DS #: 4700

APN: 126.13.401.020

PROJECT: Franklin Park (Phase 3) - Update #15

SUBMITTAL: 1st & Supplement

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 20, 2014
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Franklin Park (Phase 3) – Update #5**			**COPIES TO:** RCI Engineering
Cross Streets:	NWC of Shaumber Road & Elkhorn Trail			Toll Brothers
File Number:	F:\Depot\DSMemos\DS4700A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-13-401-020			
Zoning Action:	TMP-49525			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal & Supplement	9/25/2014 & 10/16/2014	10/20/2014	See Comments Below	$400.00	371566: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

X	is approved subject to conformance to all City standards and the following conditions:
	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.

1. 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. Revise Sheet G-4 and all pertinent plans and section details accordingly.

2. The wrought iron fence proposed in the drainage easement at the west end of *Hammett Park Avenue* must utilize *City of Las Vegas* Standard Drawing 421B. Contact Raul Cruz at 229-3224 for the AutoCAD details (421 series) to be included with the improvement plans.

3. Sheet G-4 and all pertinent sheets: Provide a connection detail between the existing 42"-RCP and the new 42"-RCP at the end of *Hammett Park Avenue*.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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: T19S/R59E/13
AREA F-13

****
*** FAX TX REPORT ***
****

TRANSMISSION OK

JOB NO.	4673
DESTINATION ADDRESS	7024530801
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	10/20 16:54
USAGE T	00'37
PGS.	2
RESULT	OK

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** **October 20, 2014**
TO: **Land Development Services** Department of Building & Safety				**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Franklin Park (Phase 3) – Update #5**			**COPIES TO:** RCI Engineering
Cross Streets:	NWC of Shaumber Road & Elkhorn Trail			Toll Brothers
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Parcel Number:	126-13-401-020			
Zoning Action:	TMP-49525			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
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REMARKS:

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	is conditionally approved subject to Clark County Public Works Department concurrence.

1. 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. Revise Sheet G-4 and all pertinent plans and section details accordingly.

2. The wrought iron fence proposed in the drainage easement at the west end of *Hammett Park Avenue* must utilize *City of Las Vegas* Standard Drawing 421B. Contact Raul Cruz at 229-3224 for the AutoCAD details (421 series) to be included with the improvement plans.

3. Sheet G-4 and all pertinent sheets: Provide a connection detail between the existing 42"-RCP and

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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 (CCRFCD) 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 CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

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

I. GENERAL REQUIREMENT		
Yes	No	
	N/A	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.)
	N/A	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
✓		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. _____ by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		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.
✓		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.)

II. GRADING PLAN INFORMATION		
Yes	No	
✓		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 flows. An overflow path must be provided over all storm drains.
✓		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.
✓		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.
✓		Back of lot elevations and lot drainage pattern for all lots including common lots.
	N/A	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 approval of the drainage study.
✓		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.)
✓		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.
✓		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	
✓		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.
✓		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.
✓		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.
✓		Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 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.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

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

RCI Engineering

Letter of Transmittal

September 25, 2014

To: Flood Control Division
CLV Department of Public Works
333 North Rancho Drive
Las Vegas, Nevada 89106

From: Rick Read, P.E.
Job# 3110.0003

RE: Update #5 to the Technical Drainage Study for Franklin Park Phase 2A (Formerly Franklin Park at Providence)

Copies	Description
1	Technical Drainage Study Update #5
1	CD – Electronic Copy
1	Check#9427646 for $400

Comments:
Please let me know if you have questions or need any additional information.

Thanks,
Rick

Received by: _____

4325 Dean Martin Drive, Suite 300 - Las Vegas, NV 89103
Main 702.453.0800 www.RCINEVADA.com Fax 702.453.0801

RCI Engineering

Letter of Transmittal

September 25, 2014

To: Flood Control Division
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Please let me know if you have questions or need any additional information.

Thanks,
Rick

Received by: _____

4325 Dean Martin Drive, Suite 300 - Las Vegas, NV 89103
Main 702.453.0800 www.RCINEVADA.com Fax 702.453.0801

UPDATE #5 TO THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK PHASE 2A (Phase 3)

Prepared for:

Toll Brothers Inc.
1140 N. Town Center Drive Suite 250
Las Vegas, NV 89144
Phone: (702) 243-9800
Fax: (702) 243-9610

September 2014

PROJECT 3110.0003

RCI Engineering
4325 Dean Martin Drive, Suite 300 * Las Vegas, NV 89103
Tel: 702.453.0800 * Fax: 702.453.0801
www.rcicnevada.com

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: UPDATE TO FRANKLIN PARK PHASE 2A (PHASE 3) Date: September 2014

Location of Development: a) Descriptive (Cross Streets) North/South: Farm / Elkhorn

East/West: Shaumber / Puli

b) Section: 13 Township: 19S Range: 59E

c) APN : 126-13-401-018

Name of Owner: Toll Brothers Inc.

Telephone No.: 702-243-9800 Fax No.: 702-243-9610 E-Mail Address:

Address: 1140 N. Town Center Drive Suite 250 Las Vegas, Nevada 89144

Contact Person-Name: Rick Read, P.E. **Telephone No.:** (702)998-2102

*** E-Mail Address:** rread@rcinevada.com **Fax No.:** (702)453-0801

Firm: RCI Engineering

Address: 4325 Dean Martin Drive, Suite 300

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: 33.2 Acres +/- Being Developed/Disturbed: 17.9 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.): Single Family Residential
5. Approximate upstream land area which drains to the subject site: 85 Acres
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Update #3 to the Technical Drainage Study for Franklin Park Phase 2A DS # 4622
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: East to Shaumber Road storm drain facilities
8. Briefly describe your proposed schedule for the subject project: ASAP

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.

***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

Updated 05/01/2008

3110.0003

September 25, 2014

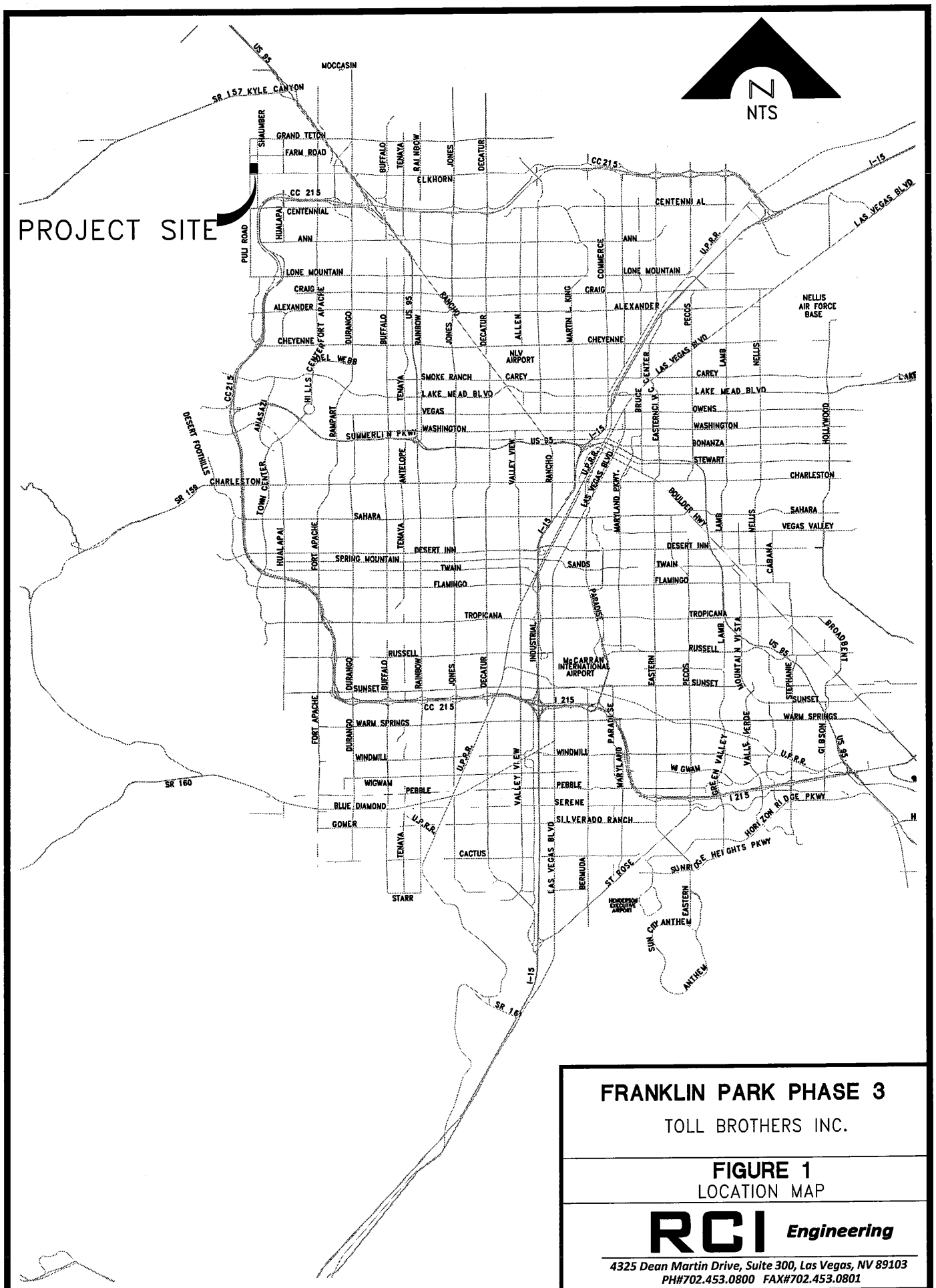
Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works
731 South Fourth Street
Las Vegas, NV 89101

RE: UPDATE #5 TO THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK PHASE 3

Dear Mr. Sung:

The purpose of this drainage study update is to accompany the improvement plans and to address the development of Phase 3 of the Project. This report will serve as Update #5 to the original drainage study.

The project is bordered on the north by the existing Manchester Park residential development, on the south by undeveloped Pod 211 of the Providence Master Planned Community. The site is bordered on the east by fully developed Shaumber Road and existing residential housing. The west side of the Project is bordered by partially developed Puli Road and existing desert landscape. Please refer to Figures 1 and 2 for the vicinity and location maps.



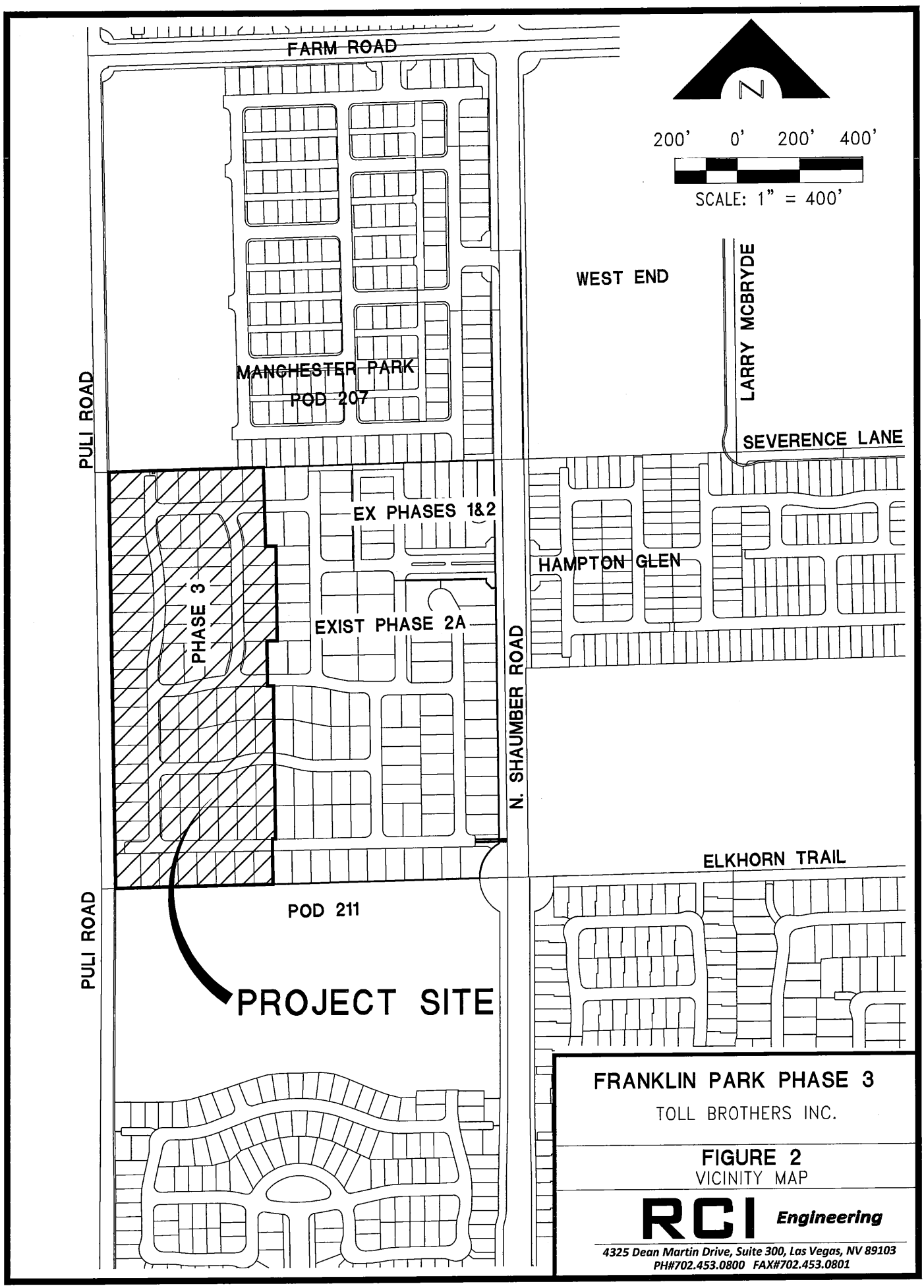
FRANKLIN PARK PHASE 3

TOLL BROTHERS INC.

FIGURE 1
LOCATION MAP

RCI Engineering
4325 Dean Martin Drive, Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

O:\3110_Toll\0003_FranklinPark_DRAIN\FIGURES\update5\figure1.dwg rread 9/05/14 2:59pm



FRANKLIN PARK PHASE 3

TOLL BROTHERS INC.

FIGURE 2

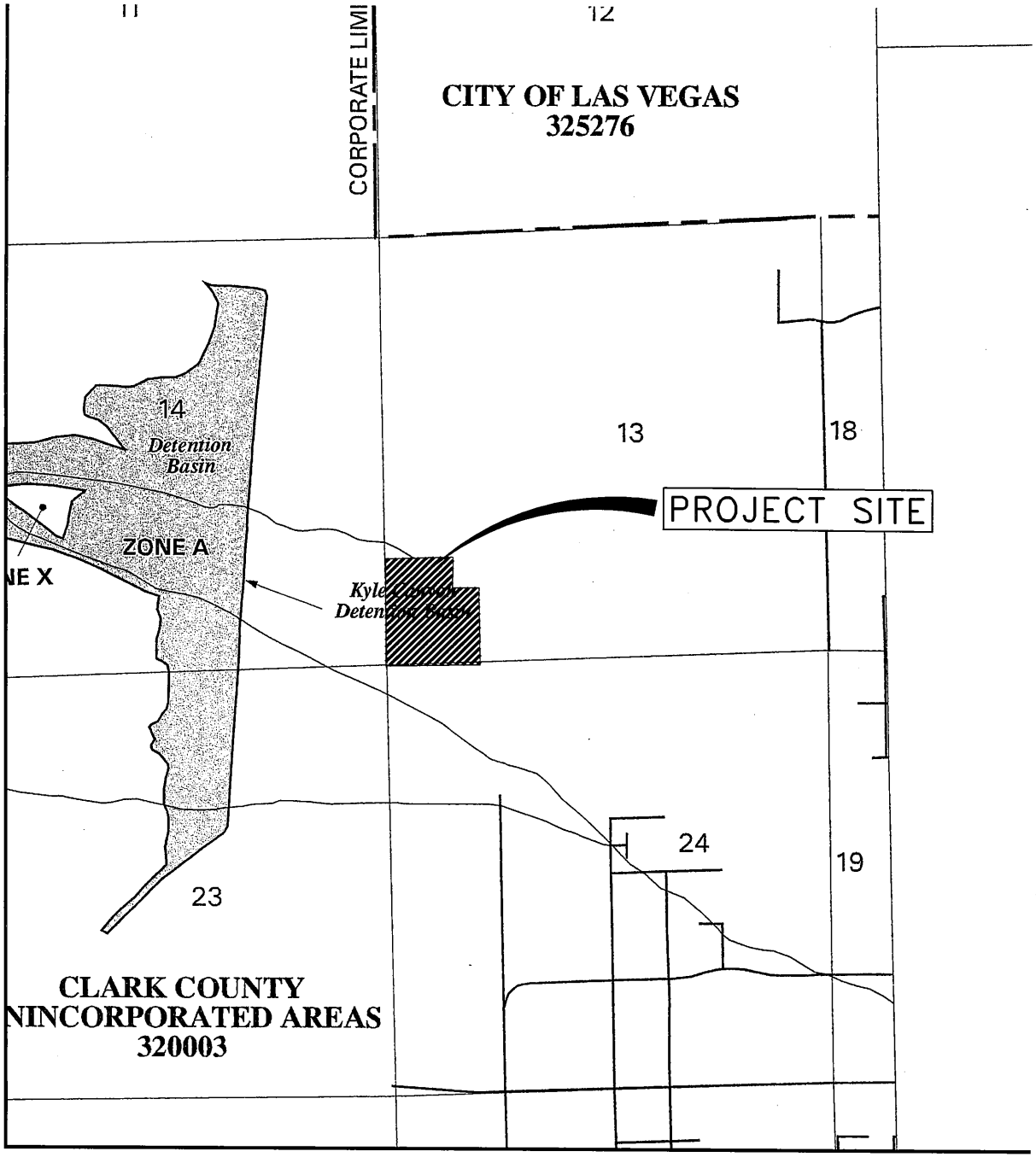
VICINITY MAP

RCI Engineering
4325 Dean Martin Drive, Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

O:\3110_Toll\0003_FranklinPark_DRAIN\FIGURES\update5\figure2.dwg rread 9/05/14 3:01pm

Since approval of the Third Update the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) has not been updated. Figure 3 was reproduced from the FIRM containing Community Panel Number 32003C1750F, dated September 27, 2002. Review of the FIRM shows that the Project is currently located within a Zone X. Zone X areas are defined as areas outside of the 100-year floodplains; areas of 100 year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100 year flood.

The Third Update referenced the *2008 Clark County Regional Flood Control District (CCRFCD) Master Plan Update*. Since approval of the Original Study the 2008 MPU has been replaced with the 2013 MPU. Figure 4 is reproduced from Figure F-12 of the 2013 CCRFCD Master Plan Update. This figure depicts the project site in relation to existing and proposed CCRFCD facilities. As shown on the figure, the site is not bordered by any CCRFCD Facilities.



N

PANEL 1750 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 1750 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAS VEGAS, CITY OF	325276	1750	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	1750	E

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

MAP NUMBER
32003C1750 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

FRANKLIN PARK PHASE 3

TOLL BROTHERS, LLC

FIGURE 3
F.I.R.M. MAP

RCI Engineering
4325 Dean Martin Drive, Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

O:\3110_Toll\0003_FranklinPark_DRAIN\FIGURES\updates\figure3.dwg rread 9/05/14 3:23pm

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 12
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin

- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

FIGURE 4

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)

US95 I-15 I-215

1	2	3				A1	A2
4	5	6				A3	A4
	7	8	9	10		A5	A6
11	12	13	14	15	16	17	
	18	19	20	21	22	23	
	24	25	26	27	28		
	29	30	31	32	33	34	
	35	36	37	38	39	40	
	41	42	43	44	45	46	
	47	48	49	50	51	52	
	53	54	55	56			
	57	58	59				

AREA OF STUDY

MOSH 0063
MOKC 0000
MOKC 0222
MOKC 0325
MOKC 0380
KCUN 0000
MOIR 0096
MOIR 0052
MOIR 0000
MOIR 0098
MOSR 0095
MOSR 0000
MOSR 0060
MOSR 0058
MOSR 0061
MOHU 0116
MOHU 0100
MOHU 0136
MOHU 0118
MOHU 0134
KYLE CANYON RD
CNGT 0222
GRAND TETON DR
CNGT 0118
CNGT 0224
CNGT 0247
LVMD 3314
FARM RD
EKHU 0023
EKHU 0000
EKHU 0020
EKHU 0001
GREENBURY ST
DORRELL LA
BCHU 0054
LVMD 3315
GOAN 0127
GOAN 0070
RCBC 0100
RCBC 0140
215
GOBW 0215
GOBW 0291
CENTENNIAL PKWY

The project drainage has previously been addressed in *The Technical Drainage Study For Franklin Park at Providence Phases 1 & 2*, (Reference 1, hereinafter referred to as the Original Study) by GC Wallace, Inc. which addressed three different phase of the project (Phase I Models, Phase II East half of the site and Phase 3 west half of the site). After approval of those drainage studies the site layout, lot size, street alignments, and grading for Phase 2A and Phase 2B were revised and addressed in *Update #3 To The Technical Drainage Study For Franklin Park Phase 2A* (Reference 2, Hereinafter referred to as the Third Update) by RCI Engineering. The Third Update (First Update by RCI Engineering) was approved on September 10, 2013. The Third Update was submitted to address a change to the lot size and street layout from what was presented in the Original Study by GC Wallace, Inc. In addition to the Third Update, a Fourth Update was submitted and approved which addressed changing approximately 100-feet of storm drain in Duran Park Street from a 42-inch RCP to a 36-inch RCP. The Fourth Update was approved on August 21, 2014. Pertinent references and the approval letter from the Third Update have been included in Appendix C. The Fourth Update will not be referenced in this report.

The Third Update accompanied the improvement plans for Phase 2A of the Project and addressed interim and ultimate drainage conditions for the entire Franklin Park site. Since the Third Update addressed the latest lot layout, storm drain, and drainage patterns for the site most of the reference material in Appendix C will be from that study. The only reference from the Original Study will be the plan and profile sheets for Hammett Park Avenue. The reason is that there is an existing 42-inch storm drain in Hammett Park Avenue that ties into the Puli Road and Shaumber Road storm drains, which will be completed with the improvements proposed in this drainage study update.

DEVELOPED CONDITIONS

Currently, Puli Road has been rough graded and the Puli Road storm drain system has been installed including drop inlets. The pavement for Puli Road has not been installed. In the event that the pavement is not installed prior to construction of Phase 3 the rough graded roadway will contain offsite flows until they weir into the existing drop inlets constructed in Puli Road. The Puli Road storm drain will be considered to be fully operational under developed conditions. In the event that the inlets do not operate as intended an emergency overflow path has been determined to be at the west end of Hammett Park Avenue. Developed conditions are based on the entire Franklin Park site developed with Shaumber Road developed and Puli Road being rough graded with an operational storm drain system in place and the tributary area west of the site undeveloped.

Soils values were not revised as presented in the Original Study and Third Update. A Soils map for the site has been included in Appendix A. Rainfall values have not been revised from what was presented in the Third Update. A copy of the HEC-1 model and Figures 503 and 506 from the Third Update have been included in Appendix C.

The CN calculations have also not been revised from the developed conditions model in the Third Update. Copies of those calculations have been included in Appendix C. A CN value of 87 on "B" Type soil for 6,000 sq. ft. lots has been used for Subbasin ON1E, ON1W, and ON2W. A weighted CN value 89.7 on "B" Type soil for 6,000 sq. ft. lots and Commercial has been used for Subbasin ON2E. Curve Number calculations have been included in Appendix C.

The basin areas, basin maps and drainage patterns have not changed from what was approved in the Third Update. The only change for this study to the hydrologic model from the approved Third Update is that grading has been revised which in turn caused the

street slopes to be revised to be steeper on the west side of the project. The slopes used for the lag times for the HEC-1 model have been revised for the steeper streets which in turn shortened the lag times in the Standard Form 4 spreadsheet. The steeper streets resulted in a lag time of 0.145 for Subbasin ON1W which is .004 of an hour shorter than the lag time for that subbasin in the Third Update and a lag time of 0.075 for Subbasin ON2W which is .001 of an hour shorter than the lag time for that subbasin in the Third Update. The shorter lag time for Subbasin ON2W did not result in any change to the flows calculated in the HEC-1 model from the approved study. The shorter lag time for Subbasin ON1W resulted in a 100-year storm flow of 34 cfs which is 1 cfs more than was calculated for that subbasin in the Third Update.

The 100-year storm flow of 34 cfs from Subbasin ON1W drains southeast to Concentration Point CP1R. CP1R is the concentration point that combines the storm flows from Subbasins ON1W and ON1E at the east end of Hammett Park Avenue. The combined 100-year and 10-year storm flows at Concentration Point CP1R are 69 cfs and 29 cfs, respectively. The calculated storm flows at CP1R match the storm flows from the approved Third Update even with the increase of 1 cfs during a 100-year storm event from Subbasin ON1W. Therefore, the peak overall 100-year and 10-year storm flow from the site matches the onsite storm flows from the approved Third Update.

Subbasins ON2W and ON2E drain east through existing Phase 1 of the project to Concentration Point CP2R. The total flow generated by ON2W and ON2E during a 100-year storm event will be 23 cfs. The approved Third Update showed a total flow of 23 cfs draining to Concentration Point CP2R which matches this drainage study. The 100-year storm flow at Concentration Point CP2R will drain into existing storm drain facilities that connect into the Shaumber Road storm drain system.

The HEC-1 Model and the Standard Form 4 Spreadsheet for this study have been included in Appendix A. Copies of the HEC-1 Model, the Standard Form 4 Spreadsheet and Figure 6 from the approved Third Update have been referenced and included in

Appendix C. The changes made to this update from what was previously approved have been marked in red on the reference material.

Referenced Figure 6 in Appendix C shows prorated basin boundaries that were delineated in the Third Update. The Subbasins were prorated to more accurately model storm flow splits at intersections and the amount of 100-year storm runoff that drains to existing drop inlets. The prorated storm flows have not been revised since the overall storm flows from this update at Concentration Points CP1R and CP2R match the overall storm flows from the Third Update. Figure 6R is an updated version of Figure 6 from the Original Study. The prorated storm flows and flow splits have not been shown on Figure 6R since no drop inlets are proposed to intercept storm runoff and the finished floor elevations for Phase 3 are based on the overall 100-year storm flow of 69 cfs at the flattest slope on the site.

As was established in the Third Update, the Puli Road rough grading will direct offsite runoff south towards the low point in Puli Road located adjacent to the western end of Hammett Park Avenue. The Puli Road storm drain daylights onto the site and then drains as surface flow to an existing 42-inch RCP storm drain stub west of the Phase 2A improvements. Per the Third Update the Puli Road storm drain will convey 62 cfs into the Franklin Park storm drain. The remaining flow produced by Subbasin OFF1* will surface flow through a concrete lined common element into Hammett Park Avenue. The remaining flow will be 72 cfs (134 cfs – 62 cfs) under developed conditions. This 100-year storm flow will combine with the onsite flow of 69 cfs for a total surface flow of 142 cfs not reflecting flow picked up by the onsite storm drain facilities. That is 1 cfs more than was calculated in the Third Update. Street flow calculations and onsite storm drain facilities will be discussed in detail later on in this report.

The Offsite storm flows (OFF1*) were referenced in the Third Update from the offsite storm flows established in the *Update #2 To The Technical Drainage Study For Franklin Park at Providence* (Reference 3) by Wood Rodgers, Inc. and have been accepted for this

update. The Wood Rodgers Study was approved in November of 2007. A copy of Figure 7-U2 from the Wood Rodgers Study showing Subbasin OFF1* has been included in Appendix C. An updated developed condition HEC-1 analysis for the revised basin slopes discussed above has been included in Appendix A and the results have been summarized below in Table 1 and shown on Figure 6R. Table 1 below also shows the storm flows from the Third Update for comparison.

TABLE 1
DEVELOPED CONDITION HEC-1 RESULTS

Subbasin	Third Update		Subbasin	Fifth Update	
	Q_{100} (cfs)	Q_{10} (cfs)		Q_{100} (cfs)	Q_{10} (cfs)
OFF1*	134	43	OFF1*	134	43
ON1W	33	14	ON1W	34	14
ON1E	36	15	ON1E	36	15
CP1R	69	29	CP1R	69	29
CP1RR	191	67	CP1RR	192	67
ON2W	4	1	ON2W	4	1
ON2E	20	9	ON2E	20	9
CP2R	23	10	CP2R	23	10

* Shown on Figure 7-U2 referenced from the Wood Rodgers Study

The Franklin Park site under developed conditions will produce a 100-year storm flow of 92 cfs total (69 from CP1R plus 23 from CP2R). It was determined in the approved *Master Drainage Study For Cliffs Edge*, (Reference 4, hereinafter referred to as the Master Study) by VTN Nevada, May 2004 that the site (POD 209) will produce a 100-year storm flow of 114 cfs under developed conditions. The Shaumber Road storm drain system and streets were designed to convey the 100-year storm flow of 114 cfs. Proposed development of the site will generate a 100-year storm flow of 92 cfs, which is 22 cfs less than was anticipated in the Master Drainage Study For Cliffs Edge. Therefore, the minor changes presented in this update will not negatively affect downstream streets, storm drain, or developments.

ULTIMATE CONDITIONS

Under ultimate conditions, Franklin Park will be constructed as shown in the developed condition analysis. The only difference between developed conditions and ultimate conditions is that the area between Puli Road and the Kyle Canyon Detention Basin (Subbasin OFF1*) will be considered as developed. As previously referenced in the Third Update the ultimate conditions for this offsite area were determined in the Cliffs Edge Master Study. Pertinent excerpts from the Master Study have been included in Appendix C. In the Master Study it was determined that the existing Puli Road storm drain has been designed to collect the entire 62 cfs at Concentration Point CP-76 as shown on Figure 5-N in Appendix C. The worst case offsite storm flows tributary to the site occur under developed conditions as discussed above and the onsite drainage does not change from developed to ultimate conditions. Therefore, an ultimate condition analysis was not required for this update. The Wood Rodgers Study (Update #2) had previously looked at the ultimate condition analysis for the site. A copy of Figure 8 from Update #2 which shows the ultimate conditions storm flows to hydraulic facilities has been included in Appendix C.

