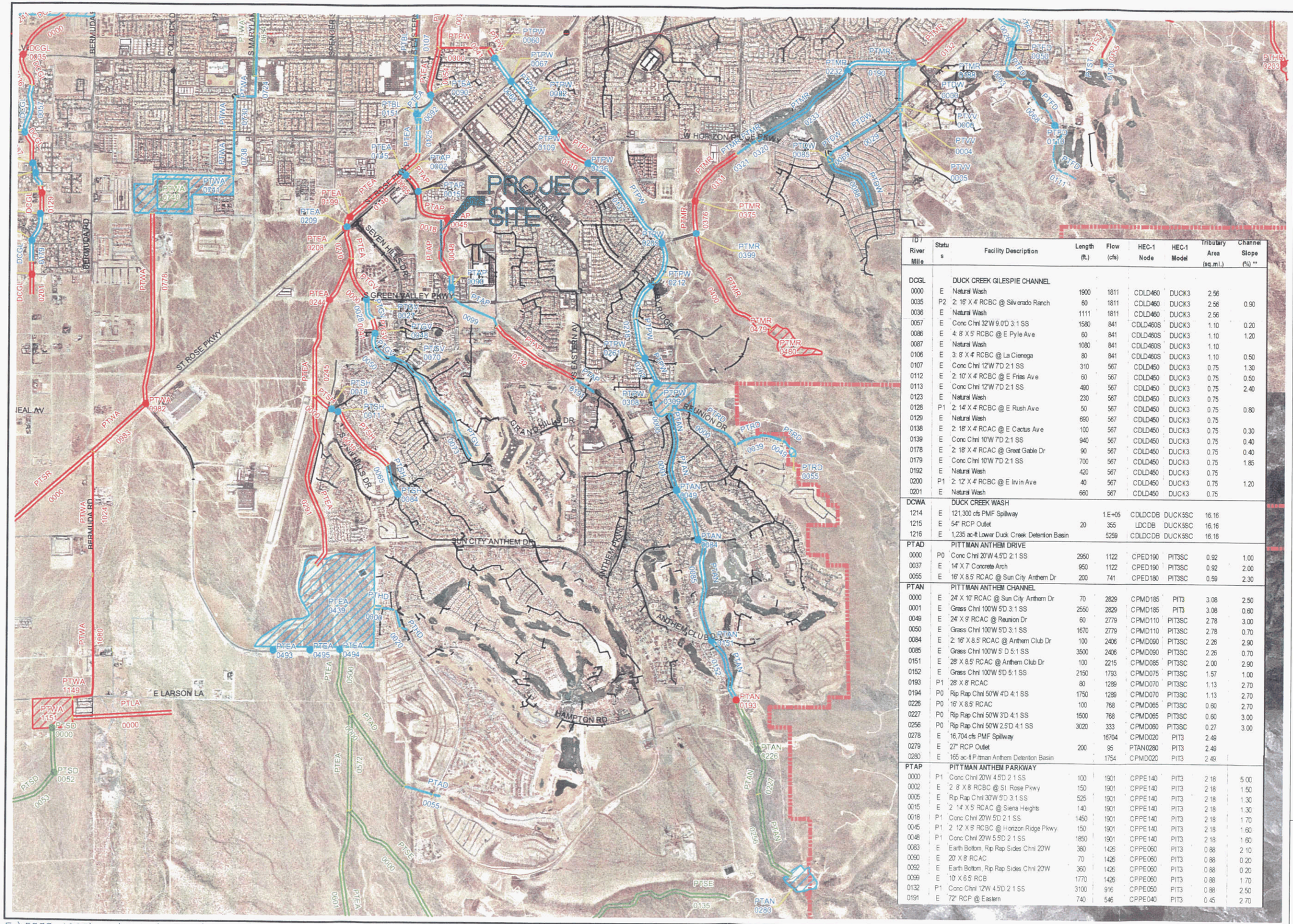


FIGURE H-25

PBS&J

G.C. WALLACE, INC.



ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
DCGL		DUCK CREEK GILESPIE CHANNEL						
0000	E	Natural Wash	1900	1811	CDLD460	DUCK3	2.56	
0035	P2	2: 16' X 4' RCBC @ Silverado Ranch	60	1811	CDLD460	DUCK3	2.56	0.90
0036	E	Natural Wash	1111	1811	CDLD460	DUCK3	2.56	
0057	E	Conc Chnl 32'W 9.0'D 3:1 SS	1580	841	CDLD460S	DUCK3	1.10	0.20
0086	E	4: 8' X 5' RCBC @ E Pyle Ave	60	841	CDLD460S	DUCK3	1.10	1.20
0087	E	Natural Wash	1080	841	CDLD460S	DUCK3	1.10	
0106	E	3: 8' X 4' RCBC @ La Cienega	80	841	CDLD460S	DUCK3	1.10	0.50
0107	E	Conc Chnl 12'W 7'D 2:1 SS	310	567	CDLD450	DUCK3	0.75	1.30
0112	E	2: 10' X 4' RCBC @ E Frias Ave	60	567	CDLD450	DUCK3	0.75	0.50
0113	E	Conc Chnl 12'W 7'D 2:1 SS	490	567	CDLD450	DUCK3	0.75	2.40
0123	E	Natural Wash	230	567	CDLD450	DUCK3	0.75	
0128	P1	2: 14' X 4' RCBC @ E Rush Ave	50	567	CDLD450	DUCK3	0.75	0.80
0129	E	Natural Wash	690	567	CDLD450	DUCK3	0.75	
0138	E	2: 18' X 4' RCAC @ E Cactus Ave	100	567	CDLD450	DUCK3	0.75	0.30
0139	E	Conc Chnl 10'W 7'D 2:1 SS	940	567	CDLD450	DUCK3	0.75	0.40
0178	E	2: 18' X 4' RCAC @ Great Gable Dr	90	567	CDLD450	DUCK3	0.75	0.40
0179	E	Conc Chnl 10'W 7'D 2:1 SS	700	567	CDLD450	DUCK3	0.75	1.85
0192	E	Natural Wash	420	567	CDLD450	DUCK3	0.75	
0200	P1	2: 12' X 4' RCBC @ E Irvin Ave	40	567	CDLD450	DUCK3	0.75	1.20
0201	E	Natural Wash	660	567	CDLD450	DUCK3	0.75	
DCWA		DUCK CREEK WASH						
1214	E	121,300 cfs PMF Spillway		1.E+05	CDLDCDB	DUCK5SC	16.16	
1215	E	54" RCP Outlet	20	355	LDCDB	DUCK5SC	16.16	
1216	E	1,235 ac-ft Lower Duck Creek Detention Basin		5259	CDLDCDB	DUCK5SC	16.16	
PTAD		PITTMAN ANTHEM DRIVE						
0000	P0	Conc Chnl 20'W 4.5'D 2:1 SS	2950	1122	CPED190	PIT3SC	0.92	1.00
0037	E	14' X 7' Concrete Arch	950	1122	CPED190	PIT3SC	0.92	2.00
0055	E	16' X 8.5' RCAC @ Sun City Anthem Dr	200	741	CPED180	PIT3SC	0.59	2.30
PTAN		PITTMAN ANTHEM CHANNEL						
0000	E	24' X 10' RCAC @ Sun City Anthem Dr	70	2829	CPMD185	PIT3	3.08	2.50
0001	E	Grass Chnl 100'W 5'D 3:1 SS	2550	2829	CPMD185	PIT3	3.08	0.60
0049	E	24' X 9' RCAC @ Reunion Dr	60	2779	CPMD110	PIT3SC	2.78	3.00
0050	E	Grass Chnl 100'W 5'D 3:1 SS	1670	2779	CPMD110	PIT3SC	2.78	0.70
0084	E	2: 16' X 8.5' RCAC @ Anthem Club Dr	100	2406	CPMD090	PIT3SC	2.26	2.90
0085	E	Grass Chnl 100'W 5' D 5:1 SS	3500	2406	CPMD090	PIT3SC	2.26	0.70
0151	E	28' X 8.5' RCAC @ Anthem Club Dr	100	2215	CPMD085	PIT3SC	2.00	2.90
0152	E	Grass Chnl 100'W 5'D 5:1 SS	2150	1793	CPMD075	PIT3SC	1.57	1.00
0193	P1	28' X 8' RCAC	80	1289	CPMD070	PIT3SC	1.13	2.70
0194	P0	Rip Rap Chnl 50'W 4'D 4:1 SS	1750	1289	CPMD070	PIT3SC	1.13	2.70
0226	P0	16' X 8.5' RCAC	100	768	CPMD065	PIT3SC	0.60	2.70
0227	P0	Rip Rap Chnl 50'W 3'D 4:1 SS	1500	768	CPMD065	PIT3SC	0.60	3.00
0256	P0	Rip Rap Chnl 50'W 2.5'D 4:1 SS	3020	333	CPMD060	PIT3SC	0.27	3.00
0278	E	16,704 cfs PMF Spillway		16704	CPMD020	PIT3	2.49	
0279	E	27" RCP Outlet	200	95	PTAN0280	PIT3	2.49	
0280	E	165 ac-ft Pittman Anthem Detention Basin		1754	CPMD020	PIT3	2.49	
PTAP		PITTMAN ANTHEM PARKWAY						
0000	P1	Conc Chnl 20'W 4.5'D 2:1 SS	100	1901	CPPE140	PIT3	2.18	5.00
0002	E	2: 8' X 8' RCBC @ St Rose Pkwy	150	1901	CPPE140	PIT3	2.18	1.50
0005	E	Rip Rap Chnl 30'W 5'D 3:1 SS	525	1901	CPPE140	PIT3	2.18	1.30
0015	E	2: 14' X 5' RCAC @ Siena Heights	140	1901	CPPE140	PIT3	2.18	1.30
0018	P1	Conc Chnl 20'W 5'D 2:1 SS	1450	1901	CPPE140	PIT3	2.18	1.70
0045	P1	2: 12' X 6' RCBC @ Horizon Ridge Pkwy	150	1901	CPPE140	PIT3	2.18	1.60
0048	P1	Conc Chnl 20'W 5.5'D 2:1 SS	1850	1901	CPPE140	PIT3	2.18	1.60
0063	E	Earth Bottom, Rip Rap Sides Chnl 20'W	380	1426	CPPE060	PIT3	0.88	2.10
0090	E	20' X 8' RCAC	70	1426	CPPE060	PIT3	0.88	0.20
0092	E	Earth Bottom, Rip Rap Sides Chnl 20'W	360	1426	CPPE060	PIT3	0.88	0.20
0099	E	10' X 6.5' RCB	1770	1426	CPPE060	PIT3	0.88	1.70
0132	P1	Conc Chnl 12'W 4.5'D 2:1 SS	3100	916	CPPE050	PIT3	0.88	2.50
0191	E	72" RCP @ Eastern	740	546	CPPE040	PIT3	0.45	2.70

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- Dike
- Natural Wash
- ID-Mile Separator

N W E S

0 1,000 2,000 3,000 4,000 5,000
Feet

SCALE: 1 inch = 3000 feet

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

FLOOD CONTROL FACILITIES
FIGURE F-25

PBS&J

G.C. WALLACE, INC.

F: \5533-1905\calc\Hydro\CLOMR\Figures\mpu.dwg 04-07-05 10:09:44 rdennis

Horizon Ridge Parkway Grading Plans

Call before you Dig 1-800-227-2600

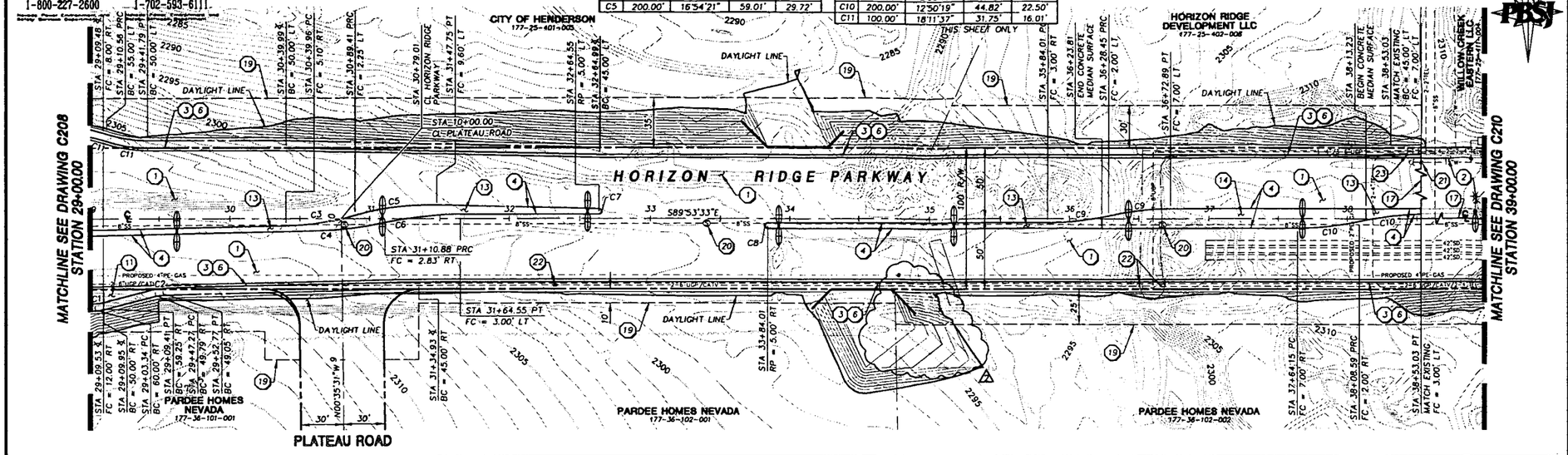
Call before you Overhead 1-702-593-6111

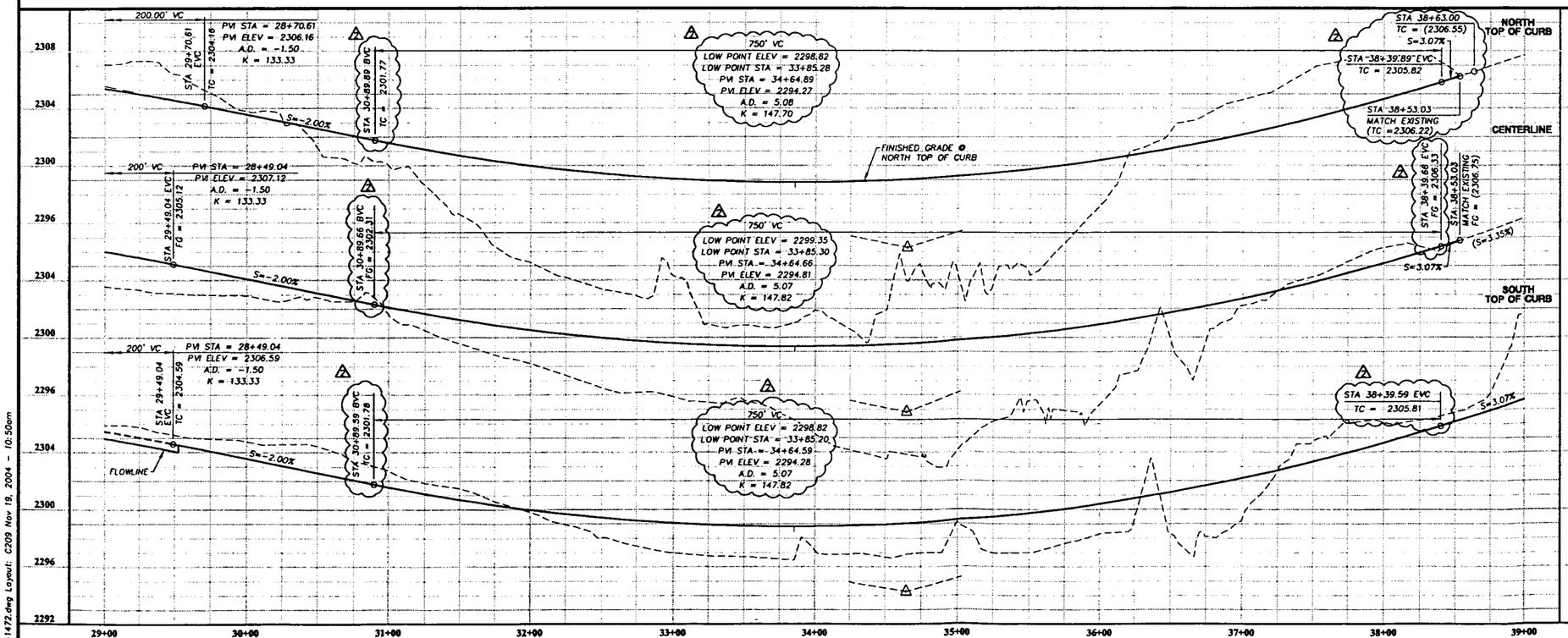
CURVE DATA

No.	RADIUS	DELTA	LENGTH	TANGENT
C1	25.00'	14°02'10"	6.12'	2.80'
C2	25.00'	12°45'34"	5.57'	2.80
C3	200.00'	14°21'34"	50.12'	25.19'
C4	250.00'	11°07'22"	48.53'	24.34'
C5	200.00'	16°54'21"	59.01'	29.72'

No.	RADIUS	DELTA	LENGTH	TANGENT
C6	250.00'	12°23'45"	54.09'	27.15'
C7	2.00'	178°43'36"	6.24'	179.98'
C8	2.00'	180°00'00"	6.28'	INFINITE
C9	200.00'	12°50'19"	44.82'	22.50'
C10	200.00'	12°50'19"	44.82'	22.50'
C11	100.00'	18°11'37"	31.75'	16.01'

