Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

CivTech

September 30, 2016

Phillip H. Kercher, PE, PTOE
Principal Traffic Engineer
Transportation Department
7447 East Indian School Road, Suite 205
Scottsdale, Arizona 85251

Registered Professional Engineer (Civil) CERTIFICATE NO. 16255 JOSEPH F. SPADAFINO Date Signed 9-30-16 ARIZONA, U.S.A. Expires 6/30/2019

RE: TIMA Addendum/Trip Generation and Comparison Statement for Block L of the Scottsdale Quarter, Scottsdale, Arizona

Dear Mr. Kercher:

The purpose of the letter is to supplement or to serve as an addendum to the approved Traffic Impact and Mitigation Analysis (TIMA) for Blocks L and M of Phase III of the Scottsdale Quarter. It is presented as a Trip Generation and Comparison Statement (TGCS) for Block L of the Scottsdale Quarter. Block L is the last remaining developable parcel in the Scottsdale Quarter project. This letter is part of an application being made to re-zone Block L.

BACKGROUND

On November 12, 2013, CivTech completed a TCGS for Blocks L and M of Phase III of the Scottsdale Quarter. Subsequent to that, in part due to the findings of the 2013 TGCS, CivTech was asked to prepare a full TIMA, completing a second submittal on March 26, 2014 and receiving an approval via email from the City on March 31, 2014.

PROPOSED DEVELOPMENT AND ACCESS

In the approved TIMA, the proposed uses for Block L included residential condominiums, and estimated 100 dwelling units (DUs); a 116-room hotel; and more than 173,000 square feet (SF) of retail space.

The proposed development will be eight stories high and will provide three levels of underground parking. An entrance from the private "North Street" shown on a prior plan has been eliminated on this site plan and new access, Access D, directly from 73rd Street to the parking garage is being proposed. The current proposal for Block L is to provide the following trip generating land uses:

- 56,253 SF of retail space, of which 5,000 SF could be dedicated to restaurant use;
- 7,560 SF of (base) restaurant floor space with a potential of 5,000 SF additional;
- Seven 2-story live/work DUs with ground-floor access directly to 73rd Street; and
- 293 studio, one-, two-, and three bedroom DUs on levels 3 through 8.

Please note that all residential units will be multi-family units for lease and not condominiums as proposed previously.

TRIP GENERATION AND COMPARISON

The trip generation potential of a development is most-often estimated using the latest edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual* as a primary reference. Currently in its 9th edition published in 2012, the manual provides trip generation data for a wide variety of land uses. The data are summarized in the document and average rates and equations

developed from the data are provided that correlate the relationship between an independent variable that describes the development size and the trips generated for each categorized land use. The manual provides information for daily and peak hour trips and, for certain uses, for other time periods as well, and trip distribution percentages, that is the percentage of entering and existing trips.

Trip rates published in the latest (9th) edition of the Institute of Transportation Engineer's (ITE) *Trip Generation Manual* were used to generate trips for the site both in the approved TIMA and for the current mix of uses. The current mix of uses are illustrated in the site plan provided by the Client. (See **Attachment A.**) The upper portion of **Table 1** is the trip generation from Block L as it appeared in the approved TIMA. The lower portion of the table is the trip generation for the currently-proposed mix of uses. The comparison is shown at the bottom of the table.

Please note that, as explained in the approved TIMA, many of the rates used were calculated by applying regression equations published in the manual and then dividing by the applicable number of units for the entire Scottsdale Quarter to yield per-unit average rates, which are shown in the table. Changes in total floor areas dedicated to a particular use and the total number of dwelling units could then affect the per-unit rate at which trips could be generated. This can be seen in **Table 1**, where a decrease in the floor area of retail space is expected to result in a higher number of trips per 1,000 SF of floor area over the course of a day and during the peak periods.

Table 1 – Trip Generation

Land Use	ITE LUC	ITE Land Use Name	Quantity Units	AM Distribution		PM Distribution	
				In	Out	In	Out
Current Approved Block L, per Approved March 2014 TIMA							
Residential Condominium/ Townhouse	230	Residential Condominium/Townhouse	100 DUs	17%	83%	67%	33%
Hotel or motel	310	Hotel	116 Rooms	59%	41%	51%	49%
Shopping Center	820	Shopping Center	173.113 KSF	62%	38%	48%	52%
Quality Restaurant	931	Quality Restaurant	0.000 KSF	50%	50%	67%	33%

Land Use	ADT		AM Peak Hour				PM Peak Hour			
	Avg. Rate	Total	Avg. Rate	In	Out	Total	Avg. Rate	In	Out	Total
Residential Condominium/ Townhouse	5.12	512	0.36	6	31	37	0.44	29	15	44
Hotel or motel	5.73	666	0.53	37	25	62	0.60	36	34	70
Shopping Center	40.76	7,058	0.88	95	58	153	3.70	308	333	641
Quality Restaurant	89.95	0	0.81	0	0	0	7.49	0	0	0
BLOCK L TOTALS		8,236		138	114	252		373	382	755

Land Use	ITE LUC	ITE Land Use Name	Quantity Units	AM Distribution		PM Distribution	
				In	Out	In	Out
Currently-Proposed Block L							
Multi-Family Residential	220	Apartments	300 DUs	20%	80%	65%	35%
Hotel or motel	310	Hotel	0 Rooms	59%	41%	51%	49%
Shopping Center	820	Shopping Center	51.253 KSF	62%	38%	48%	52%
Quality Restaurant	931	Quality Restaurant	12.560 KSF	50%	50%	67%	33%

Land Use	ADT		AM Peak Hour				PM Peak Hour			
	Avg. Rate	Total	Avg. Rate	In	Out	Total	Avg. Rate	In	Out	Total
Multi-Family Residential	6.47	1,942	0.50	30	121	151	0.61	119	64	183
Hotel or motel	0.00	0	0.53	0	0	0	0.60	0	0	0
Shopping Center	45.80	2,348	1.01	32	20	52	4.13	102	110	212
Quality Restaurant	89.95	1,130	0.81	6	5	11	7.49	64	31	95
BLOCK L TOTALS		5,420		68	146	214		285	205	490
Differences: Proposed - Block L, per Approved March 2014 TIMA										
DIFFERENCES (Numeric)		-2,816		-70	+32	-38		-88	-177	-265
DIFFERENCES (Percentage)		-34%		-51%	28%	-15%		-24%	-46%	-35%

A review of the results of the trip generation for the currently proposed mix of uses for Block L of the Scottsdale Quarter summarized in **Table 1** reveals that Block L as now-proposed should generate approximately 5,420 trips per day, 214 trips (68 in/146 out) during the AM peak hour, and 490 trips (285 in/205 out) during the PM peak hour. The expected differences are 2,816 fewer trips each day, 38 net fewer trips during the AM peak hour, and 165 net fewer trips during the PM peak hour than as documented in approved TIMA of March 2014. On a percentage basis, the expected differences are approximately 34% fewer trips generated by Block L each day with 15% fewer trips during the AM peak hour and 35% fewer trips during the PM peak hour than in the approved TIMA.

REVISED SITE TRIPS

In the approved TIMA, the relatively few residential trips anticipated from Block L were assigned to the roadways using the same directional distribution percentages as were the non-residential trips. With the sizeable increase of residential units with its the corresponding increase in the number of trips and the introduction of a travel pattern based more on commuter traffic, CivTech separately assigned the residential trips and the retail/office/restaurant trips for Block L, applying the same directional distribution percentages applied to Block K, which was rezoned from office to residential. **Table 2** summarizes the two sets of directional distribution percentages previously derived.

Table 2 – Trip Distribution

Direction (To/From)	Via	Non-Residential Trip Distribution	Residential Trip Distribution
North	Scottsdale Road	25%	17%
South	Scottsdale Road	25%	30%
South	73rd Street	9%	0%
East	Greenway-Hayden Loop	10%	45%
East	Butherus Drive	1%	0%
West	Kierland Boulevard	5%	4%
West	Greenway Parkway	25%	4%
	Totals	**100%**	**100%**

The percentages shown in **Table 2** were applied to the trips generated to determine the site traffic at the intersections within the study area. The residential, non-residential, and total site trips anticipated from Block L only are depicted in **Attachment B**, **Attachment C**, and **Attachment D**, respectively. **Attachment E** presents the total trips with trips generated by Blocks K, L, and M since the three blocks will share driveways. **Attachment F** presents the trips from Blocks K, L, and M from the approved TIMA and **Attachment G** compares the total site trips for Blocks K, L, and M between approved and as currently proposed. **Attachment B** and **Attachment C** also show the directional distributions in **Table 2** as they have been applied to the residential and non-residential trips, respectively.

CONCLUSIONS

Based on the foregoing, CivTech has concluded the following:

- Block L as now-proposed should generate approximately 5,420 trips per day, 214 trips (68 in/146 out) during the AM peak hour, and 490 trips (285 in/205 out) during the PM peak hour.
- The expected differences are 2,816 fewer trips each day, 38 net fewer trips during the AM peak hour, and 165 net fewer trips during the PM peak hour than as documented in approved TIMA of March 2014.
- On a percentage basis, the expected differences are approximately 34% fewer trips generated by Block L each day with 15% fewer trips during the AM peak hour and 35% fewer trips during the PM peak hour than in the approved TIMA.

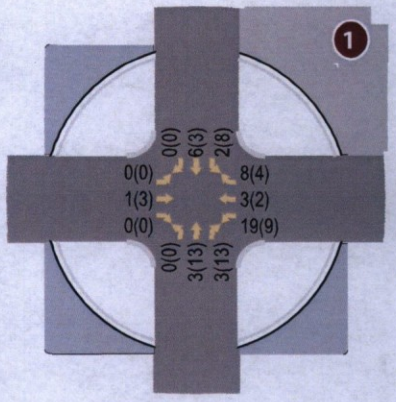
Thank you for your prompt and careful attention to reviewing this statement. Please contact me with any questions you may have on this statement.

Sincerely,

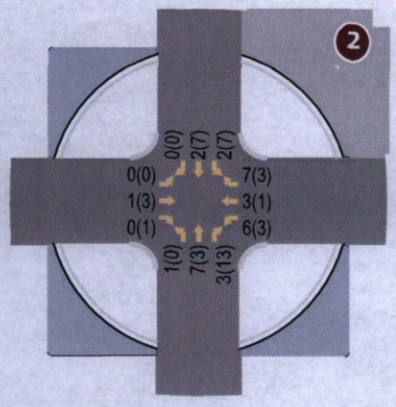
Joseph F. Spadafino, P.E., PTOE, PTP
Project Manager/Senior Traffic Engineer

Attachments

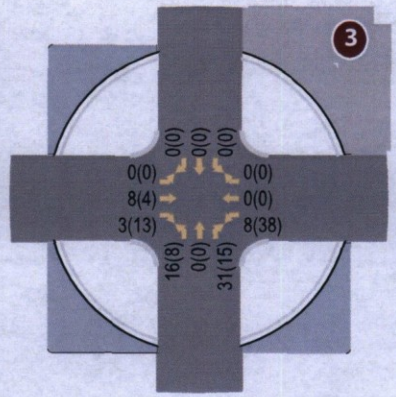
Attachment A – Site Plan
Attachment B – Block L Residential Trips with Trip Distribution (Proposed)
Attachment C – Block L Non-Residential Trips with Trip Distribution (Proposed)
Attachment D – Block L Total Trips (Proposed)
Attachment E – Blocks L&M Total Trips (Proposed)
Attachment F – Blocks L&M Total Trips (Approved)
Attachment G – Blocks L&M Trip Comparison (Approved - Proposed)



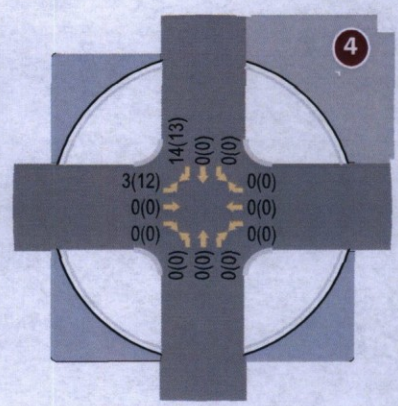
Scottsdale Rd. @ Butherus Dr.



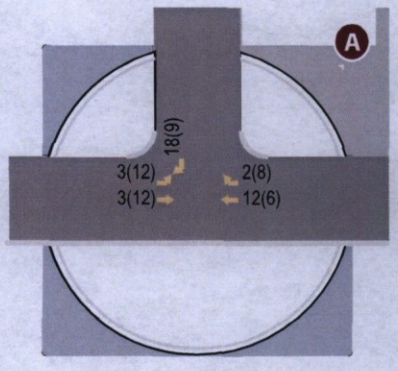
Scottsdale Rd. @ Greenway-Hayden Lp.



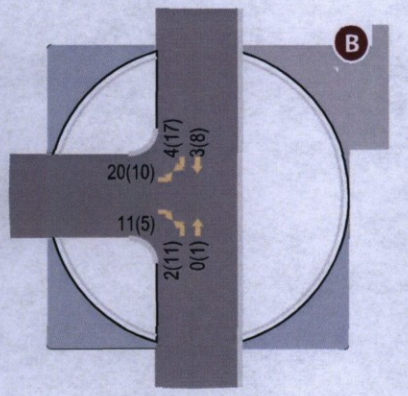
73rd St. @ Greenway-Hayden Lp.



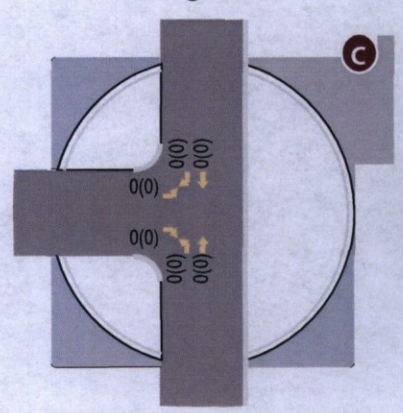
73rd St. @ Butherus Dr.