HYDRAULICS

The onsite storm drain system has been designed to collect and convey the ultimate condition flows to the storm drain system in Shaumber Road. Under Ultimate conditions the Puli Road storm drain system conveys 62 cfs to the onsite storm drain. The onsite storm drain system collects 69 cfs for a total flow rate of 131 cfs conveyed to the Shaumber Road storm drain system. The majority of the onsite storm drain system has been constructed per the G.C. Wallace improvement plans from the Original Study with some minor revisions made to drop inlets by RCI Engineering in the Third Update. Since the onsite storm flows match what was presented in the Third Update drop inlet calculations were not performed. The Original drop inlet calculations included a 50 percent clogging factor applied to the grate length and the curb opening length,

respectively, per CLV criteria. Drop inlet calculations from the Third Update have been summarized on Figure 6R.

There is an existing 42-inch storm drain system in Hammett Park Avenue that has been constructed from Shaumber Road west to within 200 feet of Puli Road. There is also an existing storm drain system in Puli Road that was designed as a part of the Cliffs Edge Master Plan. This Project will include construction of the remaining 42-inch storm drain in Hammett Park Avenue that will connect the existing offsite storm drain in Puli Road to the existing storm drain in Hammett Park Avenue and ultimately into the storm drain in Shaumber Road which matches the Cliffs Edge Master Plan. There is also an existing stub at station 13+85.75 that was constructed with the Phase 1 plans by GC Wallace, Inc. That stub is no longer required and will be abandoned with the plans submitted with this update.

An updated Standard Form 6 model for the Phase 2A storm drain and the Phase 3 storm drain has been included in Appendix B. The 100-year storm hydraulic grade line (HGL) has been shown on the plans. As is shown the 100-year HGL remains 1 foot below finished grade per the CCRFCD drainage design Manual criteria. The starting HGL for this system was referenced from the Shaumber Road storm drain plans that were designed by VTN Nevada for the Cliffs Edge Master Planned Community. Pertinent sheets from the Shaumber Road plans and from the Puli Road plans storm drain system have been included in Appendix C. The storm drain and drop inlet locations have been shown on Figure 6R. The 42-inch RCP storm drain in Hammett Park Avenue that lies within Phase 3 will be extended to the west property line and tie into the existing Puli Road storm drain system. An 8-foot Type A drop inlet will be constructed at the east end of Hammett Park Avenue to tie the onsite 42-inch RCP into an existing 42-inch stub to the site from Puli Road. The nuisance drain inlet will be turned to face Puli Road in the event that storm flows spill out of Puli Road as surface flow into the easement during a storm event. The inlet is being constructed in place of a required manhole to tie the onsite and the offsite Puli Road storm drain systems together.

There is an existing 17.5-foot Modified Type C inlet in a sump condition in Puli Road at the west end of Hammett Park Avenue. In the Ultimate Condition the existing 17.5-foot modified Type C inlet in Puli Road is designed to intercept 29 cfs as shown on Sheet SD6 from the Cliffs Edge Master Study in Appendix C. The drop inlet will intercept the 100-year storm flow at a depth of 1-foot. A drop inlet calculation for that drop inlet using a 50-percent clogging factor has been included in Appendix B. The grading in the easement has been designed to be a minimum of 1-foot above the grate elevation of that inlet. Under proposed conditions, prior to the park west of Puli Road being constructed, surface flows will drain through the easement. Therefore, a 3-foot deep cutoff wall has been designed at the easement to eliminate undercutting of the concrete surface and walls in the easement.

The site is being graded so that the pads along the west property line are in some cases 7.5 feet below the existing and future finish grade elevations in adjacent Puli Road. Cross Section 8 has been cut for Puli Road and normal depth calculations have been performed for Cross Section 8 which assume existing and future conditions drainage flows. Both cross sections have been shown in the 100-year Hydraulic Sections Table on Figure 6R. Normal Depth calculations using Flowmaster have been included in Appendix B. In the developed condition Puli Road will convey the entire 100-year storm flow of 134 cfs from Subbasin OFF1* along the west property line. It has been assumed as a worst case scenario that the existing inlets and storm drain will not operate properly in Puli Road in the existing conditions since it has only been rough graded and the inlets are is some cases higher than the existing rough grading. Therefore, under existing conditions in Puli Road the 100-year storm flow of 134 cfs will drain as surface flow to the sump at the east end of Hammett Park Avenue at a depth of 0.9 feet and a velocity of 3.41 fps. The perimeter wall along Puli Road will be solid grouted to an elevation of 3 courses above highest adjacent grade as flood protection.

A weir calculation for an emergency overflow has been performed for the easement at the west end of Hammett Park Avenue assuming that the worst case storm flows drain as surface flows to the sump in Puli Road and all of the drop inlets in Puli Road are 100-percent clogged. In that case the 100-year storm flow will weir into the easement and out of the easement on the downstream end at a depth of 1.2 feet deep. Easement walls have been solid grouted 3 courses above the highest adjacent grade to protect Lots 35 and 36 from storm flows. The finished floor elevations of those lots have been set at an elevation of 39.7 feet so that they are above the emergency overflow as runoff spills over the curb at the west end of Hammett Park Avenue at an elevation of 3039.6.

Street capacity calculations were completed in the Third Update for two onsite flow condition scenarios and have not been changed for this drainage study. The first scenario is for the ultimate condition flow rate of 69 cfs. Street cross section calculations have been run at the minimum and maximum onsite slopes to determine depth times velocity product and to set minimum FF elevations for onsite lots except those along Hammett Park Avenue. Maximum and Minimum slope street capacity calculations have been included in Appendix B, summarized below in Table 2 and shown on Figure 6R. These sections have been conservatively calculated with the entire onsite flow rate to determine worst case depth * velocity products.

TABLE 2
HYDRAULIC SECTIONS

Street	Slope (%)	Flow (cfs)	D (ft)	V (f/s)	D*V
Hellman Park Street Sect 6 Minimum Slope	0.50	69	0.78	3.97	3.1
Hammett Park Ave. Sect 7 Maximum Slope	4.34	69	0.56	7.73	4.3
Puli Road Sect 8 Developed	0.73	62	0.70	3.33	n/a
Puli Road Sect 8 Undeveloped*	0.73	134	0.87	3.41	n/a

Worst case existing conditions storm flows from referenced basin OFF1

Per Design Manual criteria, the onsite finish floor elevations shall be set at a vertical distance of twice the depth of flow in the gutter flow line up to a maximum of 18-inches above the water surface elevation. Based on the street capacity calculations for Section 6, the maximum depth of surface flow in the interior streets for the 100-year storm event will be 0.78 ft. To meet 2* depth of flow criteria the finish floor elevations should be set to a minimum of 1.56-feet above adjacent flow line.

The second scenario is the worst case emergency overflow for Hammett Park Avenue. Under developed conditions, offsite flows (134 cfs) combine with onsite flows (69) for a total flow rate of 192 cfs at Concentration Point CP1RR. In the unlikely event the entire on site storm drain system and the entire Puli Road storm drain system were to become completely clogged the entire 100-year storm flow of 192 cfs would drain east in Hammett Park Avenue as surface flow. A street cross section calculation has been run at the minimum onsite slope in Hammett Park Avenue to determine the water surface elevation for the emergency overflow path along Hammett Park Avenue. All lots along Hammett Park Avenue will be elevated to either, the emergency overflow elevation or the developed condition flow plus appropriate freeboard, whichever is higher. The street capacity calculation has been included in Appendix B and summarized below in Table 3 and shown on Figure 6R.

TABLE 3
HAMMETT PARK
EMERGENCY OVERFLOW ELEVATIONS
STREET CAPACITY RESULTS

Hammett Ave.	Slope (%)	Flow (cfs)	D (ft)	
Sect 5 Minimum Slope	1.00	192	1.02	

Under ultimate conditions the flows generated during a 100-year storm event west of Puli Road will be reduced to 62 cfs as approved in the Cliffs Edge Master Study. The existing storm drain facilities in Puli Road have been designed to intercept the entire 100-year storm flow of 62 cfs. The onsite storm drain facilities have been designed to intercept the onsite 100-year storm flows in accordance with the Third Update and the Cliffs Edge Master Study. Proposed development of the site will generate a 100-year storm flow of 92 cfs, which is 22 cfs less than was anticipated in the Master Drainage Study for Cliffs Edge. Therefore, development of Phase 3 will not negatively impact downstream properties or facilities.

If you have any questions or require additional information, please contact us at 453-0800.

Thank you,
Rick J. Read, P.E.
RCI Engineering

APPENDIX A – HYDROLOGIC CALCS

Precipitation References

Soils Maps

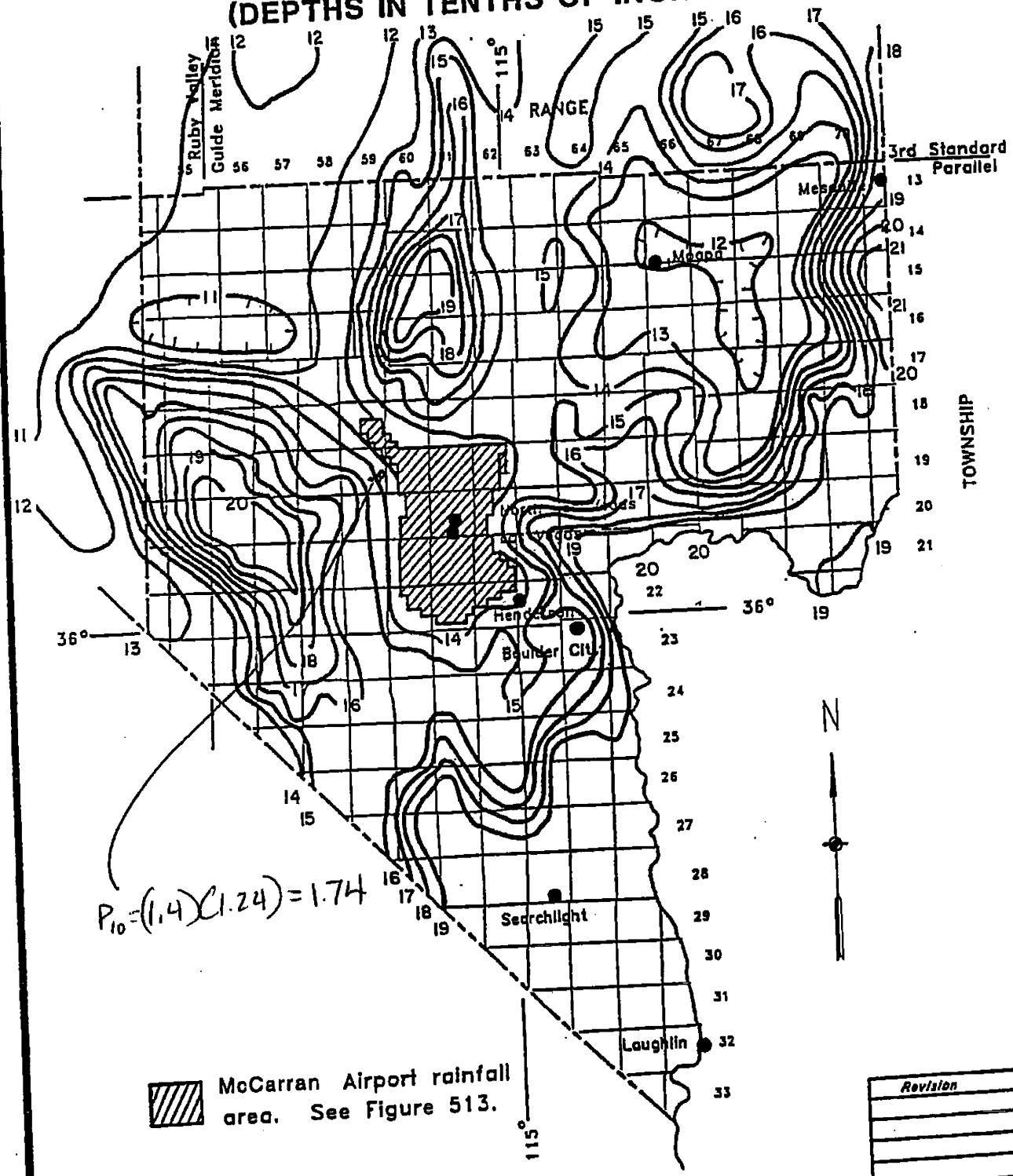
Soils References

Curve Number References

Developed Conditions

- Curve Number Calculations
- Standard Form 4
- HEC-1 Model

RAINFALL DEPTH-DURATION-FREQUENCY
10-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



McCarran Airport rainfall area. See Figure 513.

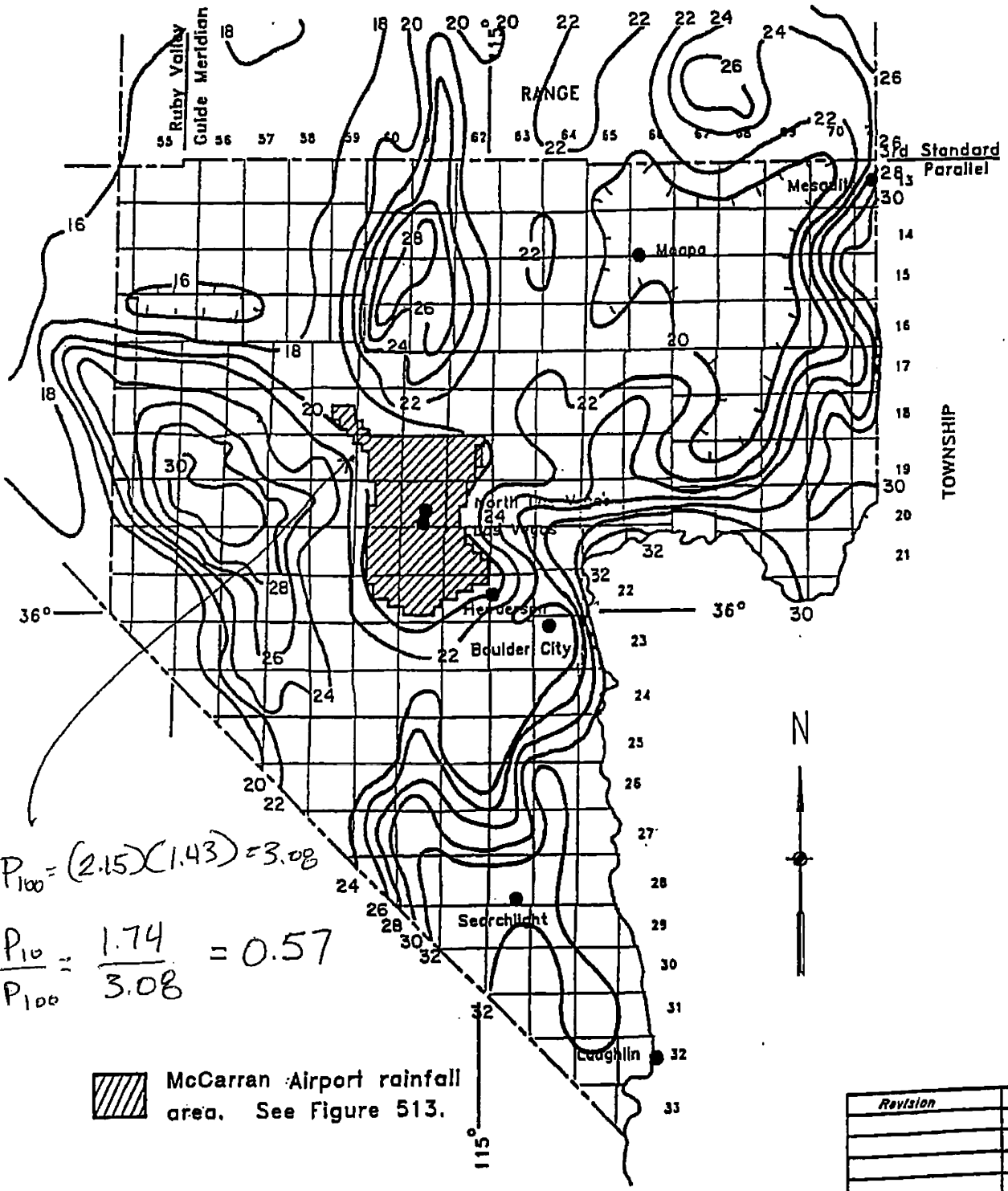
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 503

RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



$P_{100} = (2.15)(1.43) = 3.08$

$\frac{P_{10}}{P_{100}} = \frac{1.74}{3.08} = 0.57$

Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 506

PRECIPITATION ADJUSTMENT RATIOS

Recurrence Interval	Ratio to NOAA Atlas 2
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

NOTE: 1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.

2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.

3. Tables 505 and 506 require no adjustments.

Revision	Date

LEGEND

SUBBASIN BOUNDARY

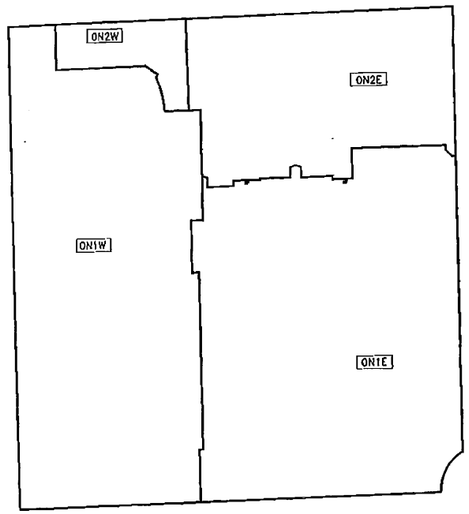
SOIL BOUNDARY

SOIL 155
HSG D

SOIL 400
HSG D

SOIL 191
HSG B

SOIL 400
HSG D



N

200' 0' 200' 400'

SCALE: 1" = 400'

FRANKLIN PARK PHASE 2A
TOLL BROTHERS INC.

SOILS MAP
ULTIMATE CONDITIONS MAP

RCI Engineering
3281 S. HIGHLAND DRIVE SUITE 810, LAS VEGAS, NV 89109
PH#702.453.0800 FAX#702.453.0801

G:\110_LEN\0003_FranklinPark_DRAINAGE\DRAINAGE\soil-exhibit.dwg rrood 8/19/13 11:07am

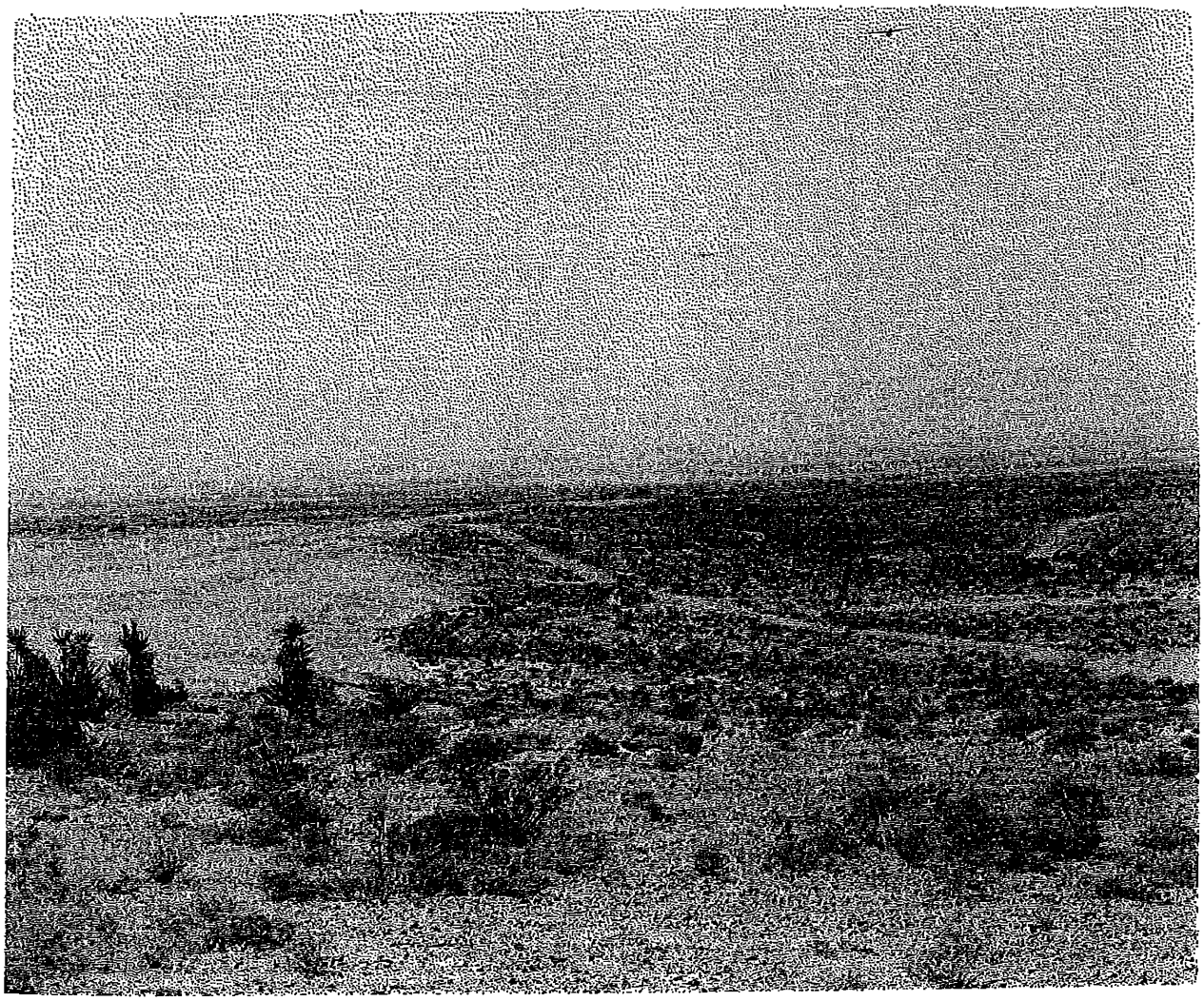
United States Department of Agriculture

Soil Conservation Service

In cooperation with United States Department of the Interior, Bureau of Land Management, and University of Nevada Agricultural Experiment Station

Soil Survey of Las Vegas Valley Area Nevada

Part of Clark County



sandy loam about 4 inches thick. The upper 7 inches of the underlying material is light yellowish brown extremely gravelly fine sandy loam, the next 6 inches is light yellowish brown very gravelly sandy loam, and the lower part to a depth of 61 inches is light yellowish brown extremely gravelly fine sandy loam. Pebbles cover 50 to 75 percent of the surface.

Included in this unit are about 5 percent Tencee soils on erosional fan remnants and 10 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as habitat for desert wildlife and for recreation. It is also used for urban development.

This unit is well suited to the construction of dwellings.

Septic tank absorption fields generally function well unless the density of housing is too high.

Roads are easily constructed and maintained.

The main limitation for lawns and landscaping is the pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

Intermittent streams form the drainageways in this unit. These drainageways are subject to rare or occasional periods of high-velocity flooding. Care should be taken during urbanization to accommodate the runoff from the drainageways. If drains become plugged during a major flood, accelerated erosion and damage to roads, buildings, and other structures can occur.

This map unit is in capability subclasses IVs, irrigated, and VIIs, nonirrigated. It is in horticultural group 2.

191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes. This very deep, well drained soil is on fan skirts. It formed in alluvium derived dominantly from limestone and dolomite.

Typically, about 85 percent of the surface is covered with a desert pavement of rock fragments. The surface layer is light yellowish brown very cobbly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam to extremely gravelly fine sandy loam.

Included in this unit are about 10 percent Tencee soils on erosional fan remnants and 5 percent Arizo soils, flooded, in channels. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of this Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate if the surface is disturbed. This soil is subject to rare periods of flooding during prolonged, high-intensity storms. Channeling and deposition are common along streambanks.

Most areas of this unit are used as habitat for desert wildlife and for recreation. A few areas are used for urban development.

The main limitation for construction of dwellings is the hazard of flooding. Dikes and channels that have outlets for floodwater can be used to protect buildings from flooding.

Dikes and channels that have outlets for floodwater can be used to protect onsite sewage disposal systems from flooding.

Channeling and deposition can be minimized and maintenance costs reduced by protecting roads from flooding.

The main limitations for lawns and landscaping are the cobbles and pebbles on the surface and throughout the soil. Topsoil is needed for best results when landscaping, particularly in areas used for lawns. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

This map unit is in capability subclass VIIs, nonirrigated, and in horticultural group 2.

192—Dalian-McCullough complex, 0 to 4 percent slopes. This map unit is on fan skirts.

This unit is 55 percent Dalian very gravelly fine sandy loam, 0 to 4 percent slopes, and 35 percent McCullough very gravelly very fine sandy loam, gravelly substratum, 0 to 4 percent slopes. Both the Dalian and McCullough soils are on alluvial fan skirts. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are about 5 percent Las Vegas soils on basin floor remnants and 5 percent Tencee soils on erosional fan remnants. Included areas make up about 10 percent of the total acreage.

The Dalian soil is very deep and well drained. It formed in alluvium derived from various kinds of rock. Typically, about 75 percent of the surface is covered with a desert pavement of pebbles. The surface layer is light yellowish brown very gravelly fine sandy loam about 5 inches thick. The underlying material to a depth of 60 inches or more is light yellowish brown very gravelly sandy loam.

Permeability of the Dalian soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thickness	Depth	Hardness	Uncoated steel	Concrete
				Ft		In		In			
182*:											
Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
Pittman	C	None	---	>6.0	---	>60	---	20-30	Thick	High	Low.
Arizo	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High	Low.
183--- Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
184--- Caliza	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
187--- Caliza	B	None	---	>6.0	---	>60	---	---	---	High	Low.
190--- Dalian	B	None	---	>6.0	---	>60	---	---	---	High	Low.
191--- Dalian	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
192*:											
Dalian	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
McCullough	B	Rare	---	>6.0	---	>60	---	---	---	High	Low.
200--- Glencarb	B	Rare	---	>6.0	---	>60	---	---	---	High	Moderate.
206--- Glencarb	C	Occasional	Jul-Sep	3.0-5.0	Jul-Jun	>60	---	---	---	High	High.
222--- Glencarb	C	Rare	---	3.0-5.0	Jul-Jun	>60	---	---	---	High	High.
236--- Glencarb	B	Rare	---	>6.0	---	>60	---	---	---	High	High.
237--- Glencarb	B	Rare	---	>6.0	---	>60	---	40-60	Thick	High	Low.
240--- Goodsprings	D	None	---	>6.0	---	>60	---	9-20	Thick	High	Low.
252, 255--- Grapevine	B	Rare	---	>6.0	---	>60	---	---	---	High	High.
260--- Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
262*:											
Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
Jean	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High	Low.
Goodsprings	D	Rare	---	>6.0	---	>60	---	9-20	Thick	High	Low.
263*:											
Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.
Jean	A	Occasional	Jun-Sep	>6.0	---	>60	---	---	---	High	Low.
264--- Jean	A	Rare	---	>6.0	---	>60	---	---	---	High	Low.

See footnote at end of table.

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

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

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

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

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

Revision	Date

REFERENCE:

TABLE 602A

CN CALCULATIONS - PROPOSED CONDITIONS

Basin	% SOIL TYPE	HYDRO	CN 6,000 SQ. FT. LOTS %		CN- COMMERCIAL %		WEIGHTED CN
ON1E		A		80		89	0.0
ON1W	100	B	100	87		92	87.0
ON2W		C		90		94	0.0
		D		92		95	0.0
							87.0

Basin	% SOIL TYPE	HYDRO					WEIGHTED CN
ON2E		A		80		89	0.0
	100	B	47	87	53	92	89.7
		C		90		94	0.0
		D		92		95	0.0
							89.7

Basin	% SOIL TYPE	HYDRO					WEIGHTED CN
		A		80		89	0.0
		B		87		92	0.0
		C		90		94	0.0
		D		92		95	0.0
							0.0

*Commercial used for existing lots (less than 6000 sq. ft.)

FRANKLIN PARK UPDATE #5

TIME OF CONCENTRATION

RCI
ENGINEERING

FRANKLIN PARK PHASE 2A
PROPOSED

BY: rjr
DATE: 9/5/14

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS	V2 VELOCITY FPS	Tt Min	Min	Min	Tlag= 0.6Tc/60 Hours	
(1)			(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(13)	(14)		
ON1E	D	87.0	0.7584	14.74	0.0230	152	1.0	7.5	1187	1.8	2.7	4.1	5.9	13.4	17.4	**0.134**	
ON1W	D	87.0	0.7584	14.10	0.0220	108	1.0	6.3	1534	1.4	2.4	3.6	8.2	14.5	19.1	**0.145**	
ON2E	D	89.7	0.7940	6.91	0.0108	101	1.0	5.6	960	2.9	3.4	5.2	3.9	9.4	15.9	**0.094**	
ON2W	D	87.0	0.7584	1.26	0.0020	95	1.1	5.9	337	3.2	3.6	5.4	1.6	7.5	12.4	**0.075**	

Tc = Ti + Tt Tlag = 0.6 Tc
Ti = 1.8 (1.1 - K) L^1/2 / S^1/3
K = 0.0132 (CN) - 0.39
Tc Check (Developed) = L/180+10

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

Existing V1 = 14.8*(S/100)^1/2
Existing V2 = 29.4*(S/100)^1/2
Minimum Tc (EX) = 10 Min per Section 602

Developed V1 = 20.2*(S/100)^1/2
Developed V2 = 30.6*(S/100)^1/2
Minimum Tc (DEV) = 5 Min per Section 602.1

REFERENCE :

STANDARD FORM 4

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   05SEP14  TIME  11:23:34   *
*                                       *
*****************************************
```


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


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

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

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


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

              *DIAGRAM
    1         ID     FRANKLIN PARK AT PROVIDENCE
    2         ID     DEVELOPED CONDITIONS
    3         ID     UNIT 2A AND UNIT 3 BUILT
    4         ID     WORST CASE OFFSITE
    5         ID     DESIGN STORM = 100-YEAR 6-HOUR STORM
    6         ID     STORM DISTRIBUTION = SDN3
    7         ID
    8         IT       5       0       0     300
    9         IO       5       0       0
   10         IN       5       0       0
   11         JR    PREC    1.00    0.57
              *

   12         KK   OFF1
   13         KM   OFFSITE DESERT SHRUB
   14         KM   REFERENCED FROM PREVIOUS FRANKLIN PARK DRAINAGE STUDY NO CHANGES TO INPUT
   15         KM   PARAMETERS FOR THIS SUBBASIN
   16         BA   .1327
   17         PB    3.12
   18         PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   19         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   20         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   21         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   22         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   23         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   24         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   25         PC   0.998   0.999   1.000
   26         LS       0    80.8
   27         UD   0.234
              *

   28         KK    ON1W
   29         KM    PHASE 3 DEVELOPED   SINGLE FAMILY RESIDENTIAL
   30         KM    AVERAGE LOT SIZE = 6300 SF
   31         BA    .022
   32         PB    3.08
   33         LS       0      87
   34         UD   0.145
              *

   35         KK    ON1E
   36         KM    PHASE 2 EXISTING    SINGLE FAMILY RESIDENTIAL
   37         KM   AVERAGE LOT SIZE = 6300 SF
   38         BA    .023
   39         LS       0      87
   40         UD   0.134
              *

   41         KK    CP1R
   42         KM   COMBINE ON1E AND ON1W
   43         HC       2
              *
```



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

   44         KK   CP1RR
   45         KM   COMBINE OF1 AND CP1R
   46         HC       2
              *

   47         KK    ON2W
   48         KM    PHASE 3     SINGLE FAMILY RESIDENTIAL
   49         KM    AVERGE LOT SIZE = 6300 SF
```

```
            50          BA   .0020
            51          LS      0      87
            52          UD    .075
                        *

            53          KK    ON2E
            54          KM    PHASE 2A, EXISTING PHASES 1 AND 2
            55          KM    PHASE 2A AVERAGE LOT SIZE = 6300 SF
            56          KM    EX. PHASES 1 AND 2 AVERAGE LOT SIZE = LESS THAN 6000 SF = COMMERCIAL
            57          BA   .0108
            58          LS      0    89.7
            59          UD   0.094
                        *

            60          KK    CP2R
            61          KM     COMBINE ON2W WITH ON2E
            62          KM     TRIBUTARY TO EXISITNG STORM DRAIN IN FRANKLIN PARK AVE
            63          HC       2
                        *
            64          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    12       OFF1
                 .
                 .
    28           .        ON1W
                 .          .
                 .          .
    35           .          .        ON1E
                 .          .          .
                 .          .          .
    41           .        CP1R.............
                 .          .
                 .          .
    44       CP1RR.............
                 .
                 .
    47           .        ON2W
                 .          .
                 .          .
    53           .          .        ON2E
                 .          .          .
                 .          .          .
    60           .        CP2R.............