THIS SHEET ONLY





KEY NOTES

1. CONSTRUCT PLANTMIX BITUMINOUS SURFACE WITH TYPE II AGGREGATE BASE. (SEE DRAWINGS C200 TO C206).
2. CONSTRUCT 3/4" OPEN GRADE (SEE DRAWINGS C200 TO C206).
3. CONSTRUCT 'L' TYPE CURB AND GUTTER PER USD #216.
4. CONSTRUCT 'A' TYPE ISLAND CURB PER USD #219.
5. CONSTRUCT TACK-ON ISLAND CURB PER USD #220.
6. CONSTRUCT CONCRETE SIDEWALK PER USD #234.
7. CONSTRUCT SIDEWALK RAMP PER USD #235 CASE III.
8. INSTALL DETECTABLE WARNING BUTTONS ON EXISTING SIDEWALK RAMP PER USD #235.
9. CONSTRUCT CONCRETE CROSS GUTTER PER USD #228.
10. CONSTRUCT CONCRETE CROSS GUTTER SPANDREL PER USD #228.
11. CONSTRUCT BUS TURN-OUT PER USD #234.1.
12. CONSTRUCT BUS STOP LOADING PAD PER USD #234.2.
13. CONSTRUCT CONCRETE (PCC) MEDIAN SURFACE PER USD #218.
14. CONSTRUCT AC MEDIAN SURFACE PER USD #218.
15. CONSTRUCT MASONRY RETAINING WALL @ BACK OF S/W PER DETAIL 1 DRAWING C241.
16. MODIFY EXISTING LANDSCAPING AND IRRIGATION SYSTEM WITHIN TEMPORARY CONSTRUCTION EASEMENT AND RIGHT-OF-WAY.
17. SAWCUT AND MATCH EXISTING (SEE GENERAL NOTE #14, DRAWING C101).
18. APPROXIMATE LIMITS OF 3/4" OPEN GRADE (SEE GENERAL NOTE #23, DRAWING C101).
19. TEMPORARY CONSTRUCTION/SLOPE EASEMENT AS NOTED.
20. ADJUST EXISTING SEWER/STORM DRAIN MANHOLE TO FINISH GRADE PER USD #408.
21. ADJUST EXISTING WATER VALVE BOX COVER TO FINISH GRADE PER UDACS PLATE #8.
22. ADJUST/RELOCATE EXISTING ELECTRICAL APPURTENANCES TO FINISH GRADE. (BY NPCO)
23. ADJUST/RELOCATE EXISTING TELEPHONE APPURTENANCES TO FINISH GRADE. (BY SPRINT)
24. ADJUST/RELOCATE EXISTING CABLE APPURTENANCES TO FINISH GRADE. (BY COX)
25. ADJUST/RELOCATE EXISTING GAS APPURTENANCES TO FINISH GRADE. (BY SWG)
26. CONSTRUCT NEW CONCRETE NON-TRAFFIC BEARING WATER METER BOX AND ADJUST SERVICE CONNECTION AS NEEDED PER UDACS PLATE #1A OR 1C.
27. REMOVE & REPLACE 4" COMBINATION AVAR PER DETAIL 3, DRAWING C242.
28. RELOCATE & ADJUST WATER TEST STATION TO F.G. PER DETAIL 1, DRAWING C242.
29. RELOCATE & ADJUST BLOW-OFF & RISER ASSEMBLY TO F.G. PER UDACS PLATE #4
30. ADJUST EXISTING SNWA MANHOLE TO FINISH GRADE PER DETAIL 1, DRAWING C243.
31. ADJUST EXISTING SNWA VAULT PER DETAIL 3, DRAWING C243.
32. MODIFY EXISTING SNWA RISER (24") PER DETAIL 4, DRAWING C243.
33. RELOCATE EXISTING SNWA A/V PER DETAIL 4, DRAWING C241.
34. RELOCATE AND ADJUST SNWA WATER TEST STATION TO F.G. PER DETAIL 1, DRAWING C242
35. CONSTRUCT CONCRETE FOOTING CAP @ BACK OF S/W PER DETAIL 2 DRAWING C241.

NOTE:
ALL MEDIAN CURVE DATA IS FACE OF CURB, ALL OTHER CURVES ARE BACK OF CURB UNLESS OTHERWISE NOTED.

GRAPHIC SCALE

40 0 20 40 80 160
(IN FEET)
HORIZ 1 inch = 40ft.
VERTICAL 1 inch = 4 ft.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83), EAST ZONE, (2701), DETERMINED BY GIS CONTROL POINTS "858" AND "964" AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA RECORDER'S OFFICE, IN FILE 88 OF SURVEYS, AT PAGE 53.

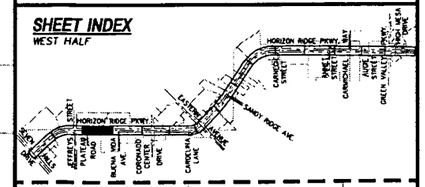
BENCHMARK

CITY OF HENDERSON BENCHMARK No. 333/FEB 1997

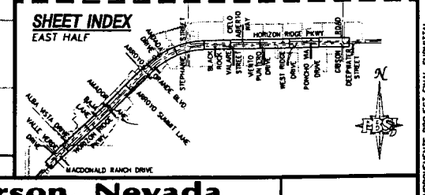
BRASS CAP IN THE TOP OF CURB AT THE SOUTHWEST CORNER OF THE INTERSECTION OF PASEO VERDE AND ARROYO GRANDE BLVD.

ELEV = 615.833 METERS (NAVD 88)
= 2020.445 FEET (NAVD 88)

SHEET INDEX
WEST HALF



SHEET INDEX
EAST HALF



REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL
2	REVISED VERTICAL CURVE AND GRADING FOR RCB	A.S.	11/18/04	
1	REVISED PLAN AND PROFILE FOR BUS TURN-OUT, CURB RETURNS, AND RCB's	A.S.	11/02/04	

DESIGNED BY: A. SPATA
DRAWN BY: L. BOYCE
CHECKED BY: A. ZENHARI
DATE: AUGUST 18, 2004

JOB No.: 51-1472
FILE NAME: C209-1472.dwg
SCALE: HORIZ.: 1"=40' VERT.: 1"=4'

PBSJ 2270 Corporate Circle, Suite 100 Henderson, NV 89074-6382 Telephone: 702/263-7275 Fax: 702/263-7200
ENGINEERING · PLANNING · SURVEYING · CONSTRUCTION SERVICES

SEAL — PROFESSIONAL ENGINEER-STATE OF NEVADA — ANGELO A. SPATA — EXP. 6-30-05 — CIVIL — No. 9353

THE CITY OF HENDERSON

City of Henderson, Nevada

HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT
GIBSON ROAD TO SEVEN HILLS DRIVE
ROADWAY PLAN AND PROFILE
STA 29+00.00 TO STA 39+00.00

XXXX

DRAWING NO. C209 — 22 / 150

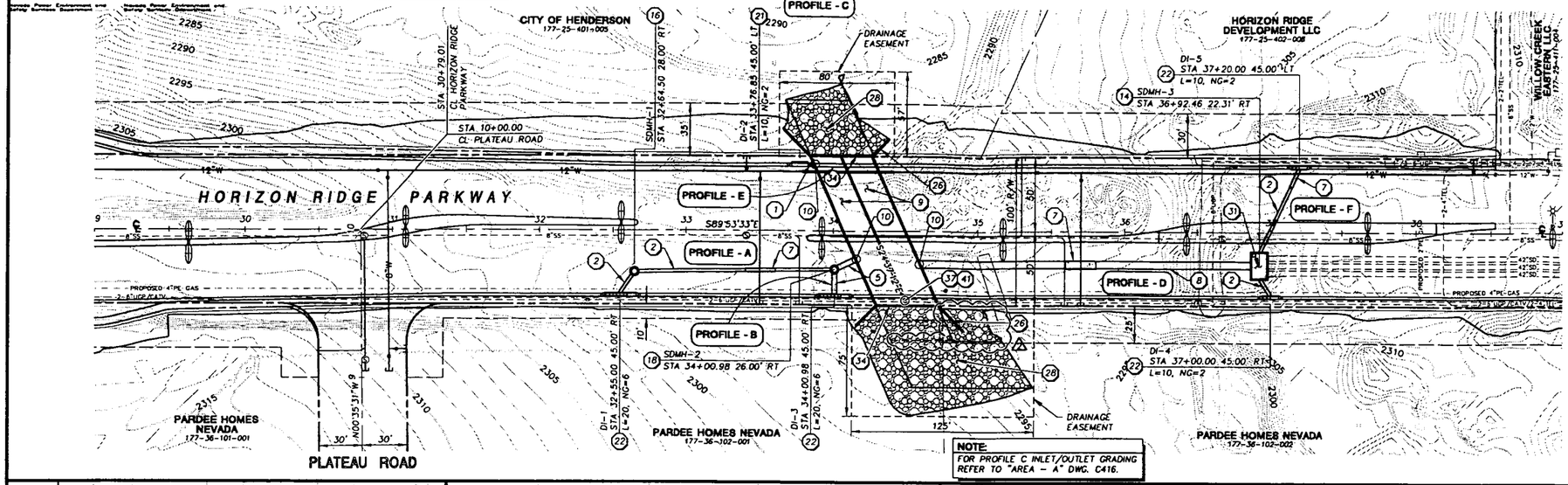
T:\projects\51\472\C209-1472.dwg Layout: C209 Nov 19, 2004 - 10:50am

HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT FINAL SUBMITTAL

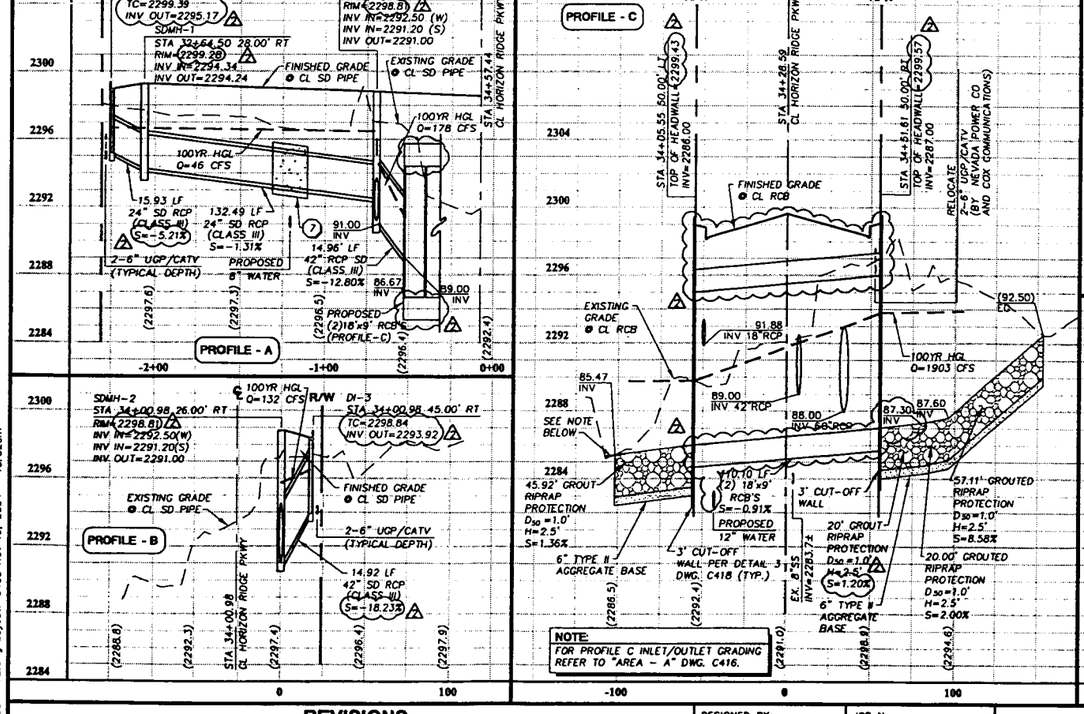
Call before you Dig 1-800-227-2600

Call before you Overhead 1-702-593-6111

NOTE: FINISHED GRADE ELEVATIONS FOR MANHOLES AND DROP INLETS ARE AT THE CENTER OF MANHOLE LIDS AND T.O.C. AT THE CENTER OF DROP INLETS. SET FINISHED GRADE ELEVATIONS FOR THE EDGES OF MANHOLE LIDS AND T.O.C. AT DROP INLETS PER STREET SLOPES.



NOTE: FOR PROFILE C INLET/OUTLET GRADING REFER TO "AREA – A" DWG. C416.



NOTE: FOR PROFILE C INLET/OUTLET GRADING REFER TO "AREA – A" DWG. C416.

KEY NOTES

1. INSTALL 18" RCP SD PER DETAIL 1, DWG. C418.
2. INSTALL 24" RCP SD PER DETAIL 1, DWG. C418.
3. INSTALL 30" RCP SD PER DETAIL 1, DWG. C418.
4. INSTALL 36" RCP SD PER DETAIL 1, DWG. C418.
5. INSTALL 42" RCP SD PER DETAIL 1, DWG. C418.
6. INSTALL 48" RCP SD PER DETAIL 1, DWG. C418.
7. CONCRETE ENCASEMENT PER DETAIL 4 DWG. C418.
8. INSTALL 60" RCP SD PER DETAIL 1, DWG. C418.
9. INSTALL (2) 18'x9' PRECAST RCB'S.
10. FIELD PIPE PENETRATION AT PRE-CAST RCB.
11. INSTALL 60" TYPE III MANHOLE WITH BOLTED LID, NEENAH R-1916 SERIES OR APPROVED EQUAL.
12. INSTALL (2) 10'x4' RCB'S PER NDOT STD. DWG. B-20.1.3.
13. INSTALL (4) 5'x4' RCB'S PER NDOT STD. DWG. B-20.1.3 AND B-20.11.
14. INSTALL TYPE I JUNCTION STRUCTURE SEE DWG C420.
15. INSTALL TYPE II JUNCTION STRUCTURE PER DWG. C421.
16. INSTALL 60" TYPE I MANHOLE PER USD DWG #403.
17. INSTALL 48" TYPE II MANHOLE PER USD DWG #405.
18. INSTALL 60" TYPE III MANHOLE PER USD DWG #406.
19. INSTALL 48" TYPE I MANHOLE PER USD DWG #403.
20. INSTALL TYPE "DM" DROP INLET PER DETAIL 1, DWG. C417.
21. INSTALL TYPE "DW" DROP INLET PER DETAIL 2, DWG. C417.
22. INSTALL NDOT TYPE III MODIFIED INLET PER DETAIL 3, DWG. C417.
23. PIPE PENETRATION PER DETAIL 4, DWG. C419.
24. RELOCATE EXISTING WATERLINE PER DWG'S CJ03 TO CJ30.
25. INSTALL NDOT CULVERT HEADWALL PER NDOT STD. DWG. R-2.5.1 AND R-2.5.2.
26. INSTALL NDOT TYPE I HEADWALL PER NDOT STD. DWG. B-20.1.5.
27. INSTALL RIPRAP PROTECTION.
28. INSTALL GROUTED RIPRAP PROTECTION
29. REMOVE BEEHIVE OUTLET.
30. REMOVE EXISTING HEADWALL.
31. REMOVE EXISTING RIPRAP END PROTECTION
32. REMOVE EXISTING DROP INLET.
33. REMOVE EXISTING MANHOLE.
34. INSTALL PEDESTRIAN RAIL TYPE "R" PER NDOT STD. DWG. B-25.1.5.
35. ABANDON EXISTING STORM DRAIN IN PLACE.
36. RELOCATE EXISTING GAS (BY SOUTHWEST GAS).
37. RELOCATE EXISTING CABLE TV (BY COX COMMUNICATIONS LAS VEGAS, INC.).
38. RELOCATE EXISTING TELEPHONE (BY SPRINT TELEPHONE COMPANY).
39. REMOVE EXISTING STORM DRAIN.
40. CONCRETE COLLAR PER DETAIL 5 DWG C418.
41. RELOCATE EXISTING POWER (BY NEVADA POWER COMPANY).
42. SNWA WATER LINE CROSSING PER DETAIL 5 DWG C418, METHOD C.
43. SNWA WATER LINE CROSSING PER DETAIL 6 DWG C418, METHOD D.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

HORIZ 1 inch = 40ft.

VERTICAL 1 inch = 4 ft.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS PROJECT IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NCS83), EAST ZONE, (2701). DETERMINED BY GIS CONTROL POINTS "858" AND "964" AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA RECORDER'S OFFICE, IN FILE 88 OF SURVEYS, AT PAGE 53.

BENCHMARK

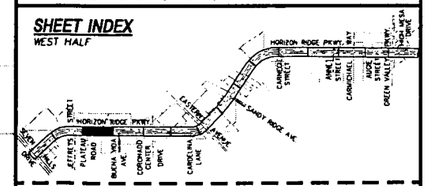
CITY OF HENDERSON BENCHMARK No. 333/FEB 1997

BRASS CAP IN THE TOP OF CURB AT THE SOUTHWEST CORNER OF THE INTERSECTION OF PASEO VERDE AND ARROYO GRANDE BLVD.

