

ADDENDUM TO THE TECHNICAL DRAINAGE STUDY FOR RANCHO MULTI FAMILY

Prepared for:

**Edward Homes
197 California Street
Las Vegas, NV 89104
Phone: (702)-665-6989
Fax: (702)-675-6319**

December 2020

PROJECT 4555.007

**RCI Engineering
500 South Rancho Drive, Suite 17 * Las Vegas, NV 89106
Tel: 702.453.0800 * Fax: 702.453.0801
www.rcicnevada.com**

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Rancho Multi-Family Date: October 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Decatur Boulevard
East/West: Airport Drive

b) Section: 18 Township: 20 S Range: 61 E

c) APN : 139-18-410-012

Name of Owner: Edward Homes

Telephone No.: 702-665-6989 Fax No.: 702-675-6319 E-Mail Address: _____

Address: 197 California Street Las Vegas, Nevada 89104

Contact Person-Name: Chris Thompson P.E. Telephone No.: 702-453-0800

* E-Mail Address: cthompson@rcinevada.com Fax No.: 702-453-0801

Firm: RCI Engineering

Address: 500 South Rancho Drive, Suite 17 Las Vegas, Nevada 89106

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivision Map	☐	Clearing and Grading Only
☐	Parcel Map	☐	Planned Unit Development	☐	Other (Please specify below)
☐	Large Parcel Map	☒	Building Permit		

1. Total Owned Land Area: At Site: 10.6 Acres +/- Being Developed/Disturbed: 10.6 Acres +/-

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ Yes** ☐ No

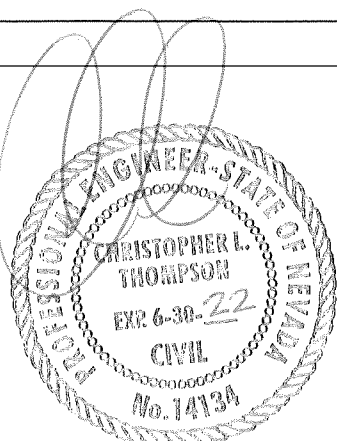
4. Proposed type of development (Residential, Commercial, Etc.): Residential Apartments

5. Approximate upstream land area which drains to the subject site: 230 Acres +/-

6. Has the site drainage been evaluated in the past? ☐ YES ☒ NO If yes, please identify documentation: _____

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
Through storm drain into a 12-foot by 8-foot RCB in Rancho Drive (CCRFCD LVRA 0012)

8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal 12/16/2022

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

***New Required Field**

****Review and concurrence of the Clark County Regional Flood Control District is required.**

	Revision	Date
Local Entity File No. _____		

REFERENCE:

STANDARD FORM 1

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: November 25, 2020
TO: Land Development Services Department of Building & Safety			FROM: Jennifer Shinn, P.E. Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:		COPIES TO:
	Rancho Multi Family		RCI Engineering
Cross Streets:	Decatur Boulevard and Airport Drive		Edward Homes
File Number:	F:\Depot\DSMemos\DS5380A.doc		Bart Anderson, P.E., DevCo
Parcel Number:	139-18-410-012		CCRFCD
Zoning Action:			NDOT
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	10/26/2020	11/23/2020	See Comments Below	\$400.00	4044499: \$400
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

The following are comments pertaining to the subject site specific drainage study and grading plans:

1. Provide a copy of the zoning/planning conditions associated with this site with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.
2. Sites with a grade difference of 2 feet above or below existing grades are required to have approval from the City of Las Vegas Planning and Development Department. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the City Planning Department (229-6301). The engineer must provide City Planning approval with the next submittal.
3. The site is adjacent to or crosses an existing or proposed Clark County Regional Flood Control District (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

<http://gustfront.ccrfcd.org/LandDev/LandDev.aspx>

Please note that effective April 6, 2020, only electronic submittals to the CCRFCD will be accepted for regional concurrence. Contact cwang@regionalflood.org for direction.

When it's applicable, structural calculations of facilities must be approved by the City prior to submittal to the Clark County Regional Flood Control District for their review and concurrence.

4. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project. NDOT concurrence is required prior to final approval of the drainage study.
5. The proposed storm drain connection to the existing CCRFCD RCB requires a structural detail and calculations. All special structures and mainline storm drain connection require details and structural calculations to be reviewed by the *City of Las Vegas Building & Safety Department*. Approval by the *Building Department* must be obtained prior to the final approval of the subject drainage study.
6. Label Document Number or Book and Page Number for all existing easements on the grading plan.
7. This site accepts offsite flows from the existing parcel to the north and conveys them through the site. Provide a "Public Drainage Easement to be Privately Maintained" and show the easement on the grading plan. Public drainage easements must be recorded by separate document prior to the final acceptance of the improvement plans unless they are to be recorded by parcel or final map.
8. All drainage easements must be public drainage easements to be privately maintained and common lots to be labeled on the grading plans and to be dedicated as such in the final map. The minimum width for a public drainage easement is 10' if the 100-year flow is less than 20 CFS. Public Drainage Easements, including access control shall be per CCAUSD 425.S1.
9. It appears the Common Areas act as drainage conveyance areas between buildings. Show and label the Common Areas as public drainage easements to be privately maintained by the HOA.
10. No permanent structures including buildings and covered parking shall encroach into the Public Drainage Easements.
11. Label the existing storm drain facilities with the CCRFCD Identifier(s) and CLV Drawing Number(s).
12. Label the existing contours.
13. The following finish floors do not meet the Regional Flood Control District minimum criteria of twice the Q_{100} depth of flow up to 18-inches above the water surface (CCRFCD Manual Section 304.4.E.1) or 6-inch minimum above the highest adjacent top of curb (CCRFCD Manual Section 1602 304.4.E.1). The following finish floors should be revised or alternate flood protection provided.

Building	TC	FF Shown	FF Required
24	2207.47	2207.90	2207.97
25	2207.38	2207.75	2207.88
26	2206.17	2206.41	2206.73

14. The following Garage Finished Floors do not meet the minimum criteria of twice the Q_{100} depth of flow up to 18-inches above the water surface in the adjacent flowline:

Building	TC	GFF Shown	GFF Required
35	2208.64	2208.73	2209.14
35	2208.64	2208.65	2209.14

35	2208.64	2208.57	2209.14
35	2208.25	2208.49	2208.75

Provide hydraulic section(s) at Building 35 to show the GFF is flood protected.

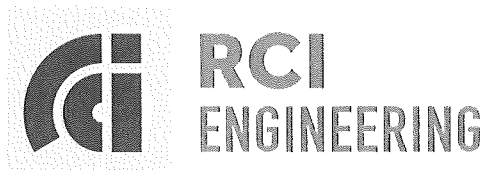
As an alternate each lot must be discussed in the drainage study, shown to be flood protected, and any necessary flood improvements shown on the grading plan.

15. Many streets within this development are designed to a 0.40% slope. This street slope is the minimum allowed without a nuisance storm drain system and is difficult to construct. The engineer and developer is advised that ponding in proposed improvements is not allowed. Sections of substandard improvements may have to be removed and replaced during the inspection process. Add a note to the Grading Plans: "Curb flow lines less than 0.60% grades shall be water tested. Any curb that does not flow shall be removed and replaced at no cost to the City."
16. **Figure 6:** The prorated basin areas of ON1 for the proposed condition sum to be 9.15 acres, however ON1 is 10.58 acres. Address the discrepancy.
17. **Figure 6:** PR5 is shown to have 2.5 cfs/acre, while all other prorated basins are shown to have 2.65 cfs/acre. It is also listed to have the same acreage in the table, but it shown to have 2.5 acres on the exhibit. Address these discrepancies.
18. **Figure 6:** The prorated basin flows of ON1 for the proposed condition sum to be 27 cfs, however ON1 has 28 cfs. Address the discrepancy.
19. **Figure 5:** Include OFF1 in the existing condition exhibit and analysis.
20. It is unclear how the onsite street flows are determined. Provide basin calculations for the onsite flows, or prorate the basin according to the hydraulic street sections, to confirm the amount of flow within street sections.
21. Velocity for Street section 2 is shown as 5.5 fps on the provided Flow Master Report, but is shown and 5.2 fps on Figure 6.
22. The common areas as well as the private streets are all to be designated a Public Drainage Easements to be privately maintained by the HOA. In the next submittal, provide an overall lot drainage map to identify intra-lot drainage areas which will be required as common lot as well as public drainage easements to be privately maintained by the Homeowners Association.
23. The flow collected into 3' valley gutters between buildings, for example the flow from Building 1 and between Building 2 and 3, is sheet flowing from valley gutters and over sidewalk into the onsite streets. The valley gutters will need to be extended and sidewalk underdrains provided at these locations.
24. Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.
25. Provide additional grades at Trash Enclosures to demonstrate positive drainage.
26. Provide a Section Detail for the northeast corner of the project site where the proposed U-Channel conveys the offsite flows at the proposed drop inlet.
27. Provide grades at the area inlets to demonstrate flows entering the system.
28. Revise the Q_{100} flow rates shown on the Profiles for DI #1 and DI#2.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way 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. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
HDR/JKS

T/R/S: T20S/R61E/S18
AREA M-18



December 16, 2020

City of Las Vegas
Flood Control
333 N Rancho Dr.
Las Vegas, NV 89106

**RE: Certification Letter for Paper and Digital Plans for the
Technical Drainage Study for Rancho Multi Family**

Mr. Sung,

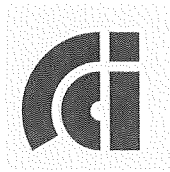
This letter has been provided as certification that the paper version of the plans match the digital PDF plans on the CD submitted with the drainage study.

Sincerely,

RCI Engineering

A handwritten signature in dark ink, appearing to be 'CT' or 'Chris Thompson', written in a cursive style.

Chris Thompson, P.E.