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                    ****************************************
*                                      *                    *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *    U.S. ARMY CORPS OF ENGINEERS      *
*              JUN   1998              *                    *    HYDROLOGIC ENGINEERING CENTER     *
*            VERSION 4.1               *                    *         609 SECOND STREET            *
*                                      *                    *       DAVIS, CALIFORNIA 95616        *
*  RUN DATE   05SEP14  TIME  11:23:34  *                    *           (916) 756-1104             *
*                                      *                    *                                      *
****************************************                    ****************************************


                          FRANKLIN PARK AT PROVIDENCE
                          DEVELOPED CONDITIONS
                          UNIT 2A AND UNIT 3 BUILT
                          WORST CASE OFFSITE
                          DESIGN STORM = 100-YEAR 6-HOUR STORM
                          STORM DISTRIBUTION = SDN3


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

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

                    COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
```

1.00 .57

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .57
HYDROGRAPH AT						
+	OFF1	.13	1	FLOW	134.	43.
				TIME	3.67	3.67
HYDROGRAPH AT						
+	ON1W	.02	1	FLOW	34.	14.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1E	.02	1	FLOW	36.	15.
				TIME	3.58	3.58
2 COMBINED AT						
+	CP1R	.05	1	FLOW	69.	29.
				TIME	3.58	3.58
2 COMBINED AT						
+	CP1RR	.18	1	FLOW	192.	67.
				TIME	3.58	3.67
HYDROGRAPH AT						
+	ON2W	.00	1	FLOW	4.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2E	.01	1	FLOW	20.	9.
				TIME	3.50	3.50
2 COMBINED AT						
+	CP2R	.01	1	FLOW	23.	10.
				TIME	3.50	3.50

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

APPENDIX B – HYDRAULIC CALCS

100-Year Interim Flow Rate Hydraulic Cross Sections for Hammett Avenue

100-Year Developed Flow Rate Hydraulic Cross Sections (Steepest and Flattest)

100-Year Existing and Developed Flow Rate Hydraulic Cross Sections Puli Road

100-year Standard Form 6 (SF6) Model Hammett Avenue

D-Load Calculations

Emergency Overflow Calculation for Easement West End of Hammett Park Avenue

Drop Inlet Calculation for Exist Drop Inlet In Puli Road

Worksheet for SEC 5 INTERIM HAMMETT PARK 100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Discharge	192.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
1+05.0	2.00
1+05.0	0.50
1+05.5	0.48
1+05.5	0.00
1+07.0	0.13
1+07.0	0.17
1+23.5	0.50
1+40.0	0.17
1+40.0	0.13
1+41.5	0.00
1+41.5	0.48
1+42.0	0.50
1+42.0	2.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+05.0, 2.00)	(1+07.0, 0.17)	0.013
(1+07.0, 0.17)	(1+40.0, 0.17)	0.016
(1+40.0, 0.17)	(1+42.0, 2.00)	0.013

Results

Normal Depth		1.02	ft
Elevation Range	0.000 to 2.000 ft		
Flow Area		26.22	ft²

Worksheet for SEC 5 INTERIM HAMMETT PARK 100 YEAR

Results

Wetted Perimeter		39.108	ft
Top Width		37.000	ft
Normal Depth		1.02	ft
Critical Depth		1.26	ft
Critical Slope		0.00393	ft/ft
Velocity		7.32	ft/s
Velocity Head		0.83	ft
Specific Energy		1.86	ft
Froude Number		1.53	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	1.02	ft
Critical Depth	1.26	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00393	ft/ft

Cross Section for SEC 5 INTERIM HAMMETT PARK 100 YEAR

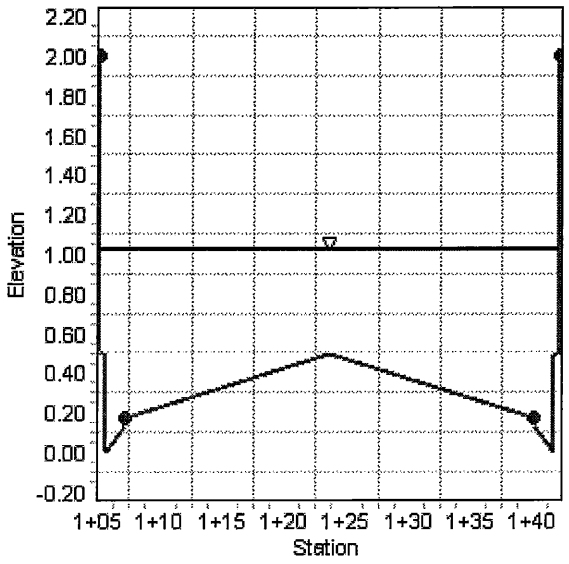
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Normal Depth	1.02	ft
Discharge	192.00	ft³/s

Cross Section Image



Worksheet for SEC 6 FLATTEST SLOPE100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Discharge	69.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
1+05.0	2.00
1+05.0	0.50
1+05.5	0.48
1+05.5	0.00
1+07.0	0.13
1+07.0	0.17
1+23.5	0.50
1+40.0	0.17
1+40.0	0.13
1+41.5	0.00
1+41.5	0.48
1+42.0	0.50
1+42.0	2.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+05.0, 2.00)	(1+07.0, 0.17)	0.013
(1+07.0, 0.17)	(1+40.0, 0.17)	0.016
(1+40.0, 0.17)	(1+42.0, 2.00)	0.013

Results

Normal Depth	0.78	ft
Elevation Range	0.000 to 2.000 ft	
Flow Area	17.36	ft²

Worksheet for SEC 6 FLATTEST SLOPE100 YEAR

Results

Wetted Perimeter		38.629	ft
Top Width		37.000	ft
Normal Depth		0.78	ft
Critical Depth		0.79	ft
Critical Slope		0.00475	ft/ft
Velocity		3.97	ft/s
Velocity Head		0.25	ft
Specific Energy		1.03	ft
Froude Number		1.02	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	0.78	ft
Critical Depth	0.79	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.00475	ft/ft

Cross Section for SEC 6 FLATTEST SLOPE100 YEAR

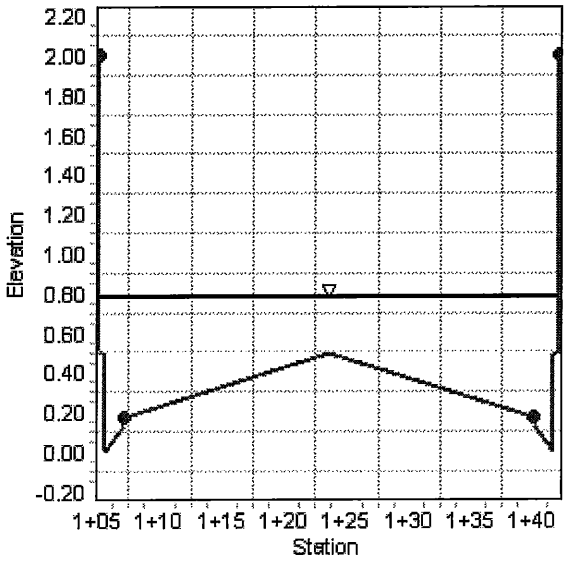
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Normal Depth	0.78	ft
Discharge	69.00	ft³/s

Cross Section Image



Worksheet for SEC 7 STEEPEST SLOPE100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.34	%
Discharge	69.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
1+05.0	2.00
1+05.0	0.50
1+05.5	0.48
1+05.5	0.00
1+07.0	0.13
1+07.0	0.17
1+23.5	0.50
1+40.0	0.17
1+40.0	0.13
1+41.5	0.00
1+41.5	0.48
1+42.0	0.50
1+42.0	2.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+05.0, 2.00)	(1+07.0, 0.17)	0.013
(1+07.0, 0.17)	(1+40.0, 0.17)	0.016
(1+40.0, 0.17)	(1+42.0, 2.00)	0.013

Results

Normal Depth	0.56	ft
Elevation Range	0.000 to 2.000 ft	
Flow Area	8.93	ft²

Worksheet for SEC 7 STEEPEST SLOPE100 YEAR

Results

Wetted Perimeter		38.173	ft
Top Width		37.000	ft
Normal Depth		0.56	ft
Critical Depth		0.79	ft
Critical Slope		0.00456	ft/ft
Velocity		7.73	ft/s
Velocity Head		0.93	ft
Specific Energy		1.48	ft
Froude Number		2.77	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	0.56	ft
Critical Depth	0.79	ft
Channel Slope	0.04340	ft/ft
Critical Slope	0.00456	ft/ft

Cross Section for SEC 7 STEEPEST SLOPE100 YEAR

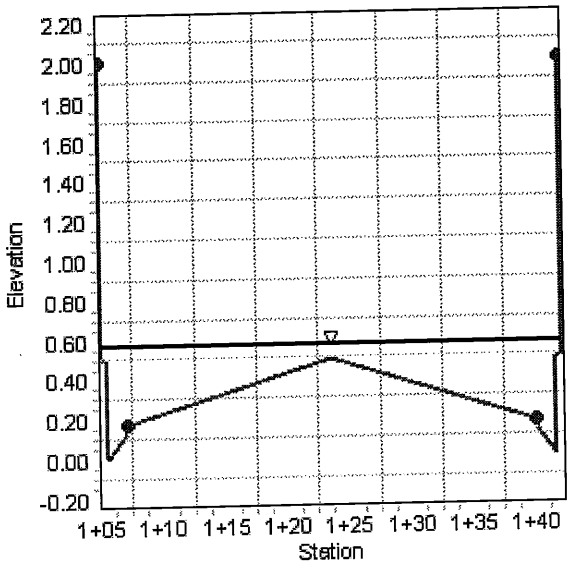
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.34	%
Normal Depth	0.56	ft
Discharge	69.00	ft³/s

Cross Section Image



Worksheet for SEC 8 EXIST PULI ROAD 100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Discharge	134.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
1+00.0	3046.00
1+58.0	3045.00
1+71.0	3045.00
1+77.0	3045.00
1+87.0	3050.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+00.0, 3046.00)	(1+87.0, 3050.00)	0.025

Results

Normal Depth		0.87	ft
Elevation Range	3045.000 to 3050.000 ft		
Flow Area		39.31	ft²
Wetted Perimeter		71.472	ft
Top Width		71.259	ft
Normal Depth		0.87	ft
Critical Depth		0.78	ft
Critical Slope		0.01149	ft/ft
Velocity		3.41	ft/s
Velocity Head		0.18	ft
Specific Energy		1.05	ft
Froude Number		0.81	
Flow Type	Subcritical		

Worksheet for SEC 8 EXIST PULI ROAD 100 YEAR

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	0.87	ft
Critical Depth	0.78	ft
Channel Slope	0.00730	ft/ft
Critical Slope	0.01149	ft/ft

Cross Section for SEC 8 EXIST PULI ROAD 100 YEAR

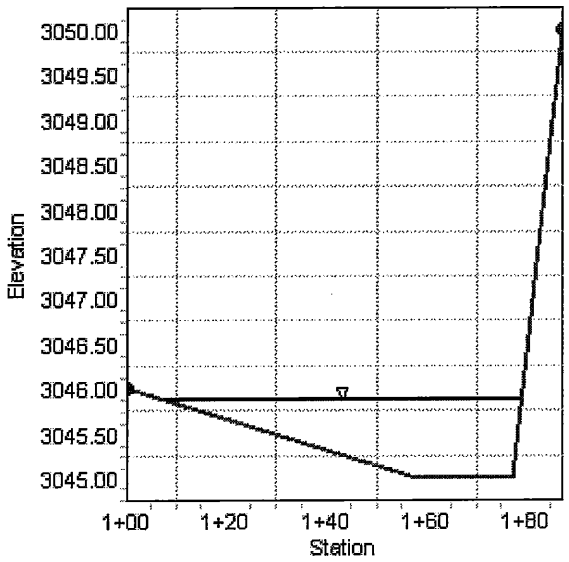
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Normal Depth	0.87	ft
Discharge	134.00	ft³/s

Cross Section Image



Worksheet for SEC 8 PULI ROAD 100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Discharge	62.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+95.0	0.70
1+00.0	0.60
1+05.0	0.50
1+05.5	0.48
1+05.5	0.00
1+07.0	0.13
1+07.0	0.17
1+40.0	0.83
1+73.0	0.17
1+73.0	0.13
1+74.5	0.00
1+74.5	0.48
1+75.0	0.50
1+80.0	0.60
1+85.0	0.70

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+95.0, 0.70)	(1+00.0, 0.60)	0.025
(1+00.0, 0.60)	(1+07.0, 0.17)	0.013
(1+07.0, 0.17)	(1+40.0, 0.83)	0.016
(1+40.0, 0.83)	(1+73.0, 0.17)	0.016
(1+73.0, 0.17)	(1+80.0, 0.60)	0.013
(1+80.0, 0.60)	(1+85.0, 0.70)	0.025

Worksheet for SEC 8 PULI ROAD 100 YEAR

Results

Normal Depth		0.70	ft
Elevation Range	0.000 to 0.827 ft		
Flow Area		18.64	ft²
Wetted Perimeter		78.781	ft
Top Width		77.703	ft
Normal Depth		0.70	ft
Critical Depth		0.74	ft
Critical Slope		0.00493	ft/ft
Velocity		3.33	ft/s
Velocity Head		0.17	ft
Specific Energy		0.88	ft
Froude Number		1.20	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	0.70	ft
Critical Depth	0.74	ft
Channel Slope	0.00730	ft/ft
Critical Slope	0.00493	ft/ft

Cross Section for SEC 8 PULI ROAD 100 YEAR

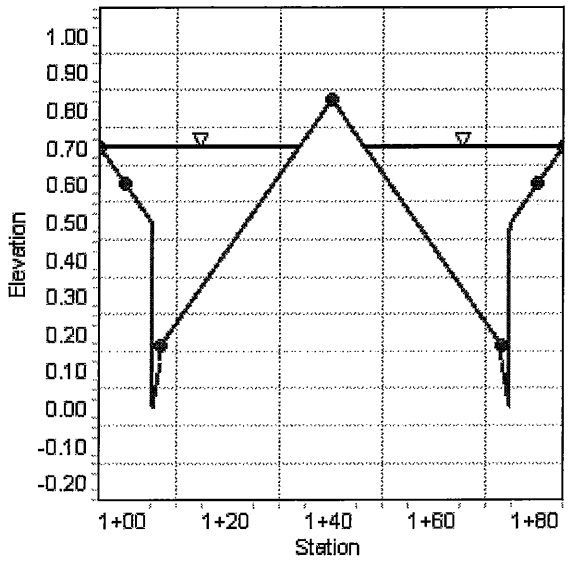
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Normal Depth	0.70	ft
Discharge	62.00	ft³/s

Cross Section Image



Worksheet for SEC 8 PULI ROAD 100 YEAR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Discharge	62.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+95.0	0.70
1+00.0	0.60
1+05.0	0.50
1+05.5	0.48
1+05.5	0.00
1+07.0	0.13
1+07.0	0.17
1+40.0	0.83

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+95.0, 0.70)	(1+00.0, 0.60)	0.025
(1+00.0, 0.60)	(1+07.0, 0.17)	0.013
(1+07.0, 0.17)	(1+40.0, 0.83)	0.016

Results

Normal Depth	0.85	ft
Elevation Range	0.000 to 0.827 ft	
Flow Area	15.43	ft²
Wetted Perimeter	45.705	ft
Top Width	45.000	ft
Normal Depth	0.85	ft
Critical Depth	0.89	ft
Critical Slope	0.00480	ft/ft

Worksheet for SEC 8 PULI ROAD 100 YEAR

Results

Velocity		4.02	ft/s
Velocity Head		0.25	ft
Specific Energy		1.10	ft
Froude Number		1.21	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.000	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	0.85	ft
Critical Depth	0.89	ft
Channel Slope	0.00730	ft/ft
Critical Slope	0.00480	ft/ft

Cross Section for SEC 8 PULI ROAD 100 YEAR

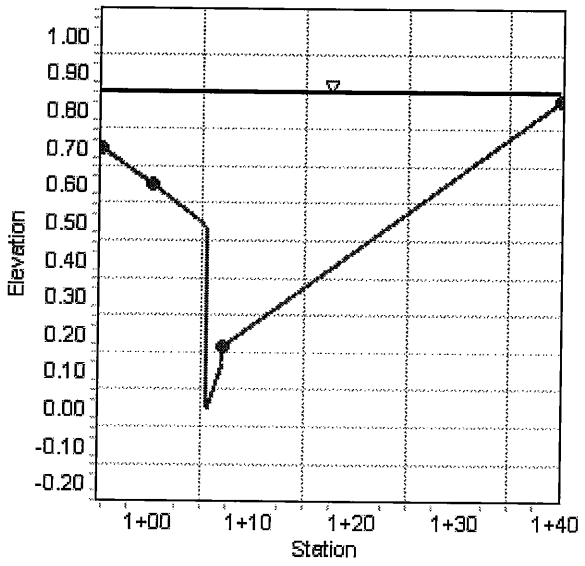
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.73	%
Normal Depth	0.85	ft
Discharge	62.00	ft^3/s

Cross Section Image



Storm Drain Hydraulics Calculations

Franklin Park UPDATE # 5-UNIT 3 Hammett Drive Storm Drain

DATE: 09/24/14

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																								EGL & HGL				COMMENTS	
																			PIPE	TRANSITION																													
STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc			CONDUIT		TRANSITION		FULL/	
FROM (ft)	TO (ft)	T/R	D (in)	SPAN (ft)	RISE (ft)	AREA (ft^2)	HYD RAD (ft)		D/S (ft)	U/S (ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	S_f (ft/ft)	H_f (ft)	H_f (ft)	Θ (deg)	K_{mh}	H_{mh} (ft)	Θ (deg)	K_j	H_j (ft)	Inlet/ Cont	K_i	H_c (ft)	Θ (deg)	K_o	H_o (ft)	R_{bend} (ft)	Θ (deg)	K_b	H_b (ft)	H_m (ft)	Total (ft)	U/S EGL	U/S HGL	U/S EGL	U/S HGL	PART FLOW	CRTL
	1000.00		54																											Outlet K_o=	1.0										99.05			
1000.00	1103.77	R	54					1	89.10	103.8	3.40%	15.90	0.0049		8.24	1.05	0.0044	0.0044	0.46																					0.00	99.51	98.46			FULL	U/S
1103.77	1108.77	T	42					1	92.63	5.0	4.80%	9.62	0.0049		13.62	2.88	0.0169	0.0107		0.05	32	0.22	0.23																0.29			99.80	96.92	FULL	U/S
1108.77	1173.19	R	42					1	92.87	64.4	8.47%	9.62	0.0049		13.62	2.88	0.0169	0.0169	1.09																					0.00	104.70	101.83			PART	D/S
1173.19	1178.19	T	42					1	98.33	5.0	6.70%	9.62	0.0049		11.51	2.06	0.0121	0.0145		0.07	1	0.02	0.06	1	0.85	1.13													1.26			105.97	103.91	FULL	U/S
1178.19	1218.01	R	42					1	98.66	39.8	2.42%	9.62	0.0049		11.51	2.06	0.0121	0.0121	0.48																					0.00	106.45	104.39			FULL	U/S
1218.01	1223.01	T	42					1	99.63	5.0	5.19%	9.62	0.0049		8.93	1.24	0.0073	0.0097		0.05	1	0.02	0.04	90	0.25	1.75													1.84			108.28	107.05	FULL	U/S
1223.01	1387.08	R	42					1	99.88	164.1	3.38%	9.62	0.0049		8.93	1.24	0.0073	0.0073	1.19																					0.00	110.17	108.94			FULL	D/S
1387.08	1392.08	T	42					1	105.44	5.0	2.35%	9.62	0.0049		6.44	0.64	0.0038	0.0055		0.03	1	0.02	0.02																1.02	1.07			111.25	110.60	FULL	U/S
1392.08	1571.78	R	42					1	105.55	179.7	1.31%	9.62	0.0049		6.44	0.64	0.0038	0.0038	0.68																					0.00	112.05	111.41			FULL	D/S
1571.78	1576.78	T	42					1	107.91	5.0	2.63%	9.62	0.0049		6.44	0.64	0.0038	0.0038		0.02	1	0.02	0.01																	0.03			112.19	111.54	FULL	D/S
1576.78	1919.26	R	42					1	108.04	342.5	3.65%	9.62	0.0049		6.44	0.64	0.0038	0.0038	1.30																					0.00	124.69	124.05			PART	D/S
1919.26	1924.26	T	42					1	120.55	5.0	3.60%	9.62	0.0049		6.44	0.64	0.0038	0.0038		0.02																					0.02			124.87	124.23	FULL	D/S
1924.26	2124.86	R	42					1	120.73	200.6	2.47%	9.62	0.0049		6.44	0.64	0.0038	0.0038	0.76																					0.00	129.82	129.18			PART	D/S
2124.86	2129.86	T	42					1	125.68	5.0	1.40%	9.62	0.0049		6.44	0.64	0.0038	0.0038		0.02																					0.02			129.89	129.25	FULL	D/S
2129.86	2293.81	R	42					1	125.75	164.0	2.11%	9.62	0.0049		6.44	0.64	0.0038	0.0038	0.62																					0.00	133.35	132.71			PART	D/S
2293.81	2298.81	T	42					1	129.21	5.0	12.48%	9.62	0.0049		6.44	0.64	0.0038	0.0038		0.02																					0.02			133.98	133.33	FULL	D/S
2298.81	2333.58	R	42					1	129.83	34.8	21.39%	9.62	0.0049		6.44	0.64	0.0038	0.0038	0.13																					0.00	141.41	140.77			PART	D/S
2333.58	2338.58	T	42					1	137.27	0.0		9.62	0.0049		6.44	0.64	0.0038	0.0038		0.00									Ki=	0.4	0.26									0.26			141.67	141.67	FULL	U/S

Summary of Results

					(Optional)			HGL with respect	Pressure Gasket
STATION	INVERT	SOFFIT	EGL	HGL	GRADE	LOCATION	DESCRIPTION	to FG	Required?
1000.00	89.10	93.60	99.05	98.00	98.00	SHAUMBER	EX MANHOLE	HGL<1ft below FG	NO
1103.77	92.63	97.13	99.51	98.46	101.80	EASEMENT	EX MANHOLE	OK	NO
1108.77	92.87	96.37	99.80	96.92	101.80	EASEMENT	EX MANHOLE	OK	NO
1173.19	98.33	101.83	104.70	101.83	107.83	EAST HAMMETT	EX 15' DI	OK	NO
1178.19	98.66	102.16	105.97	103.91	107.83	EAST HAMMETT	EX 15' DI	OK	NO
1218.01	99.63	103.13	106.45	104.39	109.70	DURAN PARK	EX MANHOLE	OK	NO
1223.01	99.88	103.38	108.28	107.05	109.70	DURAN PARK	EX MANHOLE	OK	NO
1387.08	105.44	108.94	110.17	108.94	114.60	EAST HAMMETT	EX MANHOLE	OK	NO
1392.08	105.55	109.05	111.25	110.60	114.60	EAST HAMMETT	EX MANHOLE	OK	NO
1571.78	107.91	111.41	112.05	111.41	117.90	EAST HAMMETT	EX MANHOLE	OK	NO
1576.78	108.04	111.54	112.19	111.54	117.90	EAST HAMMETT	EX MANHOLE	OK	NO
1919.26	120.55	124.05	124.69	124.05	129.00	EAST HAMMETT	EX MANHOLE	OK	NO
1924.26	120.73	124.23	124.87	124.23	129.00	EAST HAMMETT	EX MANHOLE	OK	NO
2124.86	125.68	129.18	129.82	129.18	135.00	EAST HAMMETT	SDMH#1	OK	NO
2129.86	125.75	129.25	129.89	129.25	135.00	EAST HAMMETT	SDMH#1	OK	NO
2293.81	129.21	132.71	133.35	132.71	138.40	EAST HAMMETT	8' TYPE A INLET	OK	NO
2298.81	129.83	133.33	133.98	133.33	138.40	EAST HAMMETT	8' TYPE A INLET	OK	NO
2333.58	137.27	140.77	141.41	140.77	146.20	PULI	EX 17.5' INLET	OK	NO
2333.58	137.27	140.77	141.67	141.67	146.20	PULI	EX 17.5' INLET	OK	NO

DATE:

DESIGNER:

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 42 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	42.00
WALL B, THICKNESS (in.)	4.500

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	0.50
MAXIMUM DEPTH OF FILL (ft.)	25.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	8.25
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S (C O N T .)

```
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
0.5	1.02	Y	304.	2856.	0.	3160.	1.90	475.	713.
1.0	1.05	Y	623.	2550.	0.	3172.	1.90	477.	716.
1.5	1.07	Y	956.	2768.	0.	3724.	1.90	560.	840.
2.0	1.10	Y	1305.	2556.	0.	3860.	1.90	580.	871.
2.5	1.12	Y	1669.	1840.	0.	3509.	1.90	528.	792.
3.0	1.15	Y	2051.	1356.	0.	3407.	1.90	512.	768.
3.5	1.18	Y	2450.	1126.	0.	3576.	1.90	538.	807.
4.0	1.21	Y	2868.	952.	0.	3820.	1.90	574.	862.
4.5	1.23	Y	3305.	817.	0.	4122.	1.90	620.	930.
5.0	1.26	Y	3763.	710.	0.	4473.	1.90	673.	1009.
5.5	1.30	Y	4241.	623.	0.	4864.	1.90	731.	1097.
6.0	1.33	Y	4742.	552.	0.	5294.	1.90	796.	1194.
6.5	1.36	Y	5266.	493.	0.	5758.	1.90	866.	1299.
7.0	1.40	Y	5814.	442.	0.	6257.	1.90	941.	1411.
7.5	1.43	Y	6388.	400.	0.	6788.	1.90	1021.	1531.
8.0	1.46	Y	6946.	363.	0.	7309.	1.90	1099.	1649.
8.5	1.46	Y	7404.	331.	0.	7735.	1.90	1163.	1745.
9.0	1.47	Y	7854.	304.	0.	8158.	1.90	1227.	1840.
9.5	1.47	Y	8304.	280.	0.	8583.	1.90	1291.	1936.
10.0	1.47	Y	8754.	258.	0.	9012.	1.90	1355.	2033.
10.5	1.47	Y	9203.	239.	0.	9442.	1.90	1420.	2130.
11.0	1.47	Y	9653.	222.	0.	9875.	1.90	1485.	2227.
11.5	1.48	Y	10116.	207.	0.	10323.	1.90	1552.	2328.
12.0	1.48	Y	10565.	193.	0.	10758.	1.90	1618.	2427.
12.5	1.48	Y	11015.	181.	0.	11195.	1.90	1684.	2525.
13.0	1.48	Y	11464.	170.	0.	11633.	1.90	1749.	2624.
13.5	1.48	Y	11913.	159.	0.	12072.	1.90	1815.	2723.
14.0	1.48	Y	12362.	150.	0.	12512.	1.90	1882.	2822.

14.5	1.47	N	12708.	142.	0.	12850.	1.90	1932.	2898.
15.0	1.46	N	13028.	134.	0.	13162.	1.90	1979.	2969.
15.5	1.45	N	13342.	127.	0.	13469.	1.90	2025.	3025.
16.0	1.43	N	13649.	120.	0.	13770.	1.90	2071.	3069.
16.5	1.42	N	13951.	114.	0.	14065.	1.90	2115.	3112.
17.0	1.41	N	14246.	108.	0.	14355.	1.90	2159.	3152.
17.5	1.40	N	14536.	103.	0.	14639.	1.90	2201.	3191.
18.0	1.38	N	14820.	98.	0.	14918.	1.90	2243.	3229.
18.5	1.37	N	15098.	94.	0.	15192.	1.90	2285.	3264.
19.0	1.36	N	15371.	90.	0.	15461.	1.90	2325.	3299.
19.5	1.35	N	15639.	86.	0.	15724.	1.90	2365.	3331.
20.0	1.34	N	15901.	82.	0.	15983.	1.90	2403.	3363.
20.5	1.32	N	16158.	79.	0.	16236.	1.90	2442.	3393.
21.0	1.31	N	16409.	75.	0.	16485.	1.90	2479.	3422.
21.5	1.30	N	16656.	72.	0.	16729.	1.90	2516.	3449.
22.0	1.29	N	16898.	70.	0.	16968.	1.90	2552.	3475.
22.5	1.28	N	17135.	67.	0.	17202.	1.90	2587.	3501.
23.0	1.27	N	17368.	64.	0.	17432.	1.90	2621.	3525.
23.5	1.26	N	17596.	62.	0.	17658.	1.90	2655.	3548.
24.0	1.25	N	17819.	60.	0.	17879.	1.90	2689.	3570.
24.5	1.24	N	18038.	57.	0.	18095.	1.90	2721.	3591.