ELEV = 615.833 METERS (NAVD 88)
= 2020.445 FEET (NAVD 88)

SHEET INDEX

WEST HALF



SHEET INDEX

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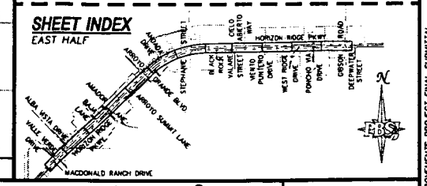


REVISIONS

REV.	DESCRIPTION	BY	DATE	APPROVAL
2	REVISED PROFILE ELEVATIONS FOR STORM DRAINS	A.Z.	11/19/04	
1	MOVED RCB's AND REVISED PLAN AND PROFILE FOR MOVE	A.S.	11/02/04	

DESIGNED BY: P. CHU
DRAWN BY: L. BOYCE
CHECKED BY: A. ZENHARI
DATE: AUGUST 18, 2004

JOB No.: 51-1472
FILE NAME: C403-1472.dwg
SCALE: HORIZ.: 1"=40' VERT.: 1"=4'

PBSJ 2270 Corporate Circle, Suite 100 Henderson, NV 89074-6382 Telephone: 702/263-7275 Fax: 702/263-7200
ENGINEERING · PLANNING · SURVEYING · CONSTRUCTION SERVICES

SEAL: PROFESSIONAL ENGINEER-STATE OF NEVADA — ALI R. ZENHARI — EXP. 1-31-06 — CIVIL — No. 08930

City of Henderson, Nevada

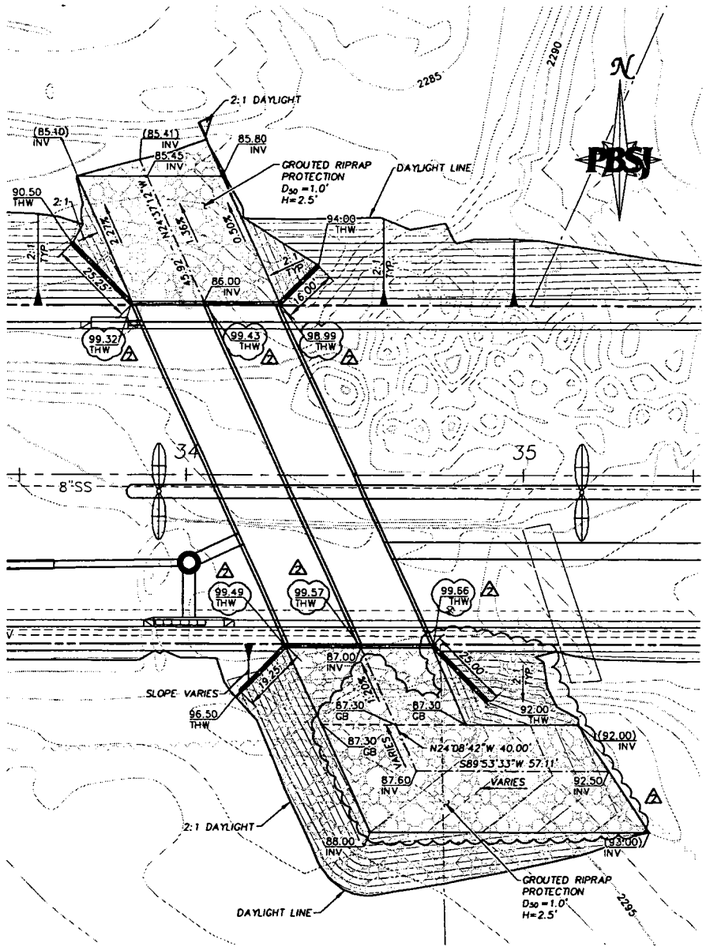
HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT
GIBSON ROAD TO SEVEN HILLS DRIVE
STORM DRAIN PLAN AND PROFILE
STA 29+00.00 TO STA 39+00.00

XXXX

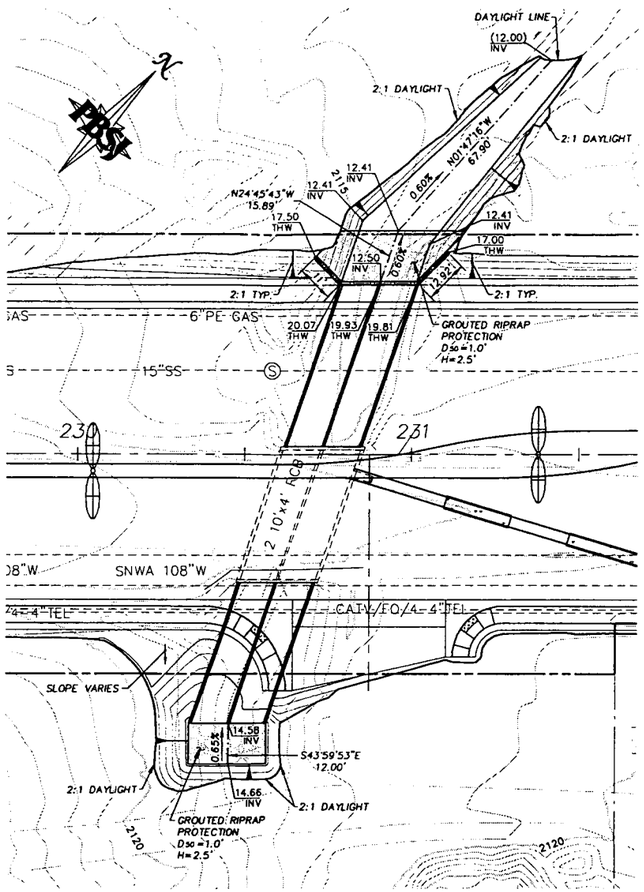
DRAWING NO. C403 | 94 / 150

T:\projects\51-1472\C403-1472.dwg Layout: C403 Nov 19, 2004 - 10:52am

HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT FINAL SUBMITTAL



DRAINAGE ENLARGEMENT AREA - A



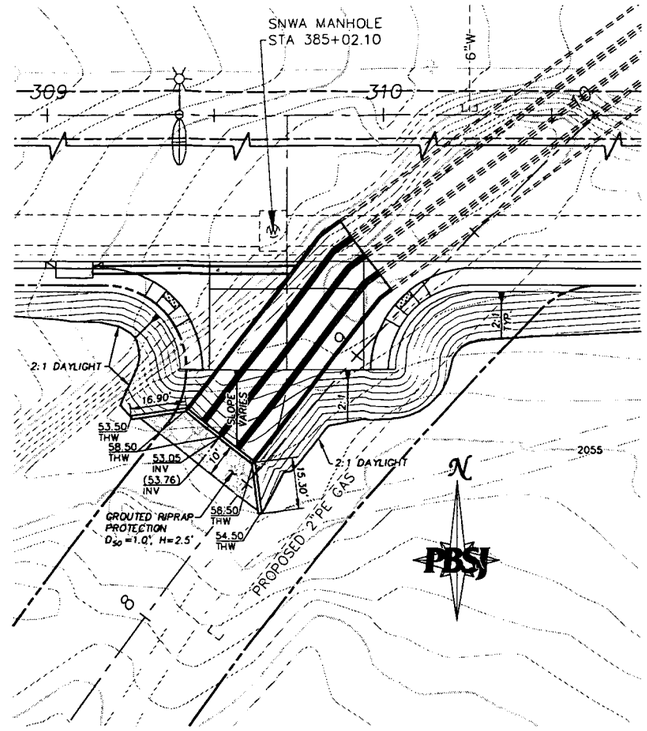
DRAINAGE ENLARGEMENT AREA - B

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

1 inch = 20 ft.



DRAINAGE ENLARGEMENT AREA - C

REVISIONS				
REV.	DESCRIPTION	BY	DATE	APPROVAL
A	REVISED GRADING	A.Z.	11/19/04	
B	MOVED RCB's AND REVISED GRADING	A.S.	11/02/04	

DESIGNED BY: L. BOYCE
DRAWN BY: L. BOYCE
CHECKED BY: A. SPATA
DATE: AUGUST 18, 2004

JOB No.: 51-1472
FILE NAME: C416-1472.dwg
SCALE: HORIZ.: 1"=20' VERT.: N/A

PBSJ
2270 Corporate Circle, Suite 100
Henderson, NV 89074-6382
Telephone: 702/263-7275
Fax: 702/263-7200
ENGINEERING · PLANNING · SURVEYING · CONSTRUCTION SERVICES

SEAL: PROFESSIONAL ENGINEER-STATE OF NEVADA — ALI R. ZENHARI — EXP. 6-30-06 — CIVIL — No. 08930

City of Henderson, Nevada

HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT
GIBSON ROAD TO SEVEN HILLS DRIVE
STORM DRAIN INLET/OUTLET
GRADING ENLARGEMENTS

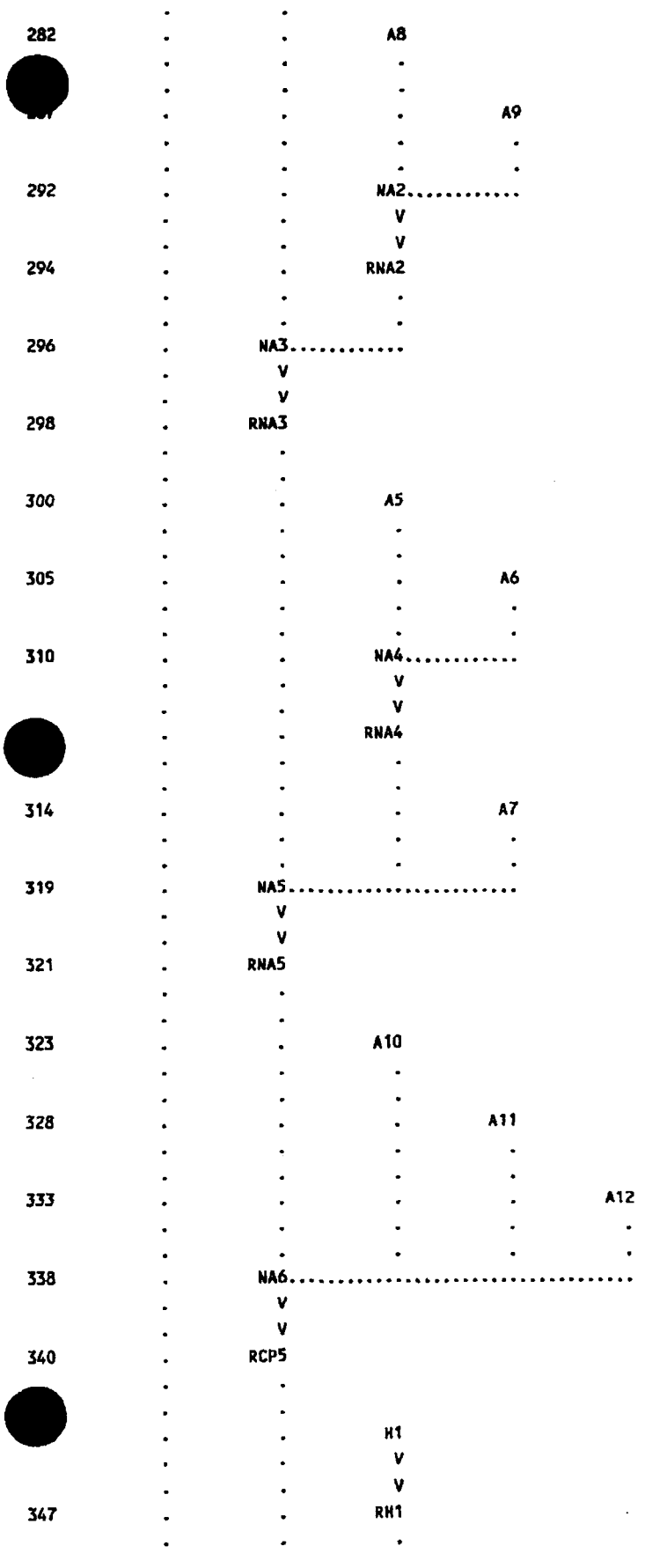
XXXX

DRAWING NO. C416 | 107 / 150

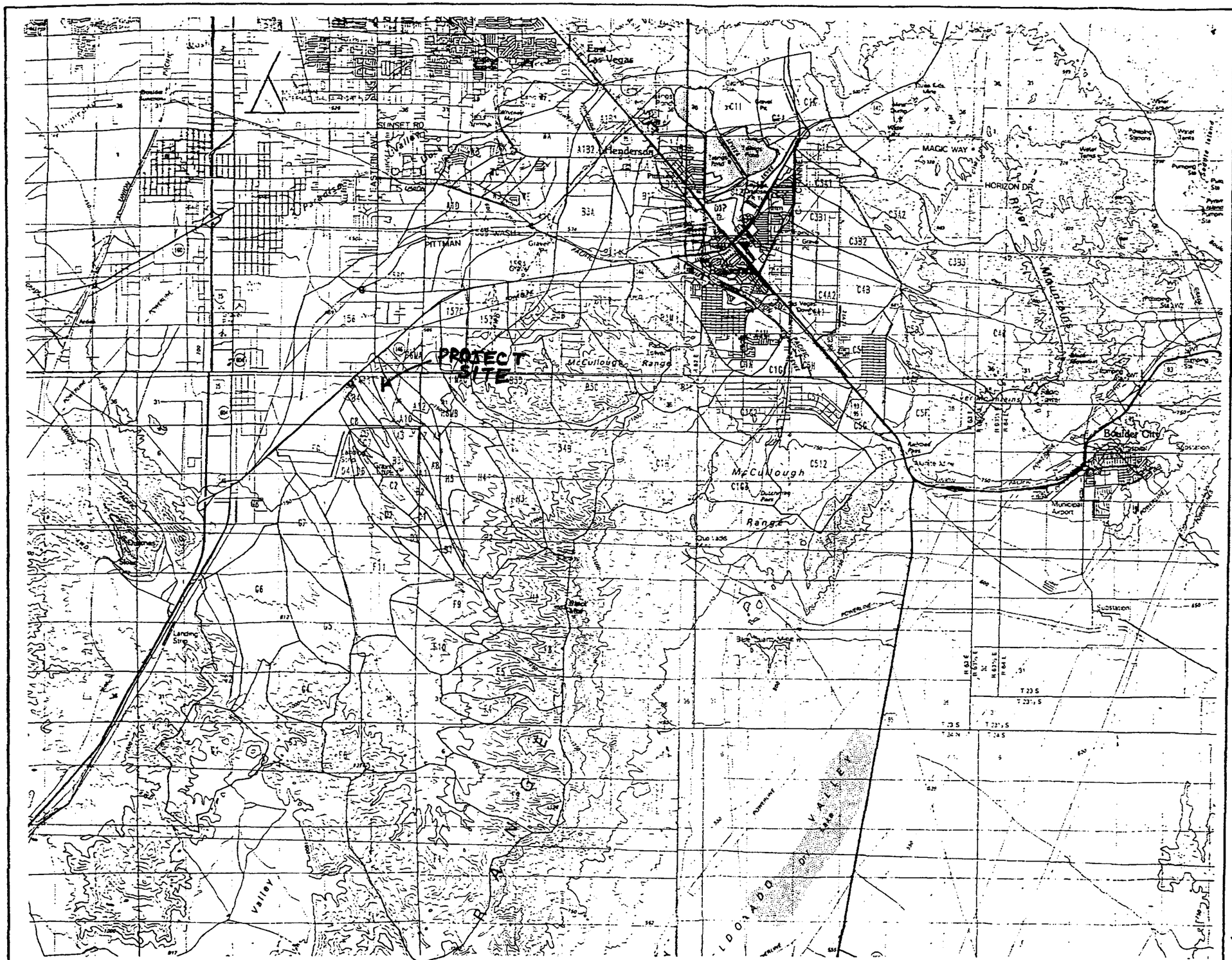
T:\projects\51472\C416-1472.dwg Layout: C416 Nov 19, 2004 - 10:55am

HORIZON RIDGE PARKWAY IMPROVEMENTS PROJECT FINAL SUBMITTAL

Flood Insurance Restudy for Pittman Wash


282
A8
A9
292
NA2
294
RNA2
296
NA3
298
RNA3
300
A5
305
A6
310
NA4
RNA4
314
A7
319
NA5
321
RNA5
323
A10
328
A11
333
A12
338
NA6
340
RCP5
H1
347
RH1

+	NA3	0.96	1	FLOW	416.	344.	200.	188.	182.	176.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00
[redacted] TO										
+	RNA3	0.96	1	FLOW	407.	336.	196.	184.	178.	173.
				TIME	4.08	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT										
+	A5	0.04	1	FLOW	25.	20.	12.	11.	11.	11.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT										
+	A6	0.05	1	FLOW	46.	38.	22.	21.	20.	19.
				TIME	3.50	3.50	3.58	3.58	3.58	3.58
2 COMBINED AT										
+	NA4	0.09	1	FLOW	68.	56.	33.	31.	30.	29.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO										
+	RNA4	0.09	1	FLOW	59.	48.	28.	26.	25.	24.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT										
+	A7	0.29	1	FLOW	135.	112.	65.	61.	59.	57.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
3 COMBINED AT										
+ [redacted]	NA5	1.35	1	FLOW	574.	475.	276.	259.	251.	243.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO										
+	RNA5	1.35	1	FLOW	529.	437.	254.	239.	231.	224.
				TIME	4.50	4.50	4.50	4.50	4.50	4.50
HYDROGRAPH AT										
+	A10	0.35	1	FLOW	191.	157.	91.	86.	83.	80.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT										
+	A11	0.42	1	FLOW	189.	156.	91.	85.	83.	80.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT										
+	A12	0.93	1	FLOW	392.	323.	187.	176.	170.	165.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
4 COMBINED AT										
+	NA6	3.05	1	FLOW	1179.	971.	563.	529.	513.	496.
				TIME	4.17	4.17	4.25	4.25	4.25	4.25
ROUTED TO										
+	RCP5	3.05	1	FLOW	1083.	894.	517.	487.	471.	456.
				TIME	4.67	4.67	4.75	4.75	4.75	4.75
[redacted] GRAPH AT										
+	H1	2.68	1	FLOW	1812.	1524.	939.	890.	865.	841.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO										



CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

1991 FLOOD CONTROL MASTER PLAN UPDATE LAS VEGAS VALLEY

LEGEND

45 SUBAREA DESIGNATION

SUBAREA DELINEATION

N

0 5,000 10,000 15,000

(APPROXIMATE)

HENDERSON BASIN HYDROLOGIC SUBAREAS

FIGURE S-5

James M. Montgomery
Consulting Engineers, Inc.

Las Vegas, Nevada

Site Photographs

Looking east at the existing drainage easements that outlet into the wash.

Looking north at the intersection of Graham Avenue and Jeffreys Street.

Looking north on Jeffreys Street.

Looking east at the existing service road to Horizon Ridge Parkway downstream of the Project Site.

Looking south from the project site to the existing ditch draining to the wash.

Looking west at the drainage easement draining to the wash on the south side of the Coronado Meetinghouse.

Looking west at the drainage easement draining to the wash on the north side of the Coronado Meetinghouse.