RCI
ENGINEERING

December 16, 2020

City of Las Vegas Flood Control
333 N Rancho Drive
Las Vegas, NV 89106

RE: Rancho Multi Family
DS5380A

Mr. Albert Sung,

The purpose of this letter is to address the comment letter dated November 25, 2020 regarding the above-referenced project. The comments are individually addressed. Each comment has been re-typed with the response to each comment.

CLV Review Comments:

Comment 1: Provide a copy of the zoning/planning conditions associated with this site with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

Response: Document provided with this submittal.

Comment 2: Sites with a grade difference of 2 feet above or below existing grades are required to have approval from the City of Las Vegas Planning and Development Department. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the City Planning Department (229-6301). The engineer must provide City Planning approval with the next submittal.

Response: Request for waiver submitted to CLV. Pending approval.

Comment 3: The site is adjacent to or crosses an existing or proposed Clark County Regional Flood Control District (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

<http://gustfront.ccrfcd.org/LandDev/LandDev.aspx>

Please note that effective April 6, 2020 only electronic submittals to the CCRFCD will be accepted for regional concurrence. Contact cwang@regionalflood.org for direction.

When it's applicable, structural calculations of facilities must be approved by the City prior to submittal to the Clark County Regional Flood Control District for their review and concurrence.

Response: Noted: Once approved by the City of Las Vegas the study will be submitted to Clark County Regional Flood for concurrence.

Comment 4: The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way. The engineer must contact NDOT for encroachment permit for the proposed project. NDOT concurrence is required prior to final approval of the drainage study.

Response: Noted: Drainage review as well as an application for an occupancy permit are in process with the Nevada Department of Transportation.

Comment 5: The proposed storm drain connection to the existing CCRFCD RCB requires a structural detail and calculations. All special structures and mainline storm drain connection require details and structural calculations to be reviewed by the City of *Las Vegas Building & Safety Department*. Approval by the *Building Department* must be obtained prior to the final approval of the subject drainage study

Response: Noted: Structural calculations and plans will be included with the offsite permit submittal.

Comment 6: Label Document Number or Book and Page Number for all existing easements on the grading plan.

Response: Labels have been added as requested.

Comment 7: This site accepts offsite flows from the existing parcel to the north and conveys them through the site. Provide a "Public Drainage Easement to be Privately Maintained" and show the easement on the grading plan. Public drainage easements must be recorded by separate document prior to the final acceptance of the improvement plans unless they are to be recorded by parcel or final map.

Response: Noted, Easement identified and labeled on revised plans. Granting of easement in process.

Comment 8: All drainage easements must be public drainage easements to be privately maintained and common lots to be labeled on the grading plans and to be dedicated as such in the final map. The minimum width for a public drainage easement is 10' if the 100-year flow is less than 20 CFS. Public Drainage Easements, including access control shall be per CCAUSD 425.S1.

Response: Since this is an apartment complex, this comment does not apply. The existing drainage easement for the CCRFCD box culvert is labeled on the plans.

Comment 9: It appears the Common Areas act as drainage conveyance areas between buildings. Show and label the Common Areas as public drainage easements to be privately maintained by the HOA.

Response: Since this an apartment complex, this comment does not apply.

Comment 10: No permanent structures including buildings and covered parking shall encroach into the Public Drainage Easements.

Response: Noted, there are no proposed buildings or parking structures in the existing CCRFCD easement for the box culvert.

Comment 11: Label the existing storm drain facilities with the CCRFCD Identifier(s) and CLV Drawing Number(s).

Response: The requested labels have been added.

Comment 12: Label the existing contours.

Response: Contour labels have been added.

Comment 13: The following finish floors do not meet the Regional Flood Control District minimum criteria of twice the Q100 depth of flow up to 18-inches above the water surface (CCRFCD Manual Section 304.4.E.1) or 6-inch minimum above the highest adjacent top of curb (CCRFCD Manual Section 1602 304.4.E.1). The following finish floors should be revised or alternate flood protection provided.

Building	TC	FF Shown	FF Required
24	2207.47	2207.90	2207.97
25	2207.38	2207.75	2207.88
26	2206.17	2206.41	2206.73

Response: The top of curbs were lowered and/or the finished floors were raised to meet the requirements. It should be noted that for these locations the drive aisle/shared driveway has an inverted crown and flow depth should be provided above the flow line within the drive aisle. For buildings 24 and 25 the highest flow line elevation is a 2206.52 and for building 26 the flow line elevation is 2205.62.

Comment 14: The following Garage Finished Floors do not meet the minimum criteria of twice the Q100 depth of flow up to 18-inches above the water surface in the adjacent flowline:

Building	TC	GFF Shown	GFF Required
35	2208.64	2208.73	2209.14
35	2208.64	2208.65	2209.14
35	2208.64	2208.57	2209.14
35	2208.25	2208.49	2208.75

Provide hydraulic section(s) at Building 35 to show the GFF is flood protected.

As an alternate each lot must be discussed in the drainage study, shown to be flood protected, and any necessary flood improvements shown on the grading plan.

Response: The north side of building 35, that is adjacent to the main drive isle, is the living area which is 0.5 feet above the TC. The south side of Building 35 are the garages with direct frontage onto an inverted crown drive isle. All of the GFE's for building 35 are 0.62 feet above the flowline of the valley gutter within the inverted crown section of the drive aisle/shared driveway.

Comment 15: Many streets within this development are designed to a 0.40% slope. This street slope is the minimum allowed without a nuisance storm drain system and is difficult to construct. The engineer and developer is advised that ponding in proposed improvements is not allowed. Sections of substandard improvements may have to be removed and replaced during the inspection process. Add a note to the Grading Plans: "Curb flow lines less than 0.60% grades shall be water tested. Any curb that does not flow shall be removed and replaced at no cost to the City."

Response: Since this is an apartment complex, this comment does not apply.

Comment 16: Figure 6: The prorated basin areas of ON1 for the proposed condition sum to be 9.15 acres, however ON1 is 10.58 acres. Address the discrepancy.

Response: Figure 6 has been revised to reflect the correct area for each basin and now matches the total area of Basin ON1.

Comment 17: Figure 6: PR5 is shown to have 2.5 cfs/acre, while all other prorated basins are shown to have 2.65 cfs/acre. It is also listed to have the same acreage in the table, but it shown to have 2.5 acres on the exhibit. Address these discrepancies.

Response: This typo has been corrected and all flows are based upon the prorated flow of 2.65 cfs/acre.

Comment 18: Figure 6: The prorated basin flows of ON1 for the proposed condition sum to be 27 cfs, however ON1 has 28 cfs. Address the discrepancy.

Response: Areas a prorated flows have been revised per comments 16 and 17 and flows have been taken to the tenth (0.1) of a cfs and not total 28 cfs which matches the ON1 flow.

Comment 19: Figure 5: Include OFF1 in the existing condition exhibit and analysis.

Response: OFF 1 has been added to Figure 2 and an updated HEC model including OFF1 has been included with this addendum.

Comment 20: It is unclear how the onsite street flows are determined. Provide basin calculations for the onsite flows, or prorate the basin according to the hydraulic street sections, to confirm the amount of flow within street sections.

Response: The original preparer of the onsite street flow calculations is no longer with our firm so exact methodology has been difficult to determine. It does appear that conservative prorated areas were estimated for flow determination. With this Addendum basins were determined and street the flow calculations were calculated. With each new calculation a basin map with the area utilized for the calculation outlined in red has been included.

Comment 21: Velocity for Street section 2 is shown as 5.5 fps on the provided Flow Master Report, but is shown and 5.2 fps on Figure 6.

Response: Figure 6 has been revised to reflect the correct velocity of 5.5 fps.

Comment 22: The common areas as well as the private streets are all to be designated a Public Drainage Easements to be privately maintained by the HOA. In the next submittal, provide an overall lot drainage map to identify intra-lot drainage areas which will be required as common lot as well as public drainage easements to be privately maintained by the Homeowners Association.

Response: Since this is an apartment complex, this comment does not apply.

Comment 23: The flow collected into 3' valley gutters between buildings, for example the flow from Building 1 and between Building 2 and 3, is sheet flowing from valley gutters and over sidewalk into the onsite streets. The valley gutters will need to be extended and sidewalk underdrains provided at these locations.

Response: Since this is an apartment complex, this comment does not apply.

Comment 24: Landscape areas are not allowed to drain over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the street. Revise all pertinent details accordingly.

Response: Since this is an apartment complex, this comment does not apply.

Comment 25: Provide additional grades at Trash Enclosures to demonstrate positive drainage.

Response: Additional grades provided.

Comment 26: Provide a Section Detail for the northeast corner of the project site where the proposed U-Channel conveys the offsite flows at the proposed drop inlet.

Response: Section added as requested.

Comment 27: Provide grades at the area inlets to demonstrate flows entering the system.

Response: Additional grades provided.

Comment 28: Revise the Q100 flow rates shown on the Profiles for DI #1 and DI#2.

Response: Revised flow rates have been added to the plans.

If you have any questions or wish to further discuss these responses please contact me at (702) 998-2101.

RCI Engineering



Chris Thompson, P.E.



**LAS VEGAS
CITY COUNCIL**

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Mayor

STAVROS S. ANTHONY
Mayor Pro Tem

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CEDRIC CREAR
BRIAN KNUDSEN
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OLIVIA DÍAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING

ROBERT SUMMERFIELD
DIRECTOR

**DEVELOPMENT
SERVICES CENTER**

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106
702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY



cityoflasvegas
lasvegasnevada.gov

September 3, 2020

Mr. Richard Simis
Rancho Village Partners, LLC
2820 Shelter Island Drive
San Diego, California 92106

**RE: ABEYANCE - EOT-78774 [PRJ-78773] - EXTENSION OF TIME - SITE
DEVELOPMENT PLAN REVIEW
CITY COUNCIL MEETING OF SEPTEMBER 2, 2020**

Dear Mr. Simis:

The City Council at a regular meeting held on September 2, 2020 voted to **APPROVE** your request for the first Extension of Time of an approved Site Development Plan Review (SDR-73295) FOR A PROPOSED 738-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT on 33.47 acres on the west side of Rancho Drive, 230 feet north of Smoke Ranch Road (APN 139-18-410-012), R-3 (Medium Density Residential) Zone, Ward 5 (Crear) [PRJ-78773].

