DS # 4521

DS INDEX:

APN: 138-29-212-003; -004 & -005

PROJECT: 901 TROPHY HILLS (TOURNAMENT HILLS UNIT 3)

SUBMITTAL 1ST

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 2, 2011
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **901 Trophy Hills (Tournament Hills Unit 3)**			**COPIES TO:** Wright One Source
Cross Streets:	NWQ of Summerlin Pkwy. & Rampart Blvd.			Robert Paul G. Trust
File Number:	F:\Depot\DSMemos\DS4521A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-29-212-003; -004 & -005			
Zoning Action:	FMP-40979			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	2/16/2011	3/2/2011	See Comments Below	$400.00	162890: $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.

1. Provide a copy of the zoning/planning conditions associated with this site (**FMP-40979**) 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. The project proposes to discharge concentrated flows through storm drain pipes at two distinct locations at the northwest property line to the adjacent golf course. Since this is concentrated flow which differs from the original sheet flow design. This may cause erosion and maintenance problem for the golf course owner/management. A notarized letter of acknowledgment or acceptance of the proposed design must be obtained from the adjacent golf course prior to the final approval of the drainage study. Also clarify whose responsibility is it for the maintenance of the storm drain pipes within the golf course.

3. At the northeast corner of the property, there appears a storm drain line running from the northeast corner of the building and ends at the north property wall, but without any note for discharging. Please address in the next submittal.

4. Construction Note #12 calls for the installation of wall opening(s) but to nowhere be found on the grading plan. Clarify in the next submittal.

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

ays

T/R/S: T20S/R60E/29
AREA L-29

P. 01

TRANSACTION REPORT

MAR-02-2011 WED 04:49 PM

FOR: CITY OF LAS VEGAS 7023828551

SEND

DATE START	RECEIVER	TX TIME	PAGES	TYPE	NOTE	M#	DP
MAR-02 04:48 PM	9337001	1'14"	2	FAX TX	OK	657	

TOTAL : 1M 14S PAGES: 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

ays

T/R/S: T20S/R60E/29

AREA L-29

Post-it® Fax Note 7671	Date 3/2/11	# of pages ▶ 2
To Rob Hansen	From Albert Sung	
Co./Dept. Wright Eng.	Co. CLV	
Phone #	Phone # 229-200	
Fax # 933-700	Fax #	

WRIGHT ENGINEERS

Rec'd : 2/16/11

UPDATE TO THE TECHNICAL DRAINAGE STUDY FOR TOURNAMENT HILLS – UNIT 3 A.K.A. 901 TROPHY HILLS

DS4521 ~~DS4521~~ L-29 $400

CITY OF LAS VEGAS
February 16, 2011

WRIGHT engineers

PREPARED FOR:

INTERFACE OPERATIONS, LLC
3355 LAS VEGAS BLVD. S.
LAS VEGAS, NV 89109

7425 Peak Drive • Las Vegas, NV 89128 • Ph. (702) 933-7000 • Fax (702) 933-7001

WRIGHT
one source

February 16, 2011

Albert Sung, P.E.
Flood Control
City of Las Vegas Public Works
731 S. Fourth Street
Las Vegas, Nevada 89101

CIVIL
STRUCTURAL
MECHANICAL
ELECTRICAL
PLUMBING
SURVEYING
PLANNING
LEED

RE: UPDATE TO THE TECHNICAL DRAINAGE STUDY FOR TOURNAMENT HILLS – UNIT 3 – LOTS 3, 4, AND 5 A.K.A. 901 TROPHY HILLS
Job No. CN111029

Dear Mr. Sung:

Wright Engineers is pleased to submit two copies of the Update to the Technical Drainage Study for your review and approval for the above-mentioned project. The site is recorded on the Clark County Assessor's maps as APN's 138-29-212-003, 004, and 005. See *Figure 1, Vicinity Map.*

This update is in regards to the redevelopment of lots 3, 4, and 5 located in Tournament Hills Unit 3. These three lots are being combined into a single lot for an approximately 49,500 square foot residence including an underground parking garage, tennis court and pool. The original homes on these three lots have already been demolished. The original drainage study for this project was completed by G.C. Wallace and was approved on September 11, 1992. The study is on file with the City of Las Vegas as DS901, copies of reference information have been provided in the Appendix.

Street Flow

Figure 6 of the original drainage study shows the drain patterns for Tournament Hills Unit 3. Point A quantified the 100-year street flow as 44cfs (17cfs, 10-year). A flow depth calculation has been completed for Players Club Drive at the minimum existing street slope of 0.5%; the resulting depth is 0.68-feet. This calculation is conservative since the project site is located on the high side of the basin. There is an existing high point in Trophy Hills Drive adjacent to the project site; therefore there is no significant flow in Trophy Hills Drive.

The building finished floor has been set at 2719-feet which is below the existing street elevation along Players Club Drive. The proposed site wall and walkway entrance along Players Club Drive is used to protect the site to 18-inches above the existing top of curb elevation. This is well over the twice the depth of flow. The bottom 2 courses of the proposed site wall will be solid grouted along Players Club Drive. The finished floor is more than 18 inches above the top of curb elevation in Trophy Hills Drive, therefore additional flood protection is not needed. An underground parking garage is also proposed which has been set at 2704-feet. The entrance to the underground parking garage has been set 18-inches above the flowline elevation in Trophy Hills Drive. This will provide more than adequate flood protection since there is no significant flow in Trophy Hills Drive.

2705 Per Plan

7425 Peak Drive
Las Vegas, NV 89128
(p) 702.933.7000
(f) 702.933.7001
800.933.7611
wrightengineers.com

Onsite Flow

A large amount of the onsite runoff drains to the exiting golf course; the original drainage study acknowledged that most back lots will drain to the golf course.

A 12" PVC onsite storm drain system has been provided to drain many areas of the site. The storm drain system has been adequately sized to handle the 100-year storm flow. There are two discharge points to the adjacent golf course along the northwestern property line. An emergency overflow path has been provided while still protecting the finished floor. A trench drain and sump pump is also provided to drain the entrance to the underground garage.

According to Figure F-25 of the 2008 CCRFCD'S *Master Plan Update*, no proposed or constructed regional facilities are located adjacent to the project site. Descriptions of nearby facilities are shown on the *Master Plan Update* on Figure 2, *Flood Control Facilities* (Appendix A).

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 32003C 2145E, Clark County, Nevada, effective September 27, 2002, the site lies within a FEMA designated Zone "X". A Zone "X" is described as an area determined to be outside the 500-year floodplain. See *Figure 3, FEMA Map.*

According to the *City of Las Vegas Flood Control Facilities Inventory and City Wide Hydrology Analysis, 1997* no proposed or constructed local facilities are located adjacent to the project site. Descriptions of nearby facilities are shown on the Figures 5 and 6 (Appendix A).

If you have any questions or comments regarding this project, please do not hesitate to contact this office at (702) 933-7000.