Looking northeast at the wash from the southwest corner of the project.

Looking at area downstream of the wash after a low-flow storm event.

Project Grading Plans, Profiles, and Details

UNDEVELOPED LAND OWNED BY THE CITY OF HENDERSON

EXISTING COURTYARD SENIOR LIVING AT SIENA

HORIZON RIDGE PARKWAY

100-YEAR FEMA FLOOD ZONE

100-YEAR FEMA FLOOD ZONE

100-YEAR FEMA FLOOD ZONE

100-YEAR FEMA FLOOD ZONE

PROPOSED STOCKPILE

7 CFS FROM LDS CHURCH

7 CFS FROM LDS CHURCH

EXISTING CORONADO MEETINGHOUSE

EXISTING CORONADO HIGH SCHOOL

EXISTING WRG DESIGN

EXISTING LONTANO APARTMENTS

EXISTING HILLCREST

EXISTING AVALON AT SEVEN HILLS (PARCEL A)

JEFFREYS STREET

GRAHAM AVE

BUENA VISTA DRIVE

LIMIT OF DISTURBED AREA = 9.92 AC

LF TEMPORARY ACCESS ROAD

GRAPHIC SCALE

100 0 50 100

(IN FEET)

1 inch = 100 ft.

NORTH

LEGEND

FLOW DIRECTION

FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	Q_{100} PROP (cfs)	REMARKS	FACILITY
1	1338	1337	Headworks to 12' x 8' RCB	Grouted Riprap w/2:1 SS to 12' X 12' Concrete Apron
1A	1338	1337		12' x 8' RCB
2	28	9	LINE E INT1 SUMP D_{50} = 12" T=24"	36" RCP
3	12	N/A	LINE F	18" RCP STUB & PLUG
4	1354	1341		12' x 8' RCB
5	14	23	LINE D INT2+OF3 SUMP D_{50} = 12"	30" RCP
6	1359	1376		12' x 8' RCB
7	N/A	N/A	LINE B	24" RCP STUB & PLUG
8	41	43	LINE C INT3 SUMP D_{50} = 12" T=24"	36" RCP
9	1383	1383		12' x 8' RCB
10	1383	1383	Transition Structure 12'x8' RCB to existing 2-18' x 9' RCB	Conc. 25' Transition
11	-	-	Existing Horizon Ridge Facilities per PBS&J Plans	Existing Drop Inlets
12	409	409	Existing Buena Vida Facility per PBS&J Plans	11' x 4'-4" Concrete Arch Culvert
13A	37	37	Existing Buena Vida Facility per PBS&J Plans	1 - 38' Modified Type C Drop Inlet with 27' Grate
13B	37	37	Existing Buena Vida Facility per PBS&J Plans	36" RCP
14	446	446		66" RCP
15	N/A	18	DITCH INT3A	2.5' DEEP RIPRAP LINED V-DITCH W/3:1 S.S. D50 = 6 INCHES
16	N/A	25	DITCH INT3B	2.5' DEEP RIPRAP LINED V-DITCH W/3:1 S.S. D50 = 6 INCHES
17	N/A	12	DITCH INT4	2.5' DEEP RIPRAP LINED V-DITCH W/3:1 S.S. D50 = 6 INCHES
18	7	12	LINE A INT4 SUMP D_{50} = 12"	30" RCP
19	12	N/A	LINE G	18" RCP
20	458	446		66" RCP
21	1572	1572	Existing Horizon Ridge Facilities per PBS&J Plans	West Cell of 18' x 9' RCB
22	781	769	Existing Horizon Ridge Facilities per PBS&J Plans	East Cell of 18' x 9' RCB
23	2079	2065	Existing Horizon Ridge Facilities per PBS&J Plans	Existing Grouted Riprap Outfall

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ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 05-02-05
PLOT TIME: 07:54:31

REV | DATE | DESCRIPTION | DATE | AGEN | APP | DATE | DOW | APP | DATE

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE (702) 804-2000 • FAX: (702) 804-2299
Surveyor
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PARDEE HOMES OF NEVADA

GREEN VALLEY 45 OFFSITE DRAINAGE

ONSITE AND NEAR OFFSITE FLOOD PROTECTION PLAN

DRAWING
EX-E
SHT OF SHTS

GREEN VALLEY 45
OFFSITE DRAINAGE

PARDEE HOMES OF NEVADA

CITY APPROVAL OF THE IMPROVEMENT PLANS IS GRANTED FOR ONE YEAR ONLY. PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL TO THE DEPARTMENT OF PUBLIC WORKS, CITY OF HENDERSON IF WORK IS NOT COMPLETED BY

_____, 20____

Ken Y. Koshiro, P.E. — DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

Curt Chandler, P.E. — DATE
FLOOD CONTROL COORDINATOR
CITY OF HENDERSON

Kurt Segler, P.E. — DATE
DIRECTOR OF UTILITY SERVICES
CITY OF HENDERSON

Robert Herr, P.E. — DATE
TRAFFIC ENGINEER
CITY OF HENDERSON

Michael W. Bouse, Director — DATE
DEPARTMENT OF BUILDING AND FIRE SAFETY
CITY OF HENDERSON

James Madden — DATE
FIRE MARSHAL
CITY OF HENDERSON

NEVADA POWER COMPANY — DATE

SOUTHWEST GAS CORPORATION — DATE

SPRINT CENTRAL TELEPHONE – NEVADA — DATE

OWNER:
PARDEE HOMES OF NEVADA
650 WHITE DRIVE, SUITE 100
LAS VEGAS, NEVADA 89119
PHONE: (702) 614-1400

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

ENGINEER — STATE OF NEVADA — G. WALLACE — No. 10801 — PROFESSIONAL — DATE: 2/1/05

FOR AGENCY REVIEW

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ISSUE EDITOR:
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PLOT TIME: 10:13:04

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
tplsonl
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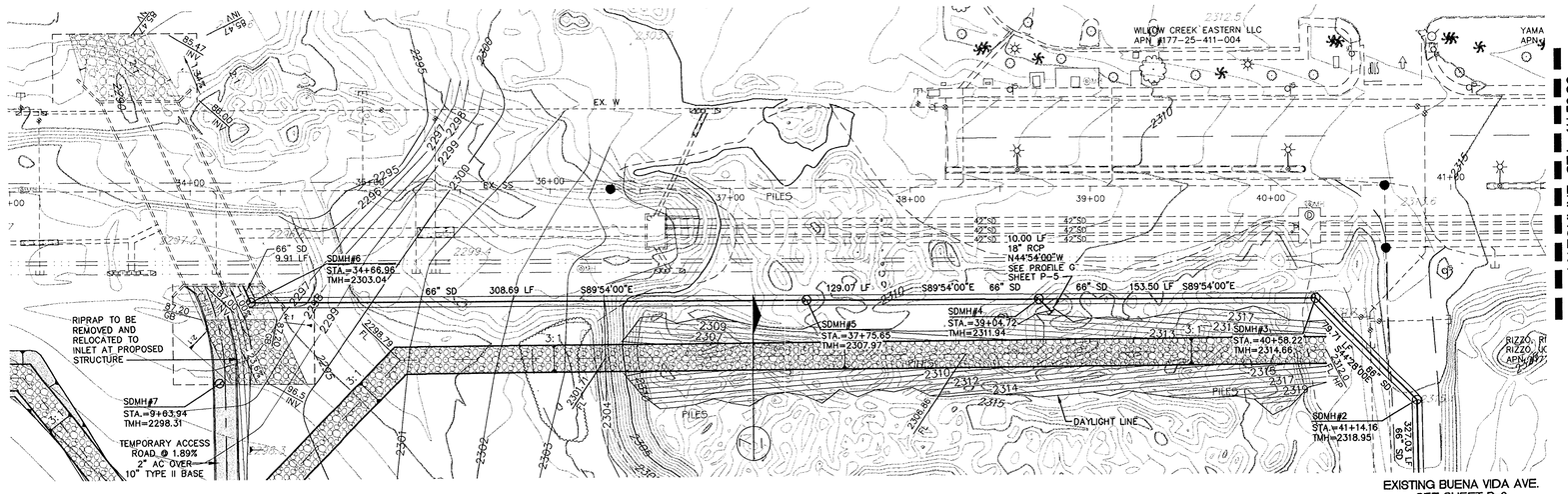
PARDEE HOMES OF NEVADA
GREEN VALLEY 45
COVER SHEET

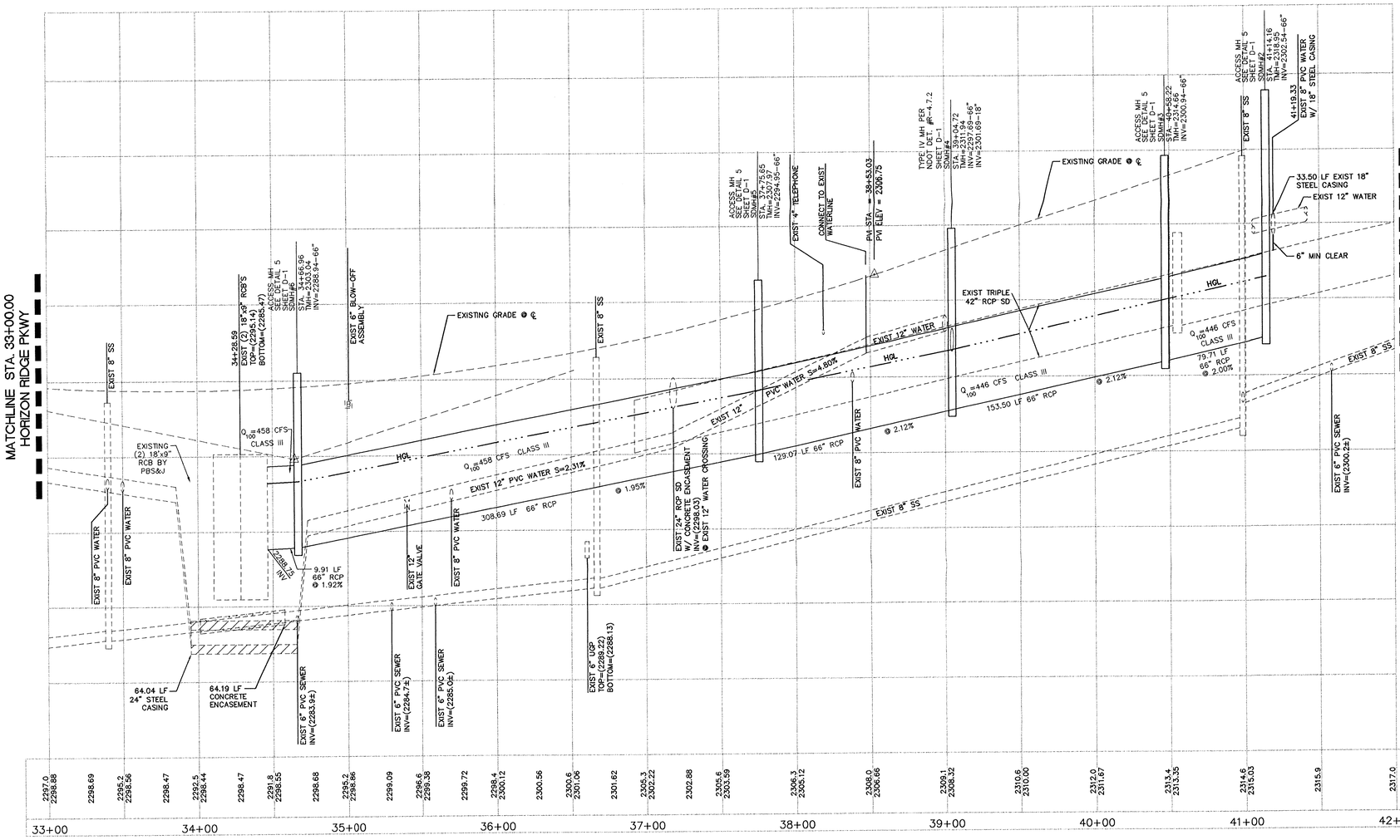
SHEET
C-1
1 OF 8 SHTS

ox2436.dwg 020917.rin



HORIZON RIDGE PKWY

(PUBLIC)



PLAN & PROFILE

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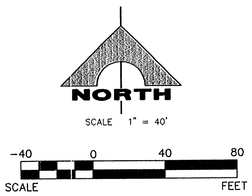
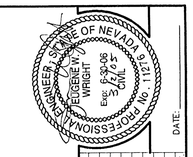
VERT. : 1" = 4'





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PLOT TIME: 12:21:20

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
tplsvi
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BASIS OF BEARINGS

NORTH 00°31'22" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW 1/4)OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 35, TOWNSHIP 22 SOUTH, RANGE 61 EAST, M.D.M., PER MAP THEREOF ON FILE IN FILE 88, PAGE 94 OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

BENCHMARK

CITY OF HENDERSON BENCH MARK NO. 329, BEING A 2" BRASS CAP IN THE TOP OF CURB AT THE NORHTEAST CORNER OF GREEN VALLEY PARKWAY AND SANDY RIDGE DRIVE.
ELEVATION=2418.66 FEET, NAVD 88 DATUM

CITY APPROVAL OF THE IMPROVEMENT PLANS IS GRANTED FOR ONE (1) YEAR ONLY. PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL TO THE DEPARTMENT OF PUBLIC WORKS, CITY OF HENDERSON IF WORK IS NOT COMPLETED BY

_____, 20 ____

APPROVAL:

_____

KEN Y. KOSHIRO, P.E. DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

PARDEE HOMES OF NEVADA

GREEN VALLEY 45

PLAN AND PROFILE

HORIZON RIDGE PARKWAY STA. 33+00.00 TO 41+00.00

DRAWING
P-1
2 OF 8 SHTS

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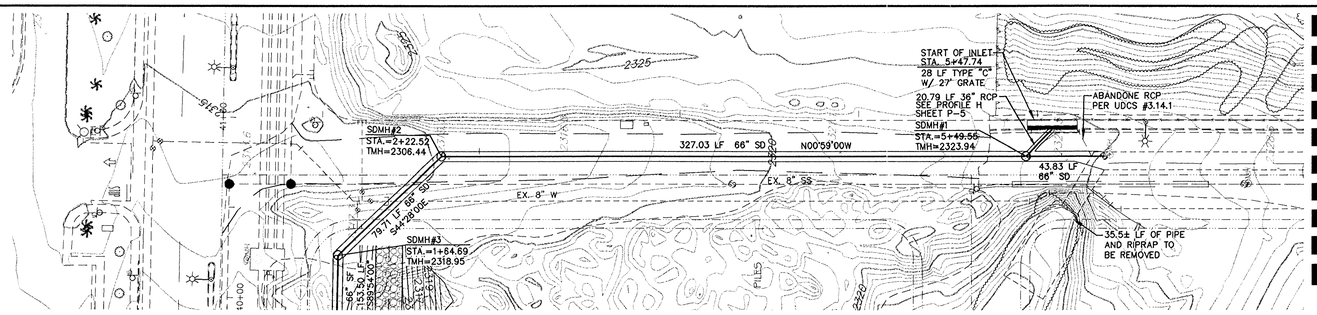
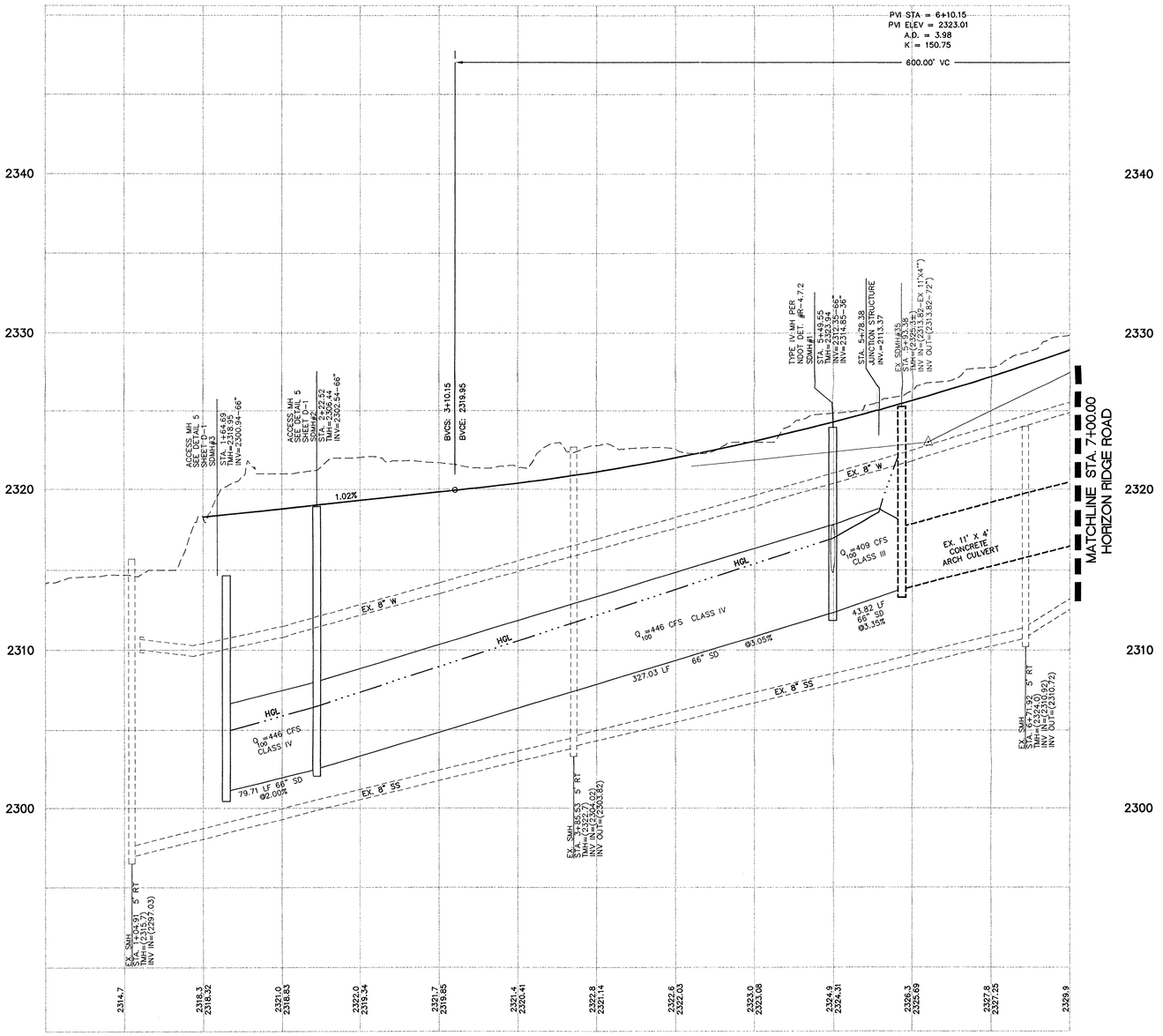


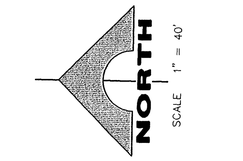
BUENA VIDA AVE.