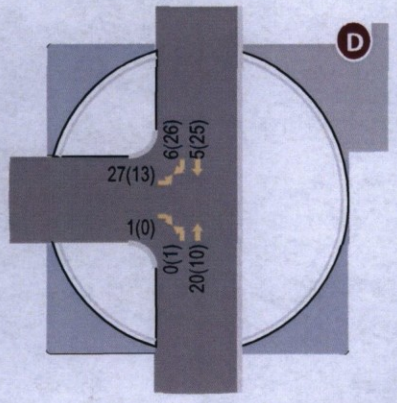
Access A @ Butherus Dr.



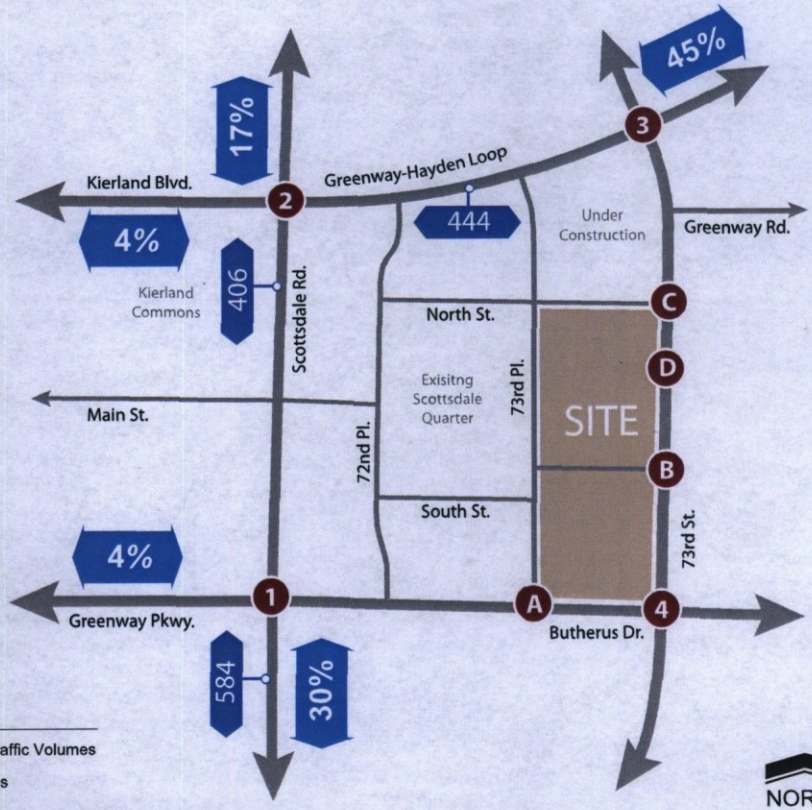
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



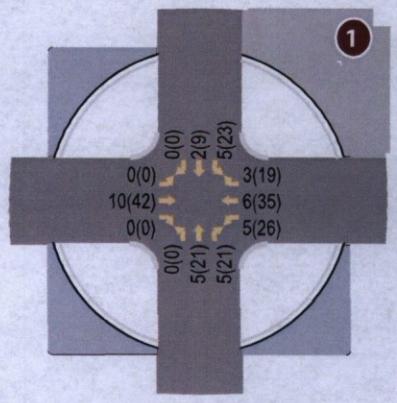
LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

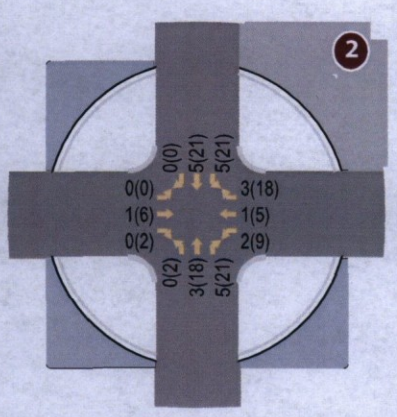
XX,XXX Average Daily Volumes

(XX%) - Directional Distribution

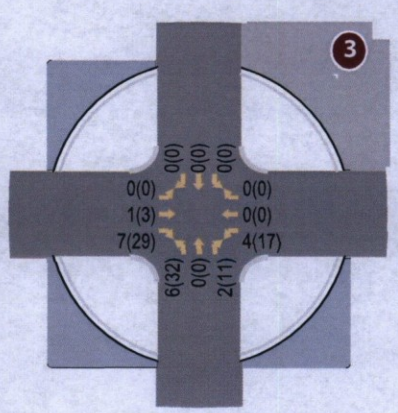
Attachment B: Block L Residential Traffic Volumes with Trip Distribution (Proposed)



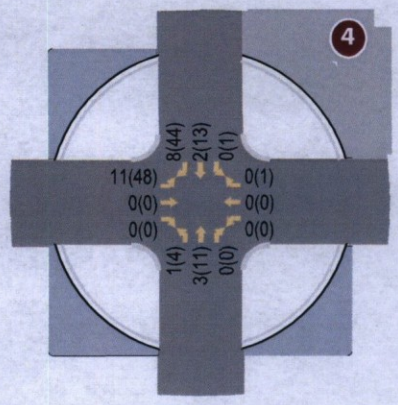
Scottsdale Rd. @ Butherus Dr.



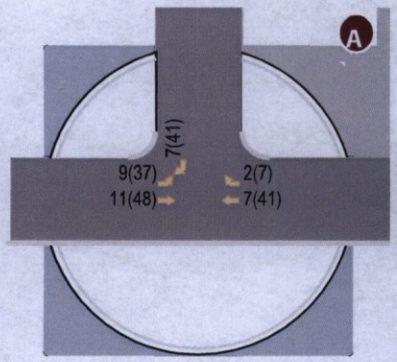
Scottsdale Rd. @ Greenway-Hayden Lp.



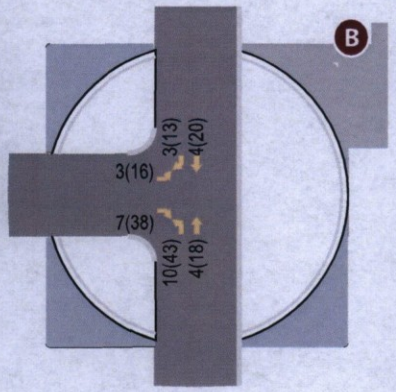
73rd St. @ Greenway-Hayden Lp.



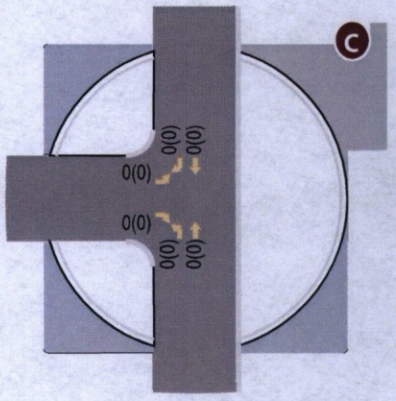
73rd St. @ Butherus Dr.



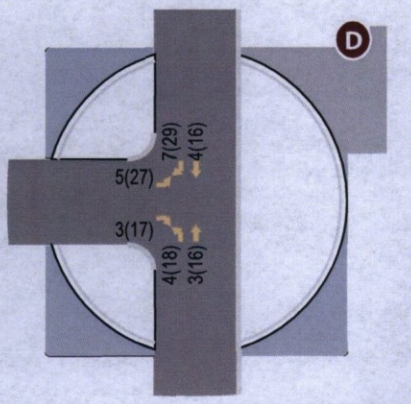
Access A @ Butherus Dr.



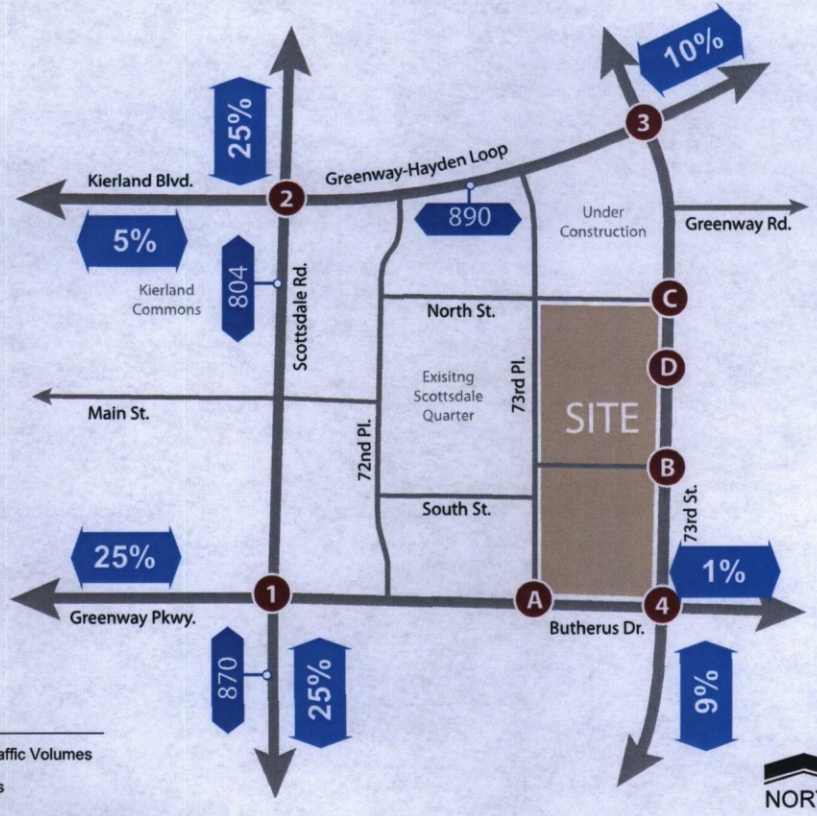
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



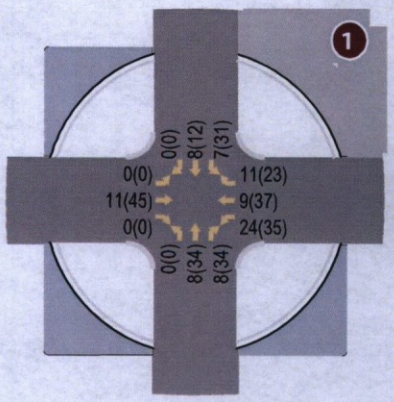
LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

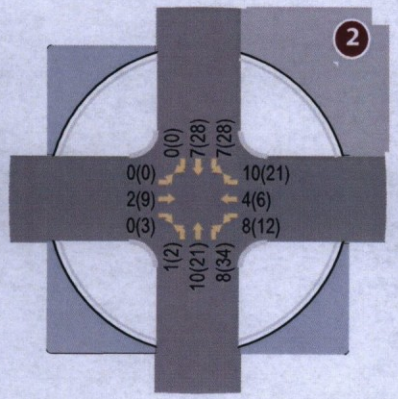
XX,XXX Average Daily Volumes

(XX%) - Directional Distribution

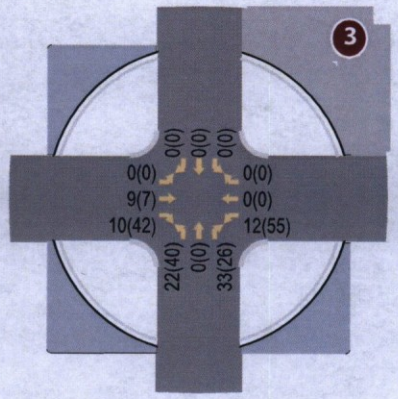
Attachment C: Block L Non-Residential Traffic Volumes with Trip Distribution (Proposed)



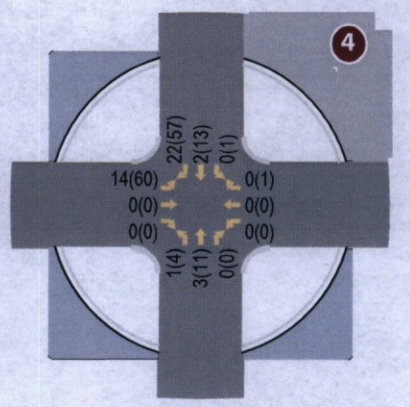
Scottsdale Rd. @ Butherus Dr.



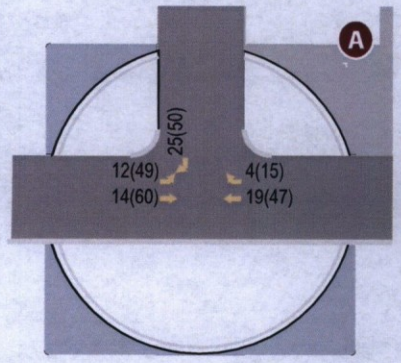
Scottsdale Rd. @ Greenway-Hayden Lp.



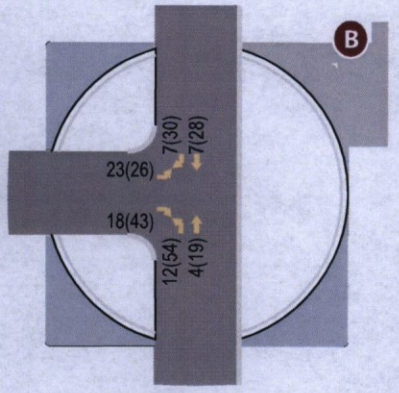
73rd St. @ Greenway-Hayden Lp.



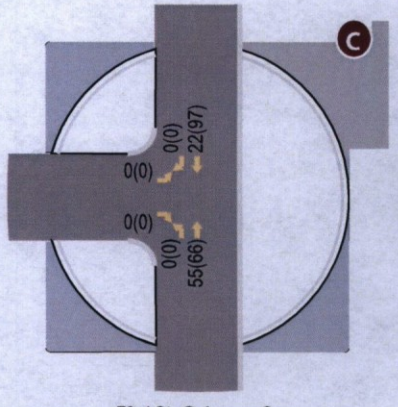
73rd St. @ Butherus Dr.