Sincerely,
Wright Engineers

PROFESSIONAL ENGINEER STATE OF NEVADA
JEREMY S. McCAY
EXP. 12-31-11
CIVIL
No. 15797

FEB 16 2011

Robert D. Hansen, E.I.
Hydrologic/Hydraulic Services

Jeremy S. McCay, P.E.
Principal

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: **901 Trophy Hills** Date: **February 15, 2011**

Location of Development: a) Descriptive (Cross Streets) North/South: **Trophy Hills Drive**
East/West: **Players Club Drive**

b) Section: **29** Township: **20 S** Range: **60 E**

c) APN: **138-29-212-003, 004, & 005**

Name of Owner: **Robert Paul G Trust**

Telephone No.: **702-374-3300** Facsimile No.: _____ Email Address: **jspurling@trailmarkinc.com**

Address: **3355 Las Vegas Blvd. S.** **Las Vegas** **NV** **89109**

Contact Person Name: **Rob Hansen** Telephone No: **(702) 933-7000**

E-mail Address: **rhansen@wrightengineers.com**

Firm: **Wright Engineers**

Address: **7425 Peak Drive, Las Vegas, NV 89128**

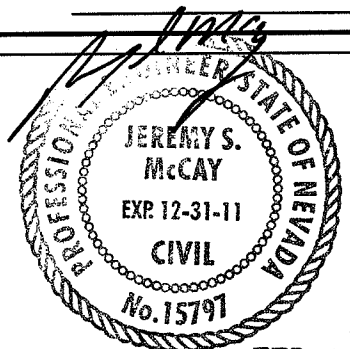
Type of Land Development/Land Disturbance Process:

- [ ] Rezoning
- [ ] Parcel Map
- [ ] Large Parcel Map
- [ ] Subdivision Map
- [ ] Planned Unit Development
- [X] Building Permit
- [ ] Clearing and Grading Only
- [ ] Other (Please specify below)

1. Total Owned Land Area: At Site: **2.52 +/- ac** Being Developed/Disturbed: **2.52 +/- ac**
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**
5. Approximate upstream land area which drains to the subject site? **< 1 ac**
6. Has the site drainage been evaluated in the past? [YES] NO If yes, please identify documentation:

   TDS for Tournament Hills Unit III, G.C. Wallace, 1992, DS901

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
   The southern portion of the site will drain to Trophy Hills Drive. The remaining portion of the site will drain to the existing golf course.
8. Briefly describe your proposed schedule for the subject project: **As soon as possible**



Engineer's Seal FEB 16 2011

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.

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

Local Entity File No.

Revision	Date

Reference: Wright Engineers, Inc. Job Number: CN111029 **STANDARD FORM 1**

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 06/06/01)

The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (Design Manual).

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	X	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
X		Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.

II. GRADING PLAN INFORMATION		
Yes	No	
X		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
X		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
X		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flow. An overflow path must be provided over all storm drains.
X		All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.

II. GRADING PLAN INFORMATION		
Yes	No	
X		Back of lot elevations and lot drainage pattern for all lots including common lots.
	X	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final aproval of the drainage study.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
X		This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
X		Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. LOCAL ENTITY CRITERIA - CITY OF LAS VEGAS - MANUAL SECTION 1600		
Yes	No	
N/A		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
N/A		Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
N/A		The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
N/A		Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir or submerged weir elevation, whichever is greater.
N/A		Lots with "B and C Type Drainage" shall be required to install an underground nuisance drainage system or a 2-foot valley gutter through the lot. 16" x 24" minimum block wall openings are required for both options.
N/A		Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: **901 Trophy Hills**	Map ID:
Firm Name: **Wright Engineers**	Engineer: **Jeremy S. McCay, P.E.**
Address: **7425 Peak Drive**	
City: **Las Vegas**	State: **NV** Zip: **89128**
Phone Number: **(702) 933-7000**	Fax Number: **(702) 933-7001**
Property Owner: **Robert Paul G Trust**	
Address: **3355 Las Vegas Blvd. S.**	
City: **Las Vegas**	State: **NV** Zip: **89109**

Reviewed by:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all includsive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
X		Design Manual **Standard Form 1** with the engineer's seal and signature.
X		Design Manual **Standard Form 4**.
X		2 copies of the 24" x 36" Drainage Plan.
	X	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS

Yes	No	
X		A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
X		A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
N/A		Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
N/A		On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
X		Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
X		Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
X		Minimum scale: 1" = 60'.
X		Project Name.
X		Vicinity Map with local and major cross streets.
X		Revision box.
X		North arrow and bar scale.
X		Engineer's/consultant's address and phone number.
X		Elevation datum and benchmark.
X		Legend for symbols and abbreviations.
X		Cut/fill scarps, where applicable.
X		Street names, grades, widths.
X		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.

REFERENCE:	STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
X		Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where applicable.
X		Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
N/A		Proposed typical street sections.
X		Streets with off-set crowns.
X		Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
X		Property Lines.
X		Right-of-way lines and widths, existing and proposed.
X		Existing improvements and their elevations.
N/A		Delineation of proposed onsite drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
N/A		Concentration points and drainage flow direction with Q100 and V100 and D100 in streets.
X		Cumulative flows, velocity , and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
X		Location and cross-section of street capacity calculations.
N/A		Cross-sectional detail for channels, including cutoff wall locations.
X		Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
X		Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
N/A		Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
X		Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
X		Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
X		Building and/or lot numbers.
N/A		Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
X		Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.
X		For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
X		Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
X		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

IV. HYDROLOGIC ANALYSIS

Yes	No	
N/A		Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
N/A		Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
N/A		Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
N/A		Use of correct precipitation values in and around the McCarran Airport rainfall area.
N/A		A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
N/A		A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
X		Copies of supporting technical information referenced form a previously approved study and a statement accepting these results.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
N/A		Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X		Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. Q_{100} d x v $\leq$ 8. Q_{10} d x v $\leq$ 6 and 12 foot dry lane for rights-of-way $\geq$ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X		A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
N/A		Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
N/A		Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection loses, where appropriate.
X		Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, which ever is greater.
N/A		A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
X		Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
X		Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X		The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.