This approval is subject to the following conditions:

Planning

1. This approval shall expire on August 15, 2022 unless another Extension of Time is approved.
2. Conformance to the Conditions of Approval for Site Development Plan Review (SDR-73295) and all other site related actions as required by the Department of Planning and Department of Public Works.
3. All City Code requirements and design standards of all City departments must be satisfied, except as modified herein.

The Notice of Final Action was filed with the Las Vegas City Clerk on September 3, 2020.

Sincerely,

Robert Summerfield, AICP
Director
Department of Planning

RTS:PL:clb

cc: Mr. Bob Gronauer
Kaempfer Crowell
1980 Festival Plaza Drive, Suite #650
Las Vegas, Nevada 89135



**LAS VEGAS
CITY COUNCIL**

CAROLYN G. GOODMAN
Mayor

LOIS TARKANIAN
Mayor Pro Tem

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BOB COFFIN
STEVEN G. SEROKA
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SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING
ROBERT SUMMERFIELD
DIRECTOR

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711 | TTY



cityoflasvegas
lasvegasnevada.gov

August 16, 2018

Mr. Randy Blanchard
Rancho Village Partners
2222 Martin Street, Suite #160
Irvine, California 92612

**RE: SDR-73295 [PRJ-73073] - SITE DEVELOPMENT PLAN REVIEW
RELATED TO ZON-73294
CITY COUNCIL MEETING OF AUGUST 15, 2018**

Dear Mr. Blanchard,

The City Council at a regular meeting held on August 15, 2018 voted to **APPROVE** a request for a Site Development Plan Review FOR A PROPOSED 738-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT on 33.47 acres on the west side of Rancho Drive, 230 feet north of Smoke Ranch Road (APN 139-18-410-012), R-PD19 (Residential Planned Development - 19 Units per Acre) Zone [PROPOSED: R-3 (Medium Density Residential)], Ward 5 (Crear) [PRJ-73073].

This approval is subject to the following conditions:

Planning

1. The applicant shall construct a perimeter block wall consistent with LVMC 19 prior to certificate of occupancy for each phase of the development.
2. Approval of a Rezoning (ZON-73294) shall be required, if approved.
3. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
4. All development shall be in conformance with the site plan and landscape plan, date stamped 05/10/18 and building elevations, date stamped 04/26/18 except as amended by conditions herein.
5. A Waiver from Title 19.06.110 is hereby approved, to allow a 10-foot wide perimeter landscape buffer along a portion of the south property line where 15 feet is required.
6. All necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
7. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.

- 8 A technical landscape plan, signed and sealed by a Registered Architect, Landscape Architect, Residential Designer or Civil Engineer, must be submitted prior to or at the same time application is made for a building permit. A permanent underground sprinkler system is required, and shall be permanently maintained in a satisfactory manner; the landscape plan shall include irrigation specifications. Installed landscaping shall not impede visibility of any traffic control device. The technical landscape plan shall include one 24-inch box tree at the ends of each parking row, plus four five-gallon shrubs for each required tree in planters.
- 9 A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.
10. Prior to or at the time of submittal for any building permit, the applicant shall provide written verification by the Federal Aviation Administration and/or the Clark County Department of Aviation of the following:
 - Applicant is required to file a valid FAA Form 7460-1, "Notice of Proposed Construction or Alteration" with the FAA, in accordance with 14 CFR Part 77, or submit to the Clark County Director of Aviation a "Property Owner's Shielding Determination Statement" and request written concurrence from the Clark County Department of Aviation,
 - No Building Permit or other construction permit shall be issued for any structure greater than 35 feet above the surface of land that, based upon the FAA's 7460 airspace determination (the outcome of filing the FAA Form 7460-1) would (a) constitute a hazard to air navigation, (b) would result in an increase to minimum flight altitudes during any phase of flight (unless approved by the Department of Aviation), or (c) would otherwise be determined to pose a significant adverse impact on airport or aircraft operations.
 - Applicant is advised that FAA's airspace determinations are dependent on petitions by any interested party and the height that will not present a hazard as determined by the FAA may change based on these comments.
 - Applicant is advised that the FAA's airspace determinations include expiration dates and that the separate airspace determinations will be needed for construction cranes or other temporary equipment.
11. Prior to the submittal of a building permit application, the applicant shall meet with Department of Planning staff to develop a comprehensive address plan for the subject site. A copy of the approved address plan shall be submitted with any future building permit applications related to the site.
- 12 All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

13. Correct all Americans with Disabilities Act (ADA) deficiencies, if any, on the sidewalk along Rancho Drive, Smoke Ranch Road, and Decatur Boulevard adjacent to this site in accordance with code requirements of Title 13.56.040 to the satisfaction of the City Engineer concurrent with development of this site. All existing paving damaged or removed by this development shall be restored at its original location and to its original width concurrent with development of this site
14. Landscape and maintain all unimproved rights-of-way, if any, adjacent to this site. All landscaping and private improvements installed with this project shall be situated and maintained so as to not create sight visibility obstructions for vehicular traffic at all development access drives and abutting street intersections.
15. Submit a License Agreement for landscaping and private improvements, if any, in the Smoke Ranch Road and Decatur Boulevard public rights of way adjacent to this site prior to this issuance of permits for these improvements. The applicant must carry an insurance policy for the term of the License Agreement and add the City of Las Vegas as an additionally insured entity on this insurance policy. If requested by the City, the applicant shall remove property encroaching in the public right-of-way at the applicant's expense pursuant to the terms of the City's License Agreement. The installation and maintenance of all private improvements in the public right of way shall be the responsibility of the adjacent property owner(s) and shall be transferred with the sale of the property for the entire term of the License Agreement. Coordinate all requirements for the License Agreement with the Land Development Section of the Department of Building and Safety (702-229-4836).
16. Obtain an Occupancy Permit from the Nevada Department of Transportation (NDOT) for all driveways or other private improvements, if any, in the Rancho Dive public right-of-way adjacent to this site prior to constructing any improvements within NDOT jurisdiction
17. No new permanent structures or landscaping taller than three feet shall be allowed in any existing public sewer easements
18. Contact the City Engineer's Office at 702-229-6272 to coordinate the development of this project with the Rancho Road – Mesquite to Decatur project and any other public improvement projects adjacent to this site. Comply with the recommendations of the City Engineer

Mr. Randy Blanchard
Rancho Village Partners
SDR-73295 [PRJ-73073] - Page Four
August 16, 2018

19. A Traffic Impact Analysis must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits, submittal of any construction drawings or the recordation of a Map subdividing this site, whichever may occur first. Comply with the recommendations of the approved Traffic Impact Analysis prior to occupancy of the site. The Traffic Impact Analysis shall also include a section addressing Standard Drawings #234.1 #234.2 and #234.3 to determine additional right-of-way requirements for bus turnouts adjacent to this site, if any, dedicate all areas recommended by the approved Traffic Impact Analysis. All additional rights of way required by Standard Drawing #201.1 for exclusive right turn lanes and dual left turn lanes shall be dedicated prior to or concurrent with the commencement of on site development activities unless specifically noted as not required in the approved Traffic Impact Analysis. Phased compliance will be allowed if recommended by the approved Traffic Impact Analysis. No recommendation of the approved Traffic Impact Analysis, nor compliance therewith, shall be deemed to modify or eliminate any condition of approval imposed by the Planning Commission or the City Council on the development of this site.
20. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits or submittal of any construction drawings, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage plan/study. The developer of this site shall be responsible to construct such neighborhood or local drainage facility improvements as are recommended by the City of Las Vegas Neighborhood Drainage Studies and approved Drainage Plan/Study concurrent with development of this site.

The Notice of Final Action was filed with the Las Vegas City Clerk on August 16, 2018

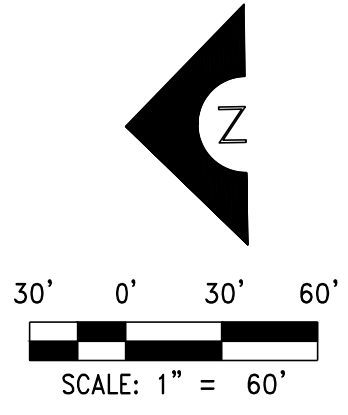
Sincerely,



Robert Summerfield, AICP
Director
Department of Planning

RTS:PL:clb

cc: Mr. Kevin Thistle
P.K Thistle Architect
7383 Atacama Avenue
Las Vegas, Nevada 89179