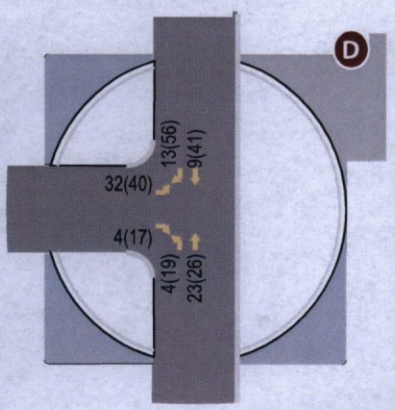
Access A @ Butherus Dr.



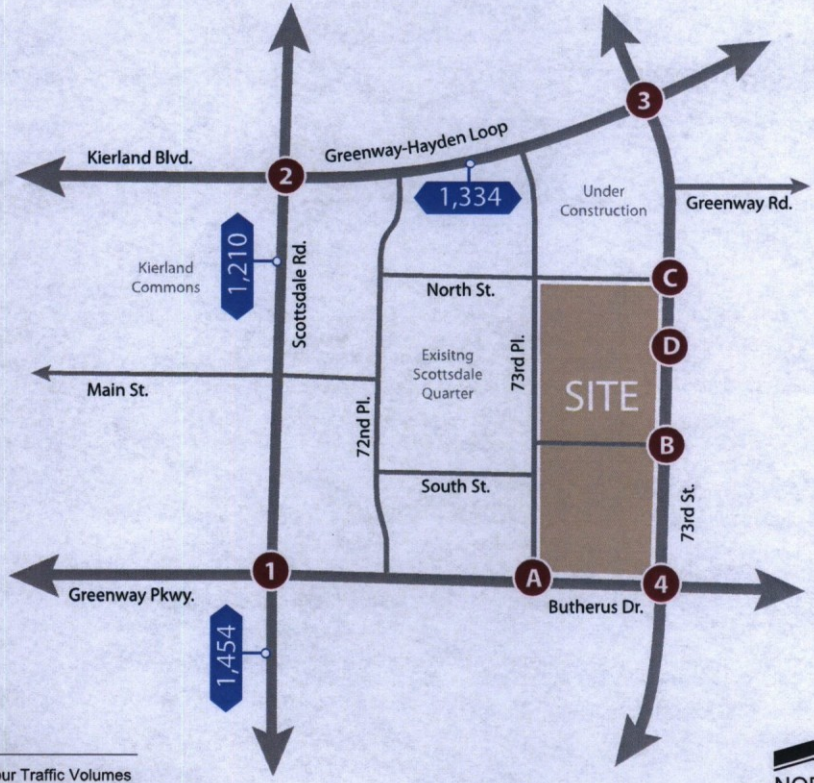
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



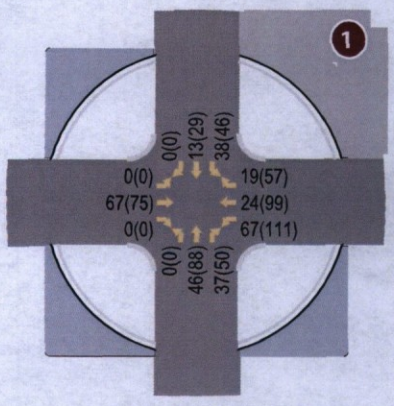
LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

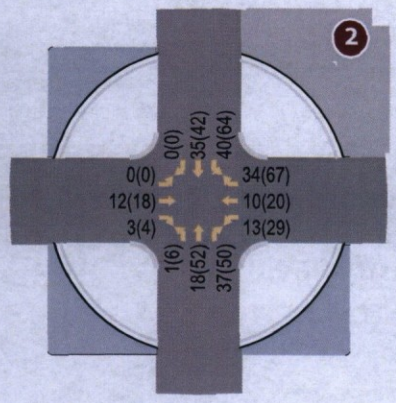
XX,XXX Average Daily Volumes

NORTH

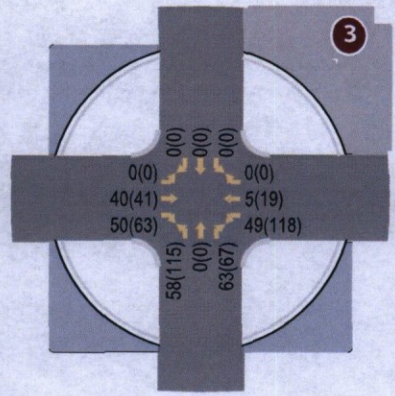
Attachment D: Block L Total Traffic Volumes (Proposed)



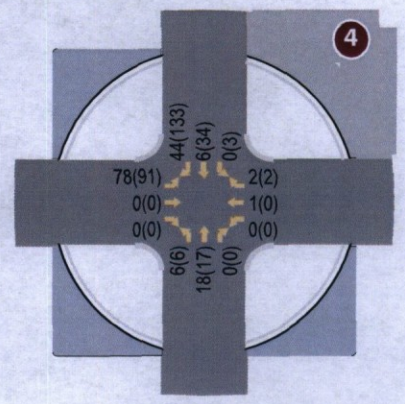
Scottsdale Rd. @ Butherus Dr.



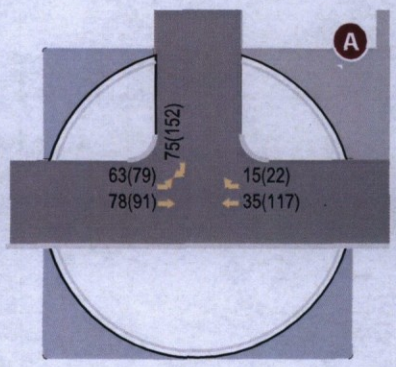
Scottsdale Rd. @ Greenway-Hayden Lp.



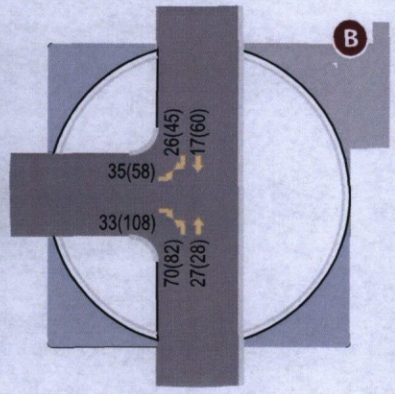
73rd St. @ Greenway-Hayden Lp.



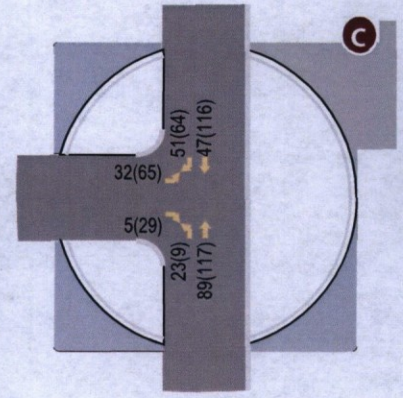
73rd St. @ Butherus Dr.



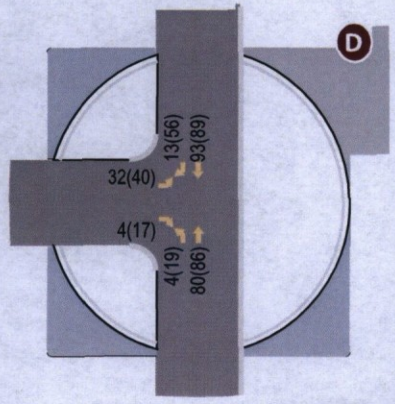
Access A @ Butherus Dr.



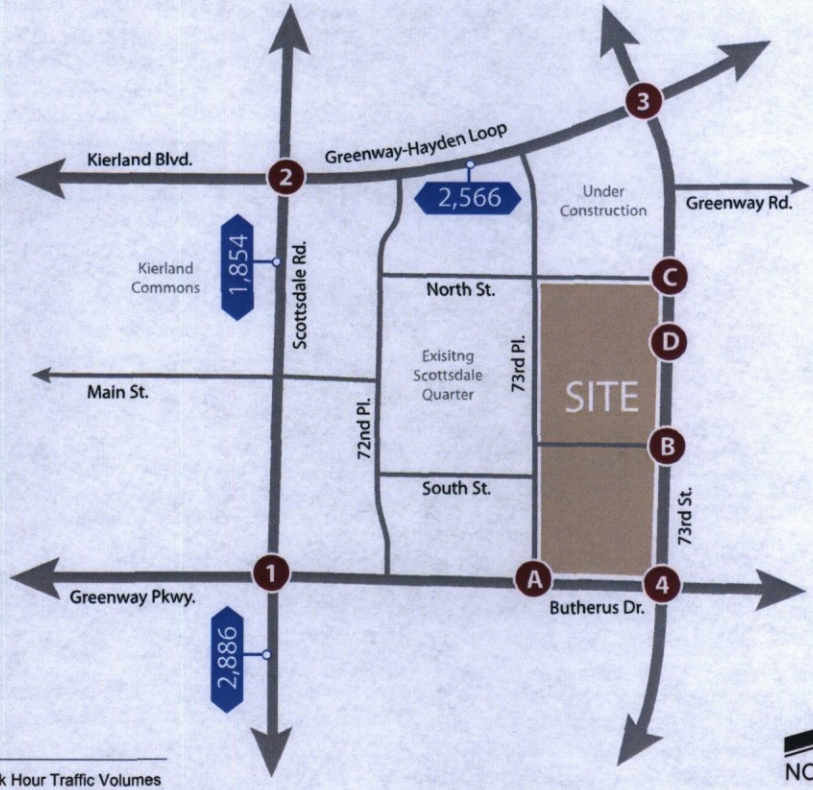
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



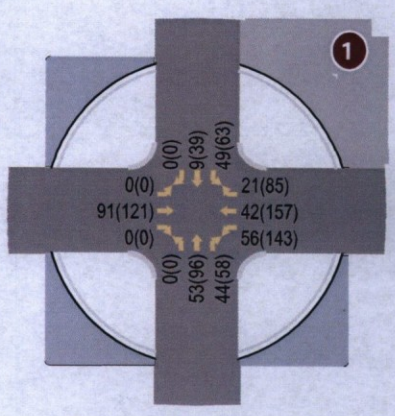
LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

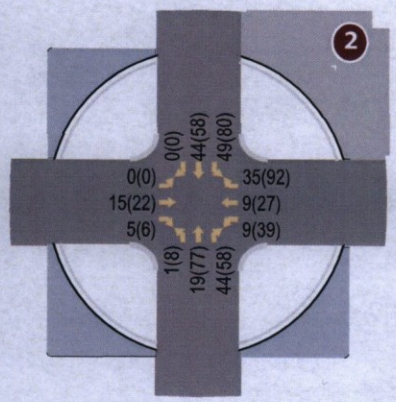
XX,XXX Average Daily Volumes

NORTH

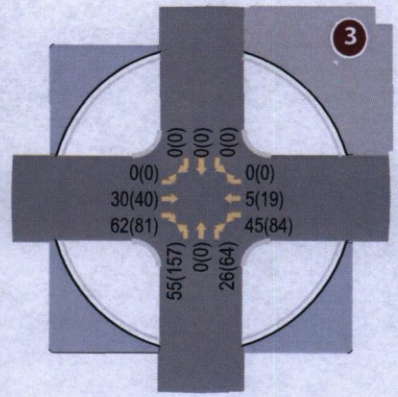
Attachment E: Blocks K,L,&M Total Traffic Volumes (Proposed)



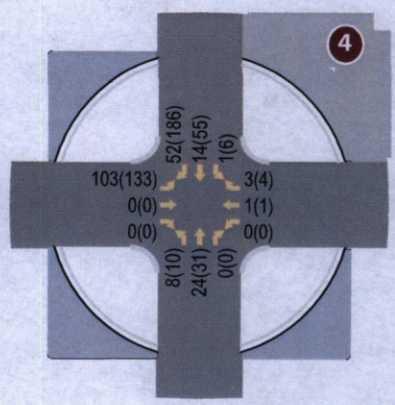
Scottsdale Rd. @ Butherus Dr.



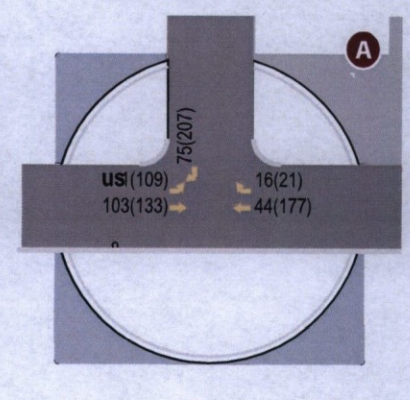
Scottsdale Rd. @ Greenway-Hayden Lp.



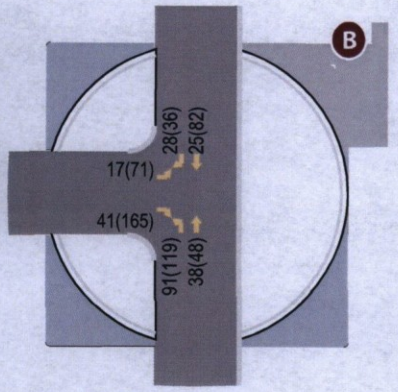
73rd St. @ Greenway-Hayden Lp.



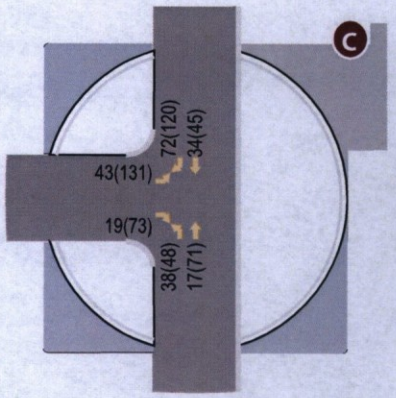
73rd St. @ Butherus Dr.