REFERENCE:	STANDARD FORM 2

APPENDIX

901 TROPHY HILLS

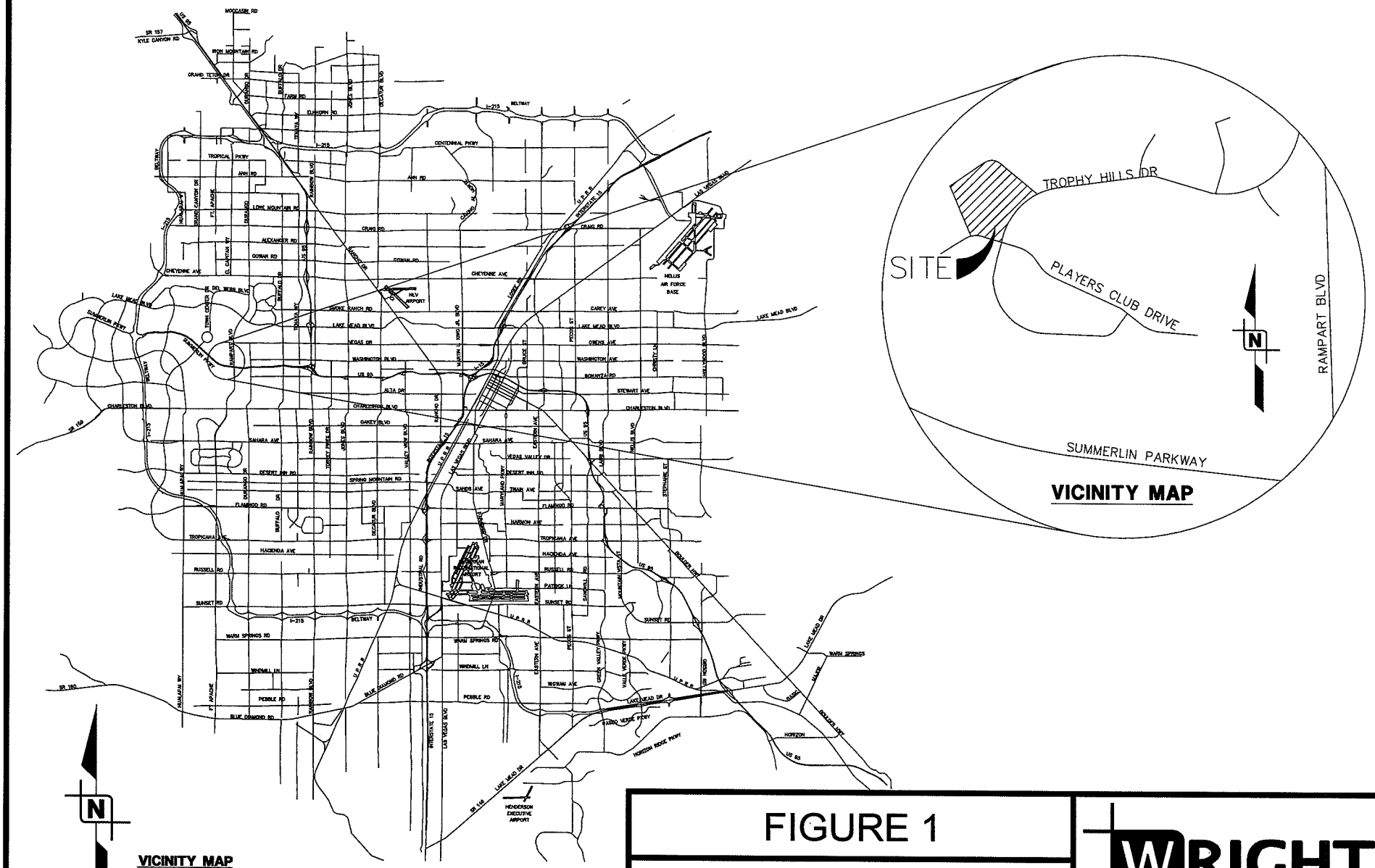


FIGURE 1

VICINITY MAP

WRIGHT one source

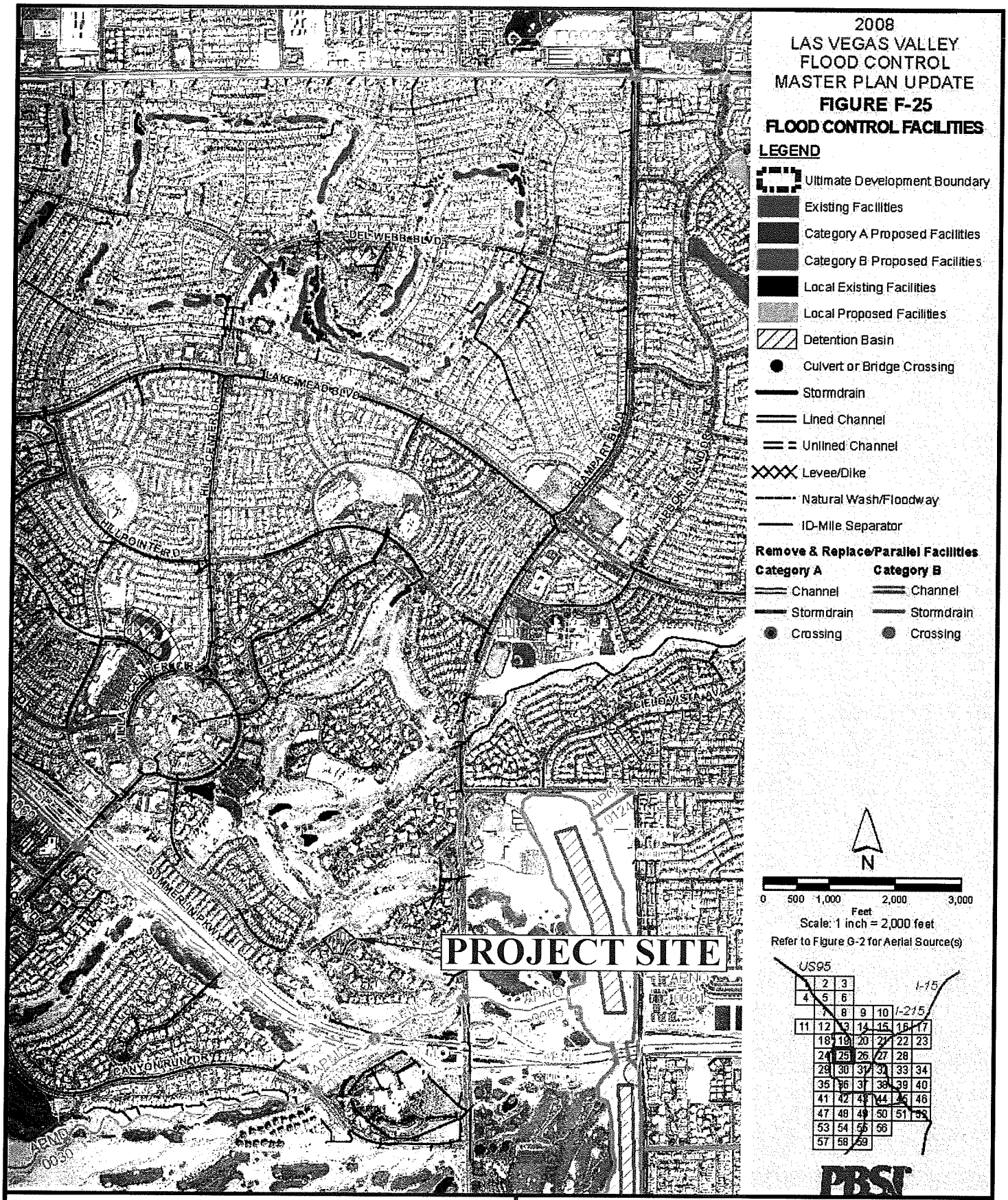


FIGURE 2

FLOOD CONTROL FACILITIES

WRIGHT one source

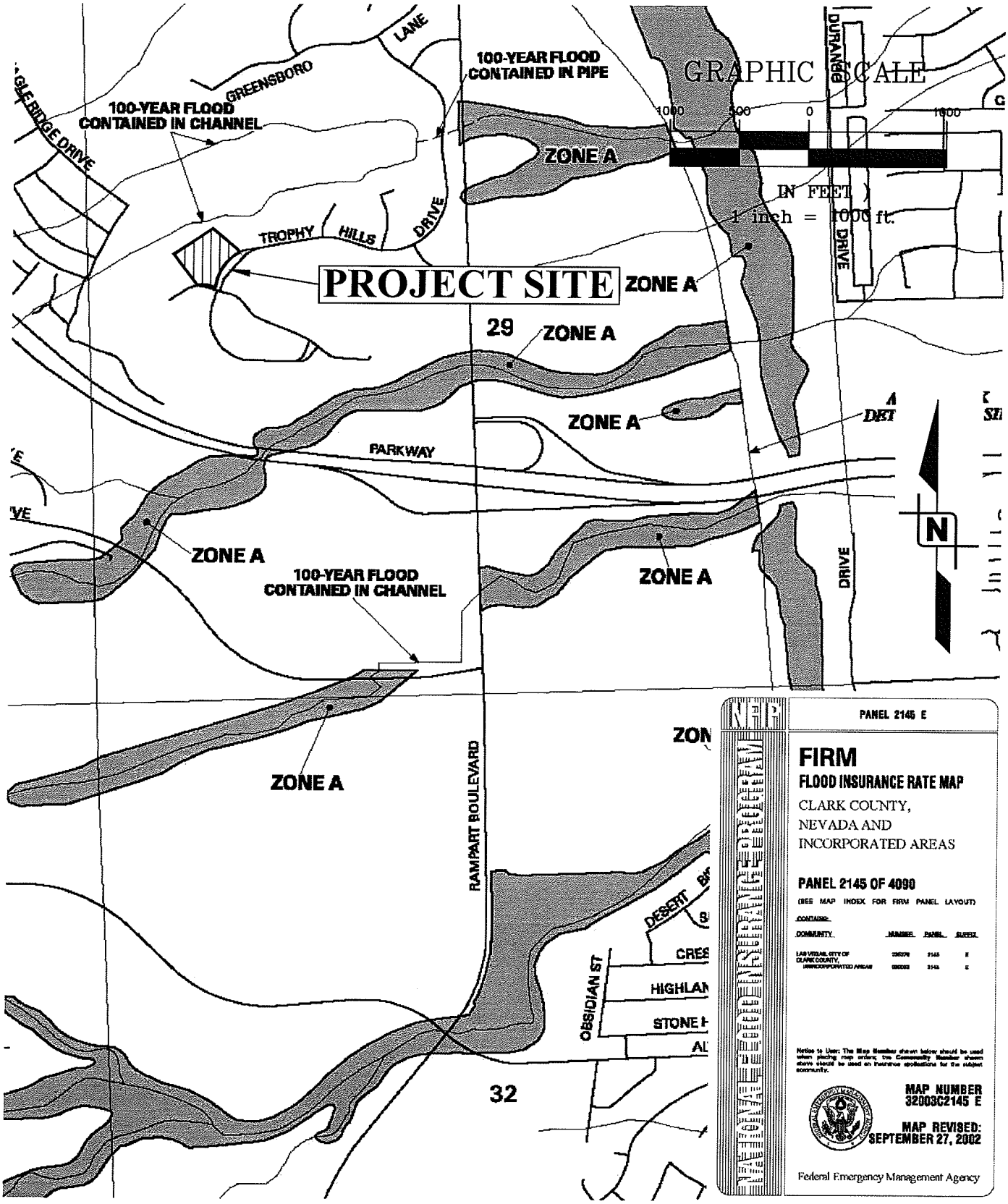


FIGURE 3

FEMA MAP

WRIGHT one source

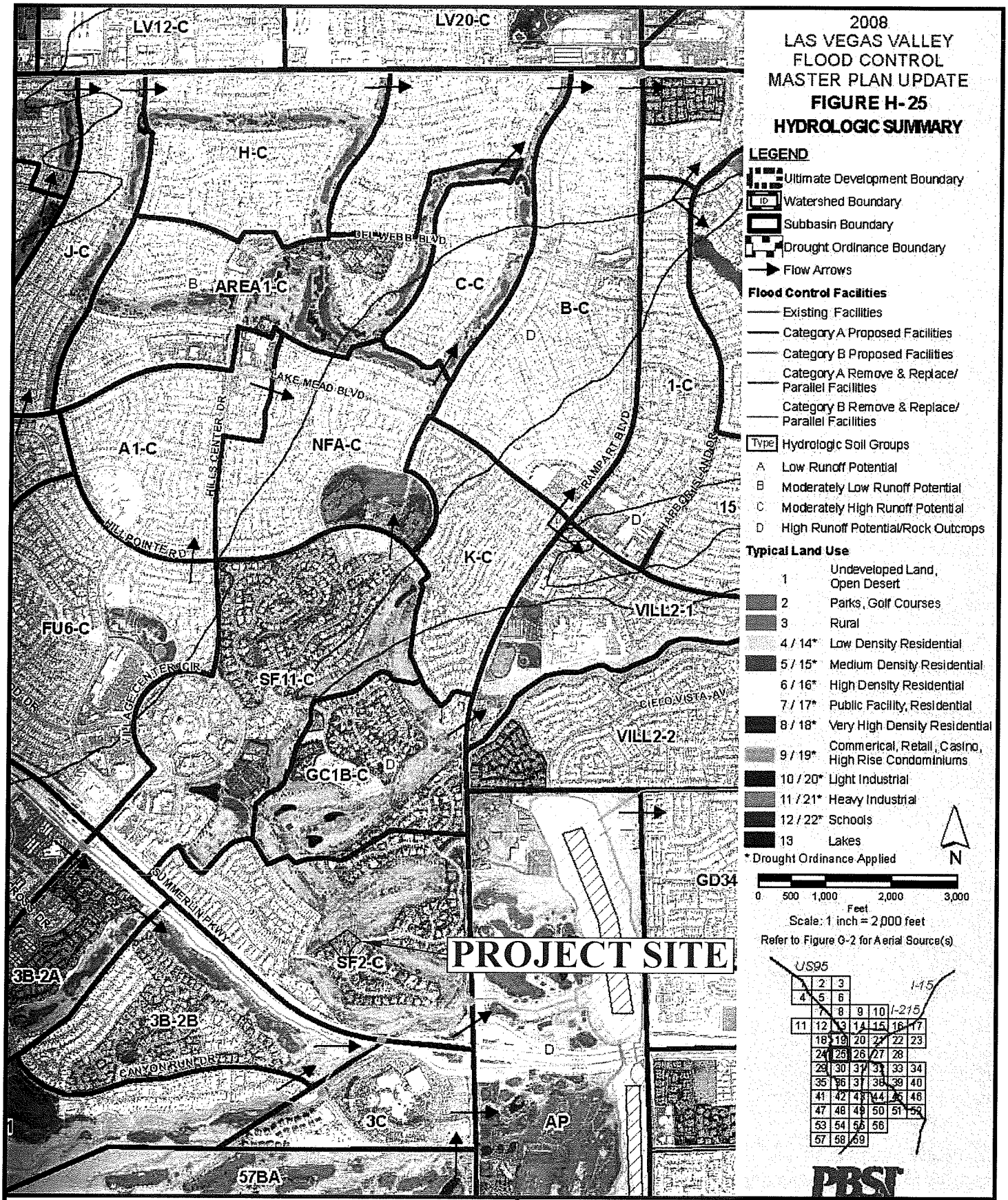