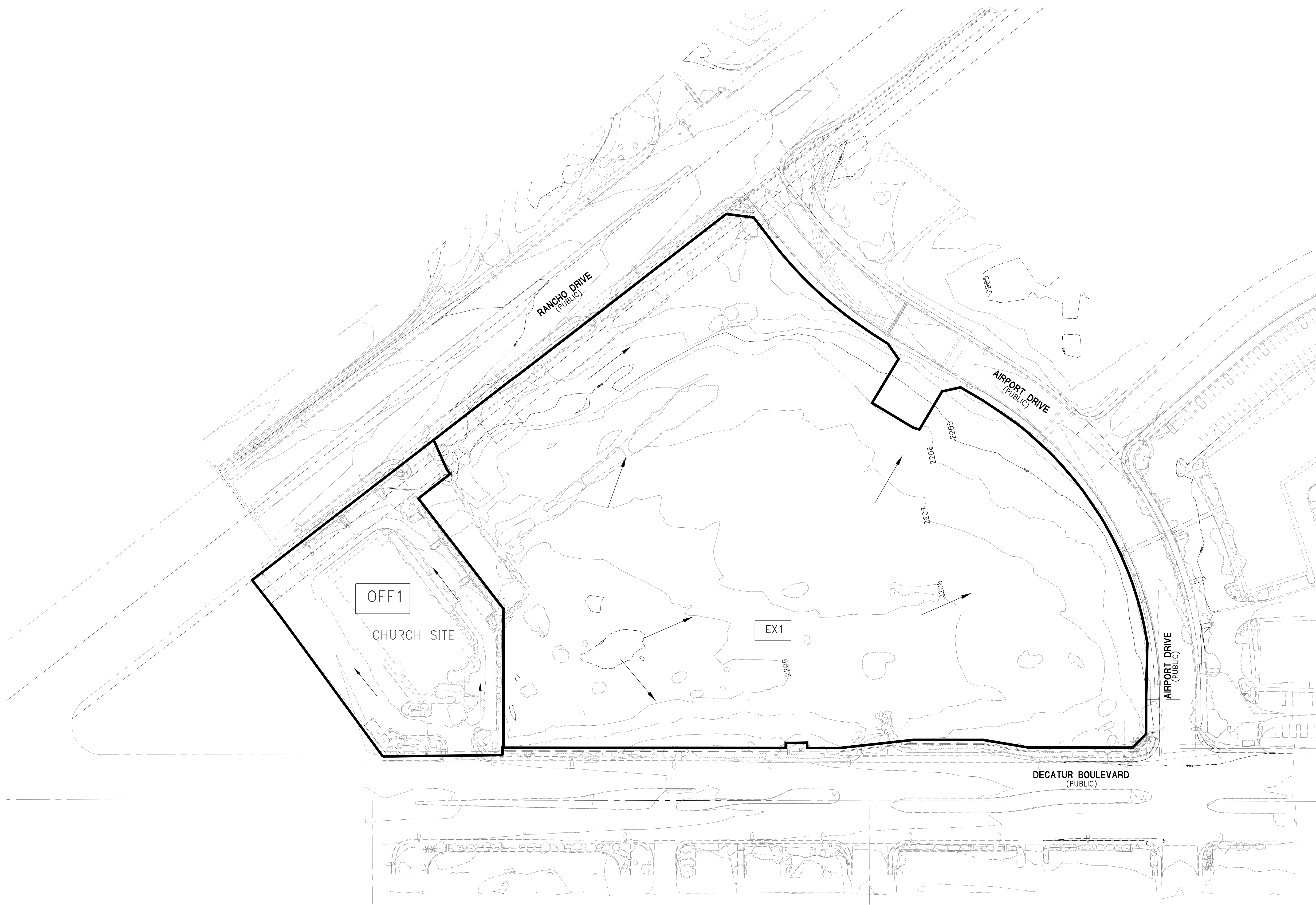
LEGEND

→ FLOW DIRECTION

— EXISTING SUBBASIN BOUNDARY

EX1 EXISTING DRAINAGE SUBBASIN

EXISTING CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	Basin Area (AC)	100 YR (cfs)	10 YR (CFS)
EX1	10.58	28	15
OFF1	1.81	6	3



RANCHO MULTI FAMILY

EDWARD HOMES

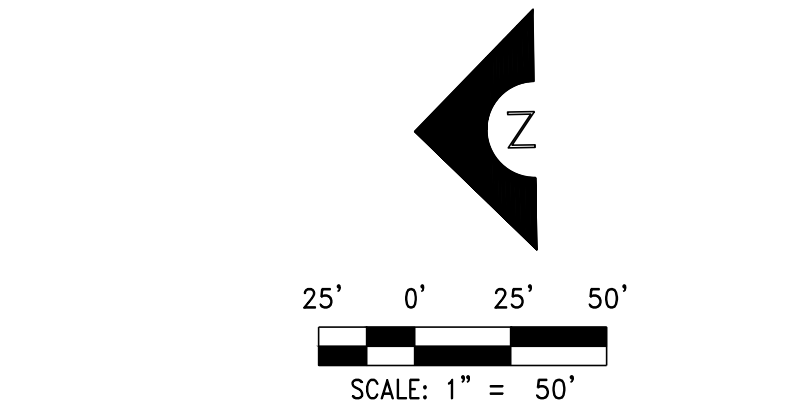
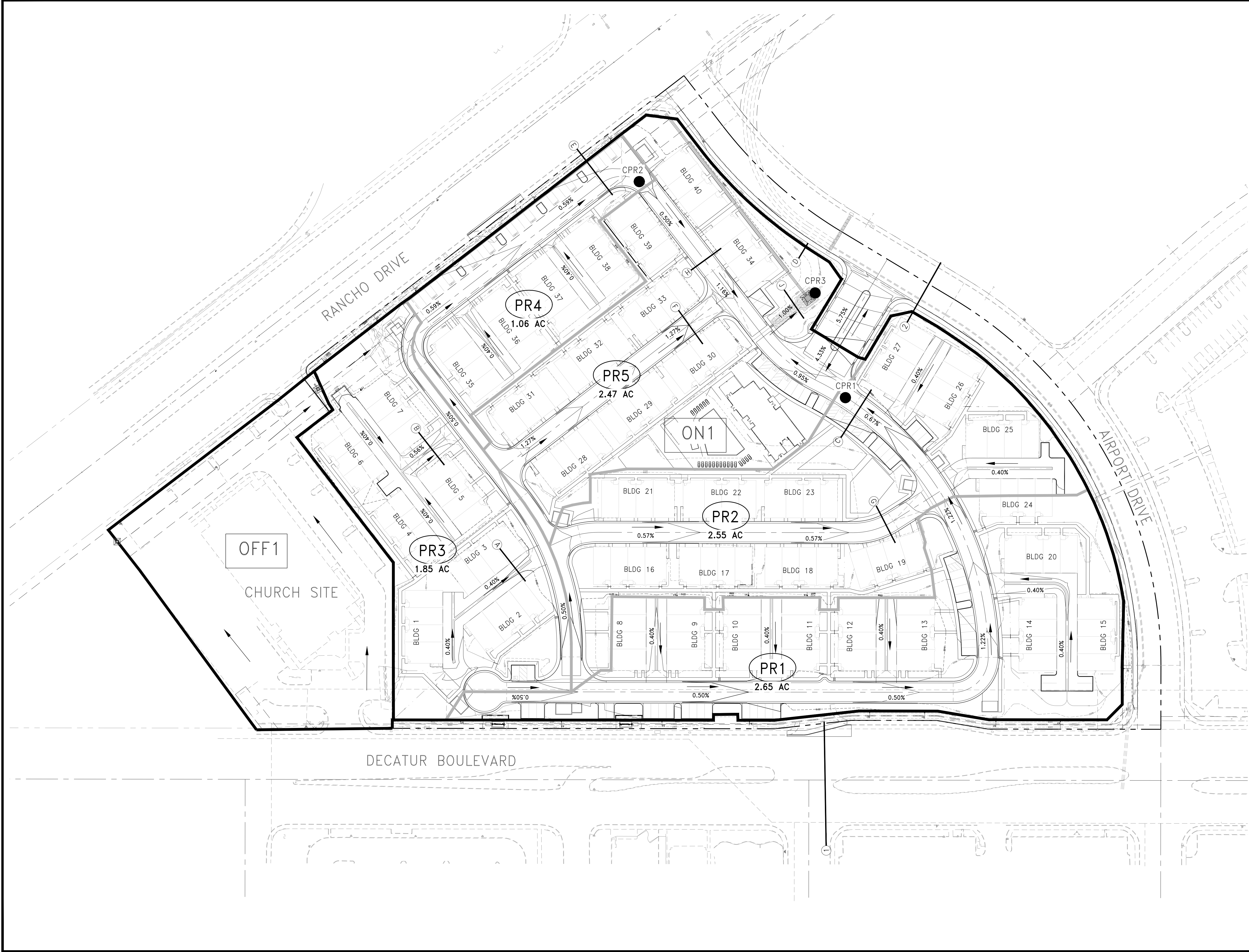
FIGURE 5_REV

EXISTING CONDITIONS MAP

RCI Engineering

500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

C:\4555_Edward_Homes\0007_Rancho_Multi-Family\DRAIN FIGURES\ORIGINAL\figures.dwg chompson 12/16/20 10:04am



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PRORATED DRAINAGE BASIN
 - PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	Basin Area (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6_REV

ULTIMATE CONDITIONS MAP

RCI Engineering

500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801


```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 14DEC20 TIME 16:39:37
*
*****

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

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X X XXXXXX XXXX X
X X X X X XX
X X X X X
XXXXXX XXXX X XXXX X
X X X X X
X X X X X
X X XXXXXX XXXX XXX

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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 -AMSK- 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 RANCHO MULTI-FAMILY
2 ID EXISTING CONDITIONS ONSITE
3 ID DESIGN STORM = 100-YEAR 6-HOUR STORM
4 ID STORM DISTRIBUTION = SDNS
5 ID
6 ID AREA (SQUARE MILES) DARF
7 ID 10-YR STORM FLOW 0.59
8 ID
9 IT 5 0 0 300
10 IO 5 0 0
11 IN 5 0 0
12 JR PREC 1.00 0.59
*

13 KK OFF1
14 KM EXIST OFFSITE BASIN
15 BA .0028
16 PB 2.77
17 FC 0.000 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
18 FC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
19 FC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
20 FC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
21 FC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
22 FC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
23 FC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
24 FC 0.998 0.999 1.000
25 LS 0 95
26 UD .080
*

27 KK ONL
28 KM ULTIMATE CONDITION SUBBASIN
29 BA .0165
30 LS 0 94
31 UD 0.139
*

32 ZZ

```

```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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

ND. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

13 OFF1
.
.
27 . ONL

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 14DEC20 TIME 16:39:37
*
*****

```

```

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

```

RANCHO MULTI-FAMILY

EXISTING CONDITIONS OMITTE
DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN3

AREA (SQUARE MILES) DARF
10-YR STORM FLOW 0.59

10 IO OUTPUT CONTROL VARIABLES
IPRNF 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA
NMEN 5 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 300 NUMBER OF HYDROGRAPH ORDINATES
NDATE 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 .59