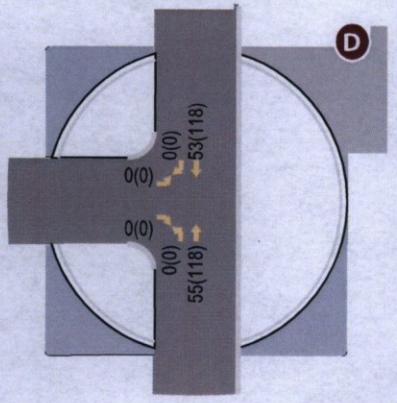
Access A @ Butherus Dr.



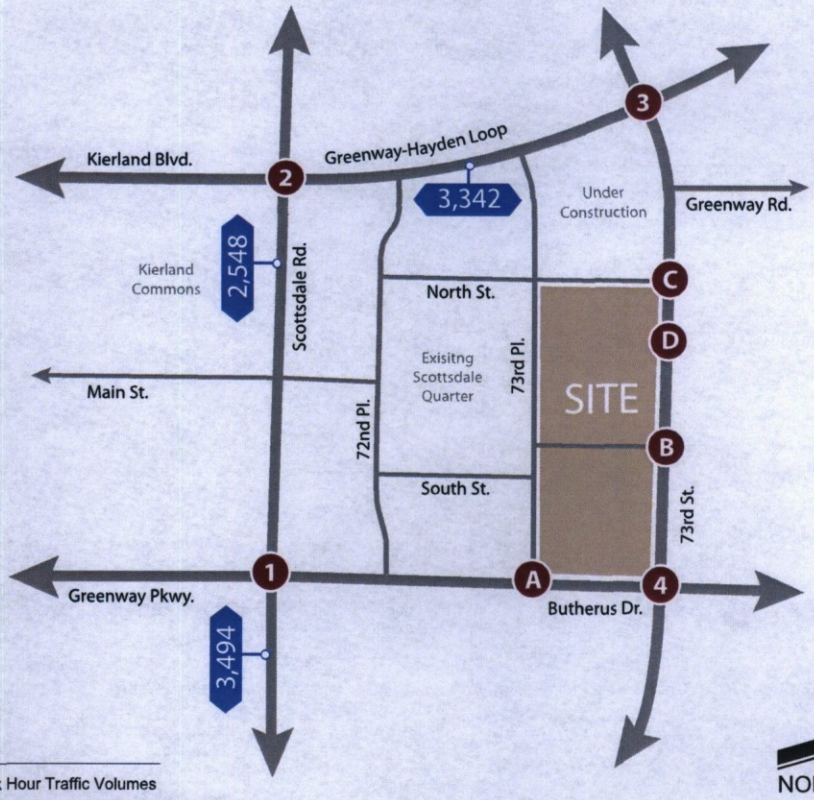
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



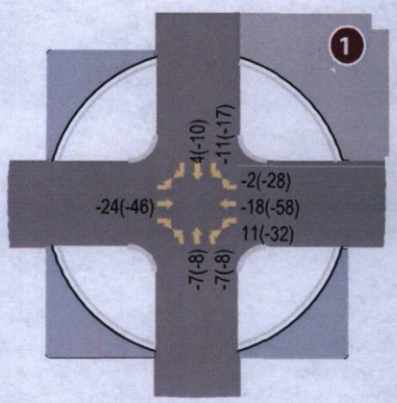
LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

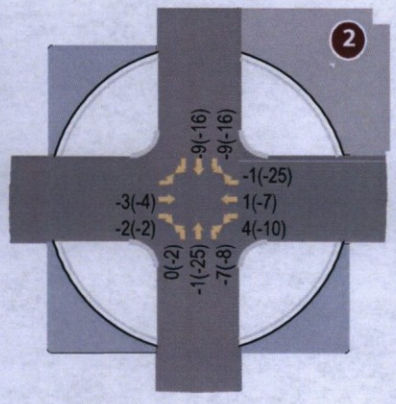
XX,XXX Average Daily Volumes

NORTH

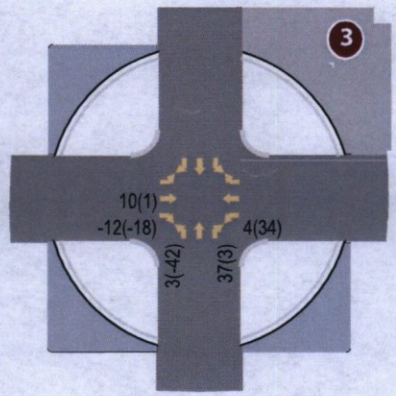
Attachment F: Blocks K,L,&M Total Traffic Volumes (Approved)



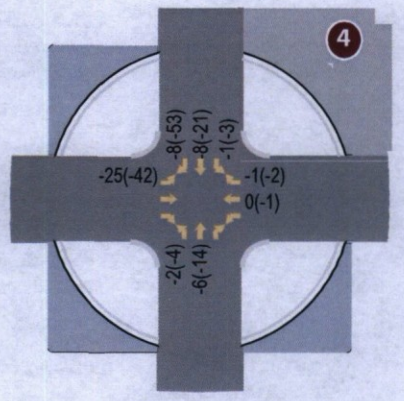
Scottsdale Rd. @ Butherus Dr.



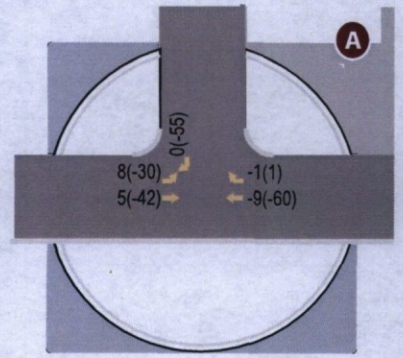
Scottsdale Rd. @ Greenway-Hayden Lp.



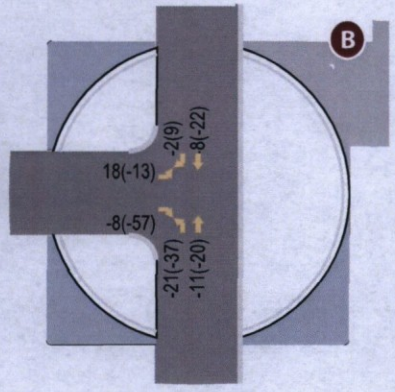
73rd St. @ Greenway-Hayden Lp.



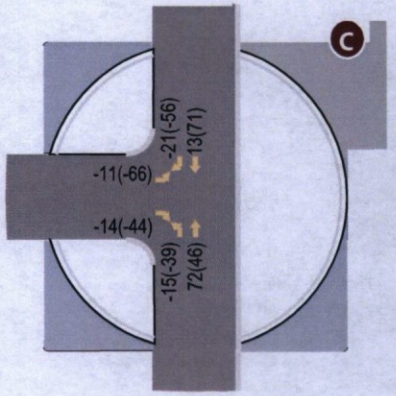
73rd St. @ Butherus Dr.



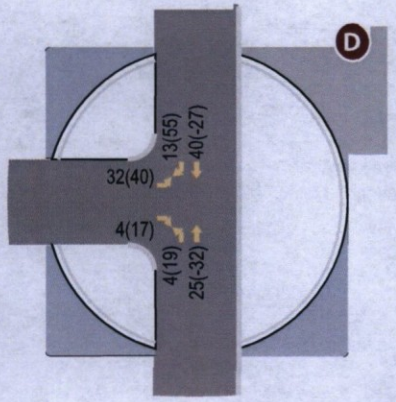
Access A @ Butherus Dr.



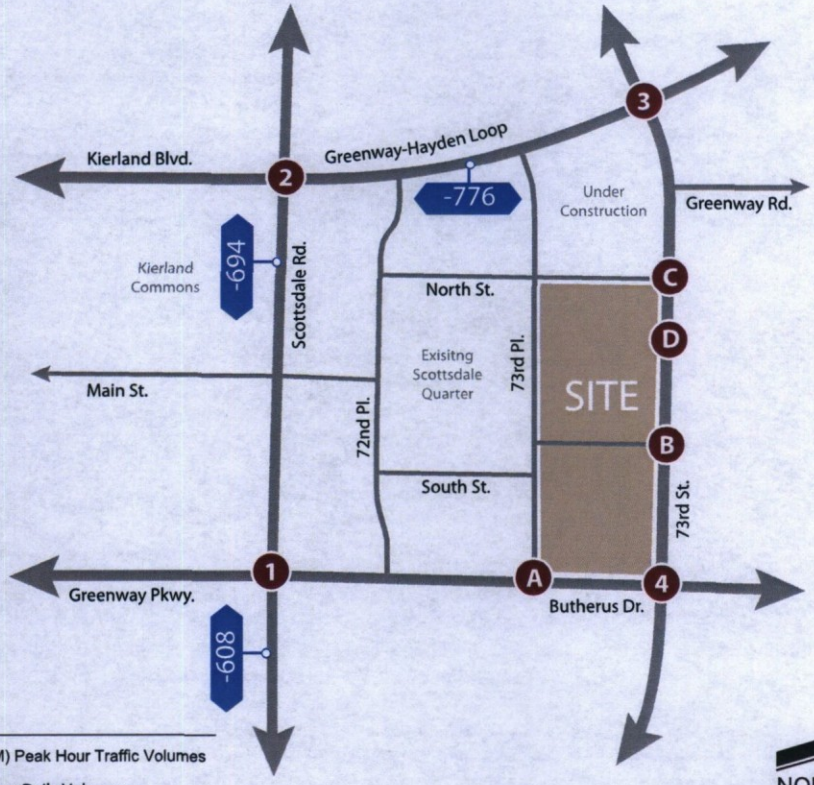
73rd St. @ Access B



73rd St. @ Access C



73rd St. @ Access D



LEGEND

XX(XX) - Difference in AM(PM) Peak Hour Traffic Volumes

XX,XXX - Difference in Average Daily Volumes

NORTH

Attachment G: Blocks K,L,&M Trip Comparison (Proposed - Approved)

BLDG H

BLDG F

BLDG E

73RD PLACE

BLDG M

SOUTH STREET

NORTH STREET

BLDG K

Valet Drop-Off

Valet Drop-Off

A
Retail
3,503 sf
62'x56.5'
18' CLR.

QUAD

Patio

C
Retail
16,359 sf
192'x90'
17' CLR.

Lobby

B
Restaurant
14,539 sf
141'x73'
18' CLR.

ELEC

Retail Service Yard 8,118 sf

MISTING & IRRIGATION CONTROL

Recycle

Retail Trash

RISER

TEL

T

Res. Service Yard 5,827 sf

DN

UP

DN

UP

Bike Storage

Ret. Trash

Recycle

GARAGE M

Underground

Tunnel

Pet Spa

Lobby

Mail

EMERGENCY GENERATOR

66 Parking Spaces

RETAIL SES (MAIN ELEC)

RES. SES (MAIN ELEC)

FIRE PUMP / RISERS / DOM WATER

Res. Concierge

Live/ Work Unit

Live/ Work Unit

Office 1,024 sf

Loading

On-Street Parking

Bike Lane

73 RD STREET/ DIAL BLVD.

NELSEN PARTNERS
ARCHITECTS & PLANNERS

WASHINGTON PRIME GROUP

LENNAR
MULTIFAMILY COMMUNITIES

Scottsdale Quarter - Block L

SCOTTSDALE, AZ | #315036 | 29 SEPTEMBER 2016

SITE PLAN / LEVEL 1

SCALE: 1" = 50' 0 25' 50'

ATTACHMENT A

DAVID EVANS
AND ASSOCIATES INC.

August 17, 2016

City of Scottsdale, Drainage Department
7447 E. Indian School Road, Suite 125
6263 Scottsdale Road, Suite 330
Scottsdale, AZ 85251

Subject: Drainage Letter for Parcel L

This letter is intended to summarize the drainage conditions for the proposed improvements on Parcels L of Scottsdale Quarter. The intent of the design is to illustrate that the proposed buildings will not flood during the 100-year design storm event and that the development of the site will not adversely impact adjacent development and match the Master Planning drainage conditions. This letter is based on the approved Master Drainage Report for Scottsdale Quarter, dated July 2008 prepared by David Evans and Associates, Inc.

Parcels L is located north of the northeastern corner of North 73rd Place and Butherus Drive in Section 11, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian. The project is approximately 1.8 acres that occupies the southeastern portion of the Scottsdale Quarter project.

The current published FEMA Flood Insurance Rate Map (FIRM) for the site is map number 04013C1760L, Effective date is October 16, 2013 shows that the entire site falls under Zone X (shaded). Zone X (shaded) is defined as "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood." The pertinent portion of the FIRM panel Figure 2 is provided in the Supporting Documents Section attached to this letter.

Existing Conditions:

The existing 1.8± acre site consists of dirt that is graded and used for construction staging and parking during Parcel M construction. There are no trees/shrubs onsite. The site slopes at flat slope in a southerly direction towards Parcel M.

Runoff is captured by stormdrain system onsite along N 73rd Place, which is an improved street with curb and gutter that slopes in a southerly direction with catch basins along the street that convey runoff into the onsite stormdrain system.

73rd Street is an improved street with curb and gutter and slopes in a southerly direction. Runoff from the street is conveyed into Butherus Dive. Butherus Drive is an improved street with curb and gutter and is slopes in a westerly direction towards Scottsdale Road.

West of the site, and west of N 73rd Street, is Phases 1 and 2 of Scottsdale Quarter that is graded to slope away from the site. Previous phases have existing storm drain system that accounts for retention from Parcel L. Stubs are also in place to connect to the proposed development to the existing underground stormdrain system. There are few stubs connecting the west side of the site to the existing underground storm drain system onsite.