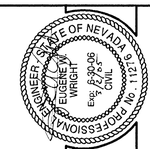
(PUBLIC)



PLAN & PROFILE

HOR. : 1" = 40'
VERT. : 1" = 4'





FOR AGENCY REVIEW

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G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
Taloni
F:\055-331900\dwg\mstr-cv\Drainage\1900-dP2.dwg

BASIS OF BEARINGS

NORTH 00°31'22" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW 1/4)OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 35, TOWNSHIP 22 SOUTH, RANGE 61 EAST, M.D.M., PER MAP THEREOF ON FILE IN FILE 88, PAGE 94 OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

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CITY OF HENDERSON BENCH MARK NO. 329, BEING A 2" BRASS CAP IN THE TOP OF CURB AT THE NORHTEAST CORNER OF GREEN VALLEY PARKWAY AND SANDY RIDGE DRIVE.
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_____, 20 ____

APPROVAL:

_____

KEN Y. KOSHIRO, P.E. DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

PARDEE HOMES OF NEVADA

GREEN VALLEY 45

PLAN AND PROFILE

BUENA VIDA AVE. STA. 1+00.00 TO 8+50.00

DRAWING
P-2
3 OF 8 SHTS

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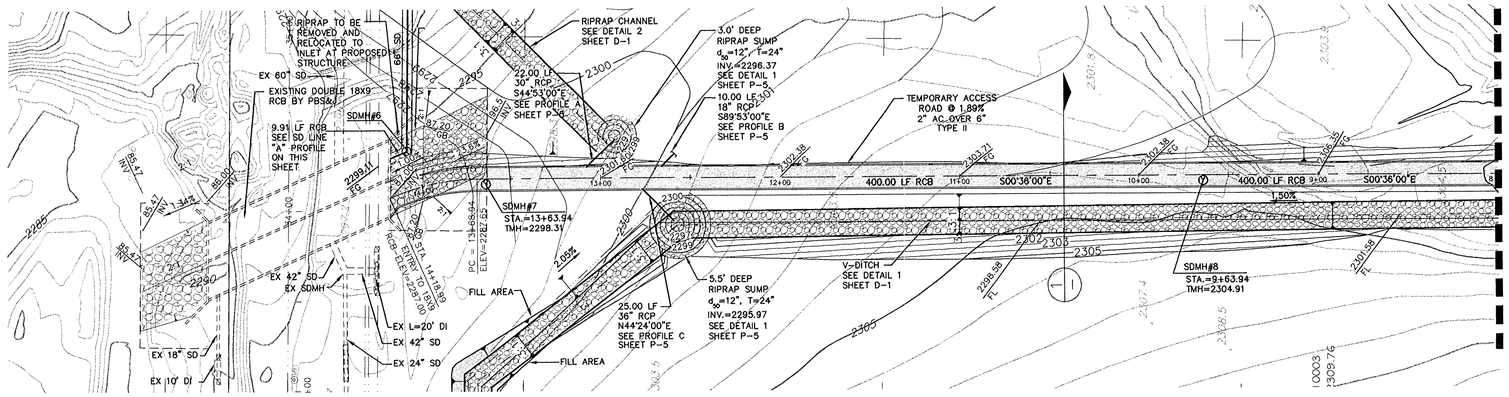
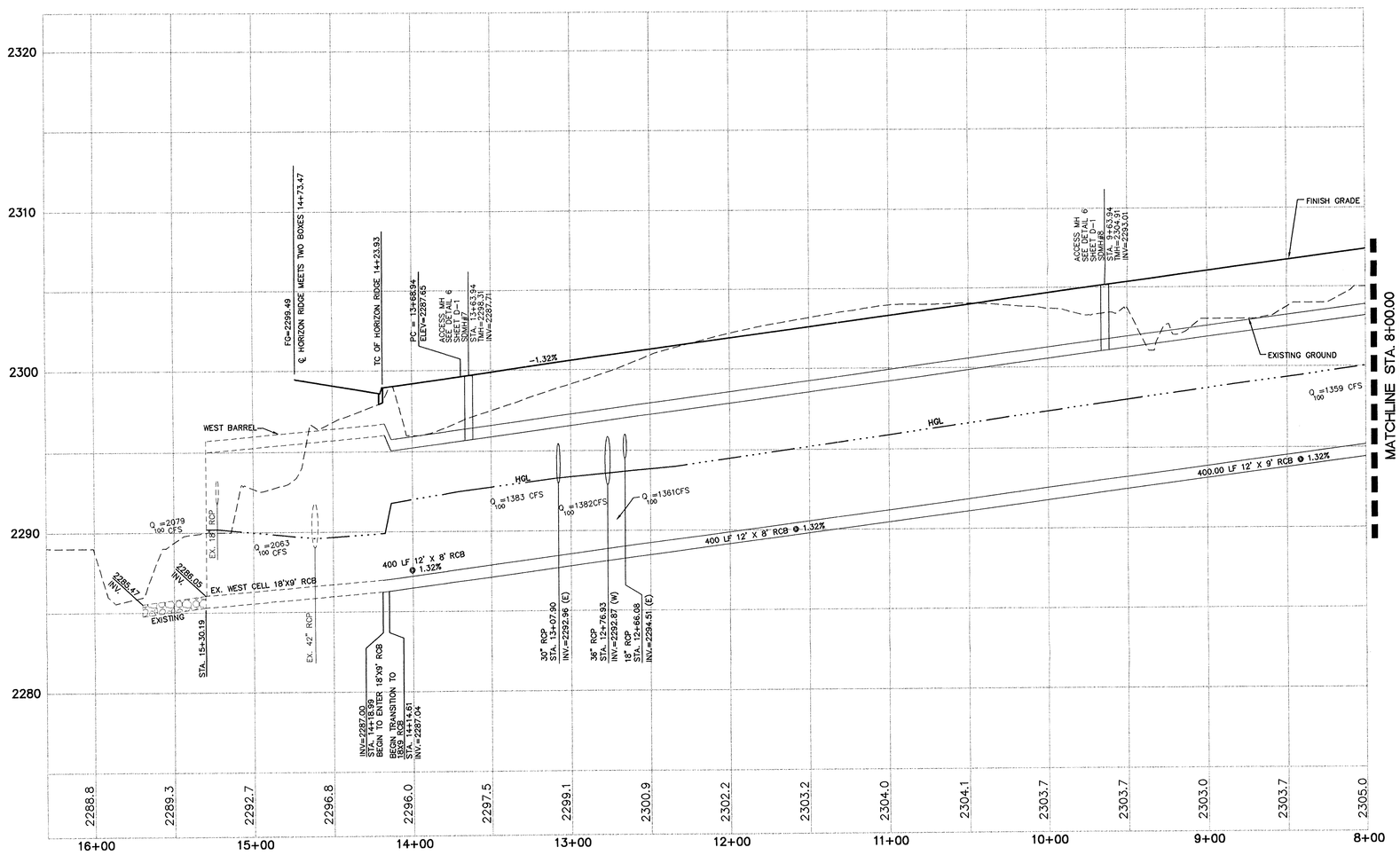
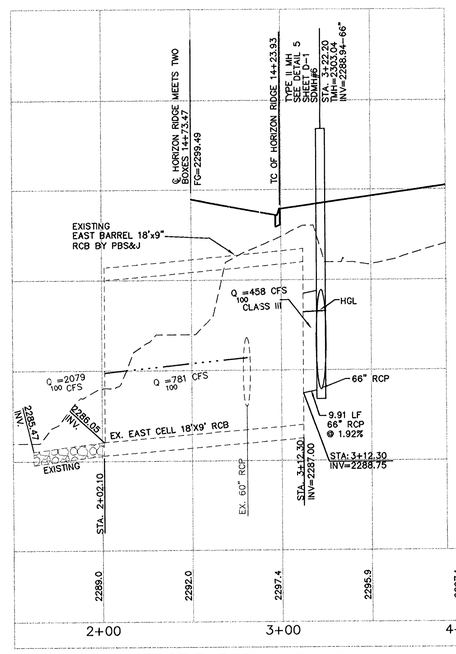


12' X 8' CULVERT



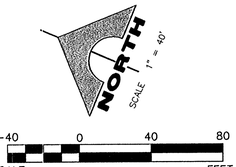
PLAN & PROFILE

HOR. : 1" = 40'
VERT. : 1" = 4'



EAST BARREL PROFILE

SEE THIS SHEET
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



BENCHMARK

CITY OF HENDERSON BENCH MARK NO. 329, BEING A 2" BRASS CAP IN THE TOP OF CURB AT THE NORHTEAST CORNER OF GREEN VALLEY PARKWAY AND SANDY RIDGE DRIVE.
ELEVATION=2418.66 FEET, NAVD 88 DATUM

BASIS OF BEARINGS

NORTH 00°31'22" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW 1/4)OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 35, TOWNSHIP 22 SOUTH, RANGE 61 EAST, M.D.M., PER MAP THEREOF ON FILE IN FILE 88, PAGE 94 OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

CITY APPROVAL OF THE IMPROVEMENT PLANS IS GRANTED FOR ONE (1) YEAR ONLY. PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL TO THE DEPARTMENT OF PUBLIC WORKS, CITY OF HENDERSON IF WORK IS NOT COMPLETED BY

_____, 20 ____

APPROVAL:

_____

KEN Y. KOSHIRO, P.E. — DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

ENGINEER, STATE OF NEVADA
No. 12970
ON PROFESSIONAL
CLIFFORD W. WRIGHT
Exp: 6-30-06
CIVIL

FOR AGENCY REVIEW

REV	DATE	DESCRIPTION	DATE	GCW	APP
			DATE	AGEN.	APP

DESIGN:
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ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 03-02-05
PLOT TIME: 12:22:03

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
tplsoni
F:\055-331900\dwg\improv\Drainage\1900-cP3.dwg

PARDEE HOMES OF NEVADA
GREEN VALLEY 45
12 x 8 BOX CULVERT

DRAWING
P-3
4 OF 8 SHTS

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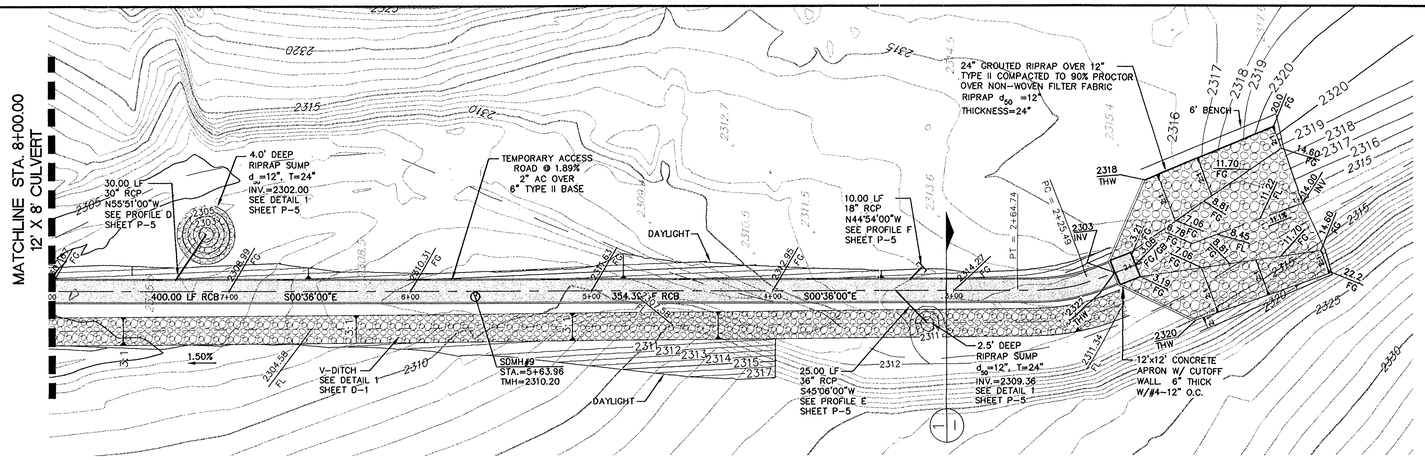
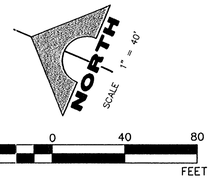
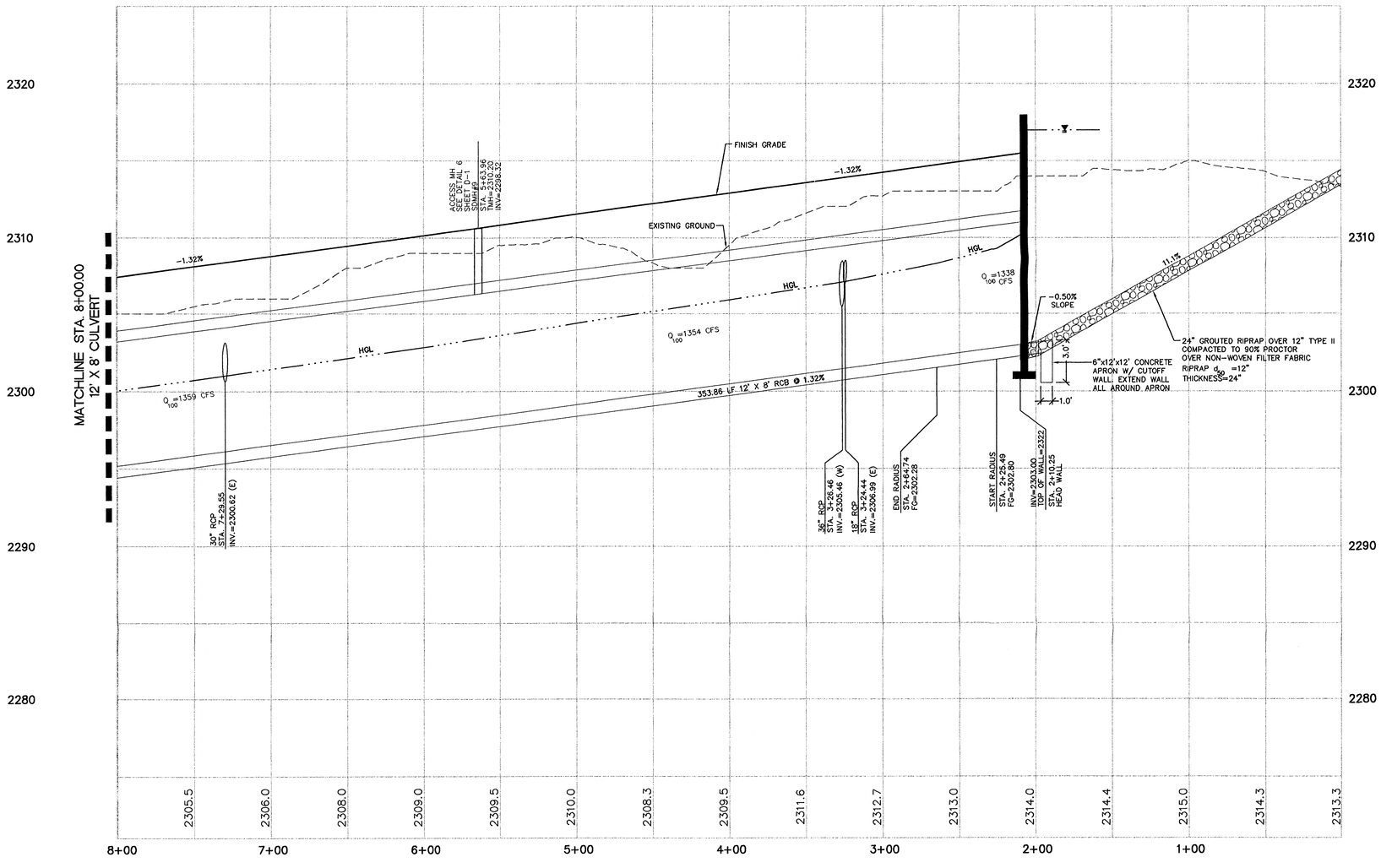




12' X 8' CULVERT



PLAN & PROFILE

HOR. : 1" = 40'
VERT. : 1" = 4'

BASIS OF BEARINGS

NORTH 00°31'22" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW 1/4)OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 35, TOWNSHIP 22 SOUTH, RANGE 61 EAST, M.D.M., PER MAP THEREOF ON FILE IN FILE 88, PAGE 94 OF SURVEYS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

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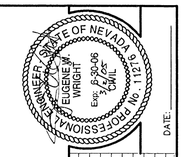
_____, 20 ____

APPROVAL:

_____

KEN Y. KOSHIRO, P.E. DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

FOR AGENCY REVIEW



REV.	DATE	DESCRIPTION	DATE	AGEN.	APP	DATE	GCW	APP

DESIGN:
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PLOT DATE: 03-02-05
PLOT TIME: 12:29:17