1

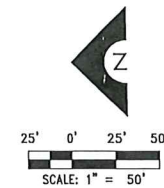
PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	RATIO 2
				1.00	.59
HYDROGRAPH AT					
+	OFF1	.00	1 FLOW	6.	3.
			TIME	3.50	3.50
HYDROGRAPH AT					
+	ON1	.02	1 FLOW	28.	15.
			TIME	3.58	3.58

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

SECTION A - 0.38 AC

$Q = 0.38 \text{ AC} \cdot 2.65 \text{ CFS/AC} = \underline{\underline{1.0 \text{ CFS}}}$



LEGEND

- STREET SLOPE
- ULTIMATE SUBBASIN BOUNDARY
- ON1 ULTIMATE DRAINAGE SUBBASIN
- CROSS SECTION LOCATION
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PRORATED BASIN BOUNDARY
- PR1 XX AC
- PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS

PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering

500 South Rancho Drive, Suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for SECT A 24-FOOT DRIVE AISLE

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.40 %
Discharge	1.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.50
1+00.00	0.44
1+10.50	0.06
1+12.00	0.00
1+13.50	0.06
1+24.00	0.44
1+24.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.50)	(1+10.50, 0.06)	0.016
(1+10.50, 0.06)	(1+12.00, 0.00)	0.013
(1+12.00, 0.00)	(1+13.50, 0.06)	0.013
(1+13.50, 0.06)	(1+24.00, 0.50)	0.016

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.18 ft
Elevation Range	0.00 to 0.50 ft
Flow Area	0.82 ft ²
Wetted Perimeter	9.47 ft
Hydraulic Radius	0.09 ft
Top Width	9.47 ft
Normal Depth	0.18 ft
Critical Depth	0.16 ft
Critical Slope	0.78 %
Velocity	1.22 ft/s

Worksheet for SECT A 24-FOOT DRIVE AISLE

Results

Velocity Head	0.02 ft
Specific Energy	0.20 ft
Froude Number	0.731
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.18 ft
Critical Depth	0.16 ft
Channel Slope	0.40 %
Critical Slope	0.78 %

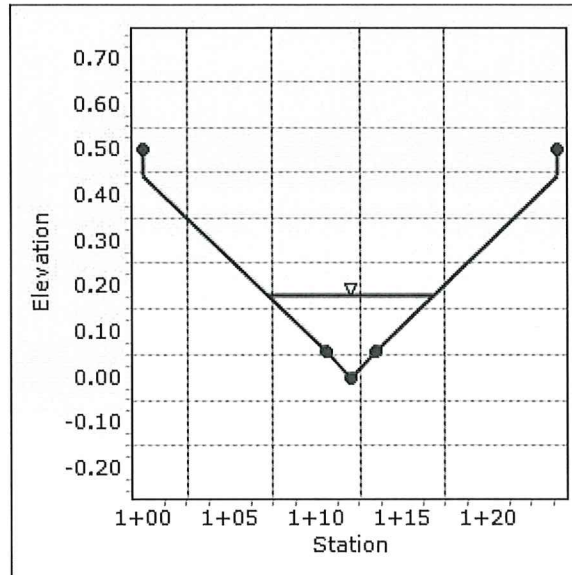
Cross Section for SECT A 24-FOOT DRIVE AISLE

Project Description

Friction Method	Manning
	Formula
Solve For	Normal Depth

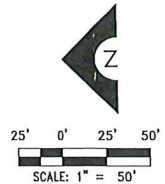
Input Data

Channel Slope	0.40 %
Normal Depth	0.18 ft
Discharge	1.00 cfs



SECTION B - 0.49 AC

$Q = 0.49 \text{ AC} \cdot 2.65 \text{ CFS/AC} = 1.3 \text{ CFS}$



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 PRORATED DRAINAGE BASIN
 - XX AC
 - CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS

PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE

PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS

CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (1/4)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering

500 South Rancho Drive, Suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for SECT B 24-FOOT DRIVE AISLE

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Channel Slope	0.56 %
Discharge	1.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.50
1+00.00	0.44
1+10.50	0.06
1+12.00	0.00
1+13.50	0.06
1+24.00	0.44
1+24.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.50)	(1+10.50, 0.06)	0.016
(1+10.50, 0.06)	(1+12.00, 0.00)	0.013
(1+12.00, 0.00)	(1+13.50, 0.06)	0.013
(1+13.50, 0.06)	(1+24.00, 0.50)	0.016

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.18 ft
Elevation Range	0.00 to 0.50 ft
Flow Area	0.88 ft ²
Wetted Perimeter	9.82 ft
Hydraulic Radius	0.09 ft
Top Width	9.82 ft
Normal Depth	0.18 ft
Critical Depth	0.17 ft
Critical Slope	0.76 %
Velocity	1.48 ft/s

Worksheet for SECT B 24-FOOT DRIVE AISLE

Results

Velocity Head	0.03 ft
Specific Energy	0.22 ft
Froude Number	0.869
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.18 ft
Critical Depth	0.17 ft
Channel Slope	0.56 %
Critical Slope	0.76 %

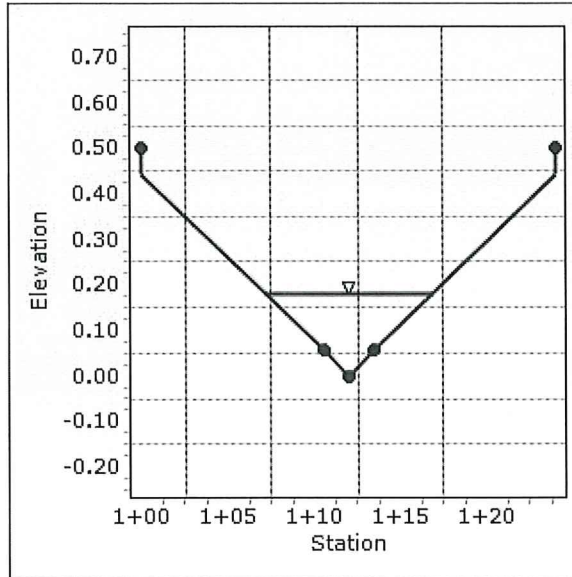
Cross Section for SECT B 24-FOOT DRIVE AISLE

Project Description

Friction Method	Manning
Solve For	Formula
	Normal Depth

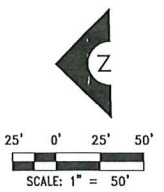
Input Data

Channel Slope	0.56 %
Normal Depth	0.18 ft
Discharge	1.30 cfs



SECTION C - TAKEN AT CPR1

Q=14 cfs



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 PRORATED DRAINAGE BASIN
 - XX AC
 - CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION						
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀	
Sect 1	0.27	278	1.31	3.78	5.0	
Sect 2	0.42	278	1.25	5.5	6.9	
Sect A	0.40	1	0.18	1.22	N/A	
Sect B	0.56	1.3	0.18	1.48	N/A	
Sect C	0.67	14	0.47	2.37	N/A	
Sect D	3.45	0.7	0.30	2.53	N/A	
Sect E	0.59	8	0.49	2.46	N/A	
Sect F	1.27	1.6	0.25	2.17	N/A	
Sect G	0.57	2.5	0.32	1.46	N/A	
Sect H	0.50	8.4	0.43	1.96	N/A	
Sect J	1.00	28	1.45	3.35	N/A	

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering
500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for 100-YR SECTION C

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.67 %
Discharge	14 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+90.00	0.48
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+13.00	0.39
1+24.00	0.17
1+24.00	0.13
1+25.00	0.00
1+25.02	0.08
1+25.34	0.25
1+25.67	0.35
1+26.00	0.38
1+31.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+90.00, 0.48)	(1+02.00, 0.17)	0.013
(1+02.00, 0.17)	(1+13.00, 0.39)	0.016
(1+13.00, 0.39)	(1+24.00, 0.17)	0.016
(1+24.00, 0.17)	(1+31.00, 0.48)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.47 ft

Worksheet for 100-YR SECTION C

Results

Elevation Range	0.00 to 0.48 ft
Flow Area	5.9 ft ²
Wetted Perimeter	39.44 ft
Hydraulic Radius	0.15 ft
Top Width	39.12 ft
Normal Depth	0.47 ft
Critical Depth	0.48 ft
Critical Slope	0.58 %
Velocity	2.37 ft/s
Velocity Head	0.09 ft
Specific Energy	0.55 ft
Froude Number	1.073
Flow Type	Supercritical

GVF Input Data

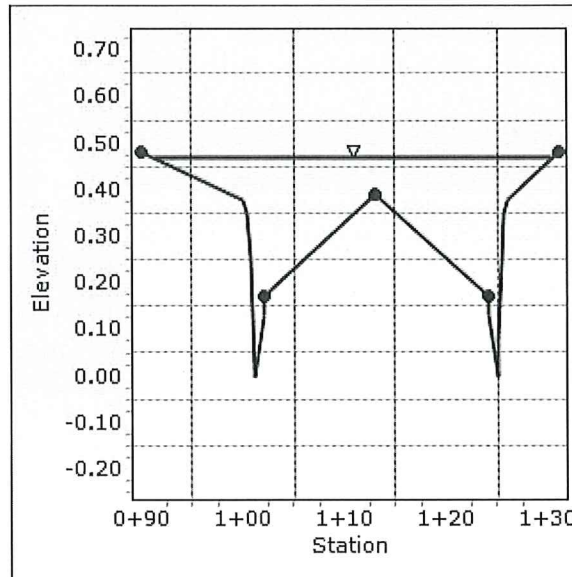
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.47 ft
Critical Depth	0.48 ft
Channel Slope	0.67 %
Critical Slope	0.58 %

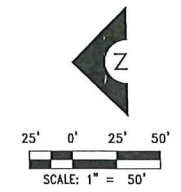
Cross Section for 100-YR SECTION C

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.67 %
Normal Depth	0.47 ft
Discharge	14 cfs