Proposed Conditions:

During developed conditions, the existing temporary parallel parking lot along 73rd Place will be removed and parcels L will be constructed with retail, residential, garage structures and surrounding hardscape areas.

On-site improvements include large buildings, surrounding hardscape and landscape areas. The proposed buildings' roof drains will connect to the existing storm drain system onsite through the existing stubs. The plan is to match the anticipated flows that are identified in the master drainage report for Scottsdale Quarter, dated July of 2008 (attached to this letter).

Retention for the site is provided as part of the stormdrain/detention system installed during the previous phases of Scottsdale Quarter. Pertinent excerpts from the Master Drainage Report for Scottsdale Quarter are included with this letter. Drainage areas BL1 and BL2 are accounted for in the Master Drainage report.

No offsite improvements are part of the project development and drainage conditions along the adjacent streets are kept the same.

The finish floors of the proposed buildings will be set higher than adjacent hardscape areas. During final design and there will be emergency outfalls of the small hardscape areas taken into account adjacent to the buildings, so that water does not back up into the buildings.

There are no storage requirements for the proposed site since the required design retention volume is accounted for in the detention system for the Scottsdale Quarter project. As mentioned above, the site will be tying into the detention system for the Scottsdale quarter and the improvements will not impact the adjacent properties. The extreme outfall of the site will be set, along the southwestern portion of the site, at an elevation that will be set lower than the lowest finish floor elevation.

Should have any questions, please contact me at 602 474-9223 or email me at ryg@deainc.com.

Sincerely,

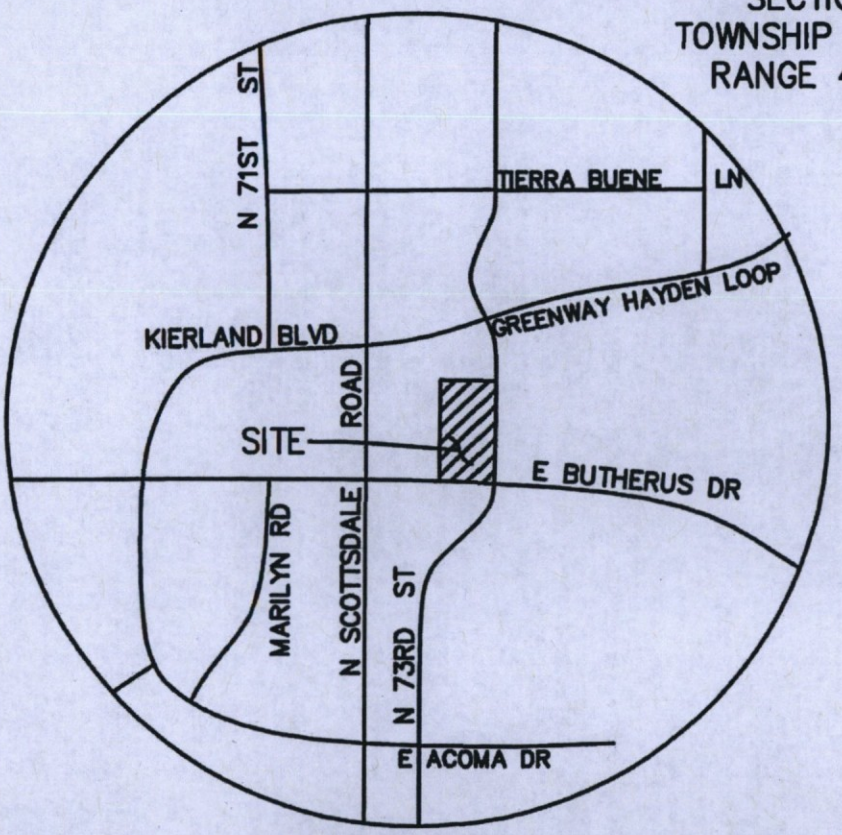
DAVID EVANS AND ASSOCIATES, INC.

Ramzi Georges, P.E., CFM

Exp: 3-31-2017

Supporting Section

SECTION 11
TOWNSHIP 3 NORTH
RANGE 4 EAST



VICINITY MAP
NTS

FIGURE 1

P: \G\GLIR00000004\0400CAD\EC\EXHIBITS\HY\Vicinity Map.dwg jcf Nov 12, 2013 10:44:22am

EXISTING SITE CONDITIONS FOR BLOCK 'L' OF SCOTTSDALE QUARTER CITY OF SCOTTSDALE, ARIZONA

DEVELOPER/OWNER

GLIMCHER
180 EAST BROAD STREET
COLUMBUS, OH 43215
(614) 887-5690

SITE ARCHITECT

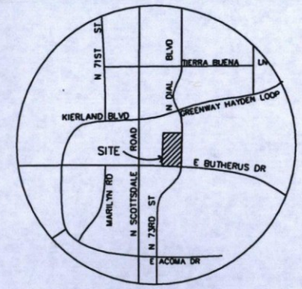
NELSEN ARCHITECTS
15044 NORTH SCOTTSDALE ROAD, SUITE 200
SCOTTSDALE, AZ 85254
CONTACT: GWEN JARICK
PHONE: (480) 949-6800

ENGINEER

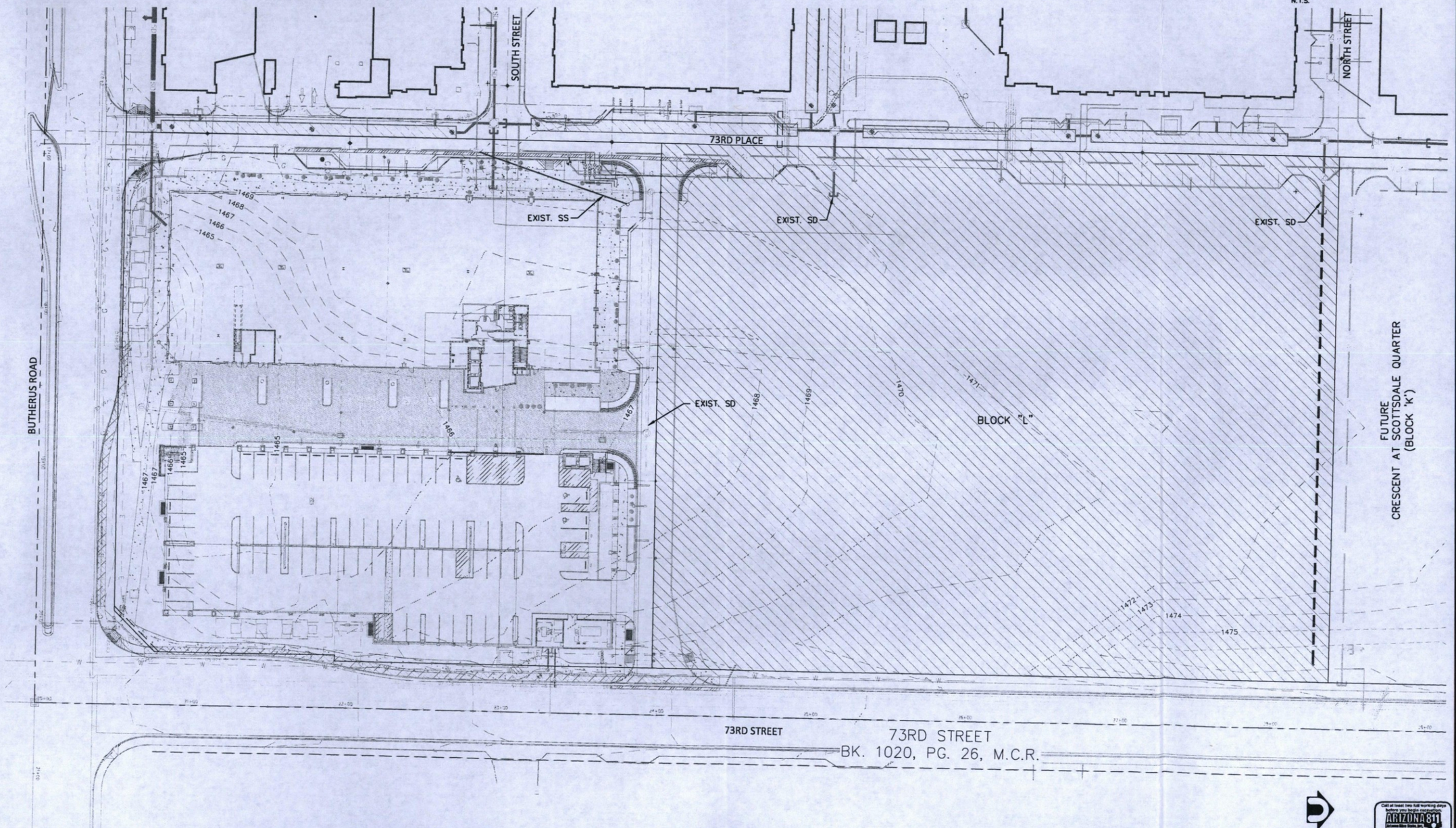
DAVID EVANS AND ASSOCIATES, INC.
4600 EAST WASHINGTON STREET, SUITE 250
PHOENIX, AZ 85034
CONTACT: RAMZI GEORGES
PHONE: (602) 678-5151

LEGEND

- EXISTING STORM DRAIN
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE



VICINITY MAP
N.T.S.



NO.	REVISION	BY	DATE

DRAWN BY: JCF
DESIGN BY: JCF
CHECKED BY: RYG
DATE: 11/2013

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.5151

Registered Professional Engineer
CERTIFICATE
37287
RAMZI GEORGES
ARIZONA U.S.A.
EXPIRES: 3/31/2017

EXHIBIT 'A'
EXISTING SITE CONDITIONS
BLOCKS 'L' & 'M', SCOTTSDALE QUARTER
SCOTTSDALE, ARIZONA

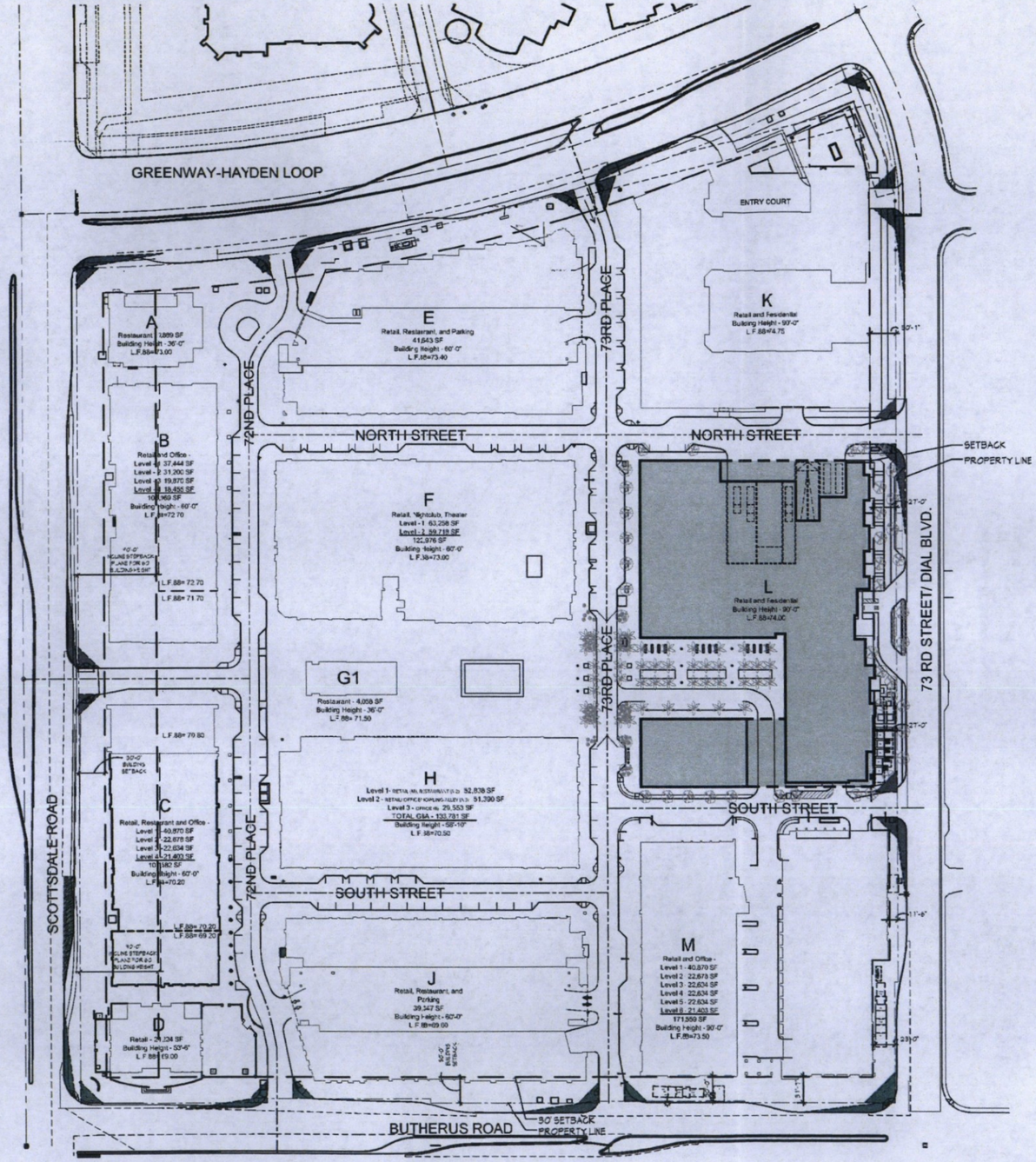
SECTION: 11
TWNSHP: 3N
RANGE: 4E

JOB NO.:
GLIR0000-0004

SHEET
1 OF 1

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

P:\GI\GLIR0000000\4\04000CAD\EC\EXHIBITS\EC-FG-008-EX COND 2016.dwg jcf Aug 17, 2016 10:56:10am