FIGURE 4

SOILS MAP

WRIGHT one source

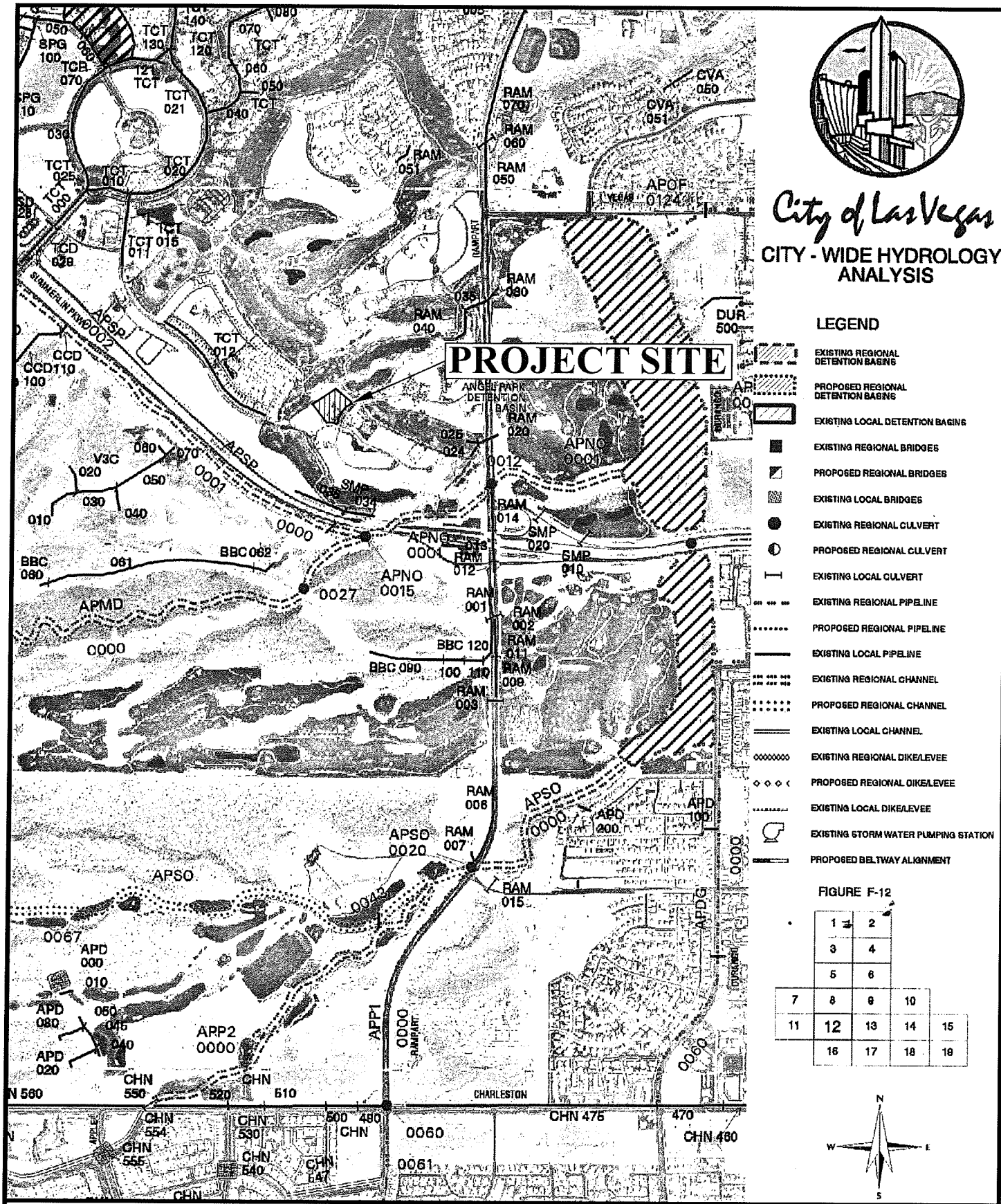
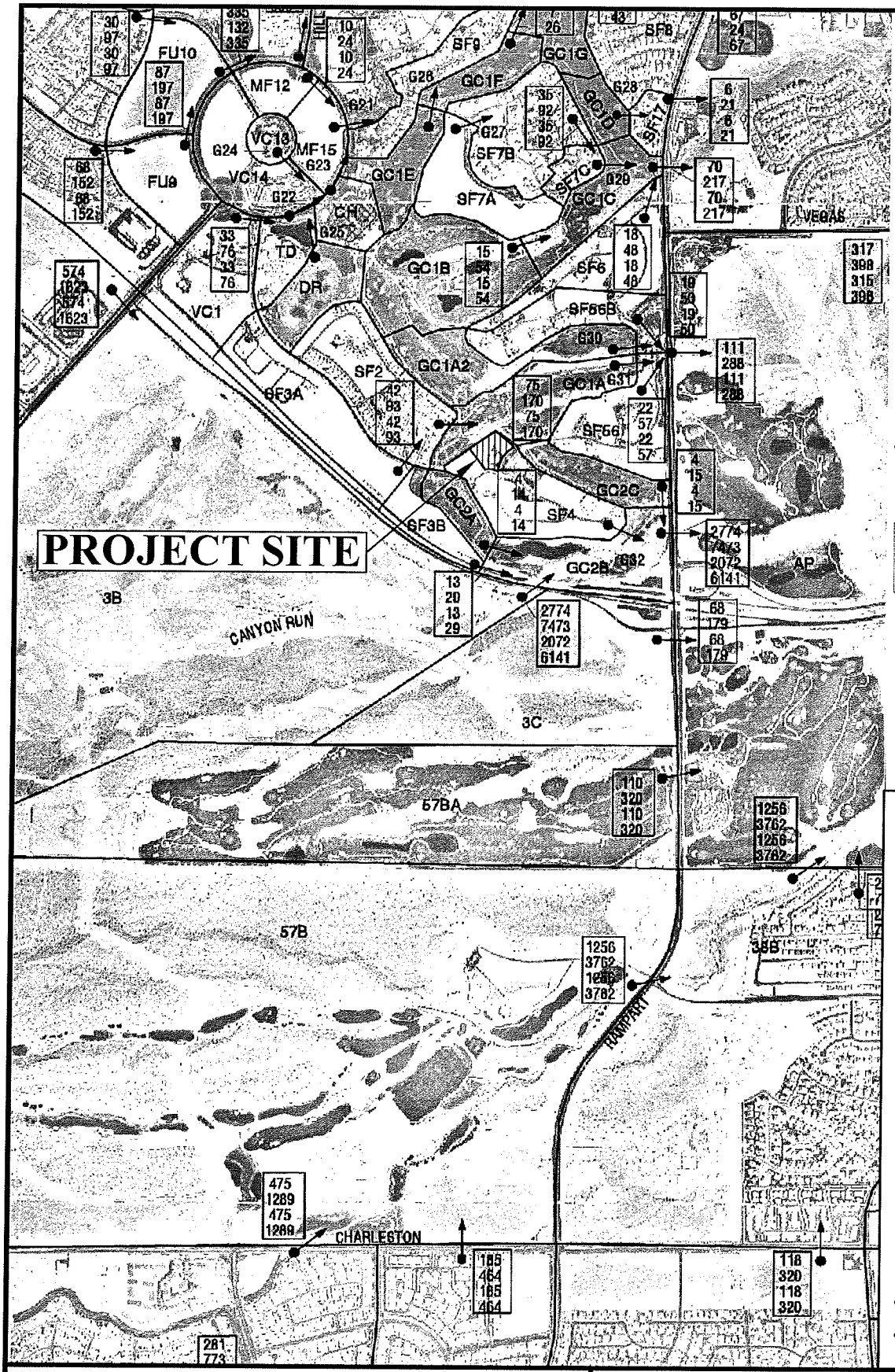


FIGURE 5

1997 CITY-WIDE HYDROLOGY ANALYSIS
FIGURE F-12

WRIGHT
one source



CITY OF LAS VEGAS NEVADA

CITY WIDE HYDROLOGY STUDY UPDATE - 1997

LEGEND

SUB-BASIN BOUNDARY

FLOW ARROW

250	10-YEAR EXISTING FLOW