PIPE DEPTH (ft.)	------EARTH LOAD----- ARCHING FACTOR	>TRANS	LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT.
25.0	1.23	N	18252.	55.	0.	18308.	1.90	2753.	3611.

SUBMERGED WEIR

EMERGENCY OVERFLOW PULI ROAD

Q100 =	134	Design Flow
L =	35	
H2 =	0	Flowmaster
ASSUME H1 =	1.20	Weir Head
C (FOR H1) =	3	
$Q_F = CL(H)^{3/2}$	138.0	Free Flow
$Q_S = Q_F * [1-(H2/H1)^{3/2}]^{0.385}$	138.0	Submerged Flow
WEIR ELEVATION	38.40	Overflow Easement
HEAD	1.20	
FREE BOARD		
MINIMUM FF =	39.6	
LOTS 35 AND 36	39.70	

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Monday, March 10, 2014

Project Units: U.S. Customary Units

Notes:

Curb and Gutter Analysis: puli inlet

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0120 ft/ft

Cross-Slope of Pavement: 0.0200 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0160

Gutter Width: 1.5000 ft

Design Flow: 29.0000 cfs

Gutter Result Parameters

Width of Spread: 24.6254 ft

Gutter Depression: 0.0000 in

Area of Flow: 6.0641 ft^2

Eo (Gutter Flow to Total Flow): 0.1545

Gutter Depth at Curb: 5.9101 in

Inlet Input Parameters

Inlet Location: Inlet in Sag

Percent Clogging: 50.0000 %

Inlet Type: Sweeper Combo

Grate Type: P - 1-7/8

Grate Width: 1.5000 ft

Grate Length: 17.5000 ft

Length of Inlet: 17.5000 ft

Curb opening height: 6.0000 in

Local Depression: 2.0000 in

Inlet Result Parameters

Perimeter: 20.5000 ft

Effective Perimeter: 10.2500 ft

Area: 35.2917 ft^2

Effective Area: 17.6458 ft^2

Depth at curb face (upstream of local depression): 0.9617 ft

Computed Width of Spread at Sag: 48.0845 ft

Flow type: Weir Flow

Efficiency: 1.0000

APPENDIX C – REFERENCE MATERIALS

Update #4 To The Technical Drainage Study for Franklin Park, by RCI Engineering

Update #3 To The Technical Drainage Study for Franklin Park, by RCI Engineering

Update #2 To The Technical Drainage Study for Franklin Park at Providence, By Wood Rogers

Master Drainage Study for Cliffs Edge, by VTN Nevada.

Technical Drainage Study for Franklin Park at Providence Phases 1 &2, by GC Wallace, Inc.

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: August 21, 2014
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Franklin Park (Phase 2A) – Update #2**			**COPIES TO:** RCI Engineering
Cross Streets:	NWC of Shaumber Road & Elkhorn Trail			Toll Brothers
File Number:	F:\Depot\DSMemos\DS4622B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-13-401-018			
Zoning Action:	TMP-49525			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	8/26/2013	9/10/2013	Approved	$400.00	330882: $400
2nd Submittal	8/19/2014	8/21/2014	See Comments Below	$100.00	367438: $100
			TOTAL FEES (LDDRS):	**$500.00**	**----**

REMARKS:

2nd Submittal: Update #2 to revise callout for an existing storm drain from 42" to 36"

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

X	is approved subject to conformance to all City standards and the following conditions:
	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.

1. **Sheet G4**: Revise Construction Note #14 to keep the existing storm drain manhole for the connection of new pipe to the existing pipe.

2. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

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.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section.* Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

END OF REMARKS
ays

T/R/S: T19S/R59E/13
AREA F-13

3110.0003

August 19, 2014

Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works
333 North Rancho Drive
Las Vegas, NV 89106

RE: UPDATE #4 TO THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK PHASE 2A

Dear Mr. Sung:

The purpose of this update is to address a change in the pipe size for the storm drain in Duran Park Street. The pipe size in Duran Park Street from the 3rd update to the drainage study was shown on the plans as a 42-inch RCP. During construction it was determined that the existing storm drain is a 36-inch RCP instead of a 42-inch RCP. In the 3rd Update the existing storm drain was being extended so that the laterals and drop inlets would fall on the updated lot lines that were addressed in that study. A copy of the red lined revision for the plans has been included. The 100-year storm hydraulic grade lines were calculated using a Standard Form 6 Spreadsheet and have been enclosed. As is shown in the spreadsheets, changing the models from a 42-inch RCP to a 36-inch RCP raised the HGL by approximately 0.3 feet at the inlets. The HGL for 100-year storm flow in the storm drain remains 1-foot below finished grade per Manual criteria.

The 3rd Update was approved on September 10, 2013 by the CLV. A copy of the approval letter has been enclosed. No other changes are proposed with this Update.

If you have any questions or require additional information, please contact us at 804-5300.

Thank you,
Rick J. Read, P.E.
RCI Engineering

UPDATE #3 TO THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK PHASE 2A

(Formerly Franklin Park at Providence)

Prepared for:

Toll Brothers Inc.
1140 N. Town Center Drive Suite 250
Las Vegas, NV 89144
Phone: (702) 243-9800
Fax: (702) 243-9610

August 2013

PROJECT 3110.0003

RCI Engineering
3281 S. Highland Drive Suite 810 * Las Vegas, NV 89109
Tel: 702.453.0800 * Fax: 702.453.0801
www.rcicnevada.com

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 10, 2013
TO: Land Development Services Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: Franklin Park (Phase 2A) – Update #1			COPIES TO: RCI Engineering
Cross Streets:	NWC of Shaumber Road & Elkhorn Trail			Toll Brothers
File Number:	F:\Depot\DSMemos\DS4622.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-13-401-018			
Zoning Action:	TMP-49525			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	8/26/2013	9/10/2013	See Comments Below	$400.00	330882: $400
			TOTAL FEES (LDDRS):	$400.00	----

REMARKS:

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

X	Is approved subject to conformance to all City standards and the following conditions:
	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.

1. **Sheet G4:** Revise Construction Note #14 to keep the existing storm drain manhole for the connection of new pipe to the existing pipe.

2. **Sheet G4:** Label the existing "*37'-Public Utility, Drainage & Emergency Access Easement*" with either the final map number or recorded document number on the grading plan.

3. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

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.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

END OF REMARKS
ays

T/R/S: T19S/R59E/13
AREA F-13

From App. Original study

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   22AUG13  TIME  14:47:11   *
*                                       *
*****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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

              *DIAGRAM
    1         ID     FRANKLIN PARK AT PROVIDENCE
    2         ID     DEVELOPED CONDITIONS
    3         ID     UNIT 2A AND UNIT 3 BUILT
    4         ID     WORST CASE OFFSITE
    5         ID     DESIGN STORM = 100-YEAR 6-HOUR STORM
    6         ID     STORM DISTRIBUTION = SDN3
    7         ID
    8         IT       5       0       0     300
    9         IO       5       0       0
   10         IN       5       0       0
   11         JR    PREC    1.00    0.57
              *

   12         KK   OFF1
   13         KM   OFFSITE DESERT SHRUB
   14         KM   REFERENCED FROM PREVIOUS FRANKLIN PARK DRAINAGE STUDY NO CHANGES TO INPUT
   15         KM   PARAMETERS FOR THIS SUBBASIN
   16         BA   .1327
   17         PB    3.12
   18         PC  0.000  0.020  0.057  0.070  0.087  0.108  0.124  0.130  0.130  0.130
   19         PC  0.130  0.130  0.130  0.133  0.140  0.142  0.148  0.158  0.172  0.181
   20         PC  0.190  0.197  0.199  0.200  0.201  0.204  0.214  0.229  0.241  0.249
   21         PC  0.251  0.256  0.270  0.278  0.281  0.283  0.295  0.322  0.352  0.409
   22         PC  0.499  0.590  0.710  0.744  0.781  0.812  0.819  0.835  0.851  0.856
   23         PC  0.860  0.868  0.876  0.888  0.910  0.926  0.937  0.950  0.970  0.976
   24         PC  0.982  0.985  0.987  0.989  0.990  0.993  0.993  0.994  0.995  0.998
   25         PC  0.998  0.999  1.000
   26         LS      0   80.8
   27         UD  0.234
              *

   28         KK    ON1W
   29         KM   FUTURE PHASE 3 SINGLE FAMILY RESIDENTIAL
   30         KM    AVERAGE LOT SIZE = 6300 SF
   31         BA    .022
   32         PB    3.08
   33         LS       0      87
   34         UD  0.149
              *

   35         KK    ON1E
   36         KM   PHASE 2A SINGLE FAMILY RESIDENTIAL
   37         KM   AVERAGE LOT SIZE = 6300 SF
   38         BA    .023
   39         LS       0      87
   40         UD  0.134
              *

   41         KK    CP1R
   42         KM   COMBINE ON1E AND ON1W
   43         HC       2
              *
```

1 HEC-1 INPUT PAGE 2

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

   44         KK   CP1RR
   45         KM   COMBINE OF1 AND CP1R
   46         HC       2
              *

   47         KK    ON2W
   48         KM    FUTURE PHASE 3 SINGLE FAMILY RESIDENTIAL
   49         KM    AVERGE LOT SIZE = 6300 SF
```

```
                50          BA   .0020
                51          LS      0      87
                52          UD  0.076
                            *

                53          KK    ON2E
                54          KM    PHASE 2A, EXISTING PHASES 1 AND 2
                55          KM    PHASE 2A AVERAGE LOT SIZE = 6300 SF
                56          KM    EX. PHASES 1 AND 2 AVERAGE LOT SIZE = LESS THAN 6000 SF = COMMERCIAL
                57          BA   .0108
                58          LS      0    89.7
                59          UD  0.094
                            *

                60          KK    CP2R
                61          KM     COMBINE ON2W WITH ON2E
                62          KM     TRIBUTARY TO EXISITNG STORM DRAIN IN FRANKLIN PARK AVE
                63          EC      2
                            *
                64          ZZ
1
                    SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    12       OFF1
                 .
                 .
    28           .        ON1W
                 .          .
                 .          .
    35           .          .         ON1E
                 .          .           .
                 .          .           .
    41           .        CP1R.............
                 .          .
                 .          .
    44       CP1RR.............
                 .
                 .
    47           .        ON2W
                 .          .
                 .          .
    53           .          .         ON2E
                 .          .           .
                 .          .           .
    60           .        CP2R.............

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*                JUN  1998              *
*             VERSION 4.1               *
*                                       *
*  RUN DATE   22AUG13  TIME  14:47:11   *
*                                       *
*****************************************

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

                        FRANKLIN PARK AT PROVIDENCE
                        DEVELOPED CONDITIONS
                        UNIT 2A AND UNIT 3 BUILT
                        WORST CASE OFFSITE
                        DESIGN STORM = 100-YEAR 6-HOUR STORM
                        STORM DISTRIBUTION = SDN3

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

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

                 COMPUTATION INTERVAL      .08 HOURS
                     TOTAL TIME BASE   24.92 HOURS

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

     JP         MULTI-PLAN OPTION
                     NPLAN          1  NUMBER OF PLANS

     JR         MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
```

1.00 .57

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .57
HYDROGRAPH AT						
+	OFF1	.13	1	FLOW	134.	43.
				TIME	3.67	3.67
HYDROGRAPH AT						
+	ON1W	.02	1	FLOW	33.	14.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1E	.02	1	FLOW	36.	15.
				TIME	3.58	3.58
2 COMBINED AT						
+	CP1R	.05	1	FLOW	69.	29.
				TIME	3.58	3.58
2 COMBINED AT						
+	CP1RR	.10	1	FLOW	191.	67.
				TIME	3.58	3.67
HYDROGRAPH AT						
+	ON2W	.00	1	FLOW	4.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2E	.01	1	FLOW	20.	9.
				TIME	3.50	3.50
2 COMBINED AT						
+	CP2R	.01	1	FLOW	23.	10.
				TIME	3.50	3.50

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

FROM ORIGINAL Approved

CN CALCULATIONS - PROPOSED CONDITIONS

Basin	% SOIL TYPE	HYDRO	CN 6,000 SQ. FT. LOTS %		CN- COMMERCIAL %		WEIGHTED CN
ON1E	100	A	100	80		89	0.0
ON1W		B		87		92	87.0
ON2W		C		90		94	0.0
		D		92		95	0.0
							87.0

Basin	% SOIL TYPE	HYDRO					WEIGHTED CN
ON2E	100	A	47	80	53	89	0.0
		B		87		92	89.7
		C		90		94	0.0
		D		92		95	0.0
							89.7

Basin	% SOIL TYPE	HYDRO					WEIGHTED CN
		A		80		89	0.0
		B		87		92	0.0
		C		90		94	0.0
		D		92		95	0.0
							0.0

*Commercial used for existing lots (less than 6000 sq. ft.)

Original

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

RCI ENGINEERING

FRANKLIN PARK PHASE 2A
Proposed / Interim Conditions

BY: CZ
DATE: 9/5/14

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS	V2 VELOCITY FPS	Tt Min	Min	Min	Tlag= 0.6Tc/60 Hours	
(1)			(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10)	(13)	(14)		
ON1E	D	87.0	0.7584	14.74	0.0230	152	1.0	7.5	1187	1.8	2.7	4.1	5.9	13.4	17.4	**0.134**	
ON1W	D	87.0	0.7584	14.10	0.0220	108	1.0	6.5	1534	~~1.3~~ 1.4	2.3	3.5	8.5	14.9	19.1	**0.149**	0.145
ON2E	D	89.7	0.7940	6.91	0.0108	101	1.0	5.6	960	2.9	3.4	5.2	3.9	9.4	15.9	**0.094**	
ON2W	D	87.0	0.7584	1.26	0.0020	95	~~1.0~~ 1.1	6.0	337	~~3.1~~ 3.2	3.6	5.4	1.6	7.6	12.4	~~**0.076**~~	0.075
INT1W	D	86.0	0.7452	14.10	0.0220	113	5.3	3.9	1460	1.4	2.4	3.7	7.8	11.7	18.7	**0.117**	
INT2W	D	86.0	0.7452	1.26	0.0020	95	3.2	4.2	337	2.8	3.4	5.1	1.7	5.9	12.4	**0.059**	

Tc = Ti + Tt Tlag = 0.6 Tc
Ti = 1.8 (1.1 - K) L^1/2 / S^1/3
K = 0.0132 (CN) - 0.39
Tc Check (Developed) = L/180+10

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

Existing V1 = 14.8*(S/100)^1/2 Developed V1 = 20.2*(S/100)^1/2
Existing V2 = 29.4*(S/100)^1/2 Developed V2 = 30.6*(S/100)^1/2
Minimum Tc (EX) = 10 Min per Section 602 Minimum Tc (DEV) = 5 Min per Section 602.1

REFERENCE : **STANDARD FORM 4**

PIMA COUNTY FLOW SPLIT CALCULATIONS

	Variable	Main	Side Street
Street Names		Ellington Park St.	Beecher Park Ave.
Design Storm Event (Year)	100		
Right of way width from centerline to back of curb		18.5	18.5
Width Main (fc to CL)	W_m	18	
Width Side Street (fc to CL)	W_{ss}		18
Total (cfs)	Q	2.3	
Slope of main street ft/ft	S_m	0.0098	
Slope of side street ft/ft	S_{ss}		0.0331
Lateral Flow into side street (see equation below)	Q_l	0.7	
$Q_l = 0.042 \{Q_m^{0.93} W_{ss}^{0.85} / S_m^{0.41} W_m^{0.79}\}$			
Total Flow Remaining in Main Street = $Q - Q_l$	Q_{ms}	1.6	

*This spreadsheet is based on flow contained within curb sections with no overbank

**Q100 = LOTS 115 THROUGH 119

PRORATED AREA "A" (1 AC * 2.3 CFS/AC)

=2.3 cfs

PIMA COUNTY FLOW SPLIT CALCULATIONS

	Variable	Main	Side Street
Street Names		Beecher Park Ave.	Hellman Park Ave.
Design Storm Event (Year)	100		
Right of way width from centerline to back of curb		18.5	18.5
Width Main (fc to CL)	W_m	18	
Width Side Street (fc to CL)	W_{ss}		18
Total (cfs)	Q	5.9	
Slope of main street ft/ft	S_m	0.0137	
Slope of side street ft/ft	S_{ss}		0.005
Lateral Flow into side street (see equation below)	Q_l	1.5	
$Q_l = 0.042 \{Q_m^{0.93} W_{ss}^{0.85} / S_m^{0.41} W_m^{0.79}\}$			
Total Flow Remaining in Main Street = $Q - Q_l$	Q_{ms}	4.4	

*This spreadsheet is based on flow contained within curb sections with no overbank

**Q100 = 7 cfs in the South Side of Beecher Park Ave.

UPDATE #2 TO THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK AT PROVIDENCE

Prepared for:

Toll Brothers, Inc.
1140 N. Town Center Drive, Suite 350
Las Vegas, NV 89144
Phone: (702) 243-9800
Fax: (702) 243-9610

September 2007

Project 2153.001

Wood Rodgers, Inc.
9900 Covington Cross Dr., Ste. #102 * Las Vegas, NV 89144
Tel: 702.434.2953 * Fax: 702.434.2957
www.woodrodgers.com

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: November 6, 2007
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: Franklin Park Phase 2A at Providence (Update for different product)		COPIES TO: Wood Rodgers, Inc.
Cross Streets:	NWC of Shaumber Road & Elkhorn Road		Toll Brothers, Inc.
File Number:	F:\Depot\DSMemos\DS4235B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	126-13-410-010 & more		
Zoning Action:	TMP-23567; WVR-23568 & VAC-23569		
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	9/13/2007	10/5/2007	Not Approved	$400.00	Paid: $400
2nd Submittal	10/25/2007	11/6/2007	See Comments Below	$400.00	80828: $400
			TOTAL FEES (LDDRS):	$800.00	----

REMARKS:

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

X	is approved subject to conformance to all City standards and the following conditions:
	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 Department of Development Services concurrence.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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: T19S/R59E/13
AREA F-13



GRAPHIC SCALE

300 0 150 300

(IN FEET)

1 inch = 300 ft.

LEGEND

- OFF1 — DRAINAGE SUBBASIN
- ● CP1 — CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- STORM DRAIN

SUMMARY OF HEC-1 MODEL

BASIN OR LOCATION	Q100 (CFS)	Q10 (CFS)
OFF1	134	43
ON1	72	31
ON2	20	9

TOLL BROTHERS, INC.
FRANKLIN PARK
AT PROVIDENCE

FIGURE 7-U2

DEVELOPED CONDITIONS HEC-1

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
8900 COVINGTON CROSS DRIVE SUITE 102 / LAS VEGAS, NEVADA 89144

POD-207

DREISER PARK AVENUE

BANNEKER PARK STREET

WINESBURG STREET

ELLINGTON PARK STREET

ELLISON PARK STREET

DURAND PARK CT.

DURAND PARK STREET

HELLMAN PARK STREET

BEECHER PARK AVENUE

IRVING PARK AVENUE

HAMMETT PARK AVENUE

EXIST. FRANKLIN PARK AVENUE

SHAUMBER ROAD

PULI ROAD

ON1

ON2

HP

HP

1.2CFS

2.9CFS

4.3CFS

1.0CFS

TO BE REMOVED

62CFS TRIBUTARY FROM PULI ROAD STORM DRAIN

POD-211

HAMMETT PARK AVE.

WORST CASE FINISH FLOOR			
STREET SECTION	V	D	V X D
1	9.6	0.7	6.7
2	6.6	0.9	6.0

HAMMETT PARK AVE.

EMERGENCY OVERFLOW	
STREET SECTION	DEPTH
1	0.8
2	1.1

GRAPHIC SCALE

150 0 75 150

(IN FEET)

1 inch = 150 ft.

LEGEND

- (4) STREET CROSS SECTION
- 1 DROP INLET
- P1 STORM SEWER
- FLOW DIRECTION
- STORM DRAIN

SUMMARY OF ULTIMATE FLOWS

STREET SECTION	Q100 (CFS)	Q10 (CFS)
1	72.0	31.0
2	72.0	31.0

STREET FLOW SUMMARY

STREET SECTION	Q100			Q10		
	V	D	V X D	V	D	V X D
MAX SLOPE	7.4	0.6	4.4	5.8	0.5	2.9
MIN SLOPE	4.3	0.8	3.4	3.1	0.6	1.9

DROP INLET SUMMARY

FACILITY	TYPE	Q100 (CFS)
1	15.0' MOD CM	25.1
2	12.5' MOD CM	12.1
3	12.5' MOD CM	12.1
6	10.0' MOD CM	8.0
7	10.0' MOD CM	8.0
8	4' TYPE A	NUISANCE
9	10.0' MOD CM	6.7

STORM SEWER SUMMARY

SEGMENT	DIAMETER	Q100 (CFS)
P1	24"	6.7
P2	42"	62.0
P3	42"	68.7
P4	42"	92.9
P5	36"	16.0
P6	42"	108.9
P7	54"	134.0

TOLL BROTHERS, INC.
FRANKLIN PARK
AT PROVIDENCE

FIGURE 8
STREET SECTIONS AND
FLOOD CONTROL FACILITIES

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
9900 COVINGTON CROSS DRIVE SUITE 102 /LAS VEGAS, NEVADA 89144

J:\Jobs\2153_FranklinPark\001_FP_Phase2A\TDS\FIGURES\UPDATE_2\Figure8.dwg 9/07/07 2:10pm mushmon

DS #: 3404

APN: 126-13-101-001; all of sect. 13 & parts of sect. 24

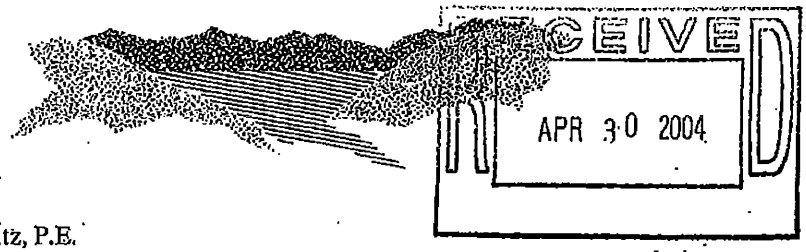
PROJECT: Cliff's Edge

SUBMITTAL: Concurrence Letters

SCANNED BY/DATE:

CHECKED BY/DATE:

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

Larry Brown
Chairman
City of Las Vegas

Chip Maxfield
Vice-Chairman
Clark County

Sharl Buck
City of North Las Vegas

Andy Hafen
City of Henderson

Michael Mack
City of Las Vegas

Mayor Bill Nicholes
City of Mesquite

Roger Tobler
City of Boulder City

Bruce L. Woodbury
Clark County

April 28, 2004

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. Fourth St
Las Vegas, NV 89101

DISTRICT CONCURRENCE: CLIFFS EDGE (DS3404) (RFCD NO. 04-5723)

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated August 13, 2003, Addendum No. 1 dated January 15, 2004, Addendum No. 2 dated March 2, 2004 and Supplement No. 1 dated March 12, 2004, for the above-mentioned project as submitted by VTN Nevada. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated March 19, 2004.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage.*

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by VTN Nevada may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Andrew R. Trelease, P.E.
Senior Civil Engineer

ART:css

c: James L. Fitzpatrick, P.E.,, VTN Nevada

File: 19-59-13.VTN

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.conrod.org*

Mayor
Michael L. Montandon

Council Members
William E. Robinson
Stephanie S. Smith
Sharl Buck
Robert L. Eliason



City Manager
Gregory E. Rose

Assistant City Manager
Dan Tarwater

Your Community of Choice
Public Works Department - Development & Flood Control
2266 Civic Center Drive • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696
www.cityofnorthlasvegas.com

April 27, 2004

Albert J. Jankowiak, P. E.
Flood Control Project Engineer
Department of Public Works
City of Las Vegas
731 South 4th Street
Las Vegas, NV 89101

Re: Master Drainage Study for Cliffs Edge
CNLV No. 15010

Dear Mr. Jankowiak:

Staff has reviewed the above referenced study, its two addenda and the supplement to the second addendum. In addition, the City of North Las Vegas is in receipt of the conditional acceptance letter by the City of Las Vegas Public Works Department.

Staff concurs with the acceptance of the Technical Drainage Study by the City of Las Vegas.

No liability is assumed by the City of North Las Vegas for the information, data, and conclusions of the Consulting Engineer. If you have any questions concerning this matter, please contact me at 633-1912.

Sincerely,

Stephen E. Casmus

Stephen E. Casmus, P.E.
Senior Engineer
Development and Flood Control Division

cc: James L. Fitzpatrick, P. E.
VTN Nevada
2727 South Rainbow Boulevard
Las Vegas, NV 89146-5148

Department of Development Services
Civil Engineering Division

500 S Grand Central Pky 1st Fl • PO Box 551799 • Las Vegas NV 89155-1799
(702) 455-4600 • Fax (702) 388-2550

Phil Rosenquist, Director • Carla J. Pearson, Assistant Director

May 14, 2004

VTN Nevada
2727 South Rainbow Boulevard
Las Vegas, Nevada 89146

MASTER DRAINAGE STUDY FOR CLIFFS EDGE - SEC 13 & 24, T 19 S., R 59 E. - HTE 04-15482

The above-referenced site is located in the City of Las Vegas adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence. The County has reviewed the study and all addenda. In addition, the County has received the acceptance letter dated May 7, 2004 from the City of Las Vegas.

Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas. The County concurs with the acceptance of this drainage study by the City of Las Vegas, subject to the following condition:

As set forth in the submittal:

1. The onsite and offsite flows are as developed in the Master Drainage Study Supplement # 2 to Addendum #2 and shown on Figure 5-N and 5-S in the submittal.

2. This approval does not allow any construction activity including grading, placement of fill or excavation of any kind. An approved technical drainage study shall be required prior to any construction activity.