SITE DATA

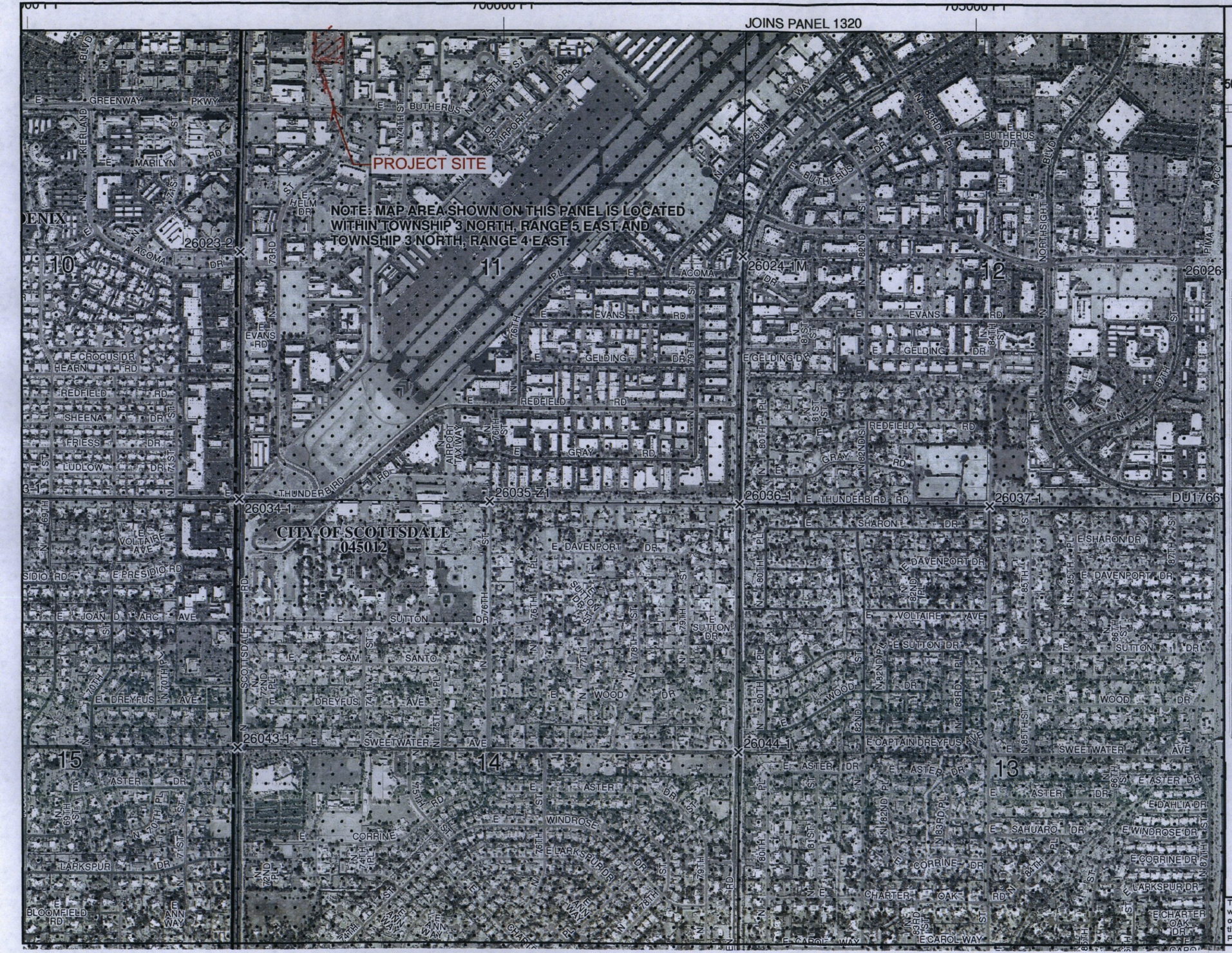
Zoning:	PRC
Gross Site Area:	1,246,149.70 28.61 Acres
Net Site Area:	**1,024,555.00** 23.52 Acres
Maximum Building Height:	90'-0"
Building Height Proposed:	90'-0"
Building Setback	30' (varies on 73rd Street)
FAR Allowed (w/o residential)	1.0 (1,024,555.00 SF)
Residential Dwelling Area Allowed :	409,822 SF (0.4 FAR)
Residential Dwelling Area Proposed :	**512,278 SF (0.5 FAR)**
Residential Dwelling Area Existing :	234,465 SF (Block K)
Residential Dwelling Area Proposed for Block L :	**277,813 SF**
Residential Dwelling Area Proposed :	**512,278 SF**
Commercial Area Total Proposed :	**843,717 SF**
Phase 1&2 Existing :	*586,791 SF*
Phase 3 Existing :	*193,414 SF*
Phase 3 Proposed :	*63,512 SF*

NELSEN PARTNERS
ARCHITECTS & PLANNERS

WP GLIMCHER LENNAR MULTIFAMILY COMMUNITIES

Scottsdale Quarter - Block L
Neighborhood Meeting
SCOTTSDALE, AZ | #315036 | 11 AUGUST 2016

SCALE: 1" = 150' 0 75' 150'



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET METE

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1760L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 1760 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MARICOPA COUNTY	040037	1760	L
PARADISE VALLEY, TOWN OF	040049	1760	L
PHOENIX, CITY OF	040051	1760	L
SCOTTSDALE, CITY OF	045012	1760	L

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
04013C1760L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Pertinent Excerpts Master Drainage Report

Pertinent Excerpts Master Drainage Report

MASTER DRAINAGE REPORT
FOR
Scottsdale Quarter

PREPARED FOR

GLIMCHER
150 East Gay Street, 24th Floor
Columbus, OH 43215
(614) 887-5671

PREPARED BY

DAVID EVANS AND ASSOCIATES, INC.
2141 E. Highland Ave., Suite 200
PHOENIX, AZ 85016
(602) 678-5151

EXPIRES 12/31/09

July 2008
DEA PROJECT NO. GLIR00000001

flows conveyed in Scottsdale Road and Greenway-Hayden Loop were analyzed using the HEC-1 flow rates minus the flow full capacity of the associated storm drain systems, which reduced peak flows through the street sections. The resulting flow depths were used to determine finished floor elevations for proposed structures adjacent to its corresponding road. Flowmaster calculations are included in Appendix D.

3.3 On-Site Storm Water Storage

City of Scottsdale requires new development to store runoff onsite that is generated by a "rainfall event up to and including the 100-year, 2-hour duration event" (Reference #1). The required storage volume for the project site will be estimated as follows:

$$V_R = (D/12)*A*C_W$$

Where:
V_R = Required storage volume in acre-feet
C_W = Weighted Runoff coefficient
D = Rainfall depth for the 100-year, 2-hour event = 2.82" (Reference #1)
A = Drainage area in acres

Underground storage facilities in the form of 96" aluminized CMP, located throughout the development) and StormTrap® (a pre-fabricated concrete system located near the southwest corner of the site – Reference 8) will be used to retain the runoff and satisfy the storm water retention requirement. Contech and StormTrap® manufacturer documentation is included in Appendix F. The owner will be responsible for maintaining all the storm water conveyance and storage facilities per manufacturer's recommendations. A slurry back fill to the CMP springline will be used during installation of the pipe (see construction plans for call out). A geotechnical report by Speedie and Associates (Reference 9) is included in Appendix H. An Addendum to the report, addressing the underground storage tanks is also included in Appendix H (Reference 10).

In the case of a storm event or multiple storm events in succession exceeding current design, excess runoff will exit the property through a local outfall point, which is also the historic outfall for the site, located at the southwestern corner of the site at the intersection of Scottsdale Road and Butherus Road, which has an elevation of approximately 1463'.

As previously mentioned, construction of the property will occur in three phases, where the defined Phase 1, 2 and 3 areas will be constructed sequentially. During Phase 1 a temporary retention basin will be constructed at the southeast corner (SEC) of the property to intercept the existing parking lot runoff and portions of the existing building runoff. A temporary drainage ditch will be graded and utilized to intercept runoff from part of the existing building and the existing parking lot along North 73rd Street (North Dial Boulevard). This temporary drainage ditch will

convey runoff to the temporary retention basin that will be graded at the SEC of the property. See Exhibit B for callout and location.

Also during Phase 1 most of the underground retention facilities will be installed around the Phase 1 buildings. The graded ditch and Temporary Retention Basin will continue to be used throughout Phase 1. Inlet protection will be provided during the construction of Phase 1 until stabilization of Phase 1 is complete.

When construction of Phase 2 begins, the temporary retention basin SEC will be backfilled and provided retention will be replaced by the underground storage facilities placed during Phase 2 that will serve for the provided retention for the entire site including Phase 3. A new temporary basin will be constructed to provide first flush requirements for the Phase 3 area as described in Section 3.1. As Phase 3 is developed, catch basins and smaller diameter storm drain will be added to Phase 3 to convey runoff to the underground retention system built in Phases 1 and 2.

Table 3
Storage Volume Summary

	Retention Required, CF	Retention provided, CF
Phase 1	185,618	270,256
Entire site	200,323	215,129

3.4 Bleed-off and Dissipation

A 6" in diameter orifice connected to an 18" storm drain pipe will be used for runoff dissipation. Calculations used to determine the orifice size are included in Appendix D. The 18" storm drain pipe will drain water from the underground storage facility to the existing 66" storm drain system on Scottsdale Road. The City of Scottsdale requires stored runoff to be discharged completely from the facility within 24-36 hours following the storm event (Reference #1). Furthermore, City of Scottsdale requires bleed off at an average rate of 1 cfs not to exceed 1.5 cfs (Reference #1).

The following flow vs. rate and time equation will be used to estimate the time required to drain the underground retention facilities:

$$Q = V_R / t$$

Where:
V_R = Required storage volume in cubic feet
Q = average rate of discharge (cubic feet per second)
t = time (seconds)

Table 3.1

EXISTING SITE RETENTION				
LAND USE	AREA	C	DEPTH	REQ RETENTION (ft^3)
pavement/roof	376,677.00	0.90	0.24	84,093.14
landscape	648,043.00	0.35	0.24	53,301.54
	Total Retention Required (ft^3)			137,394.68
	Total Volume Provided (ft^3)			90,837.16
	Retention Shortage (ft^3)			-46,557.52

Table 3.2

PHASE 1 RETENTION				
LAND USE	AREA	C	DEPTH	REQ RETENTION (ft^3)
pavement/roof/ Dial building	459,979	0.95	0.24	102,690
Pavement (ex. Dial parking)	258,170.00	0.95	0.24	57,757
Landscape (Surrounding Dial Parking)	157,956	0.35	0.24	12,992
Landscape (Remainder)	148,073	0.35	0.24	12,179
	Total Retention Required (ft^3)			185,618
	Total Proposed Retention (ft^3)			267,015
	Excess Retention (ft^3)			81,397
	Retention Required for Dial Parking and surrounding landscape (ft^3)			70,749
	Proposed Retention for Dial parking and surrounding landscape (ft^3)			71,120
	Excess Retention for Dial Parking (ft^3)			370

Table 3.3

Self Retaining, FOR PHASE 1 ONLY				
ELEVATION	SURFACE AREA	AVG. AREA	DEPTH	VOLUME (ft3)
1474	23,195	20,008	1	20,008
1473	16,821	13,140	1	33,148
1472	9,458			
	Retention Provided During Phase 1 (ft^3)			33,147

Table 3.4

STORAGE BASIN SEC, FOR PHASE 1 ONLY				
ELEVATION	SURFACE AREA	AVG. AREA	DEPTH	VOLUME (ft3)
1464	28,637	26,966	1	26,966
1463	25,294	23,673	1	50,639
1462	22,052	20,481	1	71,120
1461	18,910			
	Retention Provided During Phase 1 (ft^3)			71,120

Table 3.5

PHASE 1, 8' CMP RETENTION (to remain for phase 2)			
	Area	L.F.	Volume (ft^3)
8' CMP	50.27	2,651	133,254

Table 3.6

PHASE 1, STORM TRAP RETENTION (to remain for phase 2)			
	Area	Depth	Volume (ft^3)
Storm Trap	2,722	10	27,220

Table 3.7

PHASE 1 and 2 (FINAL) RETENTION				
LAND USE	AREA	C	DEPTH	RET. REQ (ft3)
pavement/roof	897,302	0.95	0.24	200,323
	Total Retention Required (ft^3)			200,323
	*Retention Provided (ft^3)			215,129
	Excess Retention (ft^3)			**14,806**