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2400 FAX: (702) 804-2299
tpiazzi
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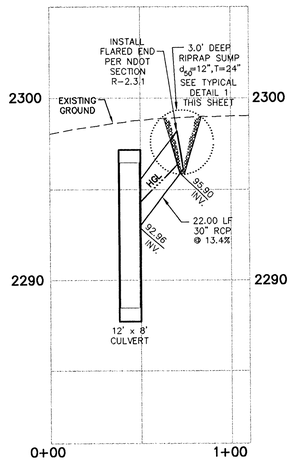
PARDEE HOMES OF NEVADA

GREEN VALLEY 45

12 x 8 BOX CULVERT

DRAWING
P-4
5 OF 8 SHTS

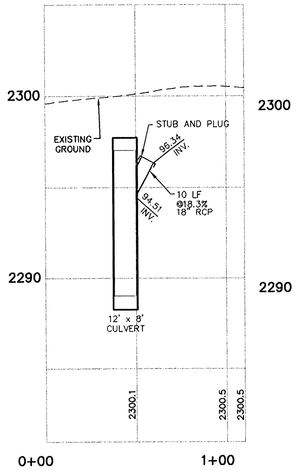
dwg 2436 dwg 030824 xls



STORM DRAIN LINE 'A' PROFILE

12' X 8' CULVERT

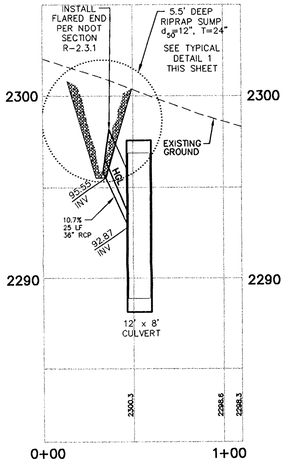
SEE SHEET P-3 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



STORM DRAIN LINE 'B' PROFILE

12' X 8' CULVERT

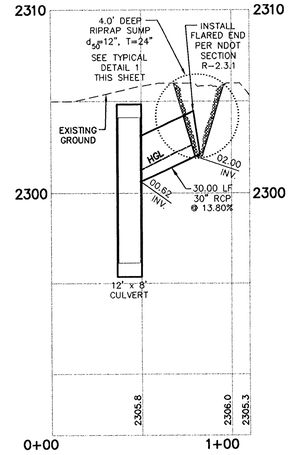
SEE SHEET P-3 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



STORM DRAIN LINE 'C' PROFILE

12' X 8' CULVERT

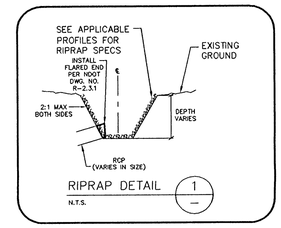
SEE SHEET P-3 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



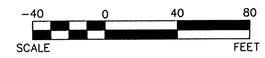
STORM DRAIN LINE 'D' PROFILE

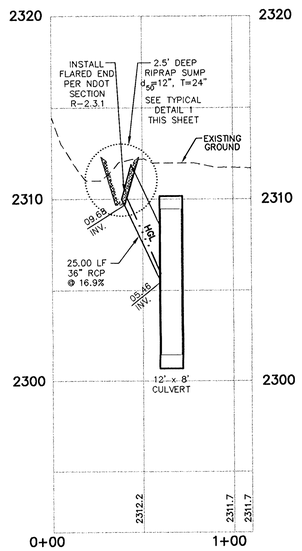
12' X 8' CULVERT

SEE SHEET P-4 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



RIPRAP DETAIL (1)
N.T.S.

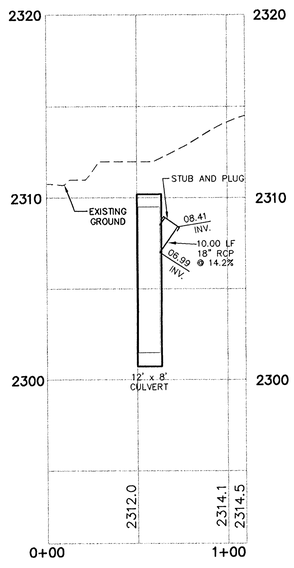




STORM DRAIN LINE 'E' PROFILE

12' X 8' CULVERT

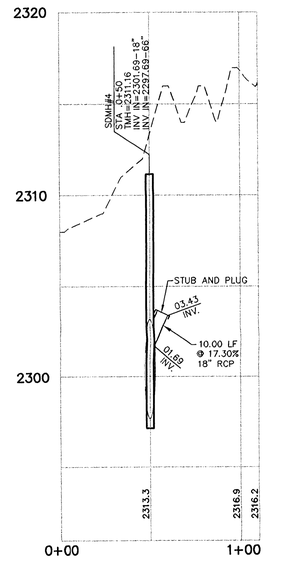
SEE SHEET P-4 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



STORM DRAIN LINE 'F' PROFILE

12' X 8' CULVERT

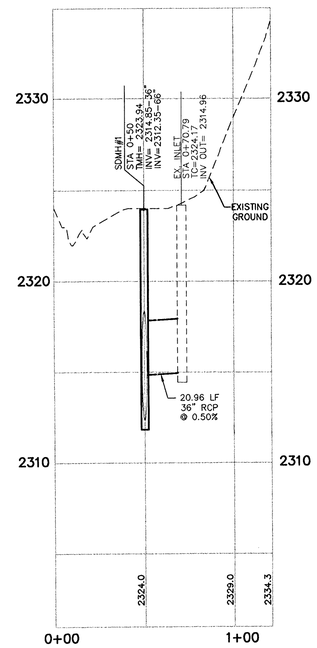
SEE SHEET P-4 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



STORM DRAIN LINE 'G' PROFILE

LATERAL TO 66" SD

SEE SHEET P-1 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'



STORM DRAIN LINE 'H' PROFILE

BUENA VIDA ROAD

SEE SHEET P-2 FOR PLAN
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'

BASIS OF BEARINGS

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BENCHMARK

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ELEVATION=2418.66 FEET, NAVD 88 DATUM

Avoid cutting underground utility lines. It's costly.
Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)

CITY APPROVAL OF THE IMPROVEMENT PLANS IS GRANTED FOR ONE (1) YEAR ONLY. PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL TO THE DEPARTMENT OF PUBLIC WORKS, CITY OF HENDERSON IF WORK IS NOT COMPLETED BY

_____, 20 ____

APPROVAL:

_____

KEN Y. KOSHIRO, P.E. — DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

STATE OF NEVADA — PROFESSIONAL ENGINEER — No. 11115 — CHARLES W. WRIGHT — Exp. 6-30-06 — CIVIL — ON PROFESSIONAL

FOR AGENCY REVIEW

REV	DATE	DESCRIPTION	DATE	AGEN	APP	DATE	GCW	APP	DATE

DESIGN:
DRAWN:
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ISSUE DATE: 03-02-05
ISSUE EDITOR:
PLOT DATE: 03-02-05
PLOT TIME: 11:51:03

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD. LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

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tolson

PARDEE HOMES OF NEVADA
GREEN VALLEY 45
INLET PROFILES

DRAWING
P-5
6 OF 8 SHTS

G:\2436.dwg\030624.wk

HORIZON RIDGE PARKWAY

EX. DOUBLE 18' x 9' CULVERT BY PBS&J

SDMH#6 9.91 LF 66" SD

308.69 LF 66" SD

SDMH#5

SDMH#4 153.50 LF 66" SD

SDMH#3 129.07 LF 66" SD

SDMH#2 327.03 LF 66" SD

SDMH#1 43.83 LF 66" SD

SDMH#7 2298.3±

3.0' DEEP RIPRAP CHANNEL d_{50}=6", T=12"

DAYLIGHT LINE

5.5' DEEP RIPRAP SUMP d_{50}=12", T=24"

2297.67 FL/INV

3.0' DEEP RIPRAP SUMP d_{50}=12", T=24"

2.5' DEEP RIPRAP CHANNEL d_{50}=6", T=12"

RIPRAP TO BE REMOVED AND RELOCATED TO INLET AT PROPOSED STRUCTURE-THIS SHEET.

LIMITS OF DISTURBED AREA - 8.90 AC.

18' TEMPORARY ACCESS ROAD

TEMPORARY ACCESS ROAD @1.89% 2" AC OVER 10" TYPE II

12'X8' RCB BOX

SDMH#8 2304.9±

JEFFREY'S STREET

BUENA VISTA AVE.

3.0' DEEP RIPRAP CHANNEL d_{50}=6", T=12"

4.0' DEEP RIPRAP SUMP T=12"

ZONE "A"

ZONE "X"

BOUNDARY LINE

2.5' DEEP RIPRAP SUMP d_{50}=12", T=24"

FILL AREA

GRAHAM AVE.

NORTH

SCALE 1" = 60'

SCALE: -60 0 60 120 FEET

BENCHMARK

CITY OF HENDERSON BENCH MARK NO. 329, BEING A 2" BRASS CAP IN THE TOP OF CURB AT THE NORHTEAST CORNER OF GREEN VALLEY PARKWAY AND SANDY RIDGE DRIVE. ELEVATION=2418.66 FEET, NAVD 88 DATUM

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Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut yards	Fill yards	Net yards	Method
stockpile 8	stockpile eg	stockpile 8		31	458557	458525 (F)	Grid

PC = 2+25.49

12"X12" 3.0' DEEP CUTOFF WALL (ALL AROUND CONC. APRON) W/#4-12" O.C.

24" GROUTED RIPRAP OVER 12" TYPE II COMPACTED TO 90% PROCTOR RIPRAP d_{50} =12" THICKNESS=24"

6' BENCH

FILL AREA

NORTH

SCALE 1" = 30'

FOR AGENCY REVIEW

STATE OF NEVADA — EUGENE W. WRIGHT — No. 6536 — CIVIL — PROFESSIONAL ENGINEER — 6/12/19

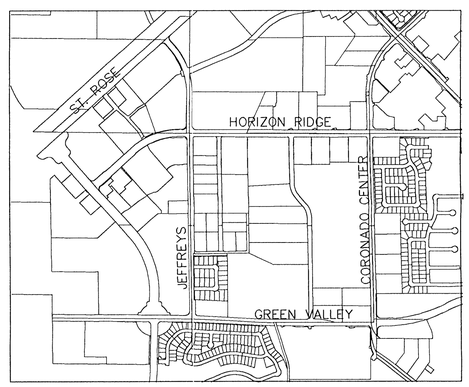
REV.	DATE	DESCRIPTION	DATE: AGEN. APP	DATE: DGN. APP

DESIGN:
DRAWN: CMP
CHECK:
ISSUE DATE: 5-11-04
ISSUE EDITOR:
PLOT DATE: 03-02-05
PLOT TIME: 12:26:26

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89146
TELEPHONE (702) 804-2000 FAX (702) 804-2099
F:\055-331900\dwg\improv\Drainage\1900-cSP1.dwg tplsoni

STOCKPILE GRADING PLAN
GREEN VALLEY 45
BY PARDEE HOMES

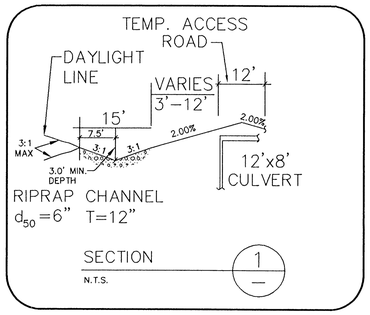
VICINITY MAP



PARDEE HOMES OF NEVADA
GREEN VALLEY 45
STOCKPILE GRADING PLAN

SHEET
SP-1
7 OF 8 SHTS

dw24.36 (dwg 07/2001) rvn



SECTION 1
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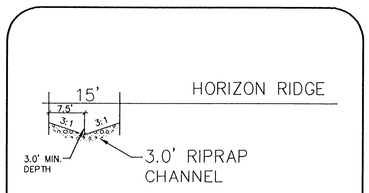

SECTION 2
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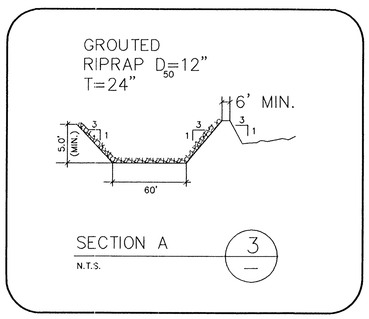

SECTION A 3
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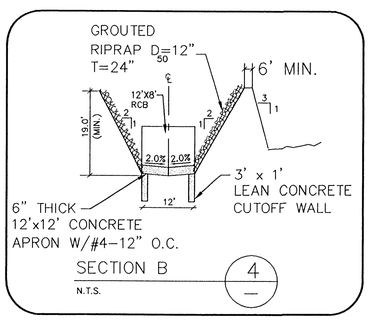

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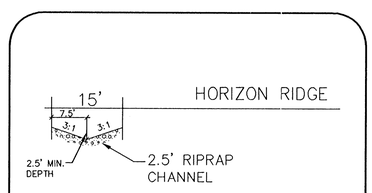
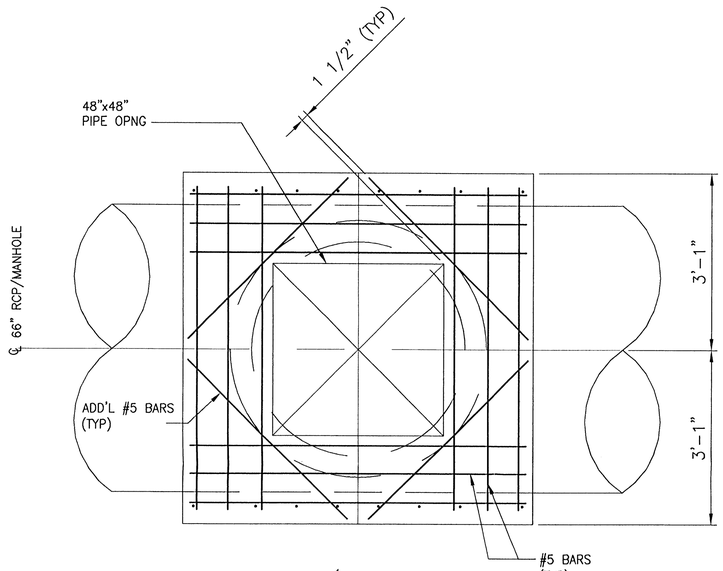
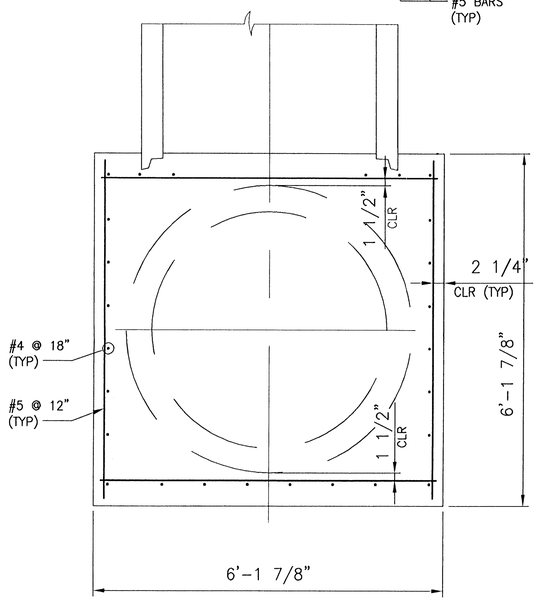


SECTION 7
N.T.S.





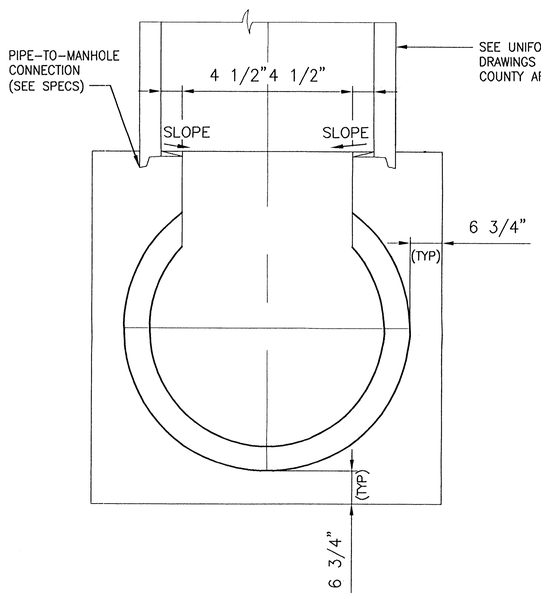
ACCESS MANHOLE #1 DETAIL

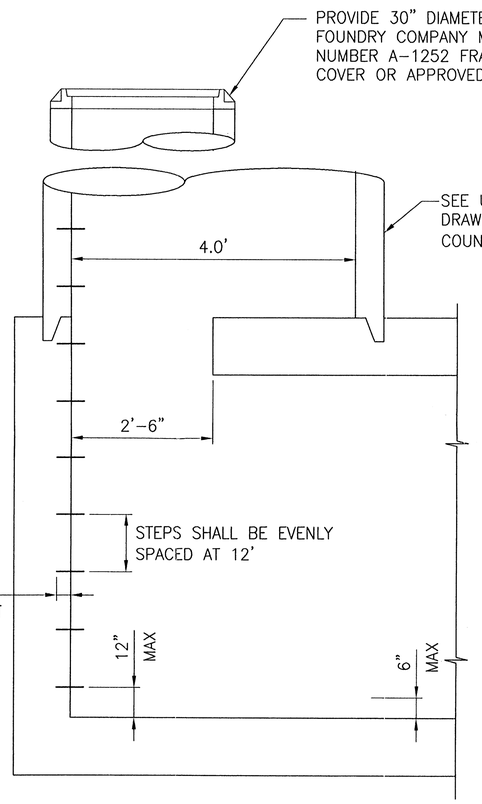
N.T.S

5

NOTES:

1. SLOPE MANHOLE FLOORS AT A SLOPE OF 1:12.
2. FULL STRENGTH GROUT AT INVERT.





ACCESS MANHOLE #2 DETAIL 6
N.T.S.