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

DEPARTMENT OF DEVELOPMENT SERVICES

BY: _____

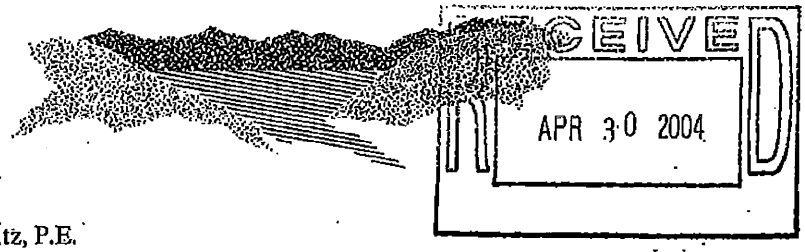
Todd L. Myers, P.E.
Senior Civil Engineer
Civil Engineering Division

TM: pts

cc: Albert J. Jankowiak, P.E.
City of Las Vegas Department of Public Works
Mike Hand, P.E.
Clark County Department of Public Works

BOARD OF COUNTY COMMISSIONERS
MARY KINCAID-CHAUNCEY, Chair • CHIP MAXFIELD, Vice-Chairman
YVONNE ATKINSON GATES • MARK A. JAMES • RORY REID • MYRNA WILLIAMS • BRUCE L. WOODBURY
THOM REILLY, County Manager

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

Larry Brown
Chairman
City of Las Vegas

Chip Maxfield
Vice-Chairman
Clark County

Sharl Buck
City of North Las Vegas

Andy Hafen
City of Henderson

Michael Mack
City of Las Vegas

Mayor Bill Nicholas
City of Mesquite

Roger Tobler
City of Boulder City

Bruce L. Woodbury
Clark County

April 28, 2004

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. Fourth St
Las Vegas, NV 89101

DISTRICT CONCURRENCE: CLIFFS EDGE (DS3404) (RFCD NO. 04-5723)

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated August 13, 2003, Addendum No. 1 dated January 15, 2004, Addendum No. 2 dated March 2, 2004 and Supplement No. 1 dated March 12, 2004, for the above-mentioned project as submitted by VTN Nevada. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated March 19, 2004.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage.*

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by VTN Nevada may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

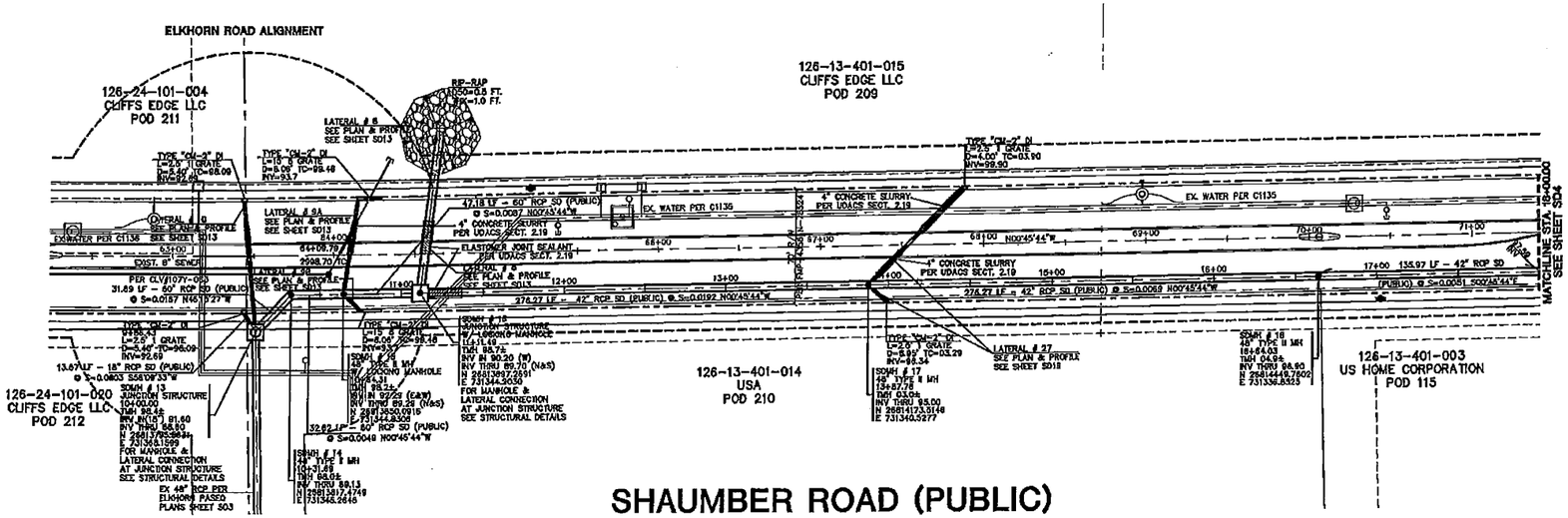
BY: _____
Andrew R. Trelease, P.E.
Senior Civil Engineer

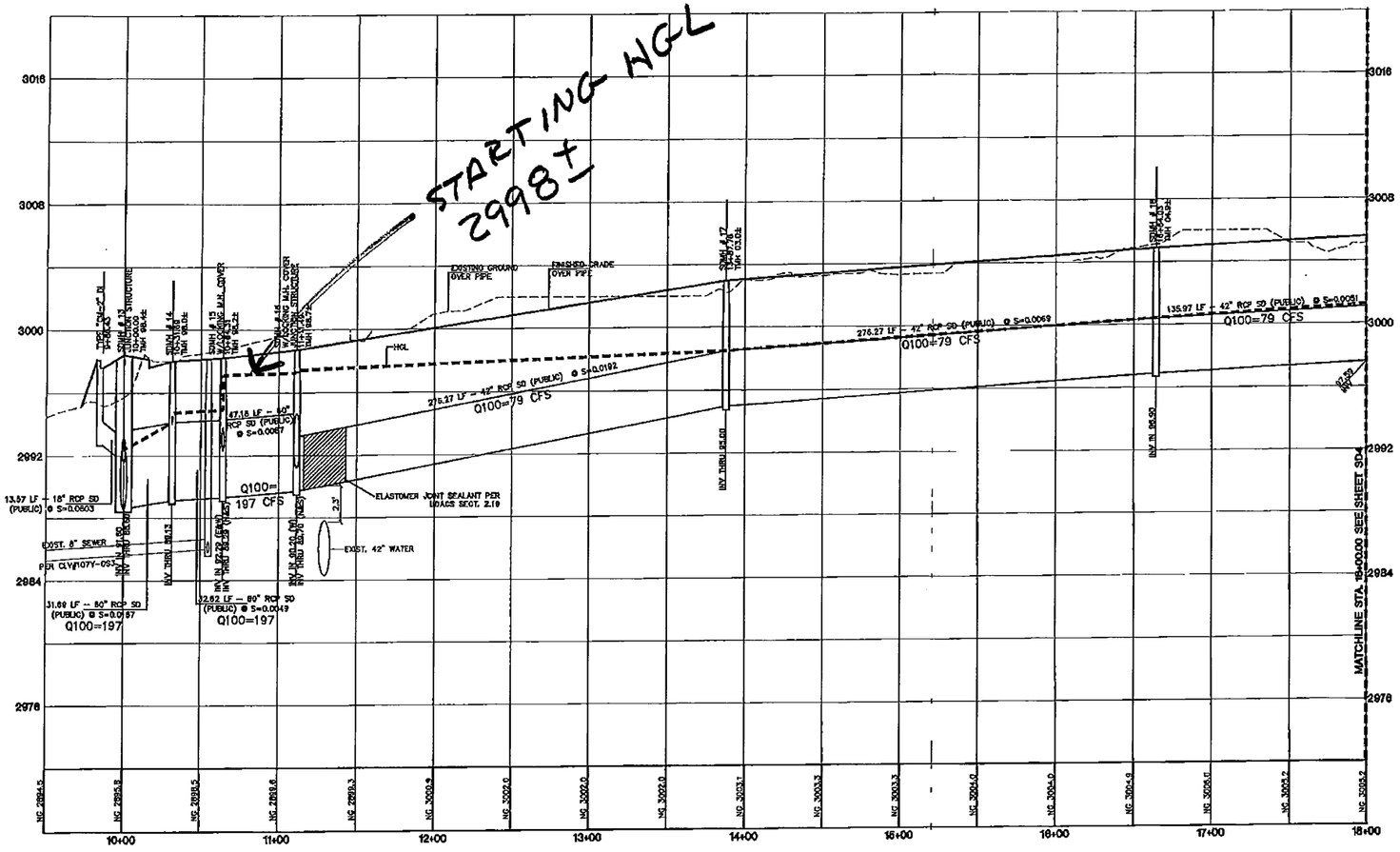
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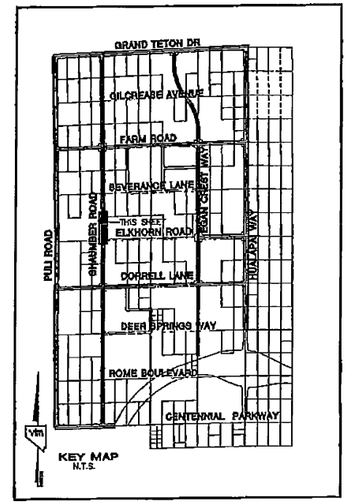
c: James L. Fitzpatrick, P.E.,, VTN Nevada

File: 19-59-13.VTN

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.ccrfcd.org*







NORTH

GRAPHIC SCALE

1" = 40'

CONTRACTOR NOTE:

CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

I CERTIFY THAT THIS PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT CITY OF LAS VEGAS FOR THIS PROJECT. 053017

DANIEL J. HOGG NO. 12811 — DATE 7-2-05

Call before you Underground 1-702-455-7511 CLARK COUNTY TRAFFIC OPERATIONS DIV. 1-702-229-6611 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Avoid cutting underground utility lines it's costly. Call before you Dig 1-800-227-2600

Avoid overhead power line contact it's costly. Call before you Overhead 1-702-227-2929

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS PROJECT IS NORTH 00°06'18" EAST BEING THE EAST LINE OF THE NORTHWEST QUARTER (NE 1/4) OF THE SECTION 24, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN FILE 123 AT PAGE 32.

PROJECT BENCHMARK

PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

CLARK COUNTY VERTICAL CONTROL: 1C00:898
NAVD88 ELEVATION: 787.794 METERS (2584.62 FEET)

RIVET AND SQUARE ALUMINUM PLATE IN A CONCRETE CYLINDER, LOCATED 25' SOUTH & 50' EAST OF GRAND CANYON DRIVE AND RED COACH AVENUE, 1' WEST OF ELECTRICAL VAULT.

CITY OF LAS VEGAS BENCHMARK

DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

CITY OF LAS VEGAS BENCHMARK: BLV99:13SES
NAVD88 ELEVATION: 869.605 METERS (2853.03 FEET)

RIVET AND PLATE IN CONCRETE CYLINDER NW CORNER OF HUALAPAI AND EUCHORN

NOTE: ADD 0.34' TO ABOVE CITY OF LAS VEGAS BENCHMARK BLV99:13SES TO MATCH ORIGINAL PROJECT BENCHMARK, CLARK COUNTY BENCHMARK 1C00-898 (2584.62 FEET) AS SHOWN ON RECORD OF SURVEY FILE 124 PAGE 94.

REV	DATE	BY	REVISION
1			
2			
3			
4			
5			
6			
7			

CLIFFS EDGE LLC
3455 CLIFF SHADOWS PARKWAY, SUITE 200
LAS VEGAS, NEVADA 89129
(702) 777-1251

CITY OF LAS VEGAS, NEVADA

2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-3145
PH. (702) 873-7540 FAX (702) 362-2597
nevada CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS

STORM DRAIN PLAN & PROFILE SHAUMBER ROAD STA. 10+00.00 TO 18+00.00

CLIFFS EDGE / PROVIDENCE SHAUMBER ROAD CENTENNIAL TO GRAND TETON

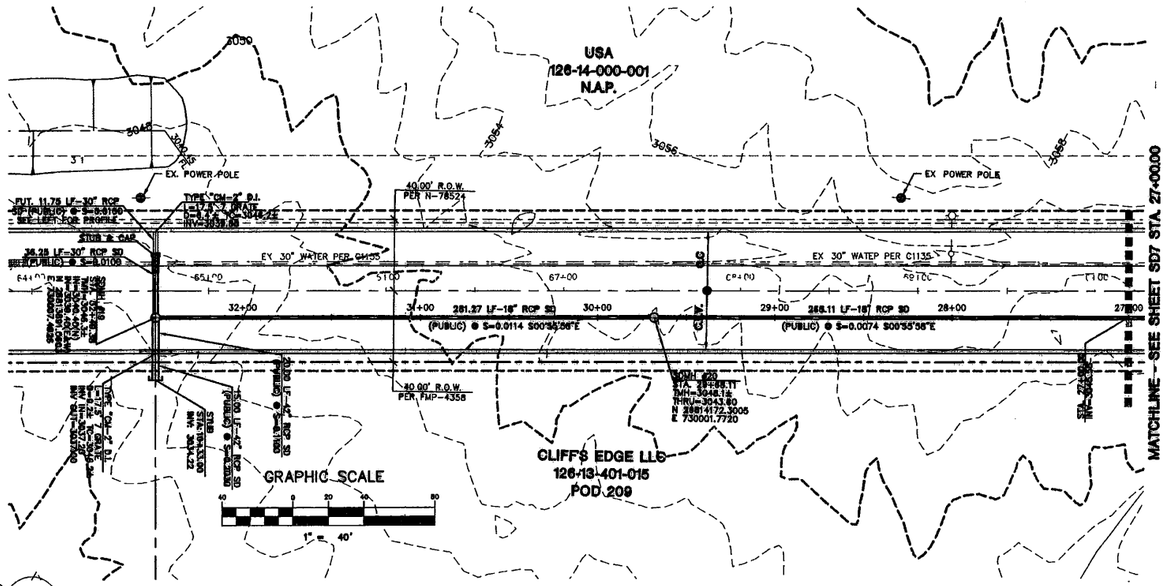
DRAWN BY: RDM — MAY'04
DESIGNED BY: M.HALL — MAY'04
CHECKED BY: JJG — MAY'04
PROJECT NO: 2999
SCALE: 1"=40' HORIZ. 1"=4' VERT.

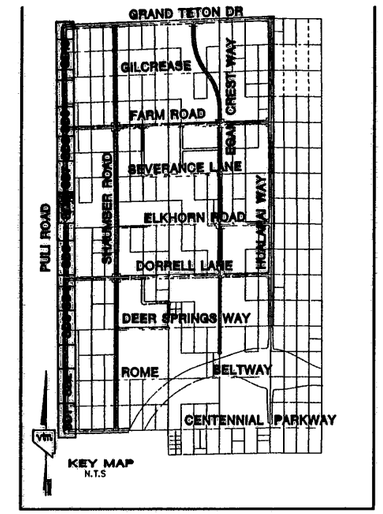
EXPIRES 06-30-07
PROFESSIONAL ENGINEER — STATE OF NEVADA
DANIEL J. HOGG No. 12811 CIVIL
7-2-05

SHEET SD3
18 OF 44 SHEETS
DRAWING NO. 1074816-SHTS

B3453

I:\2999\SHAUMBER\DWGS\SHAUMDWG

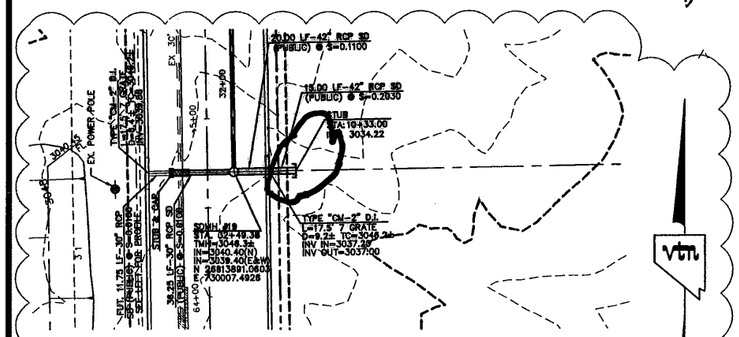




NORTH

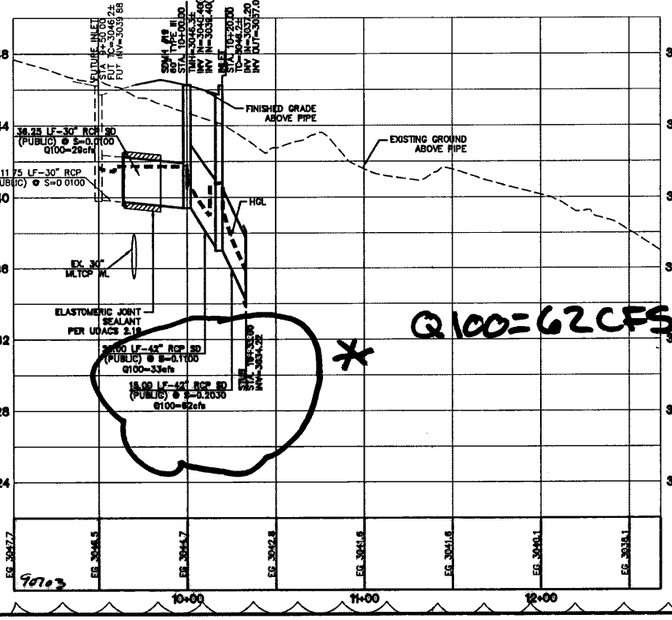
GRAPHIC SCALE
1" = 40'

CONTRACTOR NOTE:
CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.



LATERAL #31

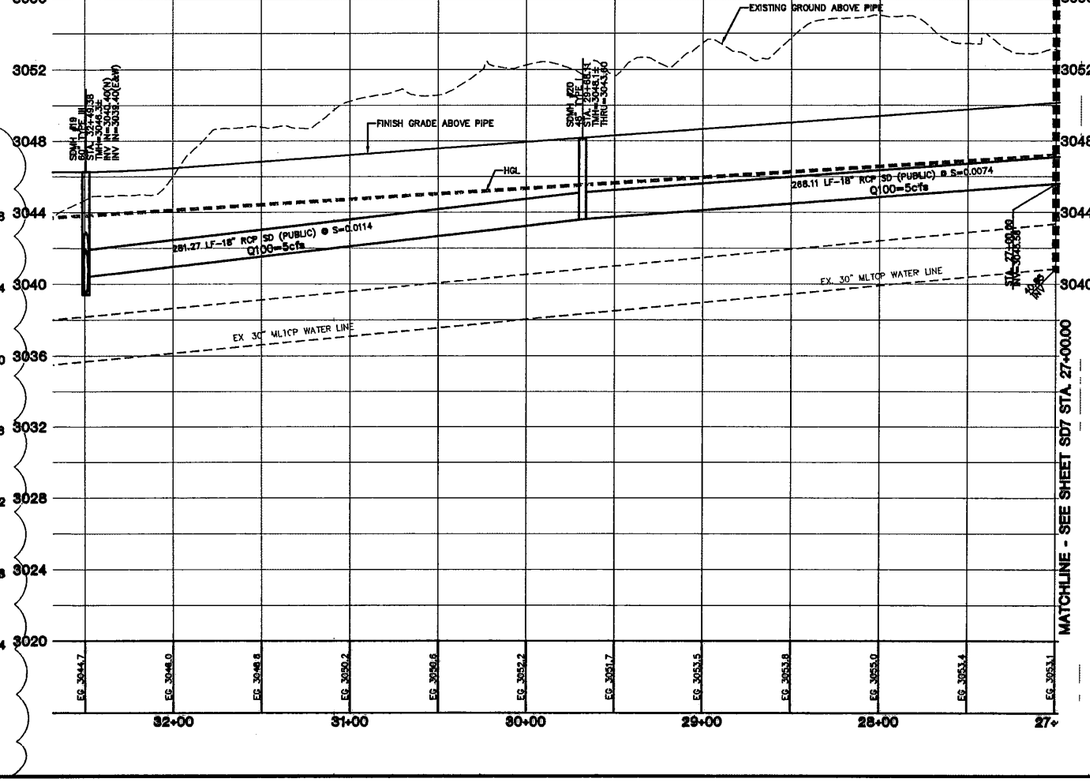
SEE RIGHT



Q100=62CFS

PULI ROAD

(PULIC R.O.W.)



"I CERTIFY THAT THIS PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT CITY OF LAS VEGAS FOR THIS PROJECT." #DS3617

DANIEL J. HOOD NO. 12811 DATE

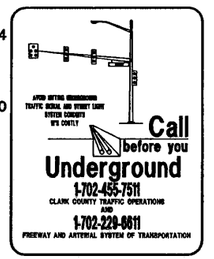
CLARK COUNTY DEPARTMENT OF DEVELOPMENT SERVICES

Acceptance of plans for filing

By _____

Acceptance of these plans for filing shall not be construed to be a permit for or an approval of any violation of any of the provisions of the state or county laws and/or specifications. Clark County shall be held free from damages which may result from the construction of the improvements from the engineering design depicted hereon.

NOTE: Power poles and/or other existing facilities not in proper location based on proposed improvements shown hereon will be relocated at no expense to Clark County



Avoid cutting underground utility lines it's costly

Call before you Dig
1-800-227-2600

Avoid overhead power line contact it's costly

Call before you Overhead
1-702-227-2929

BASIS OF BEARINGS
THE BASIS OF BEARINGS FOR THIS PROJECT IS NORTH 00°06'16" EAST BEING THE EAST LINE OF THE NORTHWEST QUARTER (NE 1/4) OF THE SECTION 24, TOWNSHIP 19 SOUTH, RANGE 58 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN ON A RECORD OF SURVEY ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN FILE 123 AT PAGE 32.

PROJECT BENCHMARK
PROJECT DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

CLARK COUNTY VERTICAL CONTROL: 1COO:8N8
NAVD88 ELEVATION: 787.784 METERS (2584.62 FEET)

RIVET AND SQUARE ALUMINUM PLATE IN A CONCRETE CYLINDER, LOCATED 25' SOUTH & 50' EAST OF GRAND CANYON DRIVE AND RED COACH AVENUE, 1' WEST OF ELECTRICAL VAULT.

CITY OF LAS VEGAS BENCHMARK
DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

CITY OF LAS VEGAS BENCHMARK: BLV99:13SE3
NAVD88 ELEVATION: 869.909 METERS (2853.63 FEET)

RIVET AND PLATE IN CONCRETE CYLINDER NW CORNER OF HUALAPAI AND ELKHORN

NOTE: ADD 0.34' TO ABOVE CITY OF LAS VEGAS BENCHMARK BLV99:13SE3 TO MATCH ORIGINAL PROJECT BENCHMARK; CLARK COUNTY BENCHMARK 1COO-8N8 (2584.62 FEET) AS SHOWN ON RECORD OF SURVEY FILE 124 PAGE 84.

HTE# 05-42792

REV	DATE	BY	REVISION
1	3/27/08	S.A.P.	REVISED LATERAL #31
2			
3			
4			
5			
6			
7			

CLIFFS EDGE LLC
3446 OLEY SPRINGS PARKWAY, SUITE 299
LAS VEGAS, NEVADA 89129
(702) 777-1221

CITY OF LAS VEGAS, NEVADA

vtn nevada CONSULTING ENGINEERS ● PLANNERS ● LAND SURVEYORS
2727 SOUTH RAINBOW BOULEVARD LAS VEGAS, NEVADA 89146-5148
PH (702) 873-7550 FAX (702) 362-2397

STORM DRAIN PLAN & PROFILE
PULI ROAD
STA. 27+00.00 TO 35+35.10

CLIFFS EDGE / PROVIDENCE
PULI ROAD - PHASE I

DRAWN BY: M.V.P. — JULY '06
DESIGNED BY: N.M. — JULY '06
CHECKED BY: B.R. — JULY '06
PROJECT NO: 5669
SCALE: 1"=40' HORIZ. 1"=4' VERT.

EXPIRES 06-30-07
PROFESSIONAL ENGINEER - STATE OF NEVADA
DANIEL HOOD
CIVIL
No. 12811

SHEET
SD6
21 OF 40 SHEETS

DRAWING NO.
107Y4816-P&P1

L:\2005\107Y4816\DWG\PULI\PULI-PHASE1.DWG

SECOND RESPONSE TO COMMENTS ON THE TECHNICAL DRAINAGE STUDY FOR FRANKLIN PARK AT PROVIDENCE PHASES 1 & 2

743.195

May 2005

Prepared for:

Toll Brothers, Inc.
1635 Village Center Circle, Suite 1
Las Vegas, Nevada 89134
Phone: (702) 243-9800
Fax: (702) 243-9610

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

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

TO: **Land Development Services** Department of Public Works	**DATE:** September 29, 2006 **FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Technical Drainage Study for: **Franklin Park at Providence (Phases 1 & 2)** **– Update for Onsite Park**	**COPIES TO:** G.C. Wallace, Inc.
Cross Streets: NWC of Shaumber Road & Elkhorn Road	Toll Brothers, Inc.
File Number: F:\Depot\DSMEMOS\DS3744G.doc	Bart Anderson, P.E., DevCo
Parcel Number: 126-13-410-001	
Zoning Action: TMP-5798	
FEMA Flood Zone: YES / NO X	
Proppsed Storm Drain: YES X / NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	2/16/2005	3/2/2005	Not Approved	$400.00	16388: $400
2nd Submittal	4/11/2005	4/25/2005	Not Approved	$400.00	19719: $400
3rd Submittal	5/9/2005 & 5/26/2005	5/27/2005	Conditional Approval	$400.00	21489: $400
Permission Letter Rec'd	6/16/2005	6/17/2005	Not Approved	N/C	N/C
4th Submittal	8/7/2006, 9/12/2006 & 9/29/2006	9/29/2006	See Comments Below	$100.00	51091: $100
			TOTAL FEES (LDDRS):	**$1,300.00**	----

REMARKS:

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

X	is approved subject to conformance to all City standards and the following conditions:
	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 the following conditions:

The following comments are repeated until they are complete:

1. *The project proposes to build a temporary drainage facility at the west boundary along Puli Road. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements and post a minimum maintenance bond of $25,000 or 25-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an 8.5-inch by 11-inch exhibit that adequately shows the location and limits of the drainage facility to Flood Control for approval. The engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.*
2. *This study addresses Phase 1 and Phase 2 developments. A technical drainage study will be required to address the last phase (Phase 3) upon development.*

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of Las Vegas Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

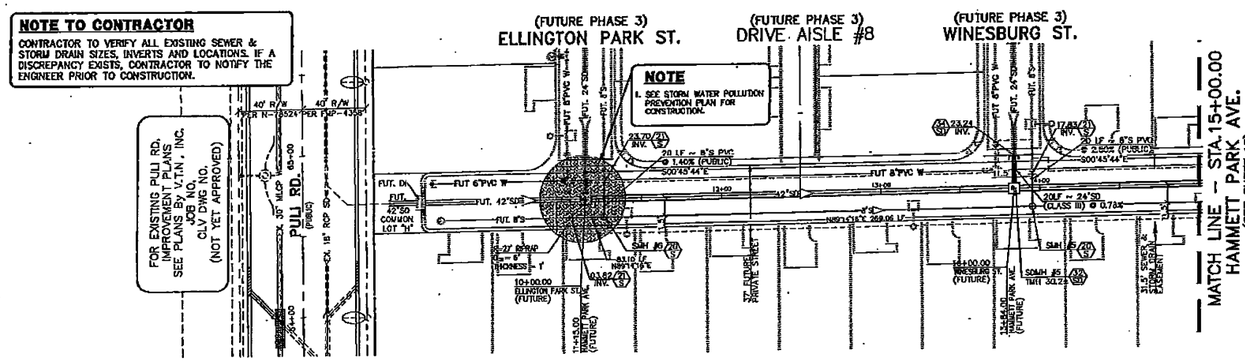
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on 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
B&H/ays

T/R/S: T19S/R59E/13
AREA F-13

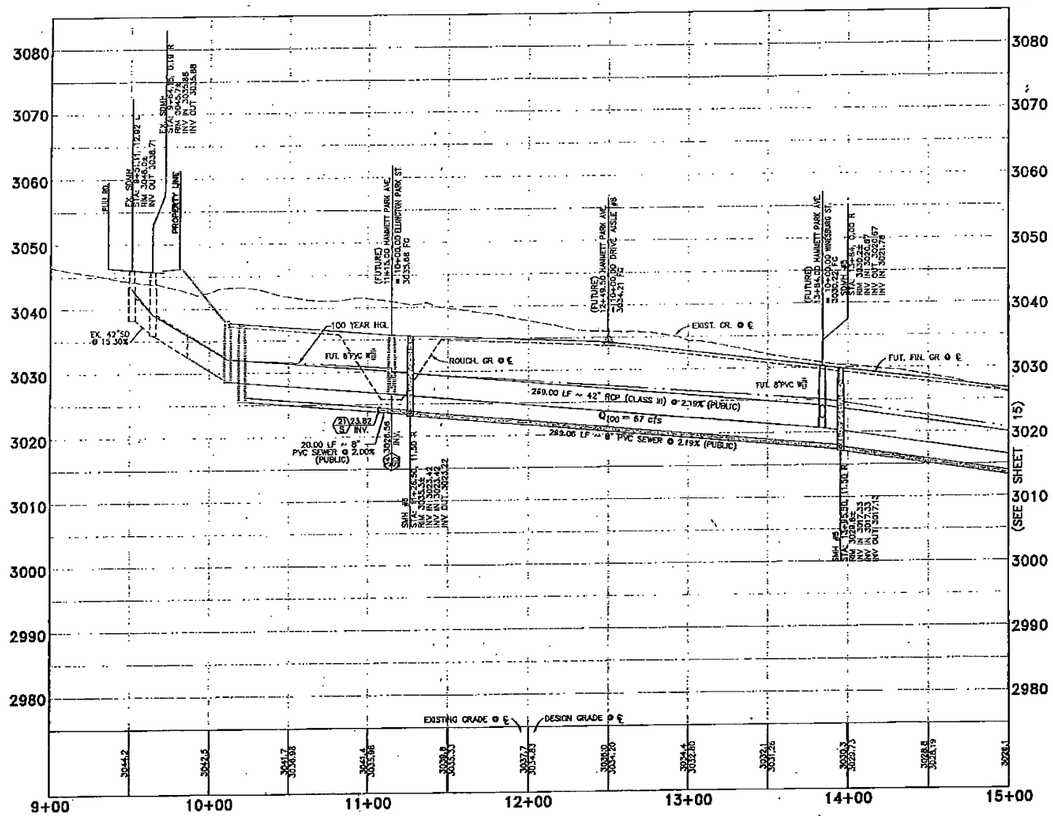
NOTE TO CONTRACTOR

CONTRACTOR TO VERIFY ALL EXISTING SEWER & STORM DRAIN SIZES, INVERTS AND LOCATIONS. IF A DISCREPANCY EXISTS, CONTRACTOR TO NOTIFY THE ENGINEER PRIOR TO CONSTRUCTION.



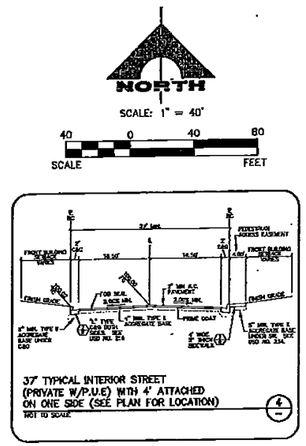
OFFSITE SEWER AND STORM (FUTURE HAMMETT PARK AVE.) (PRIVATE)

SCALE: HORIZ. 1" = 40'
VERT. 1" = 10'



NOTE

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
2. ALL PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
3. SEE THE UTILITY PLANS (SHEETS 17, 18, & 19) FOR WATER LINE DESIGN AND CONSTRUCTION INFORMATION.
4. FOR STREETLIGHTS SEE STREETLIGHT and TRAFFIC PLANS (SHEETS 20, 21, & 22).
5. FOR DRIVE AISLE INFORMATION SEE THE GRADING PLANS (SHEETS 6, 7, & 7).
6. FOR CONSTRUCTION NOTES SEE SHEET 2.



37' TYPICAL INTERIOR STREET (PRIVATE W/P.U.E) WITH 4' ATTACHED ON ONE SIDE (SEE PLAN FOR LOCATION)
NOT TO SCALE

BENCHMARK

BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. BL999 1364	RIVET AND PLATE IN CONCRETE CYLINDER AT THE NORTHWEST CORNER OF MAULAPAI WAY AND PARK ROAD	2860.79 (FEET)	871.971 (METERS)

BASIS OF BEARINGS

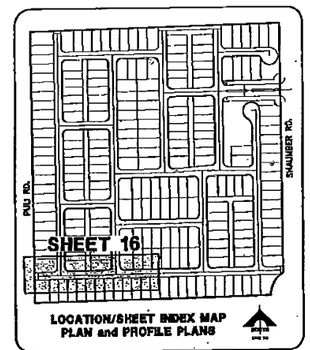
SOUTH 00°19'04" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA.

LEGAL DESCRIPTION:

LOT 209 OF BLOCK 4 AS SHOWN BY MAP OF "CLIFFS EDGE PARENT" ON FILE IN BOOK 118, PAGE 88 OF PLATS IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA, LYING WITHIN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA.