500	100-YEAR EXISTING FLOW
300	10-YEAR ULTIMATE FLOW
800	100-YEAR ULTIMATE FLOW

(FLOWS IN CFS)

NOTE:
Facility flows must be subtracted from flows shown to determine surface flows. (See "F" sheets for facility flows)

N W E S

1 INCH = 1600 FEET

FIGURE H-12

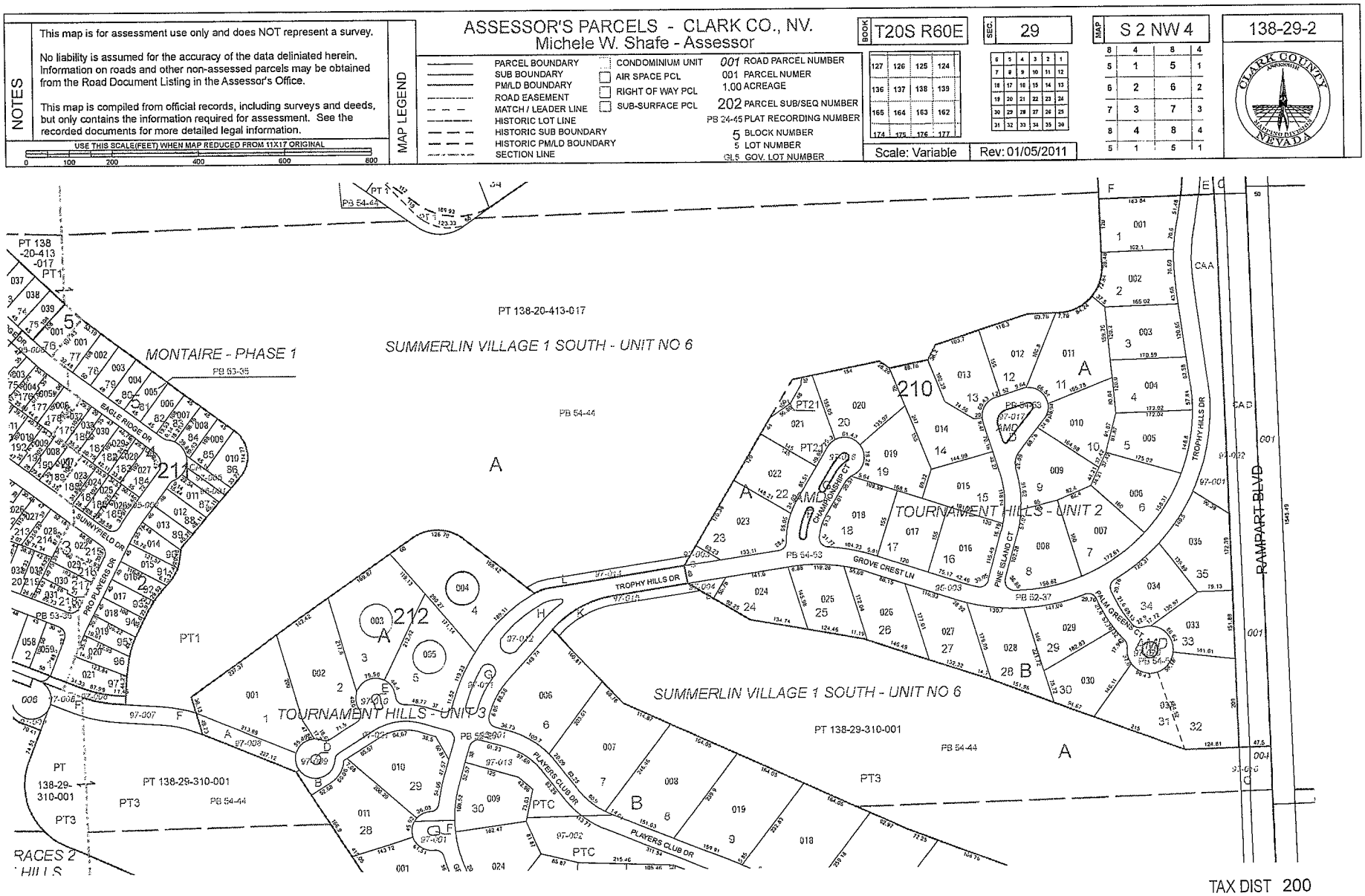
	1	2		
	3	4		
	5	6		
7	8	9	10	
11	12	13	14	15
	16	17	18	19