ESTIMATE OF QUANTITIES

•CONTRACTOR TO VERIFY

1.	66" STORM DRAIN	1,052 LF
2.	18" RCP	30 LF
3.	30" RCP	10 LF
4.	36" RCP	20 LF
5.	12'x8' CULVERT	1,208 LF
6.	NDOT TYPE IV MANHOLES	2 EA.
7.	48" MH-SEE SHEET P-5 DET. 5	6 EA.
8.	RIPRAP d50=12"	1,337 CY
9.	12' TEMP. ACCESS ROAD (6" TYPE II)	1,211 LF

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APPROVAL:

KEN Y. KOSHIRO, P.E. DATE
NEW DEVELOPMENT ENGINEER
CITY OF HENDERSON

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

Avoid cutting underground utility lines. It's costly.
Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)

FOR AGENCY REVIEW

STATE OF NEVADA — PROFESSIONAL ENGINEER — EUGENE W. WRIGHT — No. 11216 — Exp. 6-30-06 — CIVIL

REV	DATE	DESCRIPTION	DATE AGEN. APP	DATE COW APP

DESIGN:
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PLOT TIME: 11:51:29

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2399
tplsni
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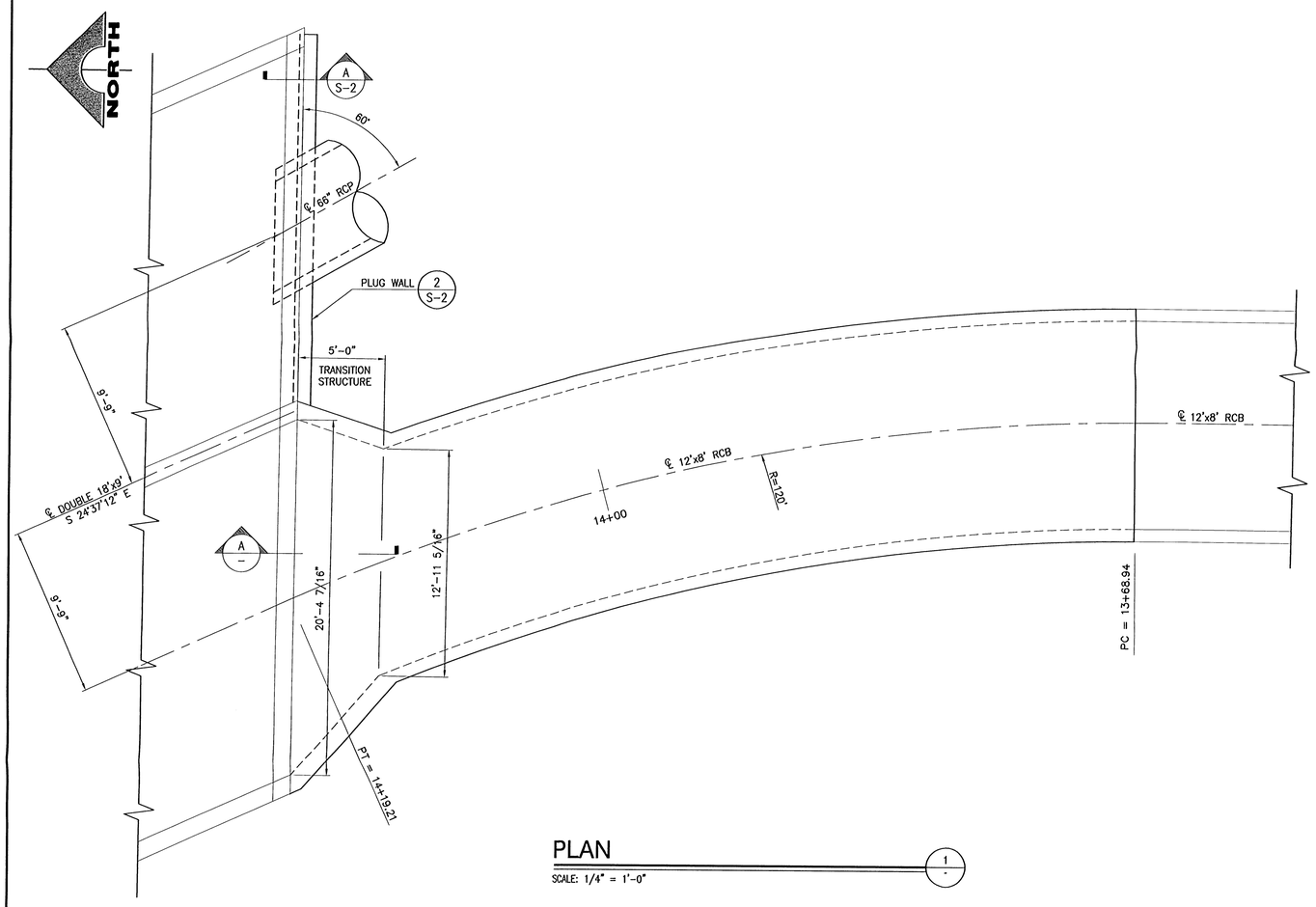
PARDEE HOMES OF NEVADA
GREEN VALLEY 45
TYP. SECTIONS AND GRADING DETAILS

DRAWING D-1
8 OF 8 SHTS

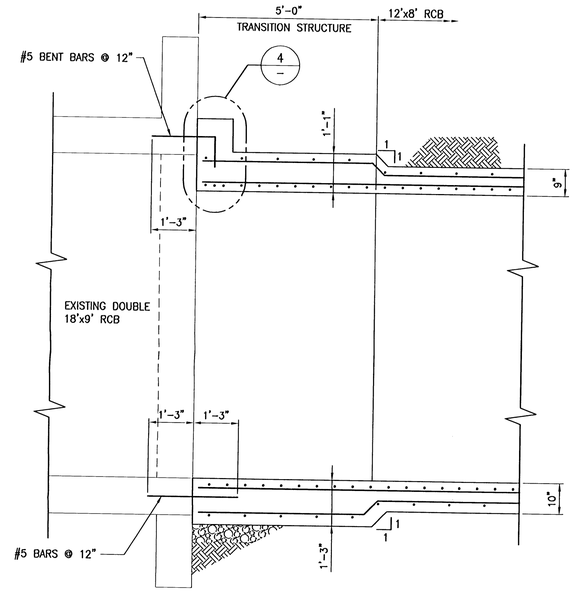
pcp2436.dwg,030624.wds



PLAN

SCALE: 1/4" = 1'-0"

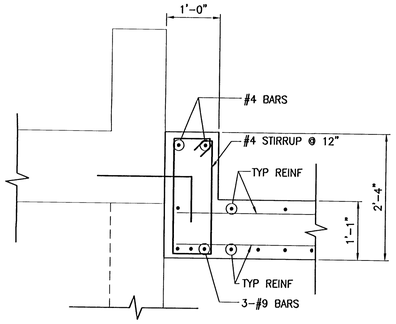
1



SECTION

SCALE: 1/2" = 1'-0"

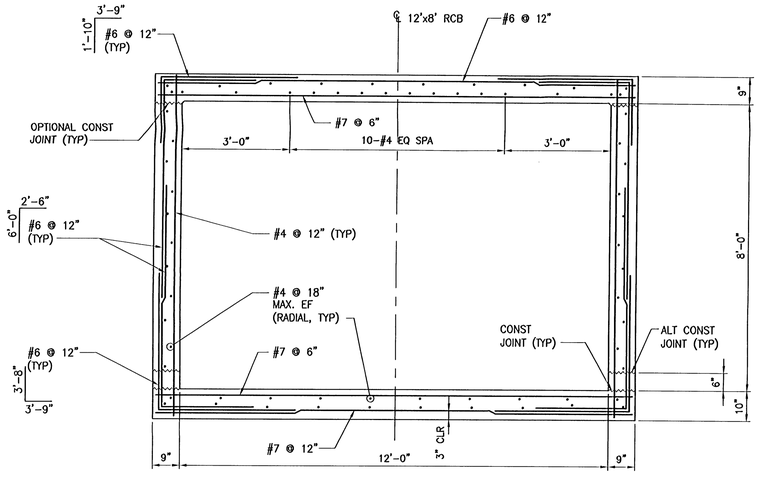
A



DETAIL

SCALE: 3/4" = 1'-0"

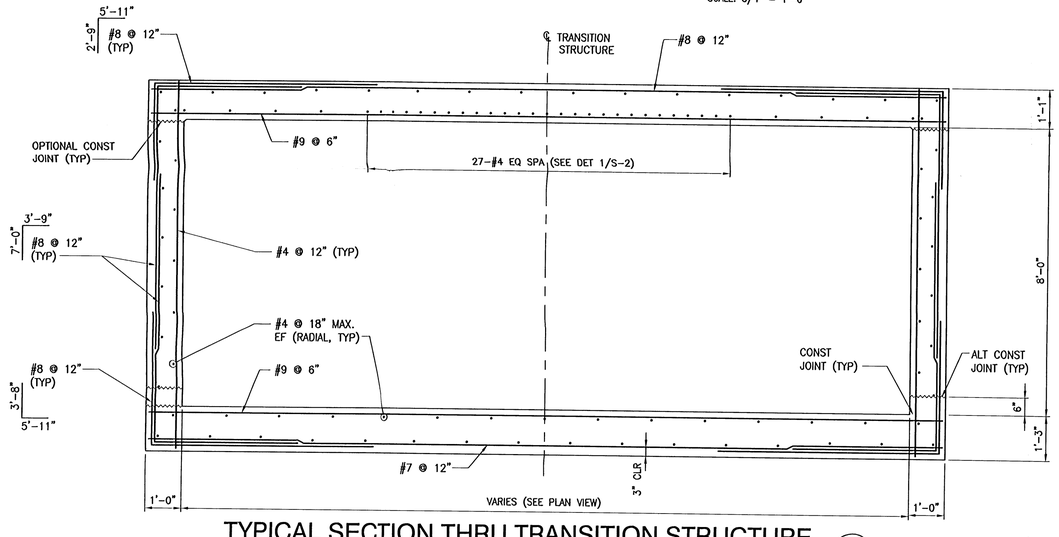
4



TYPICAL SECTION THRU 12'x8' RCB

SCALE: 1/2" = 1'-0"

2



TYPICAL SECTION THRU TRANSITION STRUCTURE

SCALE: 1/2" = 1'-0"

3

FOR AGENCY REVIEW

ENGINEER - STATE OF NEVADA
FAYSAL A. ARID
No. 12227
PROFESSIONAL ENGINEER
CIVIL
DATE: 4/27/2023

DESCRIPTION	REV DATE	DATE AGEN. APP	DATE CCRW APP

DESIGN: FAA
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PLOT TIME: 14:23:29

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 364-1005 FAX: (702) 364-1029
F:\055-331900\dwg\imeron\Drainage\1900-S1.dwg rgomez

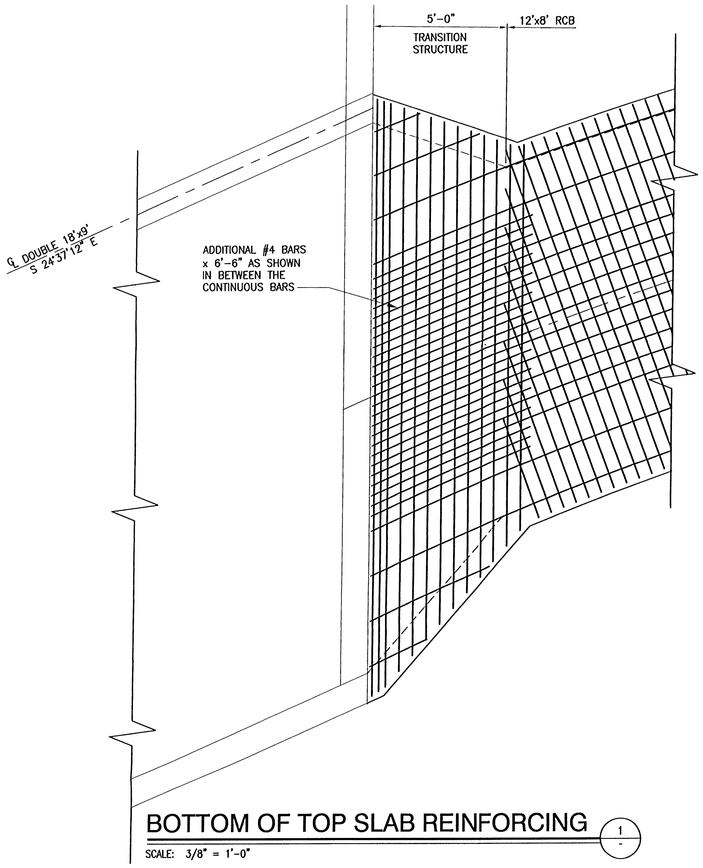
PARDEE HOMES OF NEVADA

GREEN VALLEY 45

RCB PLAN AND DETAILS

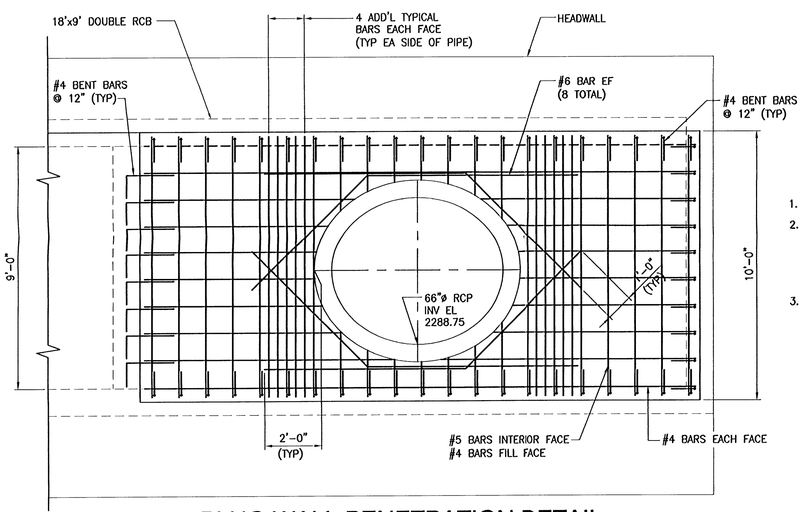
DRAWING
S-1
1 OF 8 SHTS

gc-0436.dwg 03/02/24 vek



BOTTOM OF TOP SLAB REINFORCING (1)

SCALE: 3/8" = 1'-0"

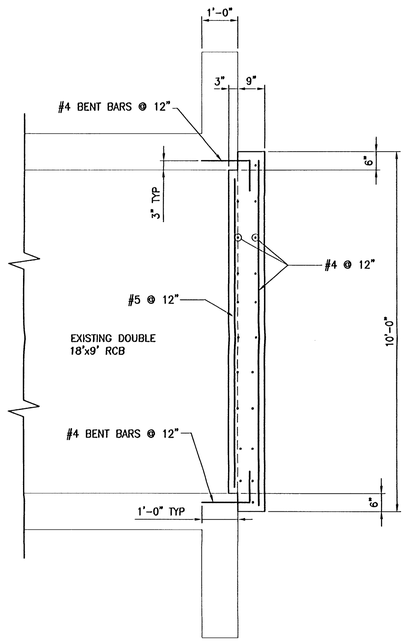


PLUG WALL PENETRATION DETAIL (2)

SCALE: 3/8" = 1'-0"

NOTES:

1. FIELD CUT ALL REINFORCING 2" CLR OF OPENINGS.
2. EVERY VERTICAL REBAR DISCONTINUED AT OPENING SHALL BE REPLACED BY AN EXTRA REBAR PLACED AT THE SIDE OF THE OPENING AS SHOWN. THE LENGTH OF THE EXTRA REBARS SHALL EQUAL THE LENGTH OF THE SCHEDULE REBARS THAT ARE NOT DISCONTINUED AT THE OPENING.
3. PROVIDE MINIMUM 2" CLR BETWEEN ALL REINFORCING BARS.



SECTION (A)

SCALE: 1/2" = 1'-0"

GENERAL STRUCTURAL NOTES:

CONCRETE: ALL CONCRETE SHALL BE CLASS 'A' MODIFIED WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH f'c=4500psi AT 28 DAYS. ALL CONCRETE SHALL BE MADE USING TYPE V CEMENT. ALL EXPOSED CORNERS SHALL BE BEVELED 3/4" UNLESS OTHERWISE NOTED.

REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS. MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 2" UNLESS OTHERWISE NOTED. HOOKS MAY BE ROTATED OR TILTED, AS NECESSARY, TO PROVIDE PROPER CLEARANCES

BEDDING MATERIAL: BEDDING MATERIAL SHALL BE 6" OF CLARK COUNTY TYPE II AGGREGATE. THE BEDDING LAYER SHALL BE COMPACTED TO AT LEAST 90 PERCENT OF THE MAXIMUM DRY DENSITY AS ESTABLISHED BY ASTM TEST METHOD D-1557.

EXISTING UTILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES WITHIN THE WORK AREA, AND PROVIDING PROTECTION FOR THE VARIOUS UTILITIES AFFECTED, BEFORE PROCEEDING WITH THE WORK.