Avoid buried underground utility lines. It's costly.
Call before you Dig.
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UNDERGROUND SERVICE (USA)

Avoid hitting overhead power lines. It's easy.
CALL BEFORE YOU DO OVERHEAD
CALL 1-702-227-2929



LOCATION/SHEET INDEX MAP PLAN and PROFILE PLANS

CLV DRAWING NO. 1074898-1

STATE OF NEVADA — KEITH HATTON — No. 15908 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — DATE: 10/30/07

DESIGN: DFF	DRAWN: SWH	CHECK: KH	ISSUE DATE:	ISSUE BY/FOR:	PLOT DATE: 10-19-06	PLOT TIME: 15:44:37

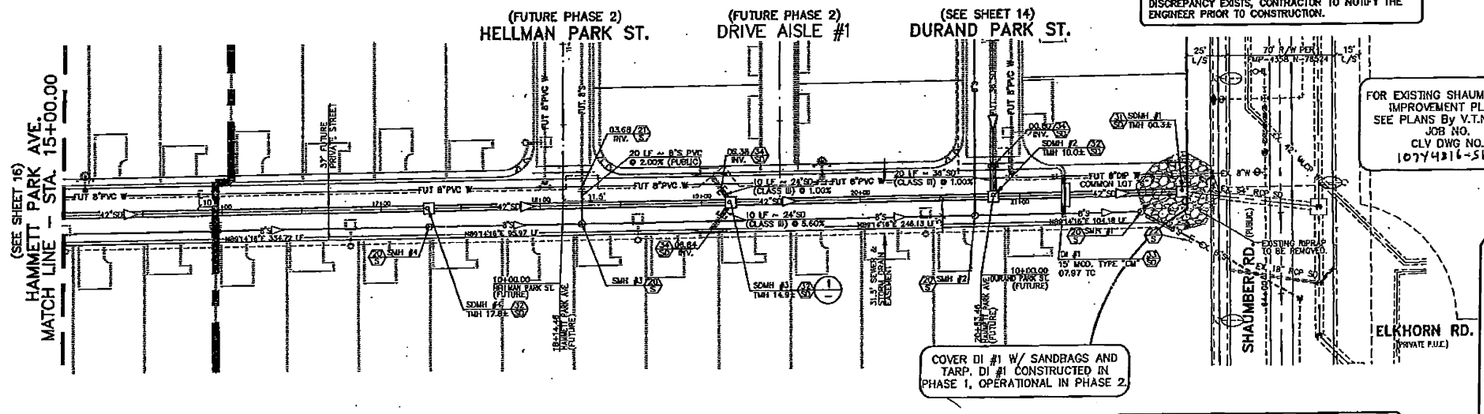
NO.	DATE	DESCRIPTION
1	10/30/07	ISSUED FOR ISSUE DATE

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

FRANKLIN PARK AT PROVIDENCE - PHASE 1 (POD 209)
A RESIDENTIAL PLANNED DEVELOPMENT
TOLL BROTHERS
OFFSITE SEWER AND STORM
(FUTURE HAMMETT PARK AVE) PLAN and PROFILE II

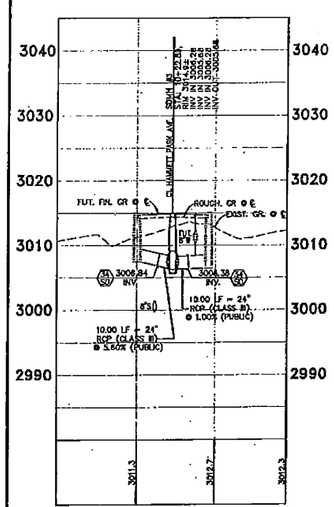
DRAWING 16
16 OF 22 SHTS

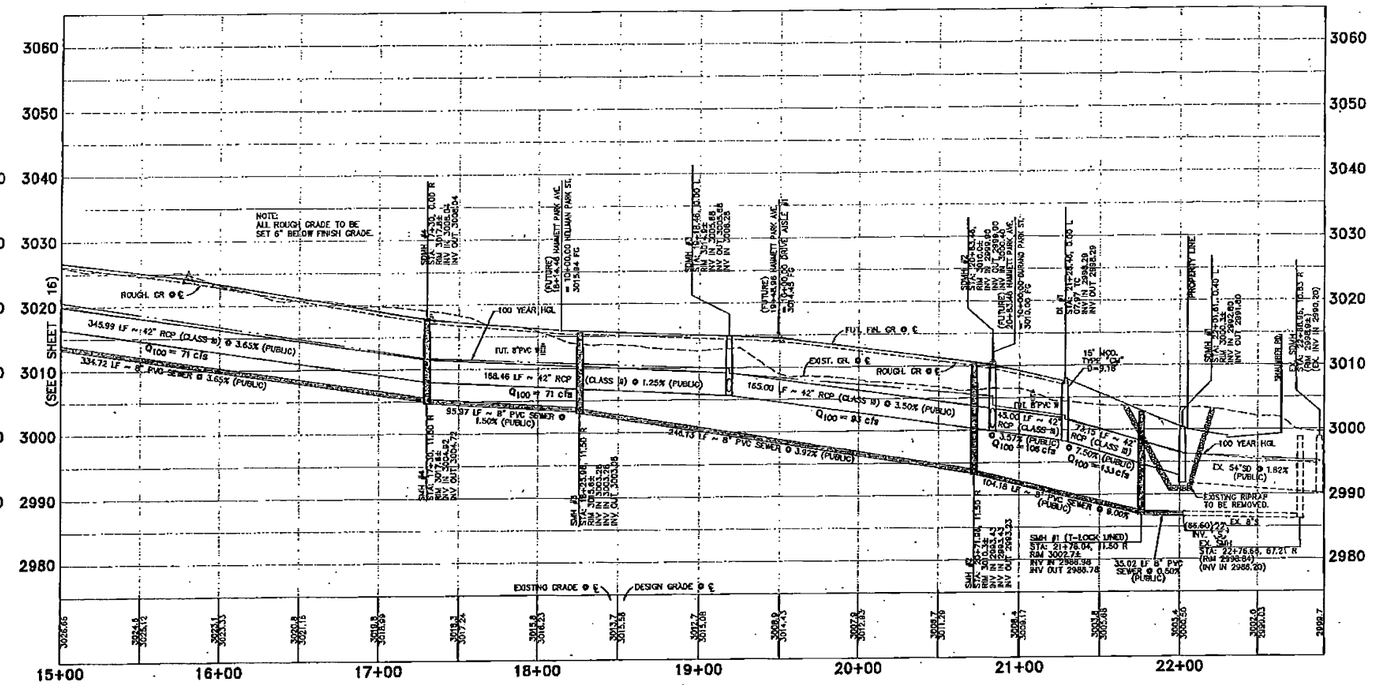
743185

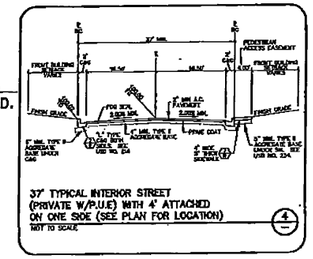


OFFSITE SEWER AND STORM (FUTURE HAMMETT PARK AVE.) (PRIVATE)

SCALE: HORIZ. 1" = 40'
VERT. 1" = 10'







NOTE

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
2. ALL PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
3. SEE THE UTILITY PLANS (SHEETS 17, 18, & 19) FOR WATER LINE DESIGN AND CONSTRUCTION INFORMATION.
4. FOR STREETLIGHTS SEE STREETLIGHT and TRAFFIC PLANS (SHEETS 20, 21, & 22).
5. FOR DRIVE AISLE INFORMATION SEE THE GRADING PLANS (SHEETS 5, 6, & 7).
6. FOR CONSTRUCTION NOTES SEE SHEET 2.

BENCHMARK

BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. 13,909 13E4	RIVET AND PLUG IN CONCRETE CURB AT THE NORTHWEST CORNER OF HUALAPAI WAY AND FARM ROAD	2860.79 (FEET)	871.971 (METERS)

BASIS OF BEARINGS

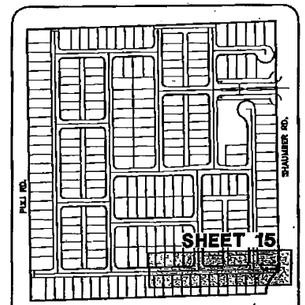
SOUTH 00°19'04" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CLARK COUNTY, NEVADA.

LEGAL DESCRIPTION:

LOT 209 OF BLOCK 4, AS SHOWN BY MAP OF "CLIFFS EDGE PARENT" ON FILE IN BOOK 118, PAGE 88 OF PLATS IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA, LYING WITHIN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST M.D.M., CLARK COUNTY, NEVADA.

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CLV DRAWING NO. 107448981

STATE OF NEVADA — KEITH J. HAJAGOS — 13466 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — DATE 10/29/15

DESIGN: JEF
DRAWN: LGY
CHECK: JEH
ISSUE DATE:
PLOT DATE: 10-29-15
PLOT TIME: 15:44:29

ISSUE DATE | BY | DESCRIPTION
ISSUED FOR: FINAL APPROVAL

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
I:\743\195\Dwg\Phase 1\Prints\743195-Sht1.dwg

FRANKLIN PARK AT PROVIDENCE - PHASE 1 (POD 209)
A RESIDENTIAL PLANNED DEVELOPMENT
TOLL BROTHERS
OFFSITE SEWER AND STORM
(FUTURE HAMMETT PARK AVE) PLAN and PROFILE I

DRAWING 15
15 OF 22 SHTS
743195

DEVELOPED ONSITE		
BASIN	Q10	Q100
102A	27	58
102B	17	34
103	34	71
104	13	33
105	23	56
106A	38	79
106B	22	45
107	59	117
108	35	70
109	36	73
110A	9	31
110B	9	31
111	9	31
112A	7	23
112B	2	8
113	25	61
114A	23	58
114B	13	33
115A	40	85
115B	11	22
116A	28	58
116B	27	58
117A	23	58
117B	13	33
118	52	109
119	29	73
121	34	71
122	32	69
123	50	123
123A	13	32
124	12	41
125	19	39
126	32	67
127	7	24
201	35	73
202	35	73
203	35	72
204	35	72
205A	54	108
205B	22	43
206	59	118
207A	52	107
207B	17	37
208A	20	41
208B	19	40
209	45	114
210	16	30
211	68	140
212	42	89
301	38	76
302	8	25
302A	7	18
303	38	76
303A	38	76
304	17	43
305	32	70
306	92	198
307	38	76
308	22	46
308A	9	18
309	39	77
OUT1	6	16
OUT2	9	21

COMBINATION POINTS		
NAME	Q10	Q100
CP-1	75	188
CP-9	76	152
CP-10	88	207
CP-13	32	86
CP-20	63	227
CP-21	70	146
CP-50	31	121
CP-51	70	145
CP-53	62	128
CP-56	108	242
CP-57	53	107
CP-61	207	414
CP-62	74	150
CP-68	74	152
CP-75	67	168
CP-76	5	62
CP-77	63	151
CP-78	63	197
CP-84	12	39

DEVELOPED OFFSITE		
NAME	Q10	Q100
DEV-1	14	60
DEV-2	17	64
DEV-3	4	36
DEV-4	2	28
DEV-5	14	65
DEV-6	23	85
DEV-7	31	114
DEV-8	31	113

MISC.		
NAME	Q10	Q100
DIV1	34	78
DIV2	18	44
D1	16	37
D2	6	14
DIVSD1	49	115
DSD1	13	13
KYLDET	363	363
RET01	14	33
REG-2A	62	186
REG-2B	148	372
REG-2C	151	384
REG-3A	95	233
REG-3B	169	396
REG-3C	137	419
REG-4A	85	230
REG-4B	112	291
REG-4C	131	331
REG-4D	151	371
REG-4E	152	373
REG-6A	78	211
REG-7A	61	188
REG-67	244	659
REG567	277	748
RG4567	410	1077

GRAPHIC SCALE

300 0 150 300 600

1" = 300'

FLOWS DISCHARGING AT BORDERS OF SITE

0	10-YR SURFACE FLOW (CFS)
0	100-YR SURFACE FLOW (CFS)
805	10-YR STORM DRAIN FLOW (CFS)
1267	100-YR STORM DRAIN FLOW (CFS)

FLOWS IN INTERIOR OF SITE

2	STORM DRAIN TYPE — SEE DESCRIPTION ON RIGHT
0	10-YR SURFACE FLOW (CFS)
29	100-YR SURFACE FLOW (CFS)
68	10-YR STORM DRAIN FLOW (CFS)
115	100-YR STORM DRAIN FLOW (CFS)

SD TYPE	DESCRIPTION
1	ULTIMATE CONDITION 10-YEAR FLOW CONTAINED IN STORM DRAIN
2	ULTIMATE CONDITION 100-YEAR FLOW (MINUS CURB HEIGHT FLOW) CONTAINED IN STORM DRAIN
3	REGIONAL FACILITY – ULTIMATE CONDITION 100 YEAR FLOW CONTAINED IN STORM DRAIN
4	FLOW CORRIDOR TO BE CONSTRUCTED WITH INDIVIDUAL PODS. ASSUME TO BE EASEMENTS WITH ANY TRIBUTARY STORM DRAIN DISCHARGING INTO EASEMENT

LEGEND

- DEV-1 OFFSITE BASIN NAME
- •CP-9 COMBINATION POINT
- *REG-4 LARGE BASIN — SEE FIGURE REG
- DIV25 FLOW REMAINING IN HEC-1 DIVERSION CARD
- D25 FLOW SPLIT OUT IN HEC-1 DIVERSION CARD
- (126) ONSITE BASIN NAME / POD NUMBER
- FLOW CORRIDOR LOCATIONS
- INFRASTRUCTURE R.O.W. LOCATIONS
- FLOW PATTERNS WITHIN BASINS / PODS
- BASIN / POD DELINEATION

Puli Storm Drain

This grading plan is a part of drainage study # 3964 which was received on 3/4/04 and Page 5 Of 5

FIGURE 5-N
BASIN MAP
INTERIM CONDITION
NORTH OF ELKHORN
CLIFFS EDGE
ADD #2 TO MDS
W.O. #5969

J:\5969-CLIFFS EDGE\ENGR\MDS-ADD2\5969-MDS-BASIN_SCH-ADD2.dwg, 02/27/2004 11:13:33 AM, mathieh, mathieh

SUBBASIN OF OFF1*
REFERENCED FROM SECOND UPDATE



N

40' 0' 40' 80'

SCALE: 1" = 80'

LEGEND

- PROPOSED FLOW DIRECTION
- PROPOSED SUBBASIN BOUNDARY
- EXISTING STORM DRAIN PIPE
- ON1 — PROPOSED DRAINAGE SUBBASIN
- EW — PRORATED BASIN
- C1 ● — PROPOSED CONCENTRATION POINT
- 1 — CROSS SECTION LOCATION
- PRORATED BASIN BOUNDARY
- C1 — PRORATED CONCENTRATION POINT

* REVISED STORM FLOWS

DEVELOPED CONDITIONS
HEC-1 MODEL SUMMARY

SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
OFF1*	85	134	43
ON1W	14.1	~~35~~ 34	14
ON1E	14.7	36	15
CP1R	N/A	69	29
CP1RR	N/A	~~191~~ 192	67
ON2W	1.2	4	1
ON2E	6.9	20	9
CP2R	N/A	23	10

DEVELOPED CONDITIONS
PRORATE BASIN SUMMARY

PRORATED BASIN	BASIN AREA ACRES	CFS/ACRE	100-YEAR CFS
A1	2.2	2.34	5.1
A2	1.0	2.34	2.3
B	3.5	2.34	8.2
C	4.2	2.34	9.8
D	2.1	2.34	5.0
EW	1.1	2.34	2.6
EE	0.9	2.44	2.2
F	1.5	2.44	3.7
G	2.8	2.44	6.9
H	5.5	2.44	13.5
I	2.6	2.44	6.0
j	1.5	2.44	3.7

DEVELOPED CONDITIONS
PRORATE CONCENTRATION POINT SUMMARY

CONCENTRATION POINT	PRORATED BASINS	100-YEAR CFS
CA	B+F+EW+EE+0.7 FS	17.4
CB	CA+H-1.5 FS	29.4
CC	A1+A2+C-1.2 FS	16.0
CD	CC+D + G+I+ 1.5 FS +0.5 FS	35.9
CE	CD+CB+J	69.0

100-YEAR
HYDRAULIC SECTIONS- ULTIMATE CONDITIONS

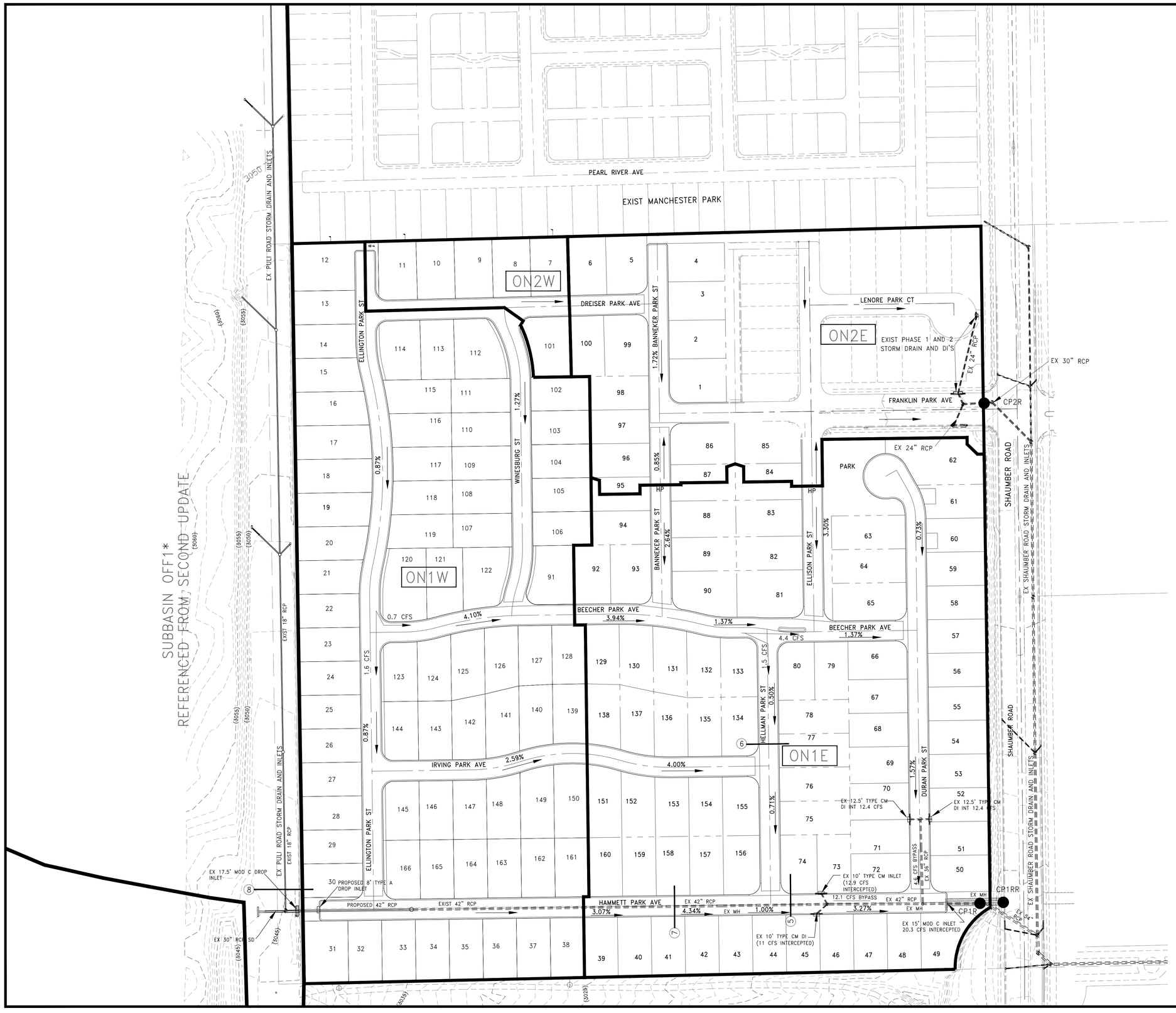
Location	Slope (%)	Q_{100} (cfs)	D_{100} (ft)	V_{100} (ft/sec)	D^*V_{100}
Section 1 Capacity	1.37	12.5	0.50	3.71	n/a
Section 6 Flattest	0.5	69	0.78	3.97	3.1
Section 7 Steepest	4.34	69	0.56	7.73	4.3

* APPROVED ORIGINAL FIGURE 6 FOR UPDATE #3

FRANKLIN PARK
TOLL BROTHERS

FIGURE 6
DEVELOPED CONDITIONS MAP

RCI Engineering
3281 S. HIGHLAND DRIVE SUITE 810, LAS VEGAS, NV 89109
PH#702.453.0800 FAX#702.453.0801



LEGEND

- PROPOSED FLOW DIRECTION
- PROPOSED SUBBASIN BOUNDARY
- EXISTING STORM DRAIN PIPE
- ON1 — PROPOSED DRAINAGE SUBBASIN
- C1 — PROPOSED CONCENTRATION POINT
- (1) — CROSS SECTION LOCATION

DEVELOPED CONDITIONS HEC-1 MODEL SUMMARY

SUBBASIN OR CP	BASIN AREA (AC)	100 YR (cfs)	10 YR (cfs)
OFF1*	85	134	43
ON1W	14.1	34	14
ON1E	14.7	36	15
CP1R	N/A	69	29
CP1RR	N/A	192	67
ON2W	1.2	4	1
ON2E	6.9	20	9
CP2R	N/A	23	10

100-YEAR HYDRAULIC SECTIONS

Location	Slope (%)	Q_{100} (cfs)	D_{100} (ft)	V_{100} (ft/sec)	D^*V_{100}
Section 5 Capacity	1.00	192	1.02	7.32	n/a
Section 6 Flattest	0.50	69	0.78	3.97	3.1
Section 7 Steepest	4.34	69	0.56	7.73	4.3
Section 8 PULI-EX	0.73	134	0.87	3.41	N/A
Section 8 PULI-DEV	0.73	62	0.70	3.33	2.3

FRANKLIN PARK
TOLL BROTHERS

FIGURE 6R
DEVELOPED CONDITIONS MAP

RCI Engineering
4325 DEAN MARTIN DRIVE, SUITE 300 LAS VEGAS, NV 89103
PH#702.453.0800 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
BY Toll Brothers

APN 126-13-401-020
CITY OF LAS VEGAS, NEVADA
15.36 +/- ACRES
SID DISTRICT 607

LEGAL DESCRIPTION

A PORTION OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13; THENCE SOUTH 88°31'50" WEST ALONG THE NORTH LINE OF SAID SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4), A DISTANCE OF 545.15 FEET TO THE WEST BOUNDARY OF THAT CERTAIN PLAT OF "FRANKLIN PARK AT PROVIDENCE PHASE 1" ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN BOOK 130, PAGE 93 OF PLATS, SAME BEING THE POINT OF BEGINNING;

THENCE ALONG THE WEST AND SOUTH BOUNDARY OF SAID PLAT THE FOLLOWING SIX (6) COURSES:
ONE (1) SOUTH 00°45'42" EAST, A DISTANCE OF 339.06 FEET;
TWO (2) NORTH 89°14'16" EAST, A DISTANCE OF 108.00 FEET TO THE BEGINNING OF A CURVE CONCAVE SOUTHWESTERLY, HAVING A RADIUS OF 20.00 FEET;
THREE (3) SOUTHEASTERLY 31.42 FEET ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 90°00'00";
FOUR (4) SOUTH 00°45'44" EAST, A DISTANCE OF 10.67 FEET;
FIVE (5) NORTH 89°14'16" EAST, A DISTANCE OF 37.00 FEET;
SIX (6) SOUTH 00°45'44" EAST, A DISTANCE OF 0.83 FEET TO THE SOUTHERLY LINE OF COMMON LOT "E" AS SHOWN ON SAID MAP;

THENCE ALONG SAID SOUTHERLY LINE OF SAID COMMON LOT "E" THE FOLLOWING FOUR (4) COURSES:
ONE (1) NORTH 89°14'16", A DISTANCE OF 258.46 FEET;
TWO (2) SOUTH 00°45'44" EAST, A DISTANCE OF 12.00 FEET;
THREE (3) SOUTH 45°45'44" EAST, A DISTANCE OF 25.46 FEET;
FOUR (4) NORTH 89°14'16" EAST, A DISTANCE OF 12.00 FEET TO THE WEST LINE OF COMMON ELEMENT "P" AS SHOWN ON SAID PLAT;

THENCE SOUTH 00°45'44" EAST ALONG SAID WEST LINE, A DISTANCE OF 807.29 FEET TO THE BEGINNING OF A NON-TANGENT CURVE, CONCAVE SOUTHEASTERLY, HAVING RADIUS OF 123.80 FEET, A RADIAL LINE TO SAID BEGINNING BEARS NORTH 29°45'04" WEST; THENCE SOUTHWESTERLY 132.90 FEET ALONG SAID CURVE AND SAID WEST LINE, THROUGH A CENTRAL ANGLE OF 61°30'23" TO THE SOUTH LINE OF SAID SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13; THENCE SOUTH 88°44'33" WEST ALONG SAID SOUTH LINE, A DISTANCE OF 1159.67 FEET TO THE EAST LINE OF COMMON ELEMENT "O" AS SHOWN ON THAT CERTAIN PLAT OF "CLIFFS EDGE PARENT" ON FILE IN THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE IN BOOK 118, PAGE 88 OF PLATS; THENCE NORTH 00°55'58" WEST ALONG SAID EAST LINE, A DISTANCE OF 1317.69 FEET TO THE NORTH LINE OF SAID SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13; THENCE NORTH 88°31'50" EAST ALONG SAID NORTH LINE, A DISTANCE OF 773.95 FEET TO THE POINT OF BEGINNING.

CONTAINING AN AREA OF 33.20 ACRES.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

RIVET & PLATE CONCRETE PAD (ELECTRIC) 200'+/- SW OF P.I. OF ELKHORN RD & SCHAUMBER RD (LANSFORD ST)

ELEVATION = 914.637 METERS (2008 ADJUSTMENT)
ELEVATION = 3000.77 U.S. SURVEY FEET (2008 ADJUSTMENT)

BASIS OF BEARINGS

NORTH 00°45'09" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN MAP ON FILE IN THE CLARK COUNTY'S RECORDER'S OFFICE IN BOOK 118, PAGE 88 OF PLATS.

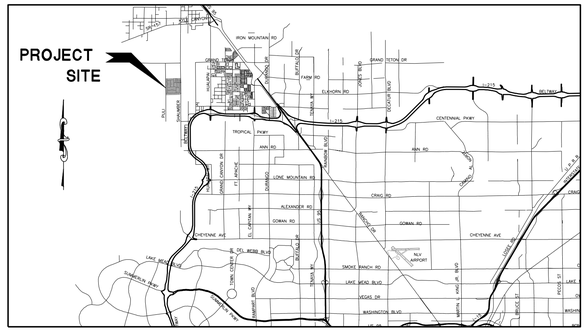
SHEET INDEX

SHT No.	DWG ID	DRAWING DESCRIPTION
1	C-1	COVER SHEET
2	N-1	GENERAL NOTES
3	N-2	LEGEND AND ABBREVIATIONS
4	G-1	GRADING PLAN (SHEET 1 OF 4)
5	G-2	GRADING PLAN (SHEET 2 OF 4)
6	G-3	GRADING PLAN (SHEET 3 OF 4)
7	G-4	GRADING PLAN (SHEET 4 OF 4)
8	D-1	GRADING DETAIL (SHEET 1 OF 2)
9	D-2	GRADING DETAIL (SHEET 2 OF 2)
10	P-1	PLAN AND PROFILE-HAMMETT PARK AVE

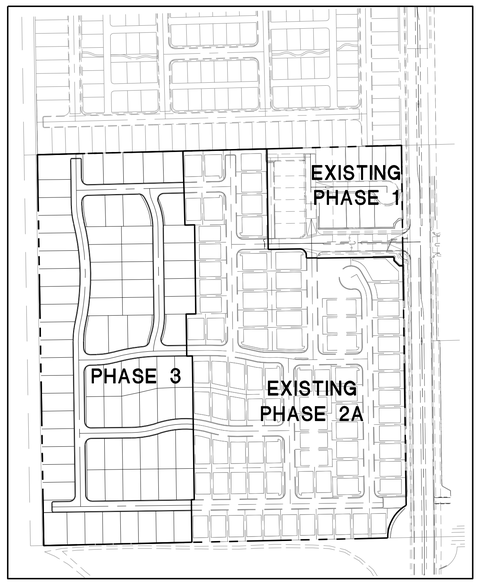
OWNER
TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

DEVELOPER
Toll Brothers
America's Luxury Home Builder
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NEVADA 89144
PH#702.243.9800 FAX#702.243.9610

DESIGN ENGINEER:
RCI Engineering
4325 Dean Martin Drive Suite 300 Las Vegas, Nevada 89103
PH#702.453.0800 FAX#702.453.0801



VICINITY MAP
NOT TO SCALE



SITE PLAN
NOT TO SCALE

APPROVED BY:

NV ENERGY

NV ENERGY COMPANY — DATE

NV ENERGY COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

CENTRAL TELEPHONE COMPANY, D/B/A CENTURYLINK

CENTRAL TELEPHONE COMPANY, D/B/A CENTURYLINK — DATE

THE CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

SOUTHWEST GAS

SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS LAS VEGAS INC.

COX COMMUNICATIONS LAS VEGAS INC. — DATE

CITY OF LAS VEGAS

DATE

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

CHRIS KNIGHT, DIRECTOR, BUILDING AND SAFETY — DATE
CITY OF LAS VEGAS PLANNING MANAGER

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

CITY OF LAS VEGAS FIRE DEPARTMENT

CITY OF LAS VEGAS FIRE DEPARTMENT — DATE

LAS VEGAS VALLEY WATER DISTRICT APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
PROJECT # ___ DATE: _____
(SHEETS C-1, N-1, N-2

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

Avoid overhead power line contact. It's costly.
Call before you Overhead
1-702-227-2929
Nevada Power Environment and Safety Services Department

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 or
1-800-227-2600
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 24, 2014
HORIZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI Engineering
4325 Dean Martin Drive Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
COVER SHEET
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
C-1
SHT 1 OF 10

DWG #
CLV PROJECT #

O:\3110_Toll\0003_FranklinPark_CIVIL\PS\PHASE II UNIT 2\S001_C01.dwg scarabay 9/24/14 10:09pm

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE. FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY NOVA GEOTECHNICAL PROJECT. E-12-044, DATED MAY, 25 2012 APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER. WALL NOTES:
16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, ANDSEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF +/– 0.1 METER (+/– 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. SANITARY SEWER SERVICE LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE SEWER SERVICE LATERAL TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERAL EXITS THE PUBLIC RIGHT-OF-WAY. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUAL.
23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST ADDITION.
24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

CITY OF LAS VEGAS TRAFFIC NOTES

1 ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

2 THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.

3 BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

4 WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.

5 IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.

6 THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREETNAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.

7 WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.

8 ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

9 STREET SIGNS AND STOPS SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.

10 THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.

11 WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.

12 THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.

13 GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.

14 ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.