PBSJ POST, BUCKLEY, SCHUH & JERNIGAN, INC.

FIGURE 6

1997 CITY-WIDE HYDROLOGY ANALYSIS
FIGURE H-12

WRIGHT one source


NOTES
This map is for assessment use only and does NOT represent a survey.
No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.
This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.
USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL
0 100 200 400 600 800
MAP LEGEND
PARCEL BOUNDARY
SUB BOUNDARY
PM/LD BOUNDARY
ROAD EASEMENT
MATCH / LEADER LINE
HISTORIC LOT LINE
HISTORIC SUB BOUNDARY
HISTORIC PM/LD BOUNDARY
SECTION LINE
CONDOMINIUM UNIT
AIR SPACE PCL
RIGHT OF WAY PCL
SUB-SURFACE PCL
001 ROAD PARCEL NUMBER
001 PARCEL NUMER
1.00 ACREAGE
202 PARCEL SUB/SEQ NUMBER
PB 24-45 PLAT RECORDING NUMBER
5 BLOCK NUMBER
5 LOT NUMBER
GL5 GOV. LOT NUMBER
ASSESSOR'S PARCELS - CLARK CO., NV.
Michele W. Shafe - Assessor
BOOK T20S R60E
SEC 29
MAP S 2 NW 4
138-29-2
Scale: Variable
Rev: 01/05/2011
CLARK COUNTY ASSESSOR'S OFFICE NEVADA
PT 138-20-413-017
SUMMERLIN VILLAGE 1 SOUTH - UNIT NO 6
MONTAIRE - PHASE 1
PB 53-35
PB 54-44
TOURNAMENT HILLS - UNIT 2
TOURNAMENT HILLS - UNIT 3
SUMMERLIN VILLAGE 1 SOUTH - UNIT NO 6
PT 138-29-310-001
PB 54-44
PT3
RAMPART BLVD
TROPHY HILLS DR
GROVE CREST LN
PINE ISLAND CT
CHAMPIONSHIP CT
PRO PLAYERS DR
SUNNYFIELD DR
EAGLE RIDGE DR
PLAYERS CLUB DR
PALM GREENS CT
TAX DIST 200

Worksheet for 37' R/W_44cfs

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50000	%
Discharge	44.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.50
0+00.5	0.50
0+00.5	0.00
0+02.0	0.17
0+18.5	0.50
0+35.0	0.17
0+36.5	0.00
0+36.5	0.50
0+37.0	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.50)	(0+02.0, 0.17)	0.013
(0+02.0, 0.17)	(0+35.0, 0.17)	0.016
(0+35.0, 0.17)	(0+37.0, 0.50)	0.013

Results

Normal Depth	0.68	ft
Elevation Range	0.00 to 0.50 ft	
Flow Area	13.27	ft²
Wetted Perimeter	38.38	ft
Top Width	37.00	ft
Normal Depth	0.68	ft
Critical Depth	0.67	ft

Worksheet for 37' R/W_44cfs

Results

Critical Slope		0.00528	ft/ft
Velocity		3.32	ft/s
Velocity Head		0.17	ft
Specific Energy		0.85	ft
Froude Number		0.98	
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	0.68	ft
Critical Depth	0.67	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00528	ft/ft

Cross Section for 37' R/W_44cfs

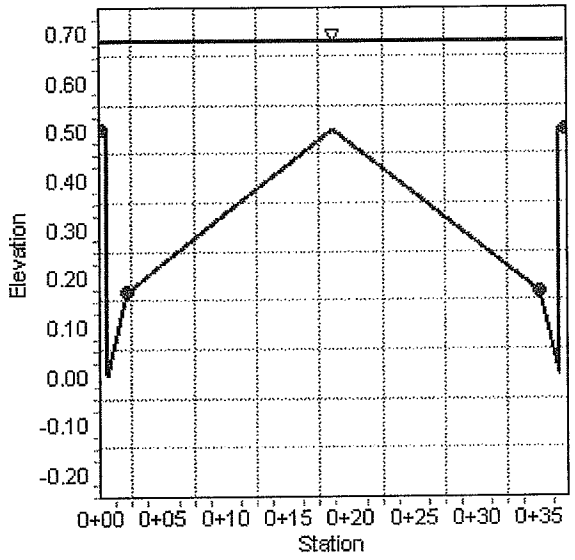
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50000	%
Normal Depth	0.68	ft
Discharge	44.00	ft³/s

Cross Section Image



DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 1 SOUTH

PARCEL 4
TOURNAMENT HILLS - UNIT III

JUNE 1992

620.702ED

Prepared for:

Howard Hughes Properties
3800 Howard Hughes Parkway
Las Vegas, Nevada 89109

Prepared by:

G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102

CITY OF LAS VEGAS

INTER-OFFICE MEMORANDUM

DATE: September 11, 1992

TO:

Kent Nash
Land Development Services
Department of Public Works

FROM: MAS for
Tom Chiatovich, PE
Chief, Flood Control
Dept. of Public Works

SUBJECT:

Summerlin Village 1 South - Parcel 4, AKA Tournament Hills - Unit III
File No. DS901C
Date of Engineer's Stamp: 08/26/92
Date Received by City: 08/27/92

COPIES TO:

G. C. Wallace, Inc.
CCRFCD
John McNellis, PE
Charles Kajkowski, PE

HISTORY:

1st Submittal	07/24/92 - Not Acceptable
2nd Submittal	08/21/92 - Not Acceptable
3rd Submittal	(See below comments)

REMARKS:

3rd Submittal (Addendum 2)

The drainage study for the subject project has been reviewed and

_X_ is acceptable in concept subject to conformance to all City standards and the following conditions:

____ must be resubmitted or supplemented.

1. **Section A** showing the grass lined overflow section on sheet G-3 (3 of 8) does not correspond with the plan view shown on the same sheet. This section must be revised to show the 15-foot sideyard setback in Lot 13 as the same line as the 20-foot private drainage easement line to reflect the plan view (or revise the plan to reflect the section).

END OF REMARKS
ssn

T/R/S: 20/60/29
L-29

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Tournament Hills-Unit 3 Date: June 16, 1992

Location of Development: a) Descriptive Summerlin Expressway/Rampart
b) Sect. 29 Twn. 20S Rng. 60E

Name of Owner: Howard Hughes Properties Assessors Parcel No: _____

Contact Person-Name: Randall K. Gremlich Telephone No: 363-1200

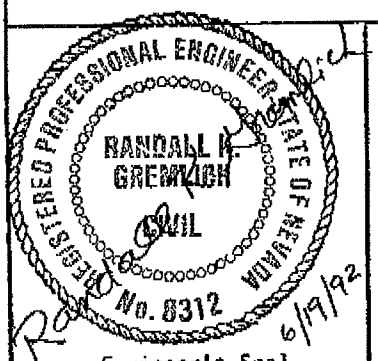
Firm: G. C. Wallace, Inc.