* Retention provided includes 2,234 LF of 18" HDPE and 489 LF of 36" HDPE pipe

Table 3.8

PHASE 2, 8' CMP RETENTION			
	Area	L.F.	Volume (ft^3)
8' CMP	50.27	940	47,254

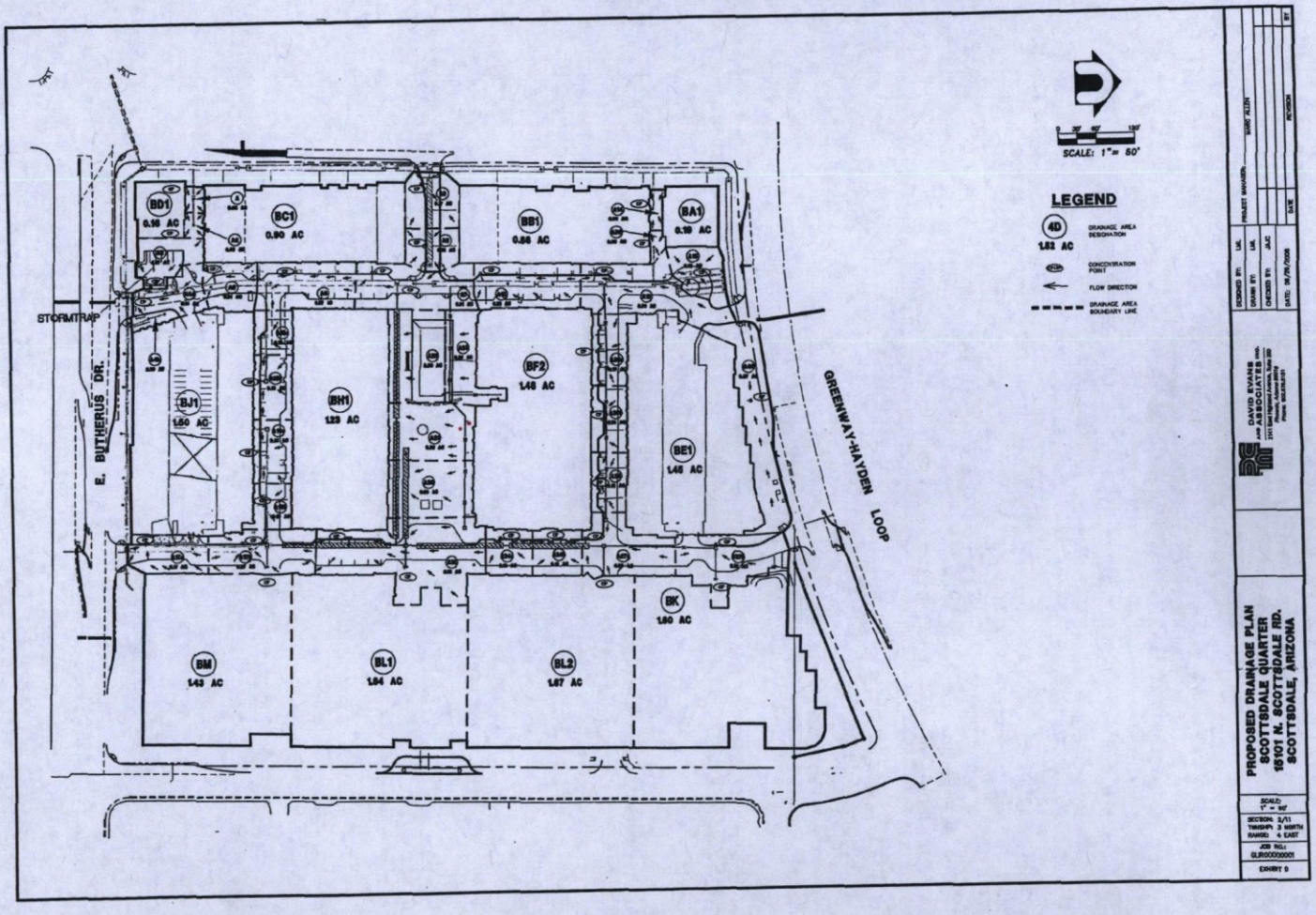
Scottsdale Quarter

Required Retention

Vreq = A*C*D/12

C = 0.95 (from above)
D = 2.82 inches

Drainage Area	Area (ac)	Area (sf)	Required Volume (cf)
A	0.03	1,269	283
A2	0.03	1,301	290
A3	0.15	6,489	1,449
A4a	0.14	6,247	1,395
A4b	0.03	1,480	330
A5	0.14	6,270	1,400
A6	0.27	11,845	2,644
A7	0.31	13,418	2,996
A8	0.13	5,602	1,251
A9	0.17	7,455	1,664
A10	0.28	12,401	2,769
A12	0.36	15,530	3,467
A13	0.15	6,639	1,482
A14	0.03	1,407	314
A15a	0.10	4,222	943
A15b	0.14	6,089	1,359
A16a	0.14	6,199	1,384
A16b	0.10	4,531	1,012
A17a	0.17	7,461	1,666
A17b	0.27	11,563	2,581
A18	0.61	26,680	5,956
A20	0.28	12,341	2,755
A21	0.28	12,342	2,755
A22	0.30	13,002	2,903
A23	0.20	8,589	1,917
A24a	0.13	5,511	1,230
A24b	0.14	5,881	1,313
A25	0.12	5,402	1,206
A26a	0.15	6,423	1,434
A26b	0.14	5,907	1,319
A27a	0.27	11,861	2,648
A27b	0.31	13,403	2,992
A39	0.02	1,075	240
A40	0.37	15,952	3,561
BA1	0.19	8,420	1,880
BB1	0.86	37,451	8,361
BC1	0.90	39,416	8,800
BD1	0.16	6,936	1,548
BE1	1.45	63,101	14,087
BF2	1.48	64,566	14,414
BH1	1.23	53,711	11,991
BJ1	1.50	65,487	14,620
BK	1.60	69,894	15,604
BL1	1.64	71,520	15,967
BL2	1.67	72,843	16,262
BM	1.43	62,172	13,880
TOTAL	20.60	897,304	200,323


BD1
0.16 AC
BC1
0.90 AC
BB1
0.86 AC
BA1
0.19 AC
BJ1
1.50 AC
BH1
1.29 AC
BF2
1.48 AC
BE1
1.48 AC
BK
1.80 AC
BM
1.48 AC
BL1
1.84 AC
BL2
1.87 AC
STORM TRAP
E. BUTHERUS DR.
GREENWAY-HAYDEN LOOP
SCALE: 1" = 50'
LEGEND
DRAINAGE AREA DESIGNATION
CONCENTRATION POINT
FLOW DIRECTION
DRAINAGE AREA BOUNDARY LINE
PROPOSED DRAINAGE PLAN
SCOTTSDALE QUARTER
15101 N. SCOTTSDALE RD.
SCOTTSDALE, ARIZONA
SCALE: 1" = 50'
SECTION 2/11
TWNSHP 3 NORTH
RANGE 4 EAST
JOB NO.:
EXHIBIT D

DAVID EVANS AND ASSOCIATES INC.

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona
By: RICHARD SACKS
Date: 10/19/16

MEMORANDUM

DATE: September 29, 2016

TO: City of Scottsdale

FROM: Vicente Ruiz

SUBJECT: **Wastewater Letter of Conformance**

PROJECT: LENN0019 – Scottsdale Quarter - Block L

1. General

This memorandum was completed under contract with Lennar and considers the wastewater flows projections proposed for Block L within the Scottsdale Quarter development. Scottsdale Quarter is a master planned mixed use development. A Wastewater Basis of Design report was prepared in January 2008 for the ultimate buildout of the project. During the planning phase projected land uses where established for the proposed blocks. These projected land uses are often revised over time to meet the current market demands. This memorandum will consider the proposed land use changes for Block L and evaluate the impacts to the existing wastewater infrastructure.

The proposed Block L will consist of several buildings containing a combination of residential dwelling units, restaurants, and retail shopping space. All of the proposed buildings will discharge to the existing Scottsdale Quarter on-site private sewer infrastructure.

2. Existing Utilities

The existing on-site utilities include underground telephone, underground electrical, underground cable, gas, sewer, and water. The existing utilities are illustrated on the Conceptual Water & Sewer Block "L", Scottsdale Quarter exhibit.

Existing sewer lines surround the proposed blocks. Existing sewer lines are located to the north, east and west of Block L. An existing public 8-inch sewer line is located east of Block L in 73rd Street. No connections to this existing sewer main are proposed for Block L. An existing private 6-inch sewer line is located north of Block L in North Street and flows east to an existing public 8-inch sewer line in 73rd Street. The existing private 8-inch sewer line in 73rd Place runs south along the western boundary of Block L.

3. Existing Master Plans and Design Reports

A basis of design report was previously prepared for Scottsdale Quarter in January 2008, by David Evans and Associates, Inc. The flows and capacities assumed for the existing on-site sewer infrastructure are based on the results provided in the basis of design report prepared by DEA. No certified flow tests were conducted specifically for this project. A Basis of Design Report was prepared for Lot K by Kimley Horn in 2013 and amended in February 2014. The demands listed in the amendment were used to update the project model.

4. Land Use

The proposed land uses for Block L has changed as shown in the land use summary table below.

TABLE 4.1 – LAND USE SUMMARY

	Scenario	Retail (ft^2)	Restaurant (ft^2)	Office (ft^2)	Hotel (rooms)	Residential (DUs)
BLOCK L	Original Projections	23,959	22,215	-	125	64
	Change	-4,097	-7589	-	-125	+236
	Proposed Projections	19,862	14,626	-	0	300

5. Computations

To evaluate the impacts to the existing on-site sewer lines the wastewater generations for each block were calculated using the revised land uses. These revised wastewater flow projections were then modeled through the existing sewer lines to calculate the change in capacity and pipe velocity.

The projected wastewater generations for each proposed block has been prepared based on the revised land uses and are summarized in the table below. The unit wastewater flow rates are based on the City of Scottsdale design standards utilized in the original design report in 2008 for each land use for blocks other than L and K. Demands for unit K were taken from the Kimley Horne Amended BOD report. A population of 1.7 per DU was used for the condo and a unit flow of 80 gpcpd was also applied. The complete wastewater generation table is attached.

TABLE 5.1 – WASTEWATER GENERATION SUMMARY

	Original Projections		Change		Proposed Projections	
	ADWF (gpd)	Peak Flow (gpd)	ADWF (gpd)	Peak Flow (gpd)	ADWF (gpd)	Peak Flow (gpd)
BLOCK K	19,667	78,668	-10,143	-35,810	9,524	42,858
BLOCK L	65,799	263,194	2,483	+29,394	68,282	292,588

All on-site sewer lines are smaller than 12 inches. A Peak Factor of 3.9 was used for the residential component of block L after using Harmon's formula. When Block K amended demands were added to the model, the net demand decreased from the original 2008 projected demands, therefore, the new block L site is in compliance with the original report.

An additional 30 gpm flow is added in the flow calculation for average day which adds 43,200 gpd. The existing capacity of the infrastructure can support 60,888 gpd and remain less than 0.65 d/D. Please see appendix for capacity summary.

The city will allow a maximum of 0.70 d/D depth, so there is extra capacity in the existing infrastructure that was designed for a maximum of 0.65 in the 8 inch sewer. All of the sewer lines on-site are private and also meet the Arizona Administrative Code requirements and the Uniform Plumbing Code requirements. Table 5.2 summarizes the percent capacity results for the existing on-site sewer mains which will serve Block L.

6. Summary

Based on the calculations preformed for this analysis the existing private on-site sewer infrastructure for Scottsdale Quarter has capacity for the proposed increase in land use for Block L.

Exp 6/30/19

SCOTTSDALE QUARTER
BLOCK L
WASTEWATER GENERATION SUMMARY

ORIGINAL PROJECTIONS (January 2008 BOD)									
Block Number	Land Use	Area (ft^2)	Dwelling Units (DU)	Persons / DU	Population / Equivalent Population	Unit Wastewater Flow	Average Daily Flow (GPD)	Peak Factor	Peak Flow (GPD)
Block L	Retail	23,959			96	0.40	9,584	4.0	38,334
	Restaurant	22,215			222	1.0	22,215	4.0	88,860
	Office	-			0	0.10	0	4.0	0
	Hotel		125	2.5	180	144	18,000	4.0	72,000
	Residential		64	2.5	160	100	16,000	4.0	64,000
							65,799		**263,194**
Block K	Retail	-			0	0.40	0	4.0	0
	Restaurant	19,667			197	1.0	19,667	4.0	78,668
	Office	-			0	0.10	0	4.0	0
	Residential		-		0		0		0
							19,667		**78,668**
PROPOSED PROJECTIONS									
Block L	Retail	19,862			99	0.50	9,931	3.0	29,793
	Restaurant	14,626			176	1.2	17,551	6.0	105,307
	Office	-			0	0.40	0	3.0	0
	Hotel		-	2.5	0	380	0	4.5	0
	Residential-condo		300	1.7	510	80	40,800	3.9	157,488
					785		**68,282**		**292,588**
Block K demands are as given in the Crescent Communities sewer report addendum by Kimley Horn July 2013.									
Block K	Retail				0	0.40	0	4.5	0
	Retail	9,190			92	1.0	9,190	4.5	41,355
	Office	3,340			3	0.10	334	4.5	1,503
	Residential			2.5	0	100	0	4.5	0
					95		**9,524**		**42,858**
PROJECTION CHANGES									
Building Number		Area (ft^2)	Dwelling Units (DU)		Population / Equivalent Population		Average Daily Flow (GPD)		Peak Flow (GPD)
Block L	Original Projections	46,174	189		658		65,799		263,194
	Proposed Projections	34,488	300		785		68,282		292,588
	Change	**-11,686**	**111**		**127**		**2,484**		**29,394**
Block K	Original Projections	19,667	-		197		19,667		78,668
	Proposed Projections	12,530			0		9,524		42,858
	Change	7137	-		**-197**		**-10,143**		**-35,810**

SANITARY SEWER DESIGN TABLE
SCOTTSDALE QUARTER
BLOCK L

	Modeling Results from Scottsdale Quarter Wastewater Basis of Design, January 2008, by DEA								Revised Calculations				
	Pipe Run	Total Flow (gpd)	Slope (ft/ft)	Pipe Size (in)	Capacity (%)	Peak Daily Flow Velocity (ft/s)	Full Flow Velocity (fps)	Pipe Full Flow Capacity 65%	Pipe Available Capacity (gpd)	Proposed Increase Peak Flow (gpd)	Remaining Available Capacity (gpd)	Revised Cumulative Peak Flow (gpd)	Revised Capacity (%)	Revised Peak Flow Velocity (fps)
BLOCK L	P-1	877,043	0.01	10	57	4.23	4.6	1,065,000	187,957	-6,416	194,373	870,627	62.7	4.4
	P-2	709,112	0.0052	10	61.3	3.13	3.3	770,000	60,888	-6,414	67,302	702,698	69.6	3.2
	P-5	138,790	0.0202	8	23.9	3.36	5.6	840,000	701,210	-6,414	707,624	132,376	25.1	3.5
	P-6	366,042	0.0077	8	51.9	3.09	3.5	515,000	148,958	7,372	141,587	373,414	52.6	3.1
	P-7	247,913	0.0077	8	41.6	2.8	3.5	515,000	267,087	14,743	252,344	262,656	42.9	2.8
	P-23	988,561	0.0157	10	53.3	5.17	5.7	1,340,000	351,439	-6,414	357,853	982,147	54.3	5.2
	P-24	952,716	0.0157	10	52.1	5.13	5.7	1,340,000	387,284	-6,414	393,698	946,302	53.1	5.2
	P-36	709,112	0.01	10	50	4.02	4.6	1,065,000	355,888	-6,414	362,302	702,698	51.3	4.1
	P-37	803,588	0.01	10	53.9	4.14	4.6	1,065,000	261,412	-6,414	267,826	797,174	55.1	4.2
	P-38	685,112	0.0052	10	59.9	3.11	3.3	770,000	84,888	-6,414	91,302	678,698	68.1	3.2
	P-39	709,112	0.0052	10	61.3	3.13	3.3	770,000	60,888	-6,414	67,302	702,698	69.6	3.2

Kimley-Horn
and Associates, Inc.