15 THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

CITY OF LAS VEGAS FIRE & RESCUE GENERAL NOTES

EFFECTIVE DATE: FEBRUARY 1, 2011 CLV ORDINANCE #6124

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6124 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS. AUTHORIZED FIRE HYDRANTS ARE AS FOLLOWS:
   - KENNEDY – GUARDIAN MODELS K81A AND K81D
   - MUELLER – SUPER CENTURION 250, MODEL A-423
   - CLOW – MEDALLION MODEL F-2546LVD
   - TROY VALVE – PATRIOT MODEL PTB100N, NEVADA HYDRANT
   - U.S.PIPE – METROFLOW/M-03
2. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.
3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE SNFC #6124, SECTION 1412.
4. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. SNFC #6124 SECTION 507.5.7.3
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. SNFC #6124 SECTION 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. SNFC 507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC 507; SNFC 507.5.7
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. SNFC 507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC 507; SNFC 507.1
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS; SNFC C102
    - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.14
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. SNFC 102.6.
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. SNFC 503.2.3
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. SNFC 503.2.7 / 503.2.8
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.4
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. SNFC 503.2.1.1 / IFC 503
23. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED ON BOTH SIDES OF THE STREET. PRIVATE DRIVE AISLES, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 24 FT FLOW LINE TO FLOW LINE WHEN SERVING NO MORE THE 6 RESIDENTS, AND WHEN ON STREET PARKING IS DISALLOWED. SNFC 503.2.1 / 503.2.11
24. ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FT (FLOW LINE TO FLOW LINE), PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FT (FLOW LINE TO FLOW LINE), WITH PARALLEL PARKING ON ONE SIDE. AND 36 FT (FLOW LINE TO FLOW LINE), IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES. THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED. SNFC 503.2.1.1
25. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IFC 503.1.1 / SNFC 503.11
26. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS. SNFC 503.1.2
27. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. SNFC 503.2.5
28. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. SNFC 503.3
29. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES. IFC / SNFC 503.6

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED: HORIZONTAL VERTICAL COMPACTION
   A. PAVEMENT AREA SUBGRADE 0.1'+ +0.0' TO –0.1' SEE SOILS REPORT
   B. ENGINEERED FILL 0.5'+ +0.1' TO –0.1' SEE SOILS REPORT
   COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT # ---

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS H

HYDRANT AND ACCESS GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.

2. AUTHORIZED FIRE HYDRANTS ARE AS FOLLOWS:
   - KENNEDY - GUARDIAN MODELS K81A AND K81D
   - MUELLER - SUPER CENTURION 250, MODEL A-423
   - CLOW - MEDALLION MODEL F-2546LVD
   - U.S.PIPE - METROFLOW/M-03

3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC § 105.7.12]

4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC § 3310, § 3312]

5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. [IFC § 507.5.7.3]

6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC § 106.3]

7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC § 507.2.1, NFPA 24]

8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC § 507]

9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [IFC § 507.5.7.1]

10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC § 507]

11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [IFC § C102]
    - RESIDENTIAL - 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.

12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC § C102.8]

13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.

14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC § C102.12]

15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.4]

16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC § C102.7]

17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC § C102.6]

18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC § C104]

19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC § 503.2.3]

20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED6%. [IFC § 503.2.7, § 503.2.8]

21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. IFC § 503.2.4]

22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. [IFC § 503.2.1]

23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [IFC § 503.2.1.1]

24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC § 503.1.1]

25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDSOR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC § 503.1.2]

26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC § 503.2.5]

27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC § 503.3]

28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM.SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC § 503.6 AND IFC APPENDIX M.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

DATE: _____ PROJECT#_ ---

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

RIVET & PLATE CONCRETE PAD (ELECTRIC) 200'+/- SW OF P.I. OF ELKHORN RD & SCHAUMBER RD (LANSFORD ST)

ELEVATION = 914.637 METERS (2008 ADJUSTMENT)
ELEVATION = 3000.77 U.S. SURVEY FEET (2008 ADJUSTMENT)

BASIS OF BEARINGS

NORTH 00°45'09" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN MAP ON FILE IN THE CLARK COUNTY'S RECORDER'S OFFICE IN BOOK 118, PAGE 88 OF PLATS.

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		ROW OR PROPERTY LINE
		EASEMENT LINE
		CENTERLINE
		CURB
		VALLEY GUTTER
		EDGE OF PAVEMENT
		SIDEWALK
		SIDEWALK RAMP
		DRIVEWAY
		SAWCUT LINE
		RETAINING WALL
		SOLID GROUTED WALL
		WROUGHT IRON VEHICULAR GATES
		WROUGHT IRON PEDESTRIAN GATES
(XXXX)	XXXX	INDEX CONTOURS
(XXXX)	XXXX	INTERMEDIATE CONTOURS
(XXXX)	XXXX	ROUGH GRADE INDEX CONTOURS
(XXXX)	XXXX	ROUGH GRADE INTERMEDIATE CONTOURS
3:1	3:1	CUT OR FILL SLOPE
	CUT / FILL	CUT AND FILL LINE
1	1	LOT NUMBER
FF=(XX.XX) PAD=(XX.X)	FF=XX.XX PAD=XX.X	FF AND PAD ELEVATION
X.XX%	X.XX%	GRADE SLOPE
(XX.XX) TC	XX.XX TC	SPOT ELEVATION
		SWALE LINE
XXX.XX'	XXX.XX'	LOT DIMENSION
		SIGHT VISIBILITY ZONE
X" WTR	X" WTR	WATERLINE MAIN AND SIZE
		FIRE HYDRANT
		WATER METER AND SERVICE LATERAL
		WATER VALVE
		WATER FITTINGS
		WATER LINE REDUCER
		WATER CAP WITH WATER BLOW OFF ASSEMBLY
		IRRIGATION SLEEVE
PRV	PRV	PRESSURE REDUCING VALVE
		REDUCED PRESSURE PRINCIPLE ASSEMBLY
X" WTR	X" WTR	SEWERLINE MAIN AND SIZE
		SEWERLINE MANHOLE
		SEWERLINE CAP
		SEWER LATERAL
BWV	BWV	BACK WATER VALVE
		100W HPS STREET LIGHT
		250W HPS STREET LIGHT
		400W HPS STREET LIGHT
		STREET LIGHT CONDUIT AND CAP
		4" FIBER OPTIC CONDUIT AND CAP
		PULLBOX
		REFLECTIVE FIRE HYDRANT MARKER
X" SD	X" SD	STORM DRAIN MAIN AND SIZE
		ROCK RIP RAP
		STORM DRAIN MANHOLE
		STORM DRAIN DROP INLET

QUANTITY ESTIMATE

DESCRIPTION	PUBLIC	PRIVATE
2-INCH ASPHALTIC CONCRETE PAVING	- SY	10,459 SY
3-INCH ASPHALTIC CONCRETE PAVING	- SY	- SY
4-INCH ASPHALTIC CONCRETE PAVING	- SY	- SY
5-INCH ASPHALTIC CONCRETE PAVING	- SY	- SY
OPEN GRADE	- SY	- SY
TYPE I GRAVEL	- CY	- CY
TYPE II GRAVEL	- CY	1,510 CY
EXCAVATION & EMBANKMENTS	- CY	- CY
CURB & GUTTER (24-INCH)	- LF	8,343 LF
CURB & GUTTER (30-INCH)	- LF	- LF
CONCRETE VALLEY GUTTER	- SF	1,250 SF
4-INCH CONCRETE SIDEWALK	- SF	- SF
5-INCH CONCRETE SIDEWALK	- SF	- SF
SIDEWALK UNDERDRAIN	- EA	- EA
3/4" WATER METER	- EA	- EA
3/4" METER WITH 1" RPPA	- EA	- EA
POWER SERVICE TO LOTS	- EA	- EA
SURVEY MONUMENTS	- EA	- EA
ADA RAMPS	- EA	- EA
"A" CURB	- LF	- LF
TACK ON CURB	- LF	- LF
10" CONCRETE BUS TURN OUT	- SF	- SF
4-INCH SEWER LATERAL	- LF	- LF
8-INCH PVC SEWER MAIN	- LF	- LF
48-INCH SEWER MANHOLES	- EA	- EA
60-INCH T-LOCK SEWER MANHOLES	- EA	- EA
BACKWATER VALVES	- EA	- EA
WATER LATERAL	- LF	- LF
6-INCH PVC WATER MAIN	- LF	- LF
8-INCH PVC WATER MAIN	- LF	- LF
12-INCH PVC WATER MAIN	- LF	- LF
IRRIGATION SLEEVES	- LF	- LF
FIRE HYDRANT	- EA	- EA
LIGHT STANDARD (STD. BASE)	- EA	- EA
ADJUST/RELOCATE STREETLIGHT	- EA	- EA
1-1/4 INCH STREET LIGHT CONDUIT	- LF	- LF
2 INCH STREET LIGHT CONDUIT	- LF	- LF
SL 125 AMP SERVICE PEDESTAL	- EA	- EA
4-IN FAST INTERCONNECT CONDUIT	- LF	- LF
STREET SIGNS -STAND ALONE	- EA	- EA
PAVEMENT STRIPING - ARTERIAL	- LF	- LF
4-INCH WIDE WHITE PAINTED LINE	- LF	- LF
FILM FOR CROSSWALKS, STRIPING, ETC.	- SF	- SF
USD 601 BARRICADE (5FT)	- EA	- EA
P-30 PULL BOX	- EA	- EA
8-INCH DIP WATER MAIN	- LF	- LF
12-INCH STORM DRAIN	- LF	- LF
24-INCH STORM DRAIN	- LF	- LF
36-INCH STORM DRAIN	- LF	- LF
42-INCH STORM DRAIN	187 LF	- LF
8.0-FOOT TYPE A DROP INLET	1 EA	- EA
60-INCH SD MANHOLE (>6')	1 EA	- EA
DRAINAGE EASEMENT - CONCRETE	1,063 SF	- SF
WROUGHT IRON FENCE	222 SF	- SF

NOTE:
THIS QUANTITY ESTIMATE IS FOR BONDING PURPOSES ONLY.
CONTRACTOR TO DETERMINE INDEPENDENT ESTIMATIONS.

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Nevada Power Environment and Safety Services Department

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Call 811 or
1-800-227-2600
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

ABBREVIATIONS

AGG	AGGREGATE
AC	ASPHALTIC CONCRETE
AP	ANGLE POINT
BC	BACK OF CURB
BVC	BEGINNING OF VERTICAL CURVE
BM	BENCH MARK
BDRY	BOUNDARY
CATV	CABLE TELEVISION
CL	CENTERLINE
CCUSD	CLARK COUNTY UNIFORM STANDARD DRAWINGS
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT
CMH	CENTER OF MANHOLE
CO	CLEAN OUT, SEWER
COMM	COMMERCIAL
CONC, PCC	CONCRETE
CONST	CONSTRUCTION OR CONSTRUCT
CU YD, CY	CUBIC YARD
CU FT, CF	CUBIC FEET
CF	CURB FACE
DCSWCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS
DIA	DIAMETER
DWY	DRIVEWAY
DI	DROP INLET
ESMT	EASEMENT
EP	EDGE OF PAVEMENT
E	ELECTRIC
ELEV	ELEVATION
ECR	END OF CURB RETURN
EVC	END OF VERTICAL CURVE
EX, EXIST	EXISTING
FT	FEET OR FOOT
FTG	FOOTING WALL
FH	FIRE HYDRANT
FG	FINISH GRADE
FL	FLOW LINE
FUT	FUTURE
PL-G	PLASTIC GAS
S-G	STEEL GAS
GB	GRADE BREAK
HP	HIGH POINT
HDP	HIGH DENSITY POLYETHYLENE
INT	INTERSECTION
INV	INVERT
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
L	LEFT
LF	LINEAR FEET
MH	MANHOLE
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
PVMT	PAVEMENT
PI	POINT OF INTERSECTION
PRC	POINT OF REVERSE CURVE
PC	POINT OF CURVE
PT	POINT OF TANGENCY
PCC	PORTLAND CEMENT CONCRETE
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CLORIDE
PP	POWER POLE
P	POWER
PL	PROPERTY LINE
POC	POINT OF CONNECTION
PROP	PROPOSED
PB	PULL BOX
RP	RADIUS POINT
RPPA	REDUCED PRESSURE PRINCIPLE ASSEMBLY
REINF	REINFORCED
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
R	RIGHT OR RADIUS
R/W	RIGHT-OF-WAY
S, SS	SANITARY SEWER
SHT	SHEET
SL	SEWER LATERAL
SW	SIDEWALK
SQ FT, SF	SQUARE FOOT
SQ YD, SY	SQUARE YARD
STA	STATION
SD	STORM DRAIN
STD	STANDARD
STL	STREETLIGHT
T	TELEPHONE
TEMP	TEMPORARY
TC	TOP OF CURB
TF	TOP OF FOOTING
TRC	TOP OF ROLL CURB
TS	TRAFFIC SIGNAL
TSI	TRAFFIC SIGNAL INTERCONNECT
TRANS	TRANSITION
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
VAR	VARIABLE
VERT	VERTICAL
VC	VERTICAL CURVE
VG	VALLEY GUTTER
VCP	VITRIFIED CLAY PIPE
WTR	WATER
WL	WATER LATERAL

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 24, 2014
HORIZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JH
APPROVED BY: JH
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI Engineering
4325 Dean Martin Drive Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
CITY OF LAS VEGAS NEVADA

LEGEND AND ABBREVIATIONS

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOHN I. LAND
No. 16441
Exp. 12/31/2015
CIVIL

DRAWING
N-2
SHT 3 OF 10

DWG #
CLV PROJECT #

O:\3110_Toll\0003_FranklinPark_CIVIL\PS\PHASE II UNIT 2\5002_N02.dwg scarabay 9/24/14 10:10pm

DISCLAIMER NOTE:

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CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAIL 1, ON SHEET D-1
2. CONSTRUCT 24" "L" TYPE CURB AND GUTTER PER USDCCA # 216
3. CONSTRUCT 8' CROSS GUTTER PER USDCCA # 228
4. CONSTRUCT 6' HIGH WROUGHT IRON FENCE PER DETAIL 16 ON SHEET D-1
5. CONSTRUCT 8' TYPE 'A' DROP INLET PER CCAUSD # 411 AND 421
6. REMOVE EXISTING RIP RAP AND CONNECT TO EXISTING AC PAVEMENT
7. EXISTING STORM DRAIN MANHOLE RIM TO BE ADJUSTED TO FINISH GRADE
8. SEE DETAIL 17 SHEET D-1 FOR CUT AND CAP STORM DRAIN PIPE

BUILDING PERMIT NOTE

ALL STRUCTURES SHOWN OR INDICATED ON THIS SUBMITTAL WITHIN THE PROPERTY REQUIRE A BUILDING PERMIT APPLICATION AND SUBMITTAL THIS INCLUDES BUILDINGS, ABOVE GROUND TANKS, SIGNS, RETAINING WALLS, FENCES, TRASH ENCLOSURES, SHADE STRUCTURES, STAIRWAYS, RAMPS, LIGHT POLES, LIGHT BOLLARDS, ETC. THIS DOES NOT INCLUDE ANY FLOOD CONTROL STRUCTURE SUCH AS PIPES, CULVERTS, ARCH CULVERTS, HEADWALLS, ETC. THIS DOES NOT INCLUDE ANY WORK WITHIN A PUBLIC STREET RIGHT-OF-WAY. THIS DOES NOT INCLUDE PRIVATE STREETS. THE REVIEW OF CIVIL IMPROVEMENT AND/OR GRADING PLANS DOES NOT INCLUDE ANY REVIEW OF ANY STRUCTURE THAT REQUIRES A BUILDING PERMIT APPLICATION."

SIGHT VISIBILITY ZONE

NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.

FLOOD ZONE NOTE

ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 32003C1750E DATED SEPTEMBER 27, 2002, THE SITE IS LOCATED IN A ZONE "X".

NOTE

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

ENGINEERS NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
2. SEE DETAIL SHEET FOR ON-SITE PAVEMENT SECTIONS. CONTRACTOR TO VERIFY WITH SOILS REPORT.
3. SEE FINAL MAP FOR EXACT PROPERTY LINE DIMENSIONS.
4. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
5. THESE PLANS SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY THE GOVERNING AGENCIES.
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   PROJECT NO. E03-257
   DATED: OCTOBER 3, 2003
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BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

RIVET & PLATE CONCRETE PAD (ELECTRIC) 200'+/- SW OF P.I. OF ELKHORN RD & SCHAUMBER RD (LANSFORD ST)

ELEVATION = 914.637 METERS (2008 ADJUSTMENT)
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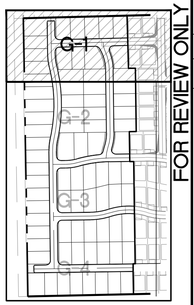
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30' 15' 0' 30' 60'
SCALE: 1" = 30'



SITE PLAN
NOT TO SCALE



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JOHN I. LAND, PE NO. 16441 DATE

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 24, 2014
HORIZ. SCALE: 1"=30'
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI Engineering
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IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLAN (SHEET 1 OF 4)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
G-1
SHT 4 OF 10
DWG #
CLV PROJECT #

G:\3110_Toll\0003_FranklinPark_CIVIL\PS\PHASE II UNIT 2\5003-601.dwg scraboy 9/24/14 10:11pm

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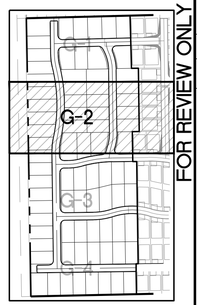
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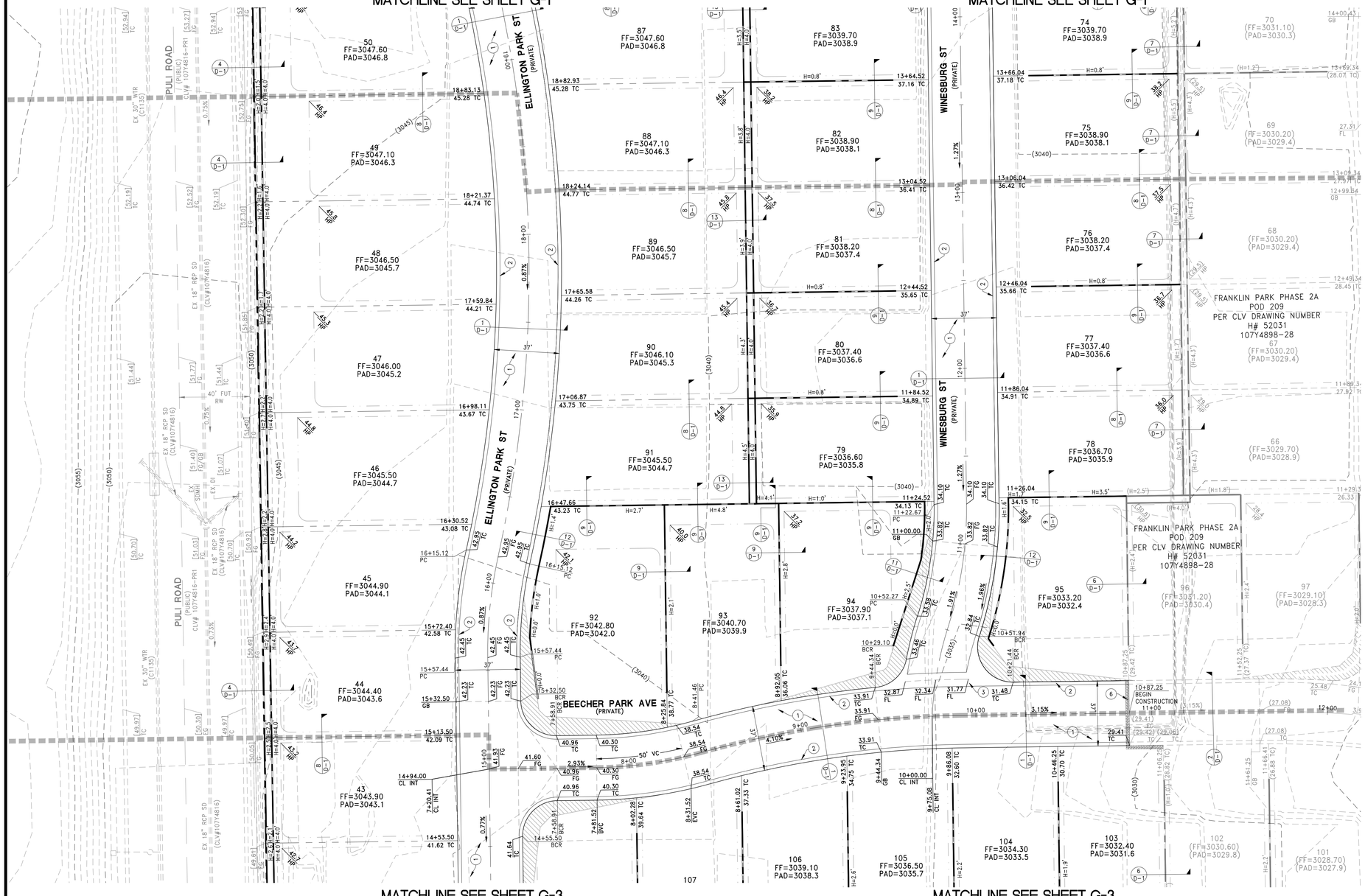
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JOHN I. LAND, PE NO. 16441 — DATE

FOR REVIEW ONLY

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DATE: September 24, 2014
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VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

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PHONE: 702-243-9800 FAX: 702-243-9610

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IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLAN (SHEET 2 OF 4)
CITY OF LAS VEGAS NEVADA

C:\3110_Toll\0003_Franklin Park_CIVIL\PS\PHASE II UNIT 2\5003-G01.dwg scarabay 9/24/14 10:11pm

PROFESSIONAL ENGINEER — STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
G-2
SHT 5 OF 10

DWG #
CLV PROJECT #

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BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

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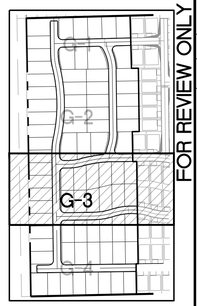
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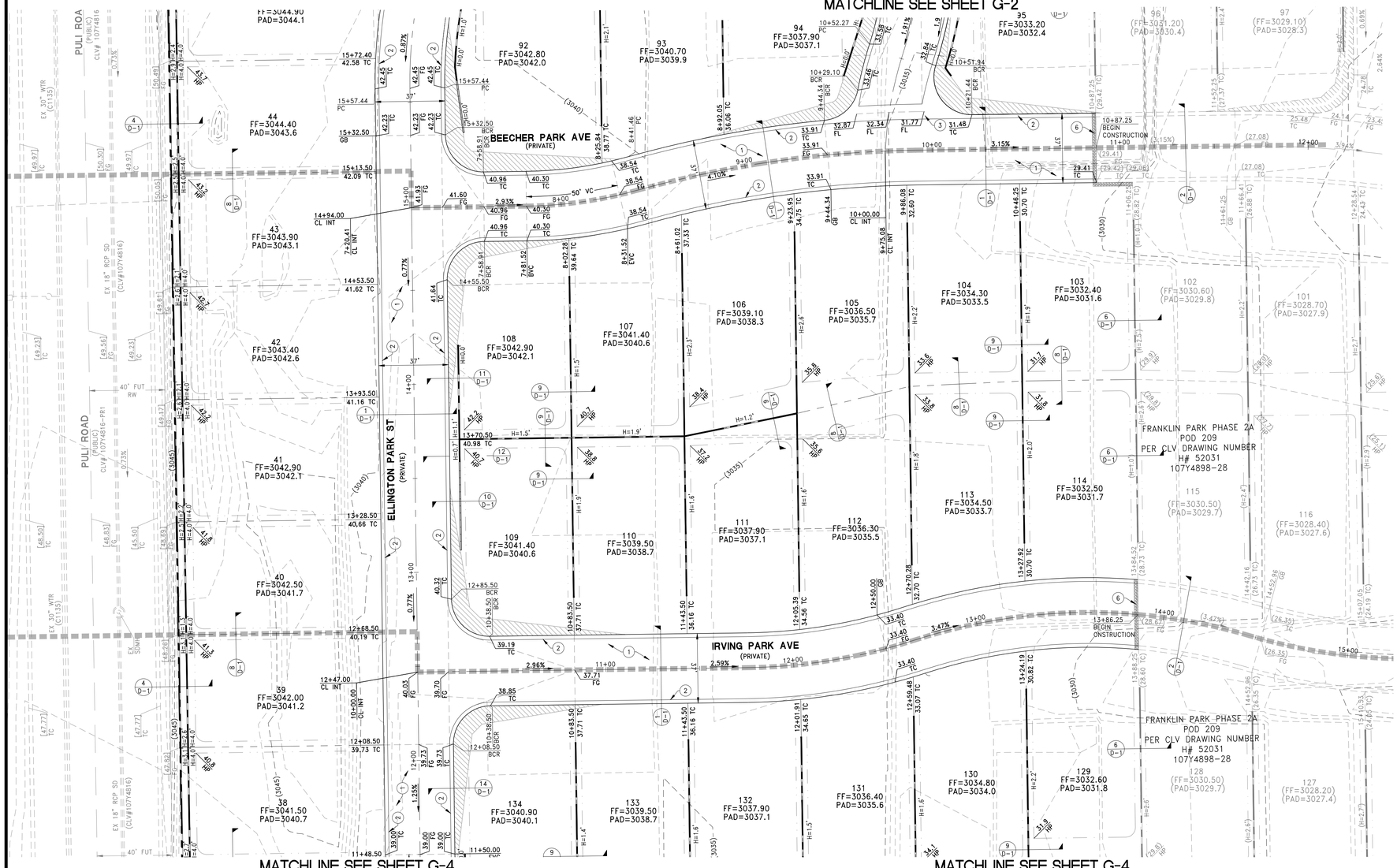
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DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

MATCHLINE SEE SHEET G-2

MATCHLINE SEE SHEET G-2



MATCHLINE SEE SHEET G-4

MATCHLINE SEE SHEET G-4

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JOHN I. LAND, PE NO. 16441 — DATE

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IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLAN (SHEET 3 OF 4)
NEVADA

CITY OF LAS VEGAS 9/24/14 10:12pm
O:\3110_Toll\0003_Franklin Park_CIVIL\PS\PHASE II UNIT 2\5003-G01.dwg scarabay

PROFESSIONAL ENGINEER — STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
G-3
SHT 6 OF 10

DWG #
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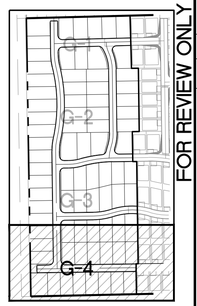
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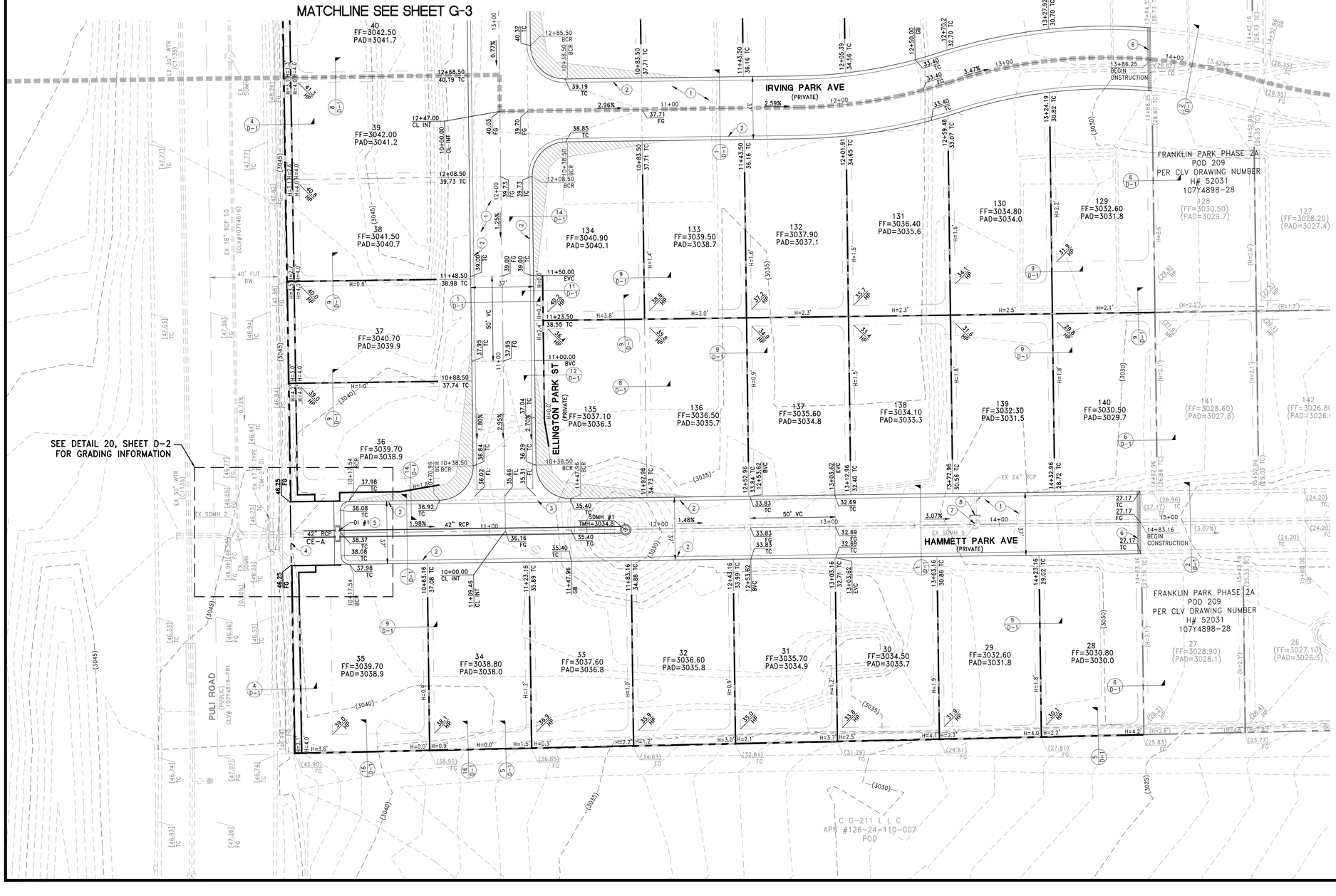
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SITE PLAN
NOT TO SCALE



I HEREBY CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS #XXXX ON FILE WITH CITY OF LAS VEGAS FOR THIS PROJECT.