Address: 1555 S. Rainbow Blvd.

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 29 Acres Being Developed/Disturbed: 29 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
5. Approximate upstream land area which drains to the subject site? 0.2 Acres
6. Has the site drainage been evaluated in the past? (YES) NO. If yes, please identify documentation: G. C. Wallace, Village 1 South, 1991
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: RPT1 - Culverts under Rampart
8. Briefly describe your proposed schedule for the subject project: Winter 1991



Engineer's Seal

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.

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

TABLE 2

Estimated Peak Runoff (cfs)

Frequency	Point "A"
10-year	17
100-year	44

These runoff values assume that not all the runoff from the parcel will be collected in the streets and then routed to Point "A". Due to topographic restraints most back lots will drain directly to the surrounding golf course. Since the fence will be wrought iron the flow of runoff away from the houses will not be impeded. The grading plan shows the area that will drain directly to the golf course. The total acreage of Parcel 4 is 29.14 acres with 6.25 acres draining directly to the golf course, 0.89 acres draining to Parcel 5, and 0.14 acres draining onto this site from the roadway to the future Parcel 2 and 3. The total area contributing to Point "A" is 22.14 acres.

Most of the 100-year runoff draining to point "A" is proposed to be picked up in drop inlets at the low point of the cul-de-sac and then carried to the adjacent golf course in a pipe. It is proposed to pick up 30 cfs in three drop inlets. A 10-foot wide easement is required along the lot line between lot 13 and 14 to allow for the flow in excess of this 30 cfs flow at this point. This easement would also need to carry this 100-year flow (44 cfs) in case the drop inlet is clogged. The drop inlets are sized to carry 50 percent more than the 30 cfs flow, and are therefore sized to pick up 45 cfs. A 10-foot long type "A" drop inlet (sump condition) plus two 6-foot long drop inlets are recommended. Whatever runoff which does not enter the drop inlet should surface flow through the 10-foot wide easement to the golf course area east of the subdivision. Lining is required for this 10-foot easement. Erosion protection is required where the easement meets the golf course area.

****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985

U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

****

THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3


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

              *DIAGRAM
    1         ID  ****************************************
    2         ID  *    SUMMERLIN PARCEL 4                 *
    3         ID  *    18 JUNE 1992     GC WALLACE INC.   *
    4         ID  *    100-YEAR AND 10-YEAR FLOW          *
    5         ID  *    6-HOUR DATA        SDN3            *
    6         ID  *    100 YEAR DESIGN DEPTH =            *
    7         ID  *                 2 x 1.43 =  2.86      *
    8         ID  ****************************************
    9         IT       5       0       0     250
   10         IO       5       0
   11         IN       5       0       0
   12         JR    PREC       1     .59

   13         KK       *
   14         KM   AREA...(AC)..        22.14 (0.0346 SQ.MI.)
   15         KM   Cn.,.........         84.5
   16         KM  LAG TIME.(HR).          0.129
   17         BA    .0346
   18         PB    2.86
   19         PC    .000    .020    .057    .070    .087    .108    .124    .130    .130    .130
   20         PC    .130    .130    .130    .133    .140    .142    .148    .158    .172    .181
   21         PC    .190    .197    .199    .200    .201    .204    .214    .229    .241    .249
   22         PC    .251    .256    .270    .278    .281    .283    .295    .322    .352    .409
   23         PC    .499    .590    .710    .744    .781    .812    .819    .835    .851    .856
   24         PC    .860    .868    .876    .888    .910    .926    .937    .950    .970    .976
   25         PC    .982    .985    .987    .989    .990    .993    .993    .994    .995    .998
   26         PC    .998    .999   1.00
   27         LS       0   84.5
   28         UD   0.129
   29         ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

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

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

13 *

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1

****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616

****

```
**************************************
*    SUMMERLIN PARCEL 4              *
*    18 JUNE 1992     GC WALLACE INC. *
*    100-YEAR AND 10-YEAR FLOW       *
*    6-HOUR DATA        SDN3         *
*    100 YEAR DESIGN DEPTH =         *
*                 2 x 1.43 =  2.86   *
**************************************
```

10 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		250	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		2045	ENDING TIME

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 20.75 HOURS

ENGLISH UNITS

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .59

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG
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

					RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2
OPERATION	STATION	AREA	PLAN		1.00	.59
HYDROGRAPH AT						
+	*	.03	1	FLOW	44.	17.
				TIME	3.58	3.58

S T R E E T F L O W S

Manning's Equation for flow capacity in a street section.

Summerlin, Parcel 4 (Begin Cul-De-Sac)

Input variables:		Output variables:	
Flow depth, d	0.69 ft	Capacity at d	88.03 cfs
Road width	37.0 ft	Velocity	5.8 fps
Crown height	0.50 ft	Top width	47.0 ft
Street slope	1.79 %		
Sidewalk width	5.0 ft	CAPACITY:	
Curb height	6 in	@ top of curb	27.3 cfs
Median width	0.0 ft	@ back of walk	51.2 cfs
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Manning's n	0.016

$\frac{1}{2}(88.03) \cong 44$ cfs Assume all flow going one way around the bulb.