February 25, 2014

Richard Sacks, P.E.
Senior Water Resources Engineer
City of Scottsdale
9379 E. San Salvador
Scottsdale, AZ 85258

RE: Scottsdale Quarter Lot K, Case Numbers: 3536-13-1
Amendment to the Approved Sewer Basis of Design Report

Dear Mr. Sacks:

Kimley-Horn and Associates, Inc. (KHA) has prepared this letter to summarize the changes to the City approved Sewer Basis of Design Report and the project's sewer design.

KHA submitted a plan revision to the City on 02/10/2014. This revision included a modification to the sewer outfall in North Street (Stubout 'F' per the attachments). This sewer now drains to the public sewer system in 73rd Street versus the onsite private system in 73rd Drive. Flow monitoring was conducted on the sewer main in 73rd Street and the City confirmed adequate capacity to accept these flows.

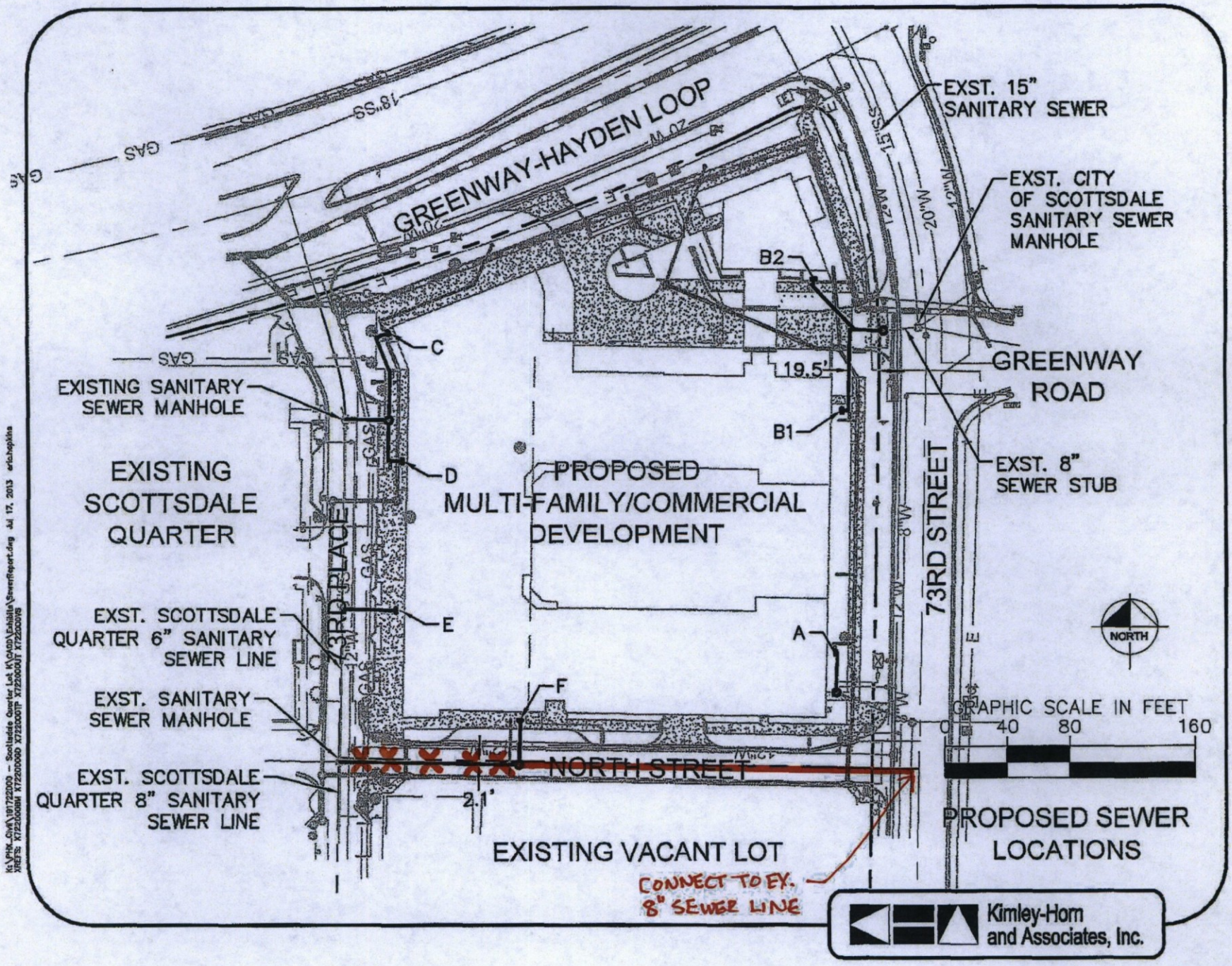
Please contact me at (602) 906-1191, if you have any further questions.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Miandra Cash

By: Miandra Cash, P.E
Project Manager


GREENWAY-HAYDEN LOOP
EXST. 15" SANITARY SEWER
EXST. CITY OF SCOTTSDALE SANITARY SEWER MANHOLE
GREENWAY ROAD
EXISTING SANITARY SEWER MANHOLE
EXISTING SCOTTSDALE QUARTER
PROPOSED MULTI-FAMILY/COMMERCIAL DEVELOPMENT
EXST. 8" SEWER STUB
73RD STREET
73RD PLACE
EXST. SCOTTSDALE QUARTER 6" SANITARY SEWER LINE
EXST. SANITARY SEWER MANHOLE
EXST. SCOTTSDALE QUARTER 8" SANITARY SEWER LINE
NORTH STREET
EXISTING VACANT LOT
CONNECT TO EX. 8" SEWER LINE
PROPOSED SEWER LOCATIONS
NORTH
GRAPHIC SCALE IN FEET
0 40 80 160
Kimley-Horn and Associates, Inc.
A
B1
B2
C
D
E
F
19.5'
2.1'

Prepared For: Crescent Communities
Prepared By: Kimley Horn and Associates, Inc.
Project No: 191722000

Sanitary Sewer Demand Table

Project: Scottsdale Quarter Lot K
Location: City of Scottsdale, Arizona
Date: July 2013

Entire Site

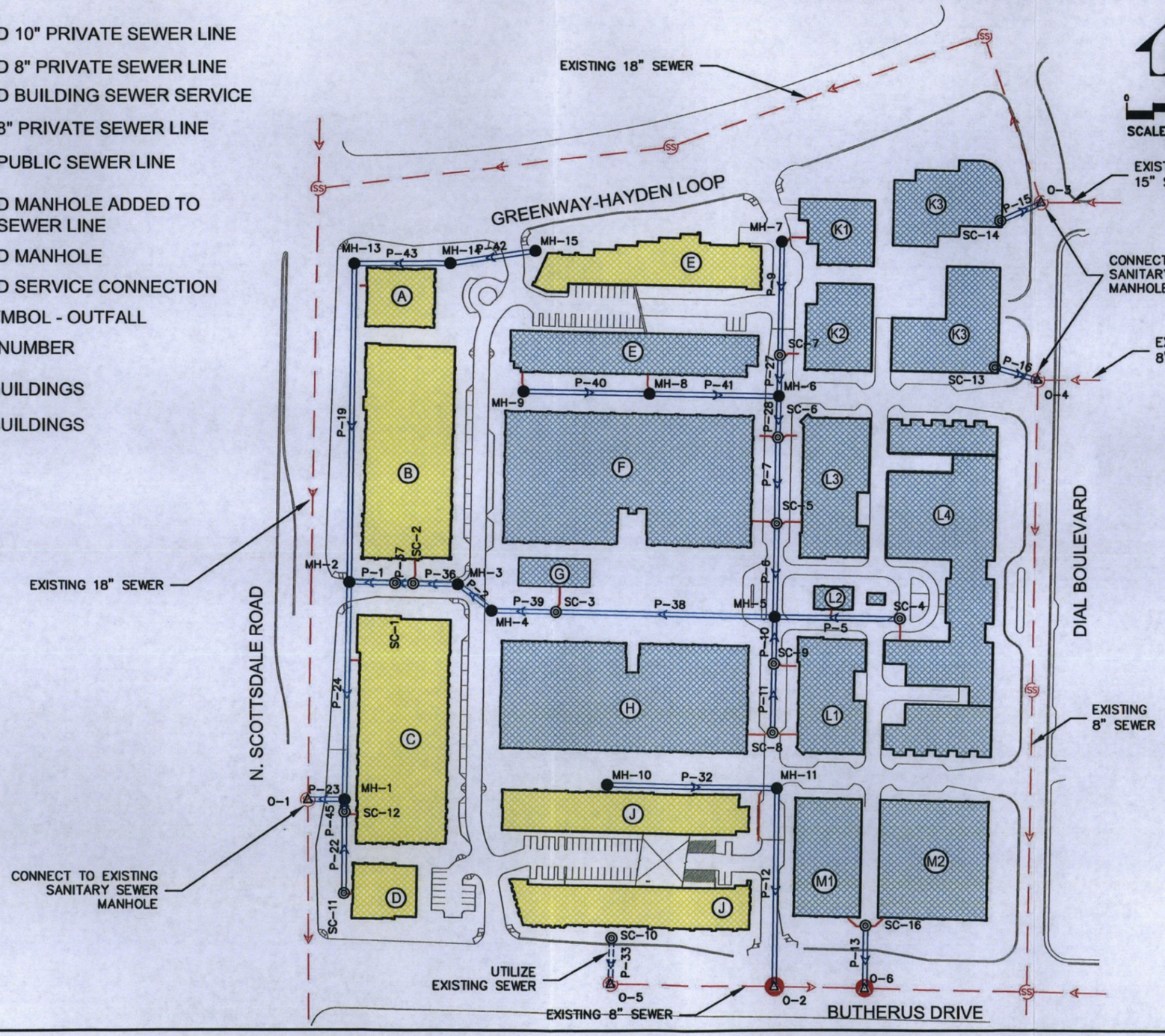
	City of Scottsdale Factors							Title 18 Chapter 9 Factors APP4.01							
STUB	Units	% Total	Room Equiv.	Avg Day Demand Per Room (gpd)	Avg Day Demand (gpd)	Peaking Factor	Peak Flow gpd (gpm)	Population Density per Unit	Population	Avg Day Demand per Person (gpppd)	APP4.01 Avg Day Demand (gpd)	Dry Weather Peaking Factor	Dry Weather Peak Flow (gpd)	Wet Weather Peaking Factor	Wet Weather Peak Flow
A	69	24.73%	82.35	140	11,530	4.5	51,884	2.5	172.5	80	13,800	3.62	49,956	1.1	54,951.60
B1	99	35.48%	118.16	140	16,543	4.5	74,442	2.5	247.5	80	19,800	3.62	71,676	1.1	78,844
B2	1	0.36%	1.19	140	167	4.5	752	2.5	2.5	80	200	3.62	724	1.1	796
C	55	19.71%	65.65	140	9,190	4.5	41,356	2.5	137.5	80	11,000	3.62	39,820	1.1	43,802
D	1	0.36%	1.19	140	167	4.5	752	2.5	2.5	80	200	3.62	724	1.1	796
E	1	0.36%	1.19	140	167	4.5	752	2.5	2.5	80	200	3.62	724	1.1	796
* F	53	19%	63.26	140	8,856	4.5	39,853	2.5	132.5	80	10,600	3.62	38,372	1.1	42,209
	279	1	333		46,620		209,790		697.5		55,800	2.42	135,036	1.1	148,540
		Total Rooms: (Including Studio)	333				(145.7)								(103.2)

Note: 279 unit count incorporates the 2 proposed retail sewer stubs and the leasing office sewer stub.

* CONNECTION POINT 'F' NOW SEWERS TO THE PUBLIC MAIN IN 73RD STREET.

LEGEND

- PROPOSED 10" PRIVATE SEWER LINE
- PROPOSED 8" PRIVATE SEWER LINE
- PROPOSED BUILDING SEWER SERVICE
- EXISTING 8" PRIVATE SEWER LINE
- EXISTING PUBLIC SEWER LINE
- PROPOSED MANHOLE ADDED TO EXISTING SEWER LINE
- PROPOSED MANHOLE
- PROPOSED SERVICE CONNECTION
- MODEL SYMBOL - OUTFALL
- BUILDING NUMBER
- PHASE 1 BUILDINGS
- PHASE 2 BUILDINGS



DRAWN BY:	DCHO
CHECKED BY:	WDR
DATE:	01/2008

BY	REVISION	DATE

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

ULTIMATE BUILD OUT SEWERCAD MODEL SCOTTSDALE QUARTER

SCALE:	1"=150'
SECTION:	2&11
TWNSHP