SECTION D-0.25 AC

$Q = 0.25 \text{ AC} \cdot 2.65 \text{ CFS/AC} = \underline{0.7 \text{ CFS}}$



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 XX AC
 - PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect1	0.27	278	1.31	3.78	5.0
Sect2	0.42	278	1.25	5.5	6.9
SectA	0.40	1	0.18	1.22	N/A
SectB	0.56	1.3	0.18	1.48	N/A
SectC	0.67	14	0.47	2.37	N/A
SectD	3.45	0.7	0.30	2.53	N/A
SectE	0.59	8	0.49	2.46	N/A
SectF	1.27	1.6	0.25	2.17	N/A
SectG	0.57	2.5	0.32	1.46	N/A
SectH	0.50	8.4	0.43	1.95	N/A
SectJ	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering
500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for SECT D RIPRAP LINED SWALE

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	3.45 %
Discharge	0.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.50
1+01.50	0.00
1+03.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.50)	(1+03.00, 0.50)	0.030

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.30 ft
Elevation Range	0.00 to 0.50 ft
Flow Area	0.28 ft ²
Wetted Perimeter	1.92 ft
Hydraulic Radius	0.14 ft
Top Width	1.82 ft
Normal Depth	0.30 ft
Critical Depth	0.32 ft
Critical Slope	2.59 %
Velocity	2.53 ft/s
Velocity Head	0.10 ft
Specific Energy	0.40 ft
Froude Number	1.146
Flow Type	Supercritical

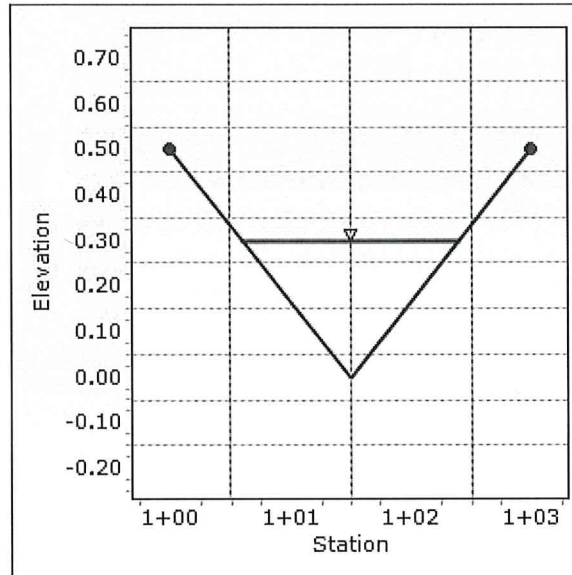
GVF Input Data

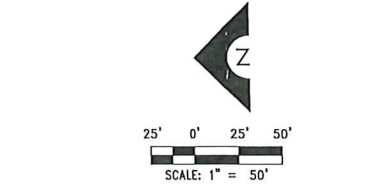
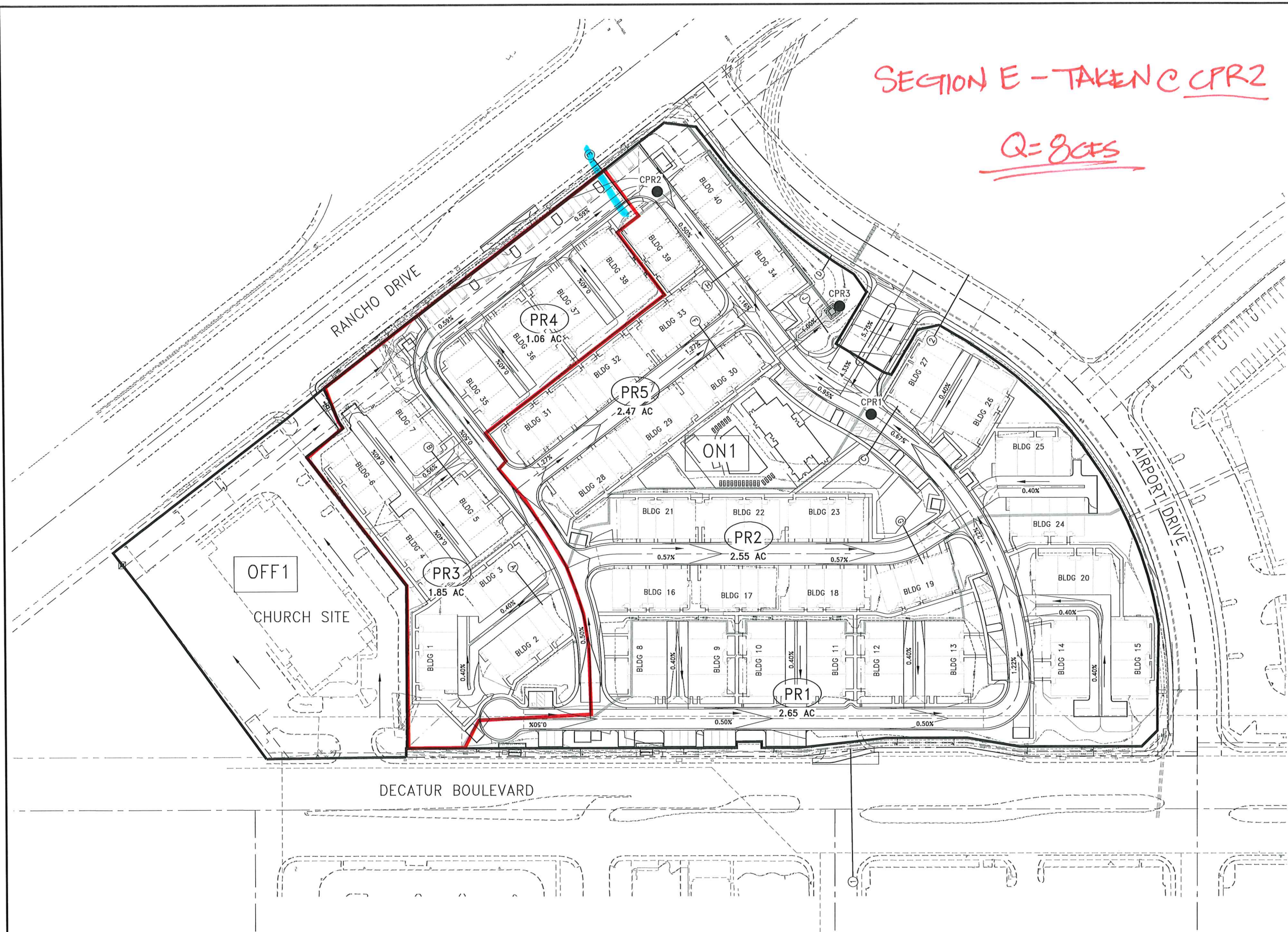
Worksheet for SECT D RIPRAP LINED SWALE

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.32 ft
Channel Slope	3.45 %
Critical Slope	2.59 %

Cross Section for SECT D RIPRAP LINED SWALE

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	3.45 %
Normal Depth	0.30 ft
Discharge	0.70 cfs





- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 XX AC PRORATED DRAINAGE BASIN
 - CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION						
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D'V ₁₀₀	
Sect 1	0.27	278	1.31	3.78	5.0	
Sect 2	0.42	278	1.25	5.5	6.9	
Sect A	0.40	1	0.18	1.22	N/A	
Sect B	0.56	1.3	0.18	1.48	N/A	
Sect C	0.67	14	0.47	2.37	N/A	
Sect D	3.45	0.7	0.30	2.53	N/A	
Sect E	0.59	8	0.49	2.46	N/A	
Sect F	1.27	1.6	0.25	2.17	N/A	
Sect G	0.57	2.5	0.32	1.46	N/A	
Sect H	0.50	8.4	0.43	1.96	N/A	
Sect J	1.00	28	1.45	3.35	N/A	

Worksheet for 100-YR SECTION E

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.59 %
Discharge	8 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+95.25	0.75
1+24.00	0.17
1+24.00	0.13
1+25.00	0.00
1+25.02	0.08
1+25.34	0.25
1+25.67	0.35
1+26.00	0.38
1+26.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+95.25, 0.75)	(1+24.00, 0.17)	0.016
(1+24.00, 0.17)	(1+26.00, 0.60)	0.013

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.49 ft
Elevation Range	0.00 to 0.75 ft
Flow Area	3.3 ft ²
Wetted Perimeter	18.37 ft
Hydraulic Radius	0.18 ft
Top Width	18.07 ft
Normal Depth	0.49 ft
Critical Depth	0.50 ft
Critical Slope	0.57 %
Velocity	2.46 ft/s

Worksheet for 100-YR SECTION E

Results

Velocity Head	0.09 ft
Specific Energy	0.59 ft
Froude Number	1.020
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.49 ft
Critical Depth	0.50 ft
Channel Slope	0.59 %
Critical Slope	0.57 %