EPOXY: EPOXY SHALL BE SIMPSON SET EPOXY. INSTALL PER ICBO REPORT ER-5279 AND IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

STATE OF NEVADA
FAYSAL A. ALDIN
No. 12224
PROFESSIONAL ENGINEER
DATE: 9/6/2005

FOR AGENCY REVIEW

REV	DATE	DESCRIPTION	DATE AGEN. APP	DATE GCW APP

DESIGN: FAA
DRAWN: TAB
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ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-06-05
PLOT TIME: 14:25:00

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2099
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PARDEE HOMES OF NEVADA

GREEN VALLEY 45

RCB SECTIONS AND DETAILS

DRAWING
S-2
OF 8 SHTS

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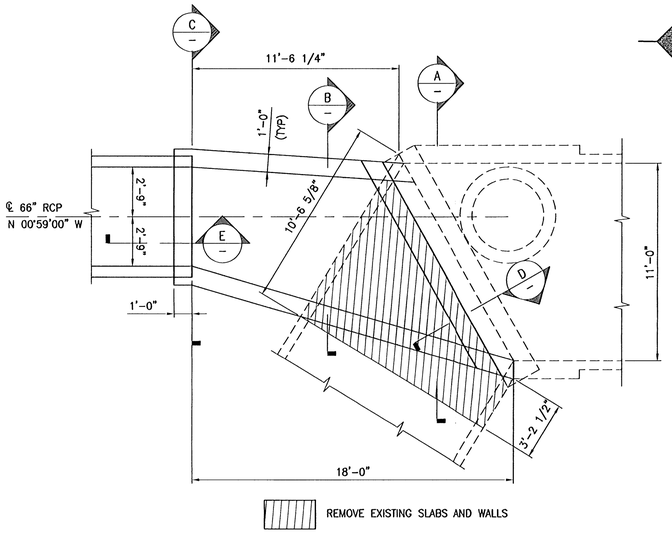
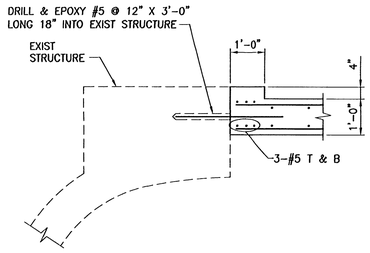


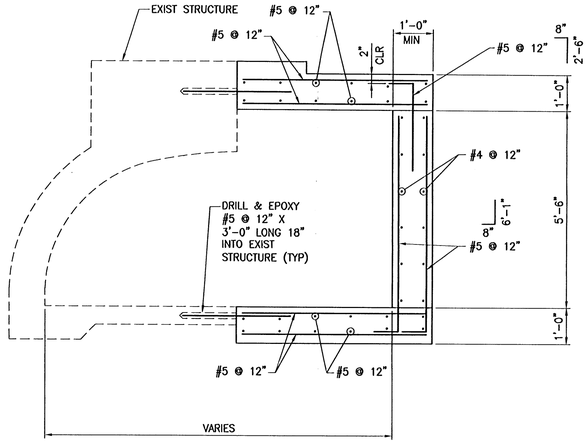
PLAN

SCALE: 1/4" = 1'-0"



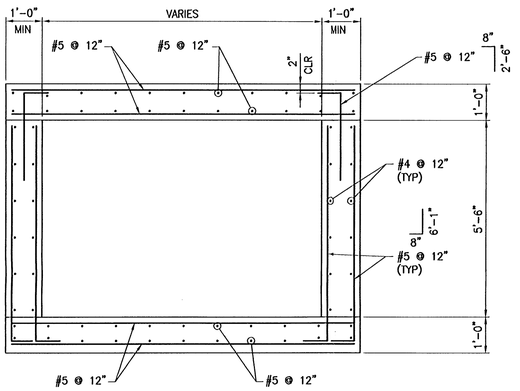
SECTION

SCALE: 1/2" = 1'-0"



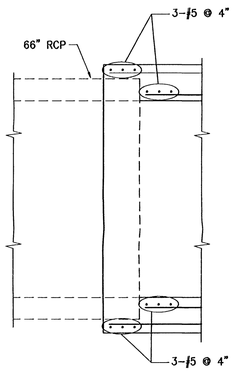
SECTION

SCALE: 1/2" = 1'-0"



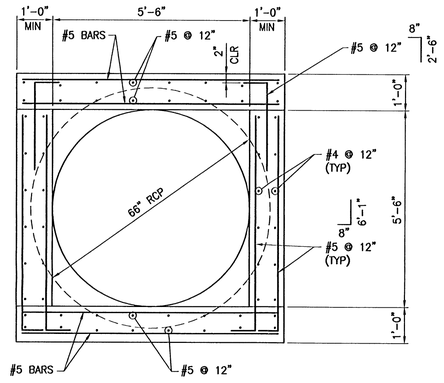
SECTION

SCALE: 1/2" = 1'-0"



SECTION

SCALE: 1/2" = 1'-0"



SECTION

SCALE: 1/2" = 1'-0"

FOR AGENCY REVIEW

ENGINEER - STATE OF NEVADA
FAYSAL A. KAFITY
No. 12122
PROFESSIONAL ENGINEER
DATE: 9/12/2005

REV.	DATE	DESCRIPTION	DATE: AGCY. APP.	DATE: CON. APP.

DESIGN: FAA
DRAWN: NO
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ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-06-05
PLOT TIME: 14:24:20

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD. • LAS VEGAS, NEVADA 89146
TELEPHONE (702) 804-2000 • FAX (702) 804-2299
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PARDEE HOMES OF NEVADA
GREEN VALLEY 45
RCB PLAN AND DETAILS

DRAWING
S-3
OF 8 SHTS

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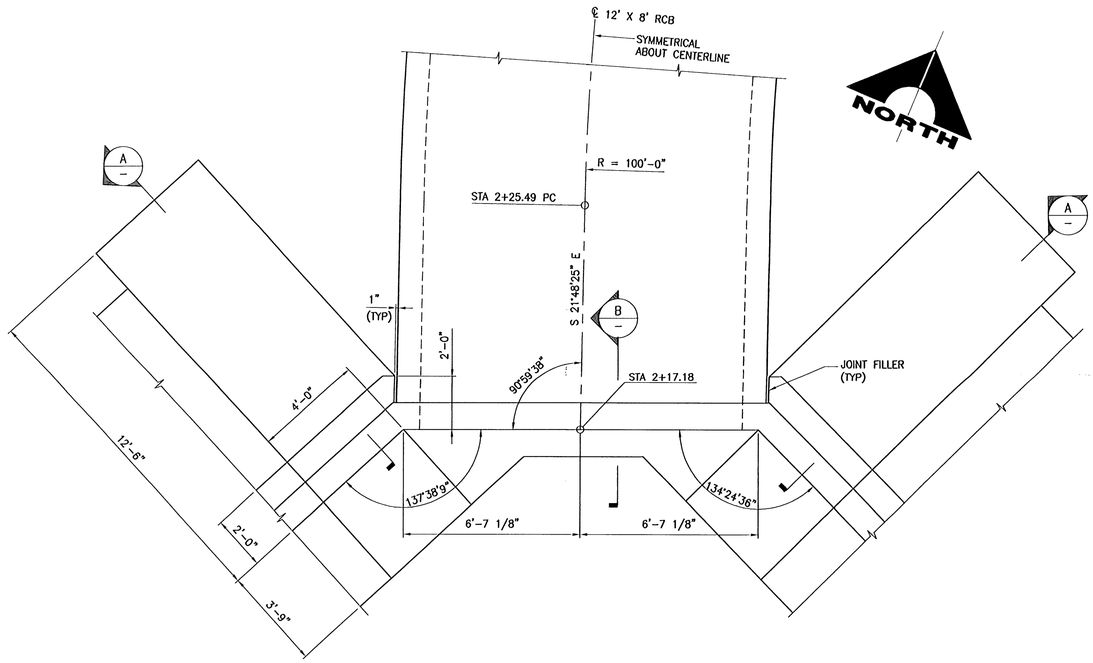
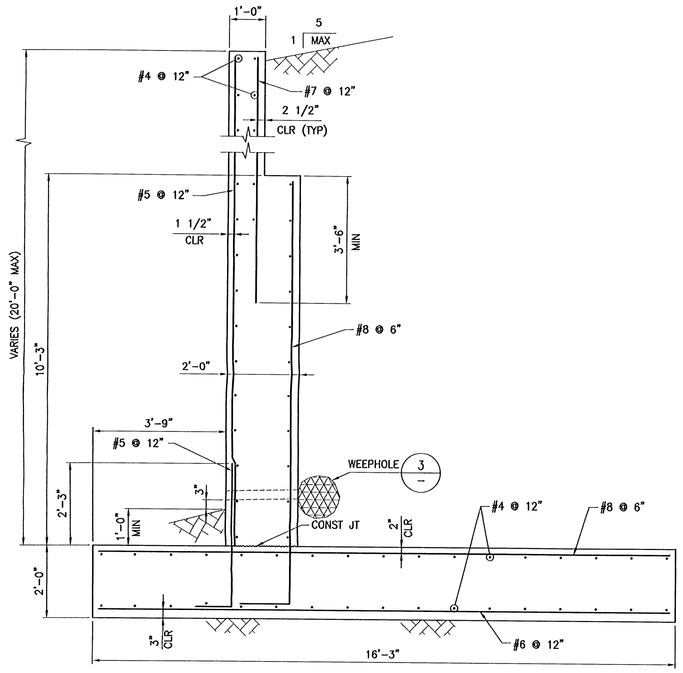


PLAN

SCALE: 3/8" = 1'-0"

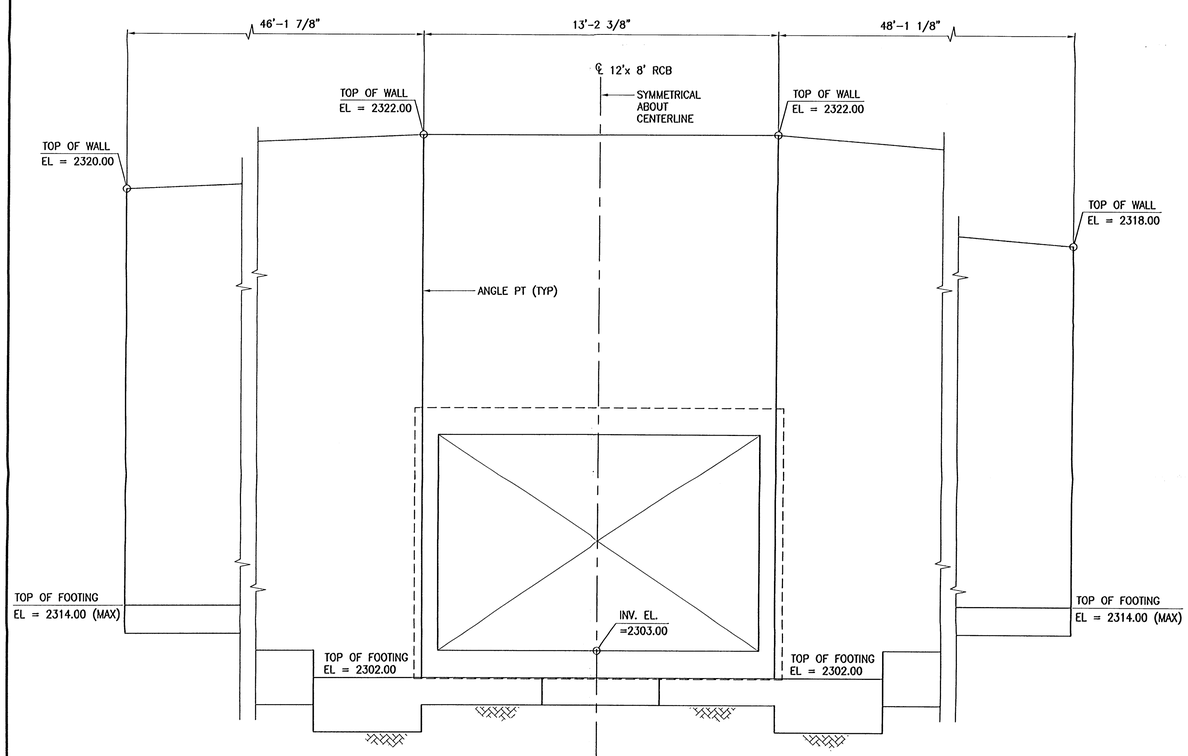


SECTION

SCALE: 1/2" = 1'-0"

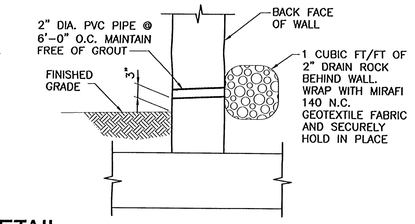
GENERAL STRUCTURAL NOTES

1. CONCRETE: ALL CONCRETE SHALL BE CLASS A WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH f'c=4500psi AT 28 DAYS. ALL CONCRETE SHALL BE MADE USING TYPE V CEMENT 0.45 MAXIMUM WATER-CEMENTITIONS RATIO BY WEIGHT, NORMAL-WEIGHT AGGREGATE CONCRETE. ALL EXPOSED CORNERS SHALL BE BEVELED 3/4" UNLESS OTHERWISE NOTED.
2. REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS. MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 2" UNLESS OTHERWISE NOTED. HOOKS MAY BE ROTATED OR TILTED, AS NECESSARY, TO PROVIDE PROPER CLEARANCES. ALL HOOKS ARE STANDARD UNLESS OTHERWISE NOTED.
3. BEDDING MATERIAL: BEDDING MATERIAL SHALL BE 6" OF CLARK COUNTY TYPE II AGGREGATE. THE BEDDING LAYER SHALL BE COMPACTED TO AT LEAST 90 PERCENT OF THE MAXIMUM DRY DENSITY AS ESTABLISHED BY ASTM TEST METHOD D-1557.
4. BACKFILL: BACKFILL BEHIND WALLS SHALL BE COMPACTED TO 90% OF STANDARD PROCTOR DENSITY.
5. EXISTING UTILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES WITHIN THE WORK AREA, AND PROVIDING PROTECTION FOR THE VARIOUS UTILITIES AFFECTED, BEFORE PROCEEDING WITH THE WORK.
6. SOILS REPORT PREPARED BY OWENS GEOTECHNICAL, INC. PROJECT NO. E-04-008 DATED JANUARY 27, 2004.
   ALLOWABLE SOIL BEARING PRESSURE = 2000 psi (Max 3500 psi)
   SOIL ACTIVE PRESSURE = 35 pcf
   SOIL PASSIVE PRESSURE = 250 pcf
   COEFFICIENT OF FRICTION = 0.40
   SEISMIC SITE CLASS = C



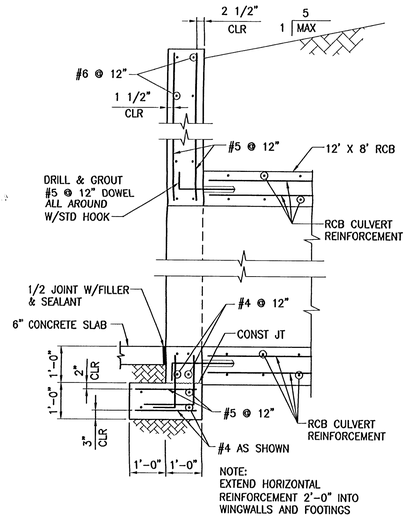
ELEVATION

SCALE: 3/8" = 1'-0"



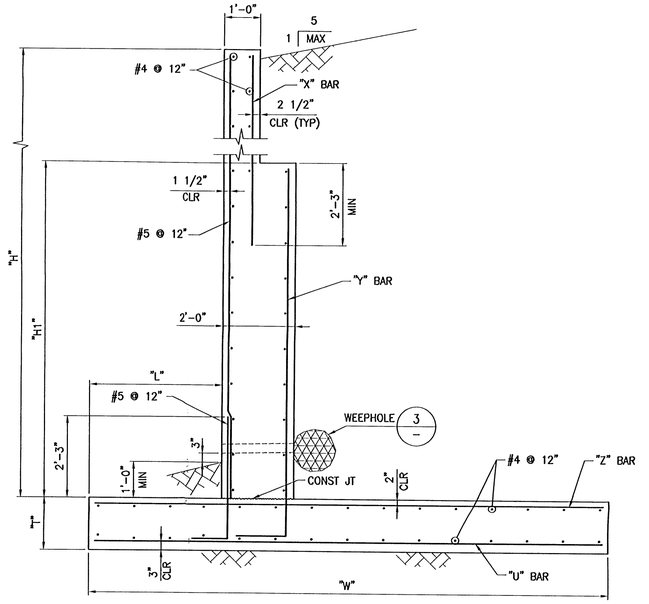
DETAIL

SCALE: 3/1" = 1'-0"



SECTION

SCALE: 1/2" = 1'-0"



DIMENSIONS					"X"	"Y"	"Z"	"U"
H	H1	W	T	L	BARS	BARS	BARS	BARS
19'-0"	9'-3"	14'-6"	18"	3'-9"	#6 @ 12"	#7 @ 6"	#8 @ 6"	#6 @ 12"
18'-0"	8'-3"	13'-9"	18"	3'-9"	#6 @ 12"	#7 @ 6"	#7 @ 6"	#6 @ 12"
16'-0"	6'-3"	12'-9"	18"	3'-9"	#6 @ 12"	#6 @ 6"	#6 @ 6"	#5 @ 12"
14'-0"	4'-3"	11'-6"	18"	3'-9"	#6 @ 12"	#6 @ 6"	#5 @ 6"	#5 @ 12"
12'-0"	2'-3"	9'-9"	15"	3'-0"	#6 @ 12"	#6 @ 12"	#5 @ 6"	#5 @ 12"
10'-0"	–	8'-0"	15"	2'-6"	–	#6 @ 12"	#6 @ 12"	#5 @ 12"
8'-0"	–	6'-6"	12"	2'-0"	–	#5 @ 12"	#5 @ 12"	#4 @ 12"
6'-0"	–	4'-9"	12"	1'-6"	–	#5 @ 12"	#5 @ 12"	#4 @ 12"

TYPICAL SECTION

SCALE: 1/2" = 1'-0"

FOR AGENCY REVIEW

ENGINEER - STATE OF NEVADA PROFESSIONAL
FAYSAL A. ARIDI
No. 12224
11/21/2004
DATE: 11/21/2004

REV	DATE	DESCRIPTION	DATE AGEN. APP	DATE GCW. APP

DESIGN: FAA
DRAWN: NO
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ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 04-06-05
PLOT TIME: 14:26:33

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
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PARDEE HOMES OF NEVADA
GREEN VALLEY 45
HEADWALL DETAILS

DRAWING
S-4
OF 8 SHTS

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Electronic Files