JOHN I. LAND, PE NO. 16441 — DATE

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 24, 2014
HORIZ. SCALE: 1"=30'
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

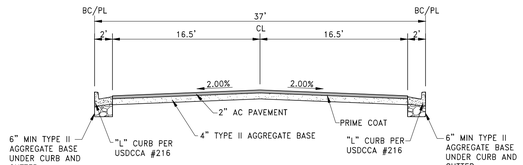
RCI Engineering
4325 Dean Martin Drive Suite 300, Las Vegas, NV 89103
PH#702.453.0000 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING PLAN (SHEET 4 OF 4)
CITY OF LAS VEGAS NEVADA

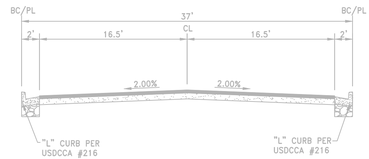
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441
PROFESSIONAL ENGINEER - STATE OF NEVADA

DRAWING
G-4
SHT 7 OF 10
DWG #
CLV PROJECT #

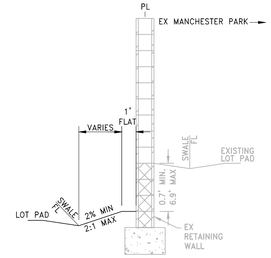
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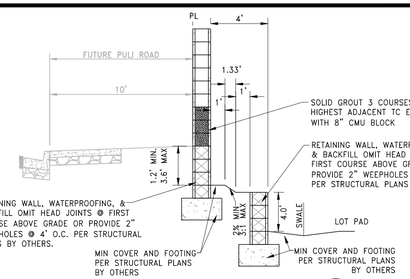
PRIVATE 37' STREET
ONSITE STREET — SCALE: NTS — 1 / D-1



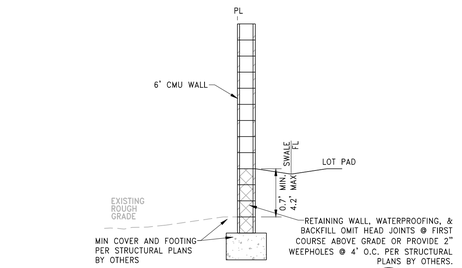
EXISTING 37' STREET
ONSITE STREET — SCALE: NTS — 2 / D-1



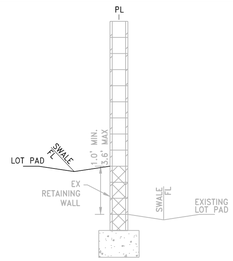
EXISTING PERIMETER WALL
RETAINING — SCALE: NTS — 3 / D-1



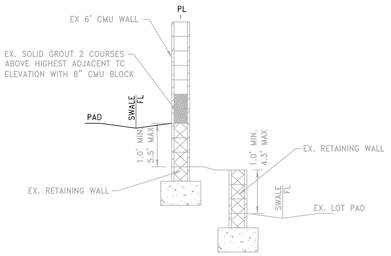
PERIMETER WALL
RETAINING — SCALE: NTS — 4 / D-1



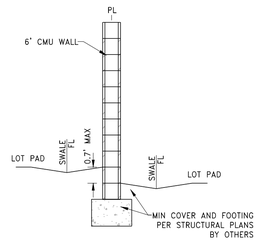
PERIMETER WALL
RETAINING — SCALE: NTS — 5 / D-1



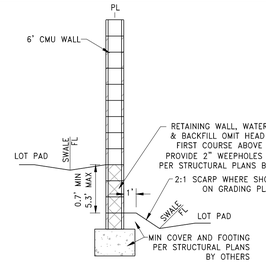
EXISTING SIDE TO SIDE
RETAINING — SCALE: NTS — 6 / D-1



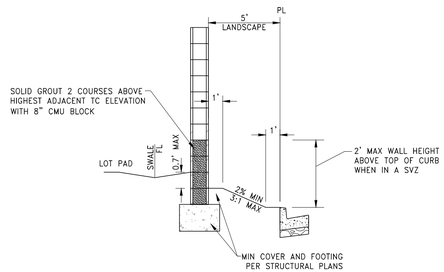
SIDE/REAR TO EXISTING
RETAINING — SCALE: NTS — 7 / D-1



REAR/SIDE WALL
NO RETAINING — SCALE: NTS — 8 / D-1

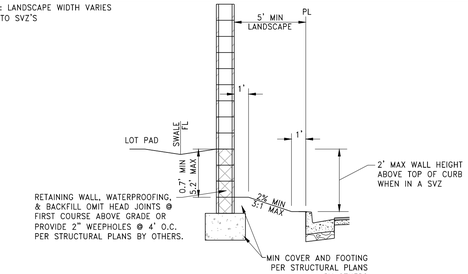


REAR/SIDE WALL
RETAINING — SCALE: NTS — 9 / D-1



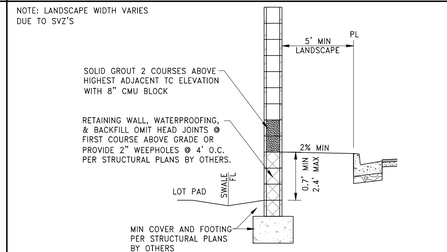
CORNER SIDE YARD TO STREET
NO RETAINING — SCALE: NTS — 10 / D-1

NOTE: LANDSCAPE WIDTH VARIES DUE TO SVZ'S

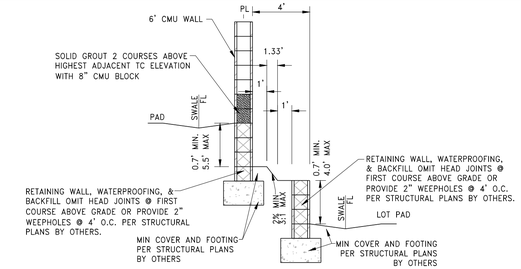


CORNER SIDE YARD STREET
RETAINING — SCALE: NTS — 11 / D-1

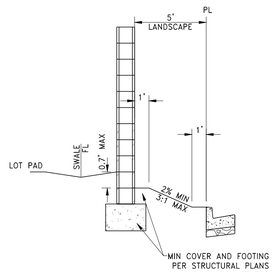
NOTE: LANDSCAPE WIDTH VARIES DUE TO SVZ'S



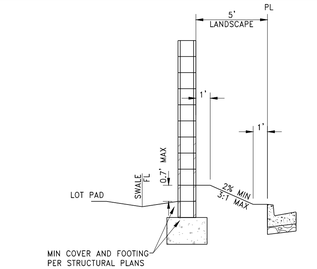
CORNER SIDE YARD TO STREET
RETAINING — SCALE: NTS — 12 / D-1



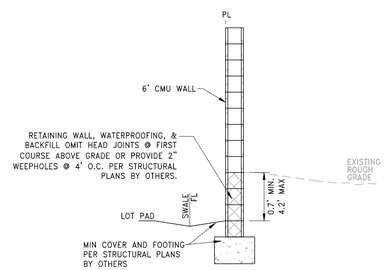
SIDE/REAR WALL
RETAINING — SCALE: NTS — 13 / D-1



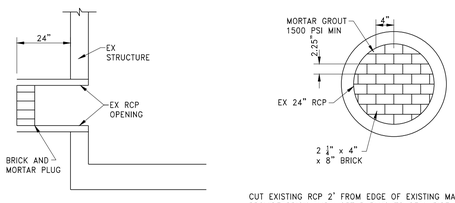
CORNER SIDE YARD TO STREET
NO RETAINING — SCALE: NTS — 14 / D-1



CORNER SIDE YARD TO STREET
NO RETAINING — SCALE: NTS — 15 / D-1

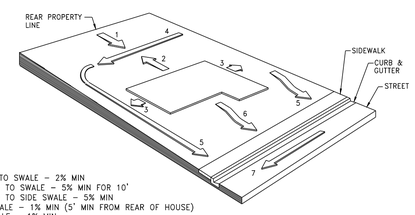


PERIMETER WALL
RETAINING — SCALE: NTS — 16 / D-1



CUT EXISTING RCP 2' FROM EDGE OF EXISTING MANHOLE AND PROVIDE BRICK AND MORTAR PLUG TO SEAL PIPE END. SMOOTH FACE FINISH ON INSIDE AND OUTSIDE OF BRICKS.

BRICK AND MORTAR DETAIL
SCALE: NTS — 17 / D-1



1. SLOPE FROM REAR TO SWALE – 2% MIN
2. SLOPE FROM HOUSE TO SWALE – 5% MIN FOR 10'
3. SLOPE FROM HOUSE TO SIDE SWALE – 5% MIN
4. SLOPE OF REAR SWALE – 1% MIN (5' MIN FROM REAR OF HOUSE)
5. SLOPE OF SIDE SWALE – 1% MIN
6. SLOPE FROM HOUSE TO SIDEWALK – 5% MIN FOR 10'
7. SLOPE OF STREET – PER GRADING PLAN

TYPICAL LOT DRAINAGE DETAIL
SCALE: NTS — 19 / D-1

GEOTECHNICAL NOTE:

A GEOLOGIST OR GEOTECHNICAL ENGINEER SHALL BE ON SITE DURING EXCAVATION AND MASS GRADING OPERATIONS TO EXAMINE THE SOIL CHARACTERISTICS AND GEOLOGICAL CONDITIONS ENCOUNTERED, AND TO PROVIDE PROFESSIONAL ADVICE TO THE OWNER IN THE EVENT THAT UNANTICIPATED SOIL PROBLEMS ARISE AND/OR SUBSURFACE SITE CONDITIONS ARE FOUND TO BE SIGNIFICANTLY DIFFERENT THAN DEFINED BY PRE EXPLORATION AND TESTING.

WALL & SCARP NOTE:

1. CONTRACTOR TO CONSTRUCT ALL SCARP AND MAINTAIN PROPER COVER OVER AND FROM ALL WALL FOOTINGS PER THE SOILS REPORT REFERRED TO ON THE GRADING PLANS, REPORT ANY PROBLEMS IN DOING SO TO THE DEVELOPER AND THE ENGINEER IMMEDIATELY.
2. SCARP LESS THAN 1' VERTICAL NOT SHOWN ON PLANS.
3. ALL WALL ALIGNMENTS SHALL FOLLOW SIGHT VISIBILITY ZONE ALIGNMENT AND REMAIN OUTSIDE OF SIGHT VISIBILITY ZONE.

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 24, 2014
HORIZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9810

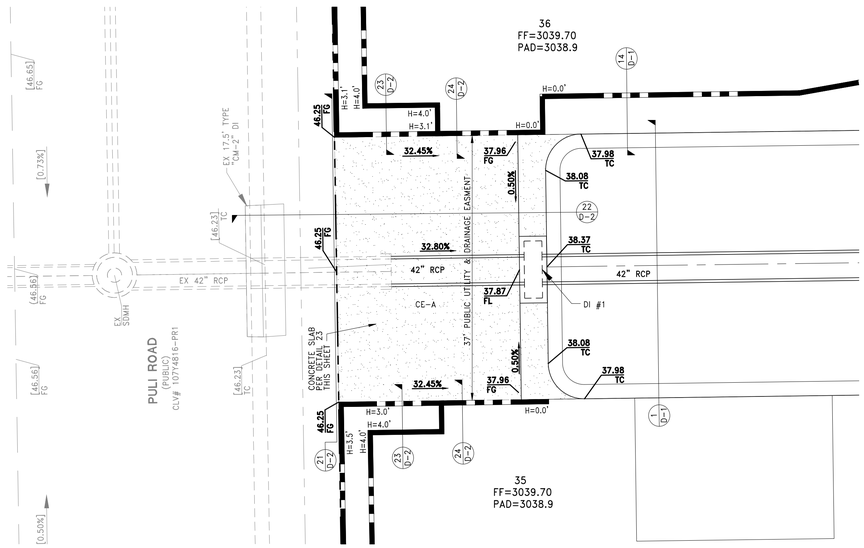
RCI Engineering
4325 Dean Martin Drive Suite 300, Las Vegas, NV 89103
PH#702.453.0800 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING DETAIL (SHEET 1 OF 2)
CITY OF LAS VEGAS — NEVADA

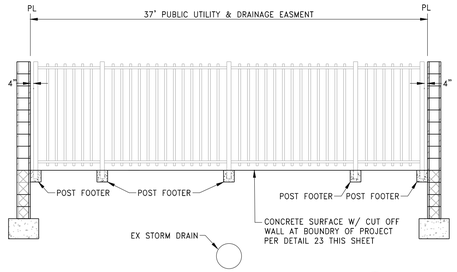
PROFESSIONAL ENGINEER — STATE OF NEVADA — JOHN I. LAND — No. 16441 — Exp. 12/31/2015 — CIVIL

DRAWING D-1
SHT 8 OF 10
DWG #
CLV PROJECT #

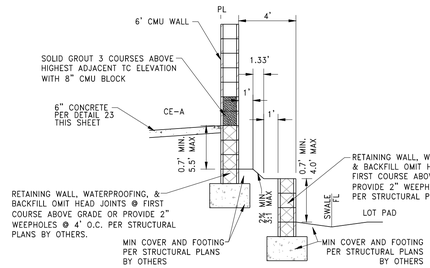
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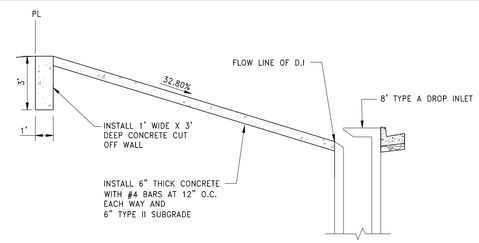
37' EASEMENT
SCALE: NTS
20
D-2



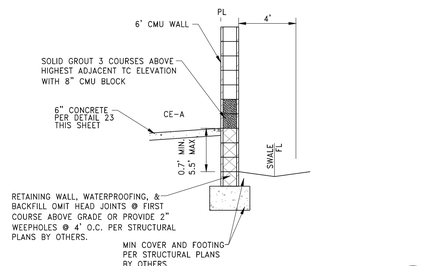
37' EASEMENT
SCALE: NTS
21
D-2



COMMON ELEMENT WALL
SCALE: NTS
22
D-2



37' EASEMENT
SCALE: NTS
23
D-2



COMMON ELEMENT WALL
SCALE: NTS
24
D-2

GEOTECHNICAL NOTE:

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WALL & SCARP NOTE:

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE: _____ PROJECT#___---

FOR REVIEW ONLY

REV	DESCRIPTION	BY	APPD	DATE

DATE: September 24, 2014
HORIZ. SCALE: N/A
VERT. SCALE: N/A
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: JIL
APPROVED BY: JIL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9810

RCI Engineering
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IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION
GRADING DETAIL (SHEET 2 OF 2)
CITY OF LAS VEGAS NEVADA

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
D-2
SHT 9 OF 10

DWG #
CLV PROJECT #

O:\3110_Toll\0003_FranklinPark_CIVIL\PS\PHASE II UNIT 2\S004_001.dwg scarabay 9/24/14 10:14am

DISCLAIMER NOTE:

UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

Avoid overhead power line contact. It's costly.
Call before you Overhead
1-702-227-2929
Nevada Power Environment and Safety Services Department

Avoid cutting underground utility lines. It's costly.
Call before you Dig
811
1-800-227-2600
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1, ON SHEET D-1
2. CONSTRUCT 24" "L" TYPE CURB AND GUTTER PER USDCCA # 216
3. CONSTRUCT 8' CROSS GUTTER PER USDCCA # 228
4. CONSTRUCT 6' HIGH WROUGHT IRON FENCE/GATES PER DETAIL 16, ON SHEET D-1
5. CONSTRUCT 4' TYPE "A" DROP INLET PER CCAUSD # 411
6. REMOVE EXISTING RIP RAP
7. EXISTING STORM DRAIN MANHOLE RIM TO BE ADJUSTED TO FINISH GRADE
8. SEE DETAIL 17 SHEET D-1 FOR CUT AND CAP STORM DRAIN PIPE

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

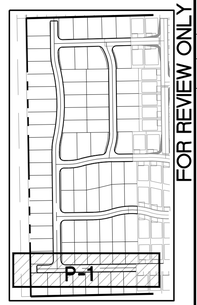
RIVET & PLATE CONCRETE PAD (ELECTRIC) 200'+/- SW OF P.I. OF ELKHORN RD & SCHAUMBER RD (LANSFORD ST)

ELEVATION = 914.637 METERS (2008 ADJUSTMENT)
ELEVATION = 3000.77 U.S. SURVEY FEET (2008 ADJUSTMENT)

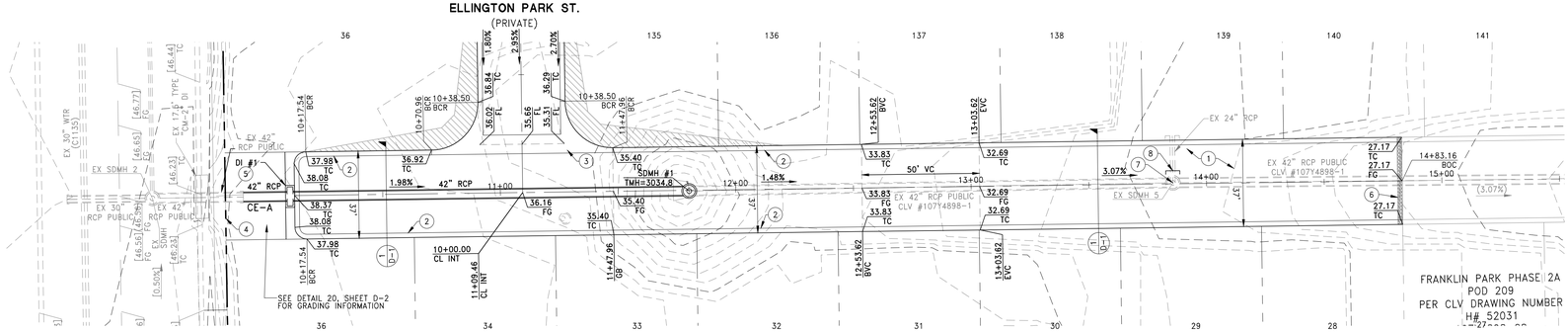
BASIS OF BEARINGS

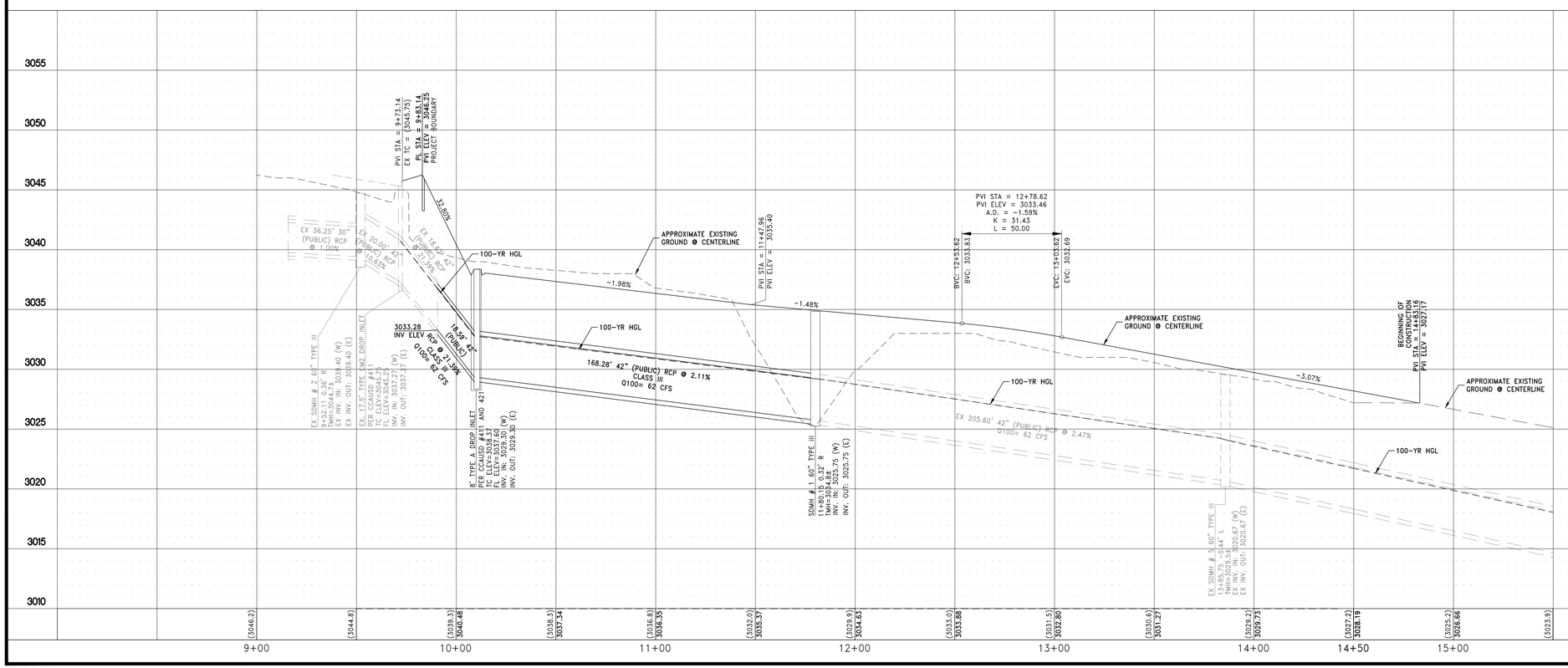
NORTH 00°45'09" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN MAP ON FILE IN THE CLARK COUNTY'S RECORDER'S OFFICE IN BOOK 118, PAGE 88 OF PLATS.

30' 15' 0' 30' 60'
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 5'



SITE PLAN
NOT TO SCALE





FOR REVIEW ONLY

REV	DESCRIPTION	BY	APP'D	DATE

DATE: September 24, 2014
HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=5'
DRAWN BY: CR
DESIGNED BY: SC
CHECKED BY: JJL
APPROVED BY: JJL
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
PHONE: 702-243-9800 FAX: 702-243-9610

RCI Engineering
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PH#702.453.0800 FAX#702.453.0801

IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION

PLAN AND PROFILE-HAMMETT PARK AVE

NEVADA
CITY OF LAS VEGAS

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
P-1
SHT 10 OF 10
DWG #
CLV PROJECT #

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Call before you Dig
Avoid cutting underground utility lines. It's costly.
811
1-800-227-2600
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-6000

CONSTRUCTION NOTES

1. CONSTRUCT AC PAVEMENT PER DETAILS 1, ON SHEET D-1
2. CONSTRUCT 24" "L" TYPE CURB AND GUTTER PER USDCCA # 216
3. CONSTRUCT 8' CROSS GUTTER PER USDCCA # 228
4. CONSTRUCT 6' HIGH WROUGHT IRON FENCE/GATES PER DETAIL 14, ON SHEET D-1
5. CONSTRUCT 17.5' MODIFIED TYPE 'C' DROP INLET PER CCAUSD # 412.1
6. REMOVE EXISTING RIP RAP
7. EXISTING STORM DRAIN MANHOLE RIM TO BE ADJUSTED TO FINISH GRADE
8. SEE DETAIL 17 SHEET D-1 FOR CUT AND CAP STORM DRAIN PIPE
9. EXISTING SEWER MANHOLE RIM TO BE ADJUSTED TO FINISH GRADE

BENCHMARK

CITY OF LAS VEGAS BENCHMARK 6LV99 24NNW6

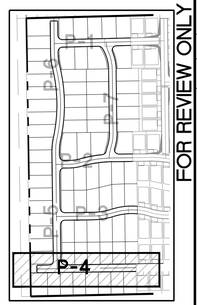
RIVET & PLATE CONCRETE PAD (ELECTRIC) 200'+/- SW OF P.I. OF ELKHORN RD & SCHAUMBER RD (LANSFORD ST)

ELEVATION = 914.637 METERS (2008 ADJUSTMENT)
ELEVATION = 3000.77 U.S. SURVEY FEET (2008 ADJUSTMENT)

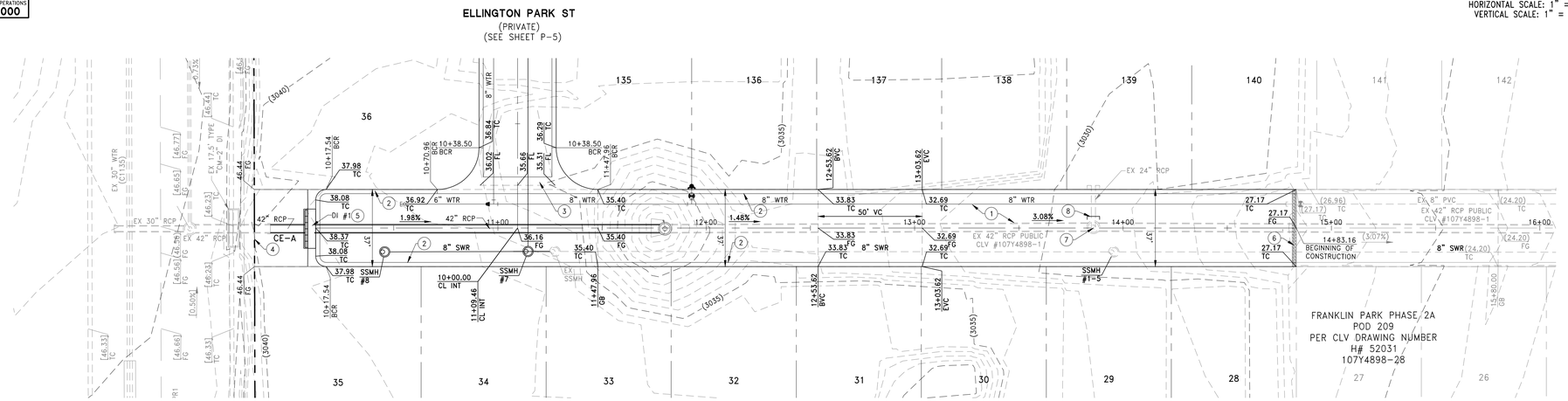
BASIS OF BEARINGS

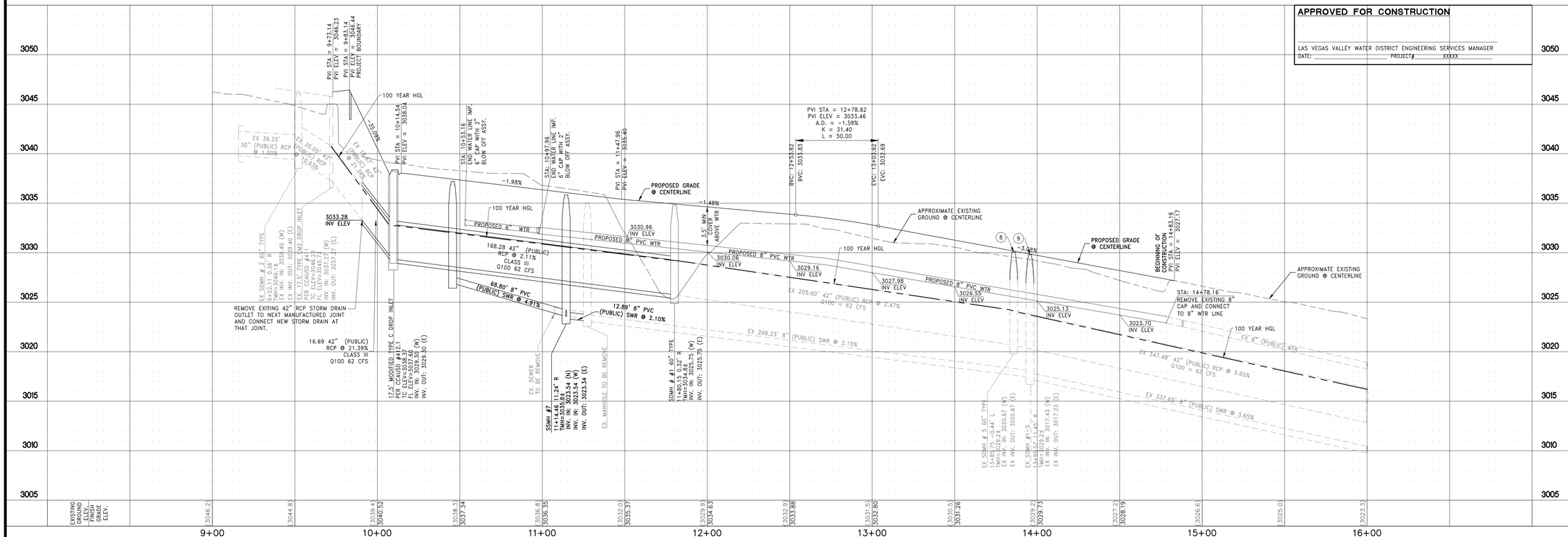
NORTH 00°45'09" EAST BEING THE BEARING OF THE EAST LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 13, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN MAP ON FILE IN THE CLARK COUNTY'S RECORDER'S OFFICE IN BOOK 118, PAGE 88 OF PLATS.

30' 15' 0' 30' 60'
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 5'



SITE PLAN
NOT TO SCALE





FOR REVIEW ONLY

REV	DESCRIPTION	BY	APP'D	DATE

DATE: October 22, 2014
HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=5'
DRAWN BY: GS
DESIGNED BY: SC
CHECKED BY: J.J.L.
APPROVED BY: J.J.L.
PROJECT #: 3110.0003

TOLL NORTH LV, LLC
1140 TOWN CENTER DRIVE, SUITE 250
LAS VEGAS, NV 89144
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RCI Engineering
4325 Dean Martin Drive Suite 300, Las Vegas, NV 89103
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IMPROVEMENT PLANS FOR
FRANKLIN PARK PHASE 3
A SINGLE FAMILY RESIDENTIAL SUBDIVISION

PLAN AND PROFILE- HAMMETT PARK AVE

NEVADA

CITY OF LAS VEGAS

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN I. LAND
Exp. 12/31/2015
CIVIL
No. 16441

DRAWING
P-4
SHT 22 OF 10

DWG #

CLV PROJECT #