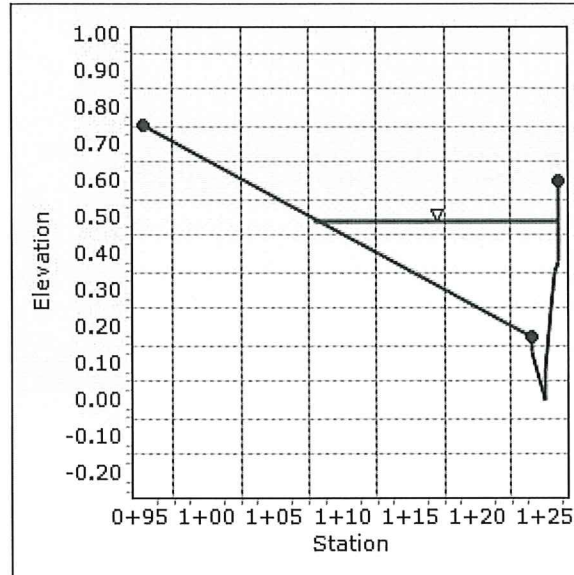
Cross Section for 100-YR SECTION E

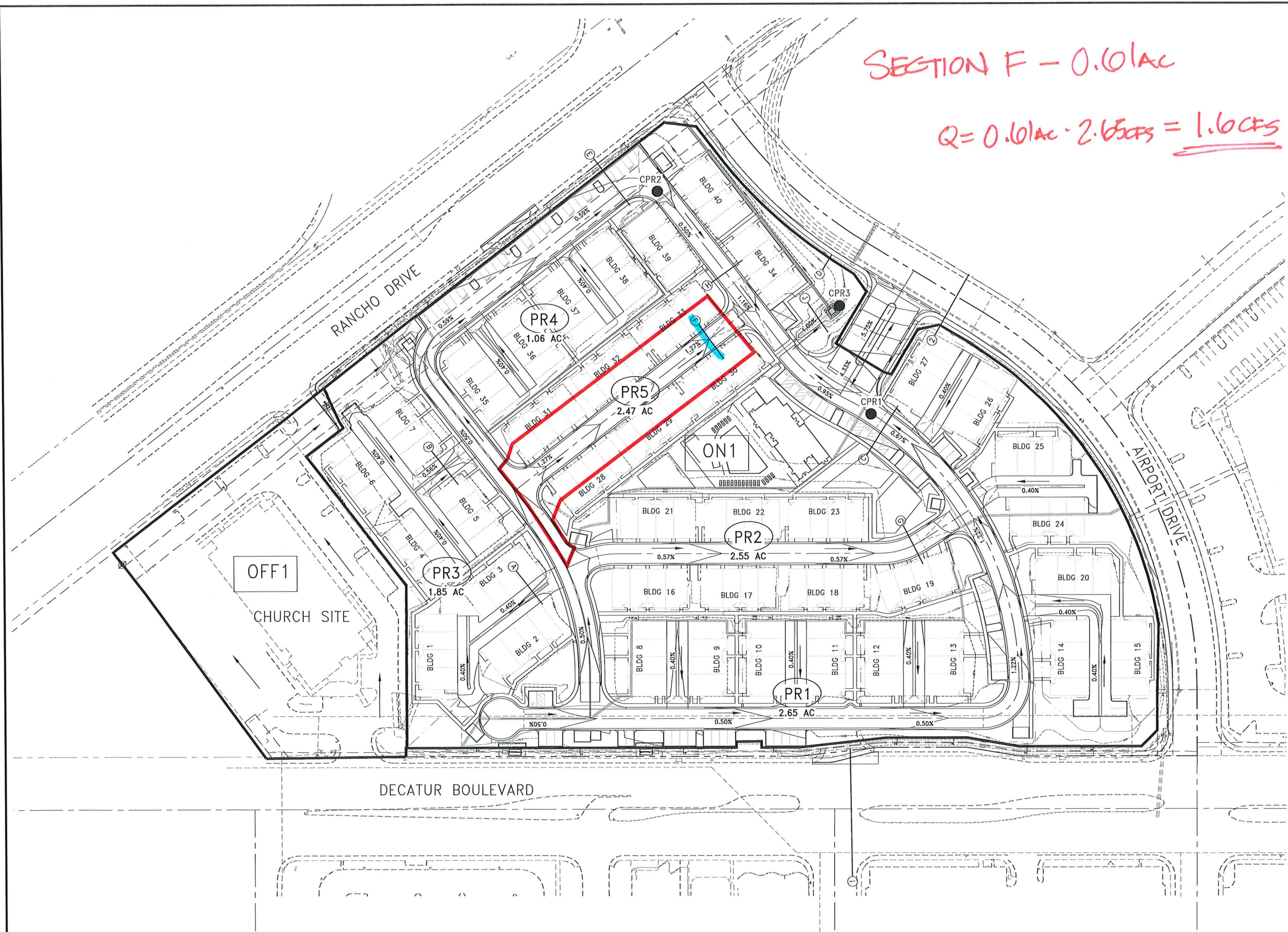
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.59 %
Normal Depth	0.49 ft
Discharge	8 cfs





SECTION F - 0.61ac

$Q = 0.61ac \cdot 2.65cfs = 1.6cfs$

LEGEND

- STREET SLOPE
- ULTIMATE SUBBASIN BOUNDARY
- ON1 ULTIMATE DRAINAGE SUBBASIN
- CROSS SECTION LOCATION
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PRORATED BASIN BOUNDARY
- PR1 XX AC PRORATED DRAINAGE BASIN
- CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	Basin Area (Ac)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY
EDWARD HOMES
FIGURE 6
ULTIMATE CONDITIONS MAP
RCI Engineering
500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for 100-YR SECTION F

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	1.27 %
Discharge	1.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+13.00	0.39
1+24.00	0.17
1+24.00	0.13
1+25.00	0.00
1+25.02	0.08
1+25.34	0.25
1+25.67	0.35
1+26.00	0.38
1+31.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.38)	(1+13.00, 0.39)	0.016
(1+13.00, 0.39)	(1+24.00, 0.17)	0.016
(1+24.00, 0.17)	(1+31.00, 0.48)	0.013

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	0.25 ft
Elevation Range	0.00 to 0.48 ft
Flow Area	0.7 ft ²

Worksheet for 100-YR SECTION F

Results

Wetted Perimeter	10.71 ft
Hydraulic Radius	0.07 ft
Top Width	10.43 ft
Normal Depth	0.25 ft
Critical Depth	0.27 ft
Critical Slope	0.59 %
Velocity	2.17 ft/s
Velocity Head	0.07 ft
Specific Energy	0.32 ft
Froude Number	1.438
Flow Type	Supercritical

GVF Input Data

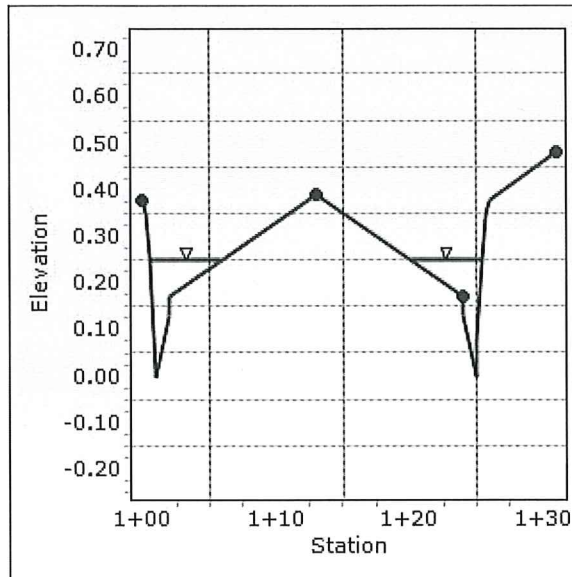
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

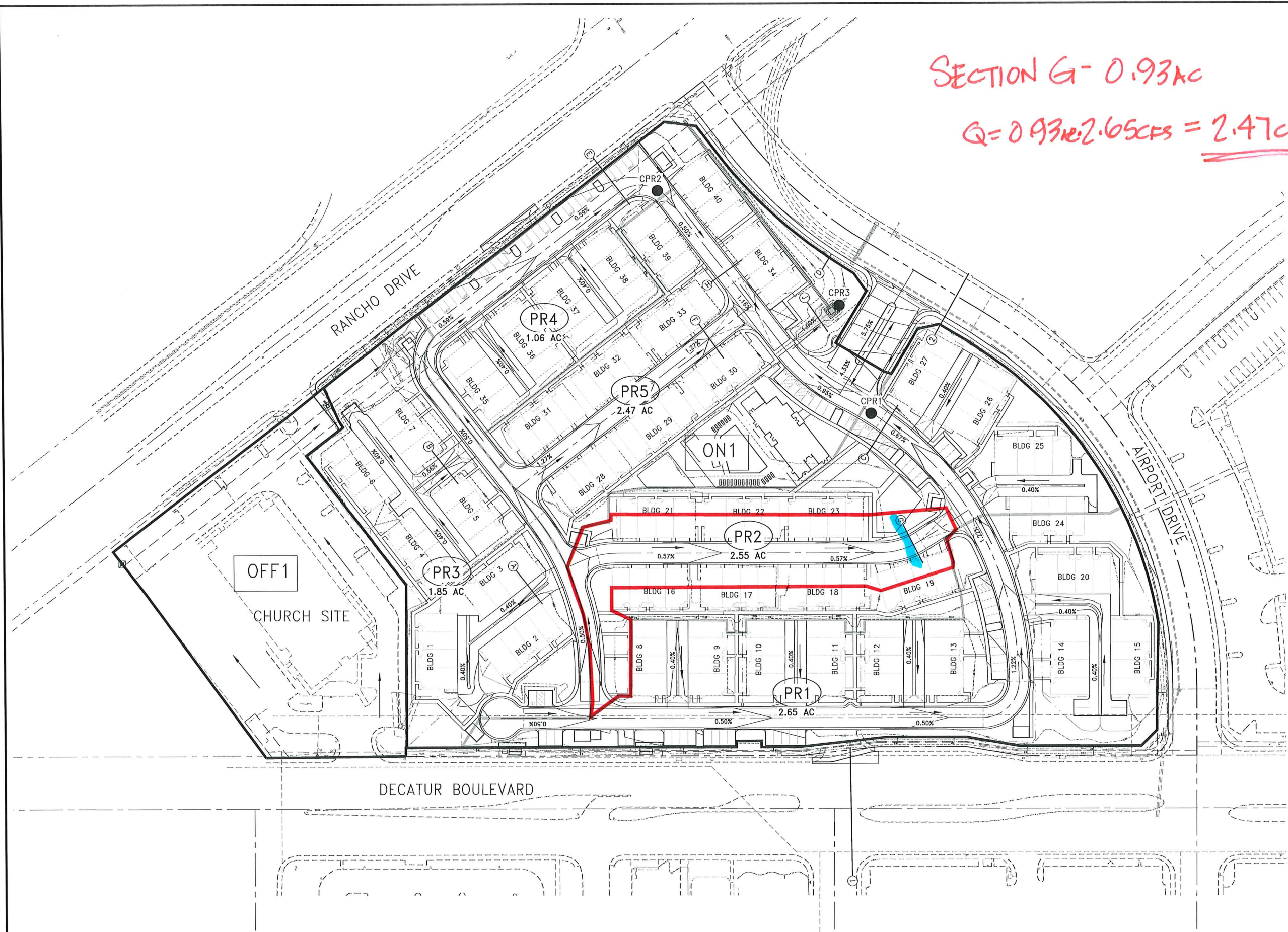
GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.25 ft
Critical Depth	0.27 ft
Channel Slope	1.27 %
Critical Slope	0.59 %