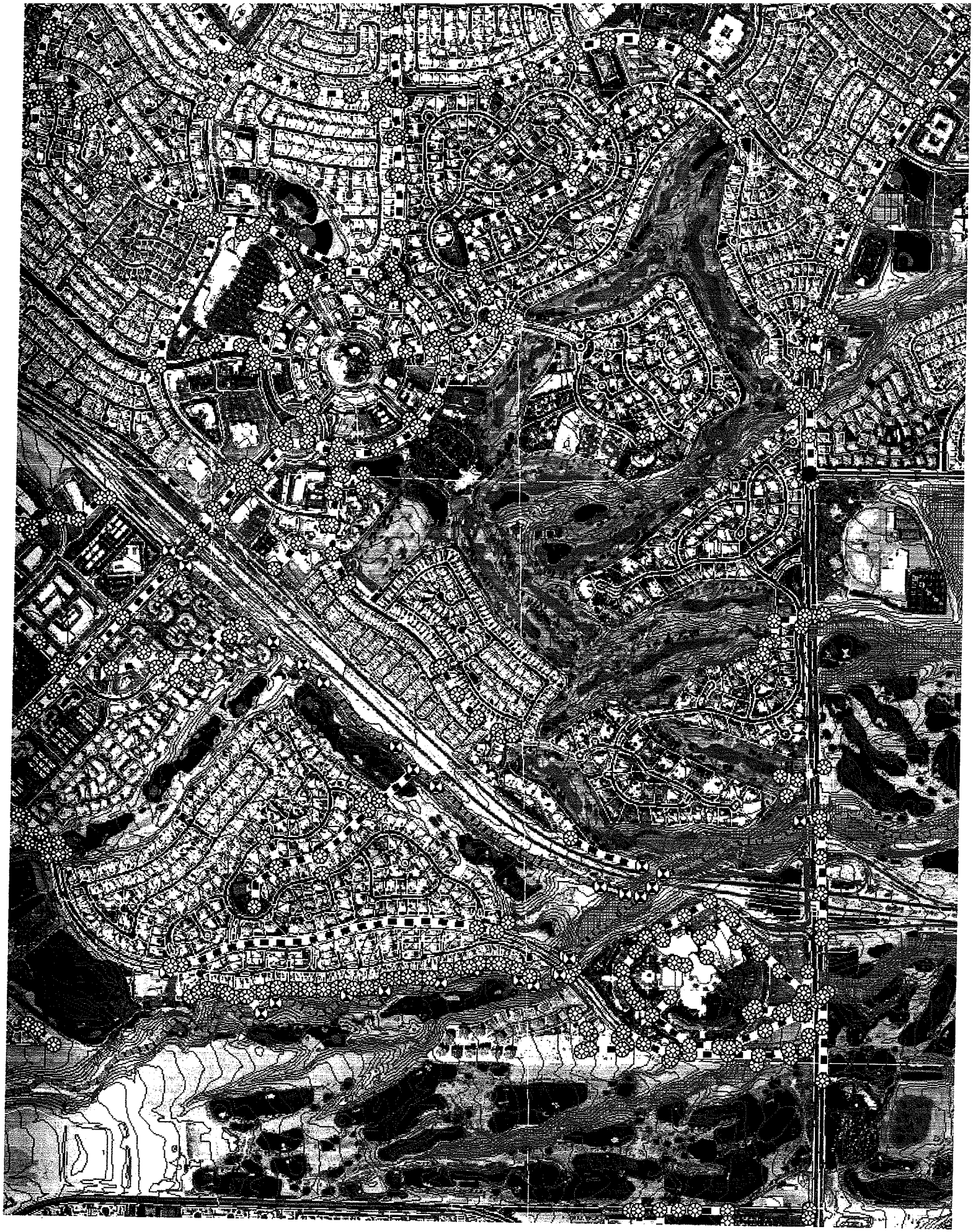
S T R E E T F L O W S

Manning's Equation for flow capacity in a street section.

Summerlin, Parcel 4 (End Cul-De-Sac)

Input variables:		Output variables:	
Flow depth, d	0.66 ft	Capacity at d	88.19 cfs
Road width	37.0 ft	Velocity	6.3 fps
Crown height	0.50 ft	Top width	47.0 ft
Street slope	2.40 %		
Sidewalk width	5.0 ft	CAPACITY:	
Curb height	6 in	@ top of curb	31.7 cfs
Median width	0.0 ft	@ back of walk	59.3 cfs
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Manning's n	0.016

$\frac{1}{2}(88.19) \cong 44$ cfs Assume all flow going one way around the bulb.



WRIGHT engineers

TRANSMITTAL

CIVIL

STRUCTURAL

MECHANICAL

ELECTRICAL

PLUMBING

ENERGY MODELING

COMMISSIONING

LEED ADMINISTRATION

DATE: Feb 16, 2011

TO: City of Las Vegas - Flood Control
333 N. Rancho Drive
Las Vegas, NV 89106

ATTN: Albert Sung

VIA: Hand Deliver
FOR: Approval
COPIES TO:

PROJECT: Private Res @ 901 Trophy Hills
PROJECT No: CN111029-002
PROJECT MGR: Jeremy S. McCay

FROM: Rob Hansen

ITEM	QTY	DESCRIPTION
CALCULATIONS	1	Update to TDS for Tournament Hills Unit 3 A.K.A. 901 Trophy Hills
CHECK	1	$400 ck#422

REMARKS:

** Duplicate Receipt **

City of Las Vegas

Development Services Center

731 South Fourth Street

Las Vegas, NV 89101

02/16/2011 11:41 Trn 162890
Cashier 890381

PRJ Permit # DS4521 $400.00

Subtotal **$400.00**
Tax $0.00
Total **$400.00**

Received CHECK $400.00
Check # 422
Change [illegible]

For questions related to this receipt call

702-[illegible]

Las Vegas
7425 Peak Drive
Las Vegas, NV 89128
(p) 702.933.7000
(f) 702.933.7001
800.933.7611

Irvine
2 Venture, Suite 200
Irvine, CA 92618
(p) 949.477.4001
(f) 949.477.4009

Phoenix
3115 S. Price Road
Chandler, AZ 85248
(p) 480.483.6111
(f) 480.483.6112

Salt Lake
9176 South 300 West
Suite 12
Sandy, UT 84070
(p) 801.352.2001
(f) 801.352.2006
wrightengineers.com
(p) 800.933.7611

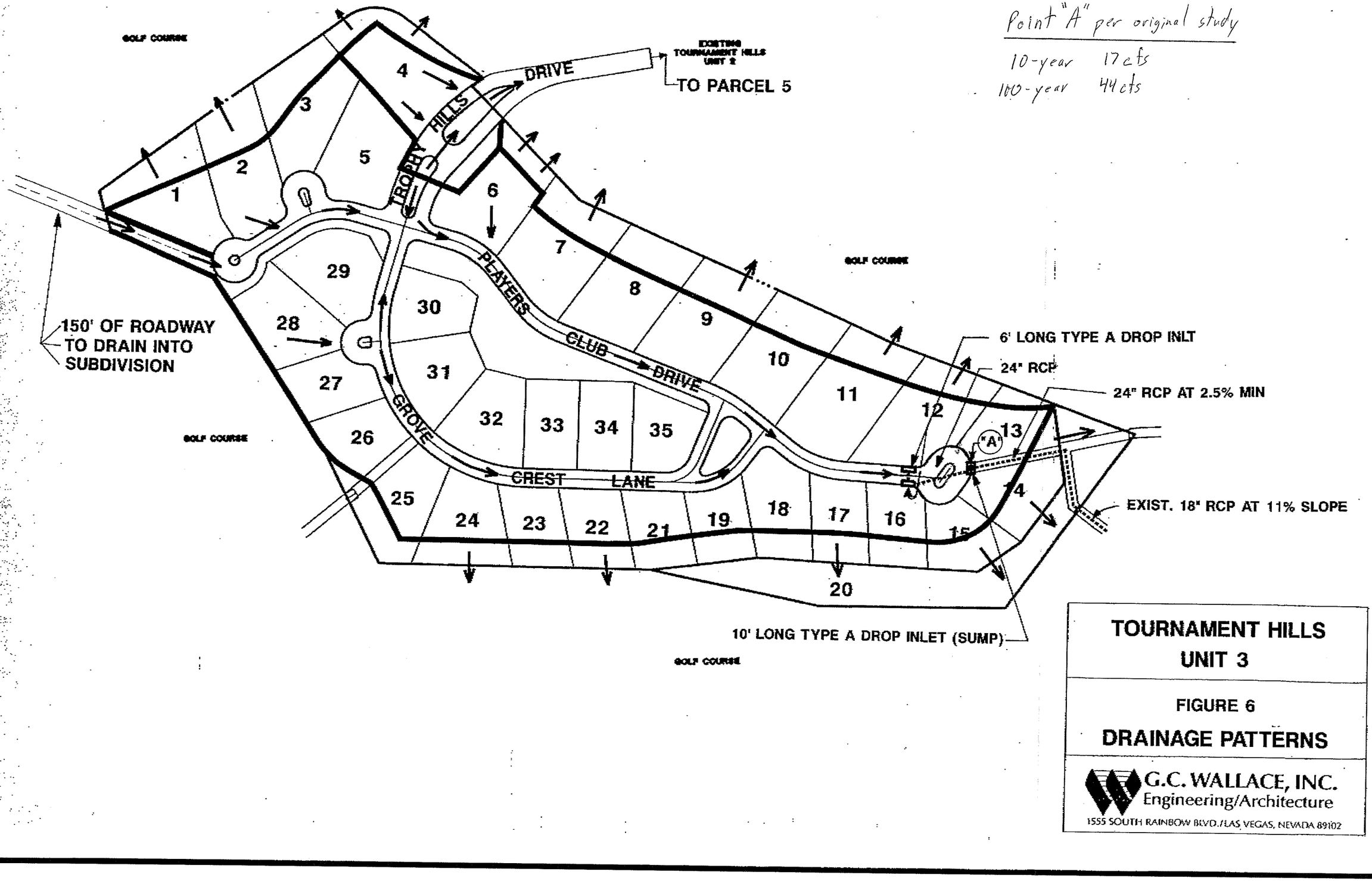
COMPLETED BY: Rob Hansen
CALLED BY: _____
TIME: _____
DATE: _____

SIGNATURE: _____
PRINT NAME: _____
DATE: _____

Point "A" per original study

10-year 17 cfs

100-year 44 cfs



TOURNAMENT HILLS UNIT 3

FIGURE 6

DRAINAGE PATTERNS

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102