Cross Section for 100-YR SECTION F

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	1.27 %
Normal Depth	0.25 ft
Discharge	1.60 cfs





SECTION G- 0.93 AC

$Q = 0.93 \text{ AC} \times 2.65 \text{ CFS/AC} = \underline{2.47 \text{ CFS}}$

LEGEND

- STREET SLOPE
- ULTIMATE SUBBASIN BOUNDARY
- ON1 ULTIMATE DRAINAGE SUBBASIN
- CROSS SECTION LOCATION
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PRORATED BASIN BOUNDARY
- PR1 XX AC PRORATED DRAINAGE BASIN
- CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	Basin Area (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY
EDWARD HOMES
FIGURE 6
ULTIMATE CONDITIONS MAP
RCI Engineering
500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for 100-YR SECTION G

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.57 %
Discharge	2.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+13.00	0.39
1+24.00	0.17
1+24.00	0.13
1+25.00	0.00
1+25.02	0.08
1+25.34	0.25
1+25.67	0.35
1+26.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.38)	(1+13.00, 0.39)	0.016
(1+13.00, 0.39)	(1+26.00, 0.38)	0.016

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.32 ft
Elevation Range	0.00 to 0.39 ft
Flow Area	1.7 ft ²
Wetted Perimeter	18.10 ft
Hydraulic Radius	0.09 ft

Worksheet for 100-YR SECTION G

Results

Top Width	17.79 ft
Normal Depth	0.32 ft
Critical Depth	0.30 ft
Critical Slope	0.85 %
Velocity	1.46 ft/s
Velocity Head	0.03 ft
Specific Energy	0.35 ft
Froude Number	0.829
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

GVF Output Data

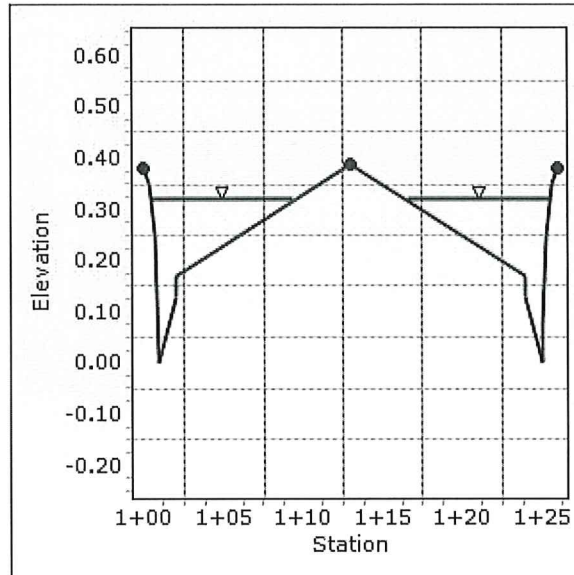
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.32 ft
Critical Depth	0.30 ft
Channel Slope	0.57 %
Critical Slope	0.85 %

Messages

Messages	Flow is divided.
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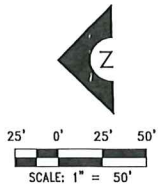
Cross Section for 100-YR SECTION G

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.57 %
Normal Depth	0.32 ft
Discharge	2.50 cfs



SECTION H - 3.17 AC

$$Q = 3.17 \text{ AC} \cdot 2.65 \text{ CFS/AC} = \underline{8.4 \text{ CFS}}$$



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 XX AC
 - PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS

PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (%)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.46	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6
ULTIMATE CONDITIONS MAP

RCI Engineering

500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for 100-YR SECTION H

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.50 %
Discharge	8.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	0.38
1+00.33	0.35
1+00.66	0.25
1+01.00	0.00
1+02.00	0.13
1+02.00	0.17
1+13.00	0.39
1+24.00	0.17
1+24.00	0.13
1+25.00	0.00
1+25.02	0.08
1+25.34	0.25
1+25.67	0.35
1+26.00	0.38

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 0.38)	(1+13.00, 0.39)	0.016
(1+13.00, 0.39)	(1+26.00, 0.38)	0.016

Options	
Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results	
Normal Depth	0.43 ft
Elevation Range	0.00 to 0.39 ft
Flow Area	4.3 ft ²
Wetted Perimeter	26.43 ft
Hydraulic Radius	0.16 ft

Worksheet for 100-YR SECTION H

Results

Top Width	26.00 ft
Normal Depth	0.43 ft
Critical Depth	0.41 ft
Critical Slope	0.72 %
Velocity	1.96 ft/s
Velocity Head	0.06 ft
Specific Energy	0.49 ft
Froude Number	0.849
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0.00

GVF Output Data

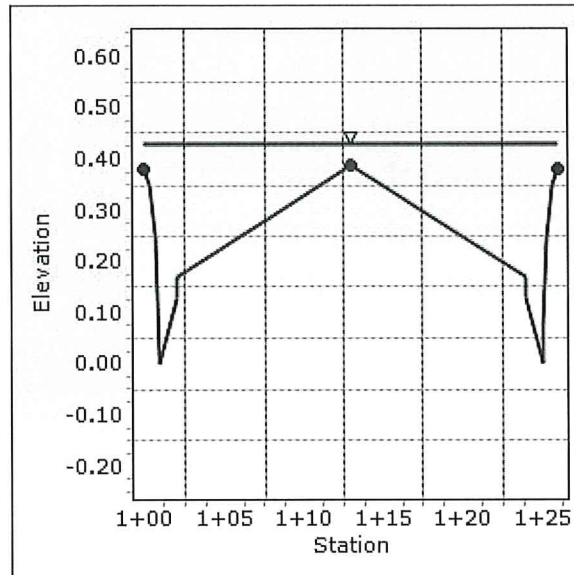
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.43 ft
Critical Depth	0.41 ft
Channel Slope	0.50 %
Critical Slope	0.72 %

Messages

Messages	Water Surface Elevation exceeds lowest end station by 0.052610376 8216495ft.
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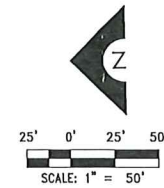
Cross Section for 100-YR SECTION H

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Channel Slope	0.50 %
Normal Depth	0.43 ft
Discharge	8.40 cfs



SECTION J - TAKEN @ CPR3

Q = 28 CFS



- LEGEND**
- STREET SLOPE
 - ULTIMATE SUBBASIN BOUNDARY
 - ON1 ULTIMATE DRAINAGE SUBBASIN
 - (A) CROSS SECTION LOCATION
 - PROPOSED STORM DRAIN
 - EXISTING STORM DRAIN
 - PRORATED BASIN BOUNDARY
 - PR1 XX AC PRORATED DRAINAGE BASIN
 - CPR2 PRORATED COMBINATION POINT

ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
ON1	10.58	28	14
OFF1	1.81	6	3

100-YR PRORATED STORM FLOWS
PRORATED STORM FLOWS= 28 CFS/10.58 ACRES= 2.65 CFS/ACRE
PR1=2.65 ACRES X 2.65 CFS/ACRE=7.0 CFS
PR2=2.55 ACRES X 2.65 CFS/ACRE=6.8 CFS
PR3=1.85 ACRES X 2.65 CFS/ACRE=4.9 CFS
PR4=1.06 ACRES X 2.65 CFS/ACRE=2.8 CFS
PR5=2.47 ACRES X 2.65 CFS/ACRE=6.5 CFS
CPR1=14 CFS
CPR2=8 CFS
CPR3=ON1=28CFS

100-YEAR HYDRAULIC CROSS SECTION					
Location	Slope (ft/ft)	Q ₁₀₀ (cfs)	D ₁₀₀ (ft)	V ₁₀₀ (ft/sec)	D*V ₁₀₀
Sect 1	0.27	278	1.31	3.78	5.0
Sect 2	0.42	278	1.25	5.5	6.9
Sect A	0.40	1	0.18	1.22	N/A
Sect B	0.56	1.3	0.18	1.48	N/A
Sect C	0.67	14	0.47	2.37	N/A
Sect D	3.45	0.7	0.30	2.53	N/A
Sect E	0.59	8	0.49	2.46	N/A
Sect F	1.27	1.6	0.25	2.17	N/A
Sect G	0.57	2.5	0.32	1.48	N/A
Sect H	0.50	8.4	0.43	1.96	N/A
Sect J	1.00	28	1.45	3.35	N/A

RANCHO MULTI FAMILY

EDWARD HOMES

FIGURE 6

ULTIMATE CONDITIONS MAP

RCI Engineering
500 South Rancho Drive, suite 17 Las Vegas, NV 89106
PH#702.453.0800 FAX#702.453.0801

Worksheet for SECT J-RIPRAP LINED SWALE

Project Description

Friction Method	Manning
	Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00 %
Discharge	28.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
1+00.00	1.50
1+06.00	0.00
1+12.00	1.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.00, 1.50)	(1+12.00, 1.50)	0.035

Options

Current Roughness Weighted Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Method	Horton's Method

Results

Normal Depth	1.45 ft
Elevation Range	0.00 to 1.50 ft
Flow Area	8.36 ft ²
Wetted Perimeter	11.92 ft
Hydraulic Radius	0.70 ft
Top Width	11.56 ft
Normal Depth	1.45 ft
Critical Depth	1.25 ft
Critical Slope	2.17 %
Velocity	3.35 ft/s
Velocity Head	0.17 ft
Specific Energy	1.62 ft
Froude Number	0.695
Flow Type	Subcritical

GVF Input Data

Worksheet for SECT J-RIPRAP LINED SWALE

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.45 ft
Critical Depth	1.25 ft
Channel Slope	1.00 %
Critical Slope	2.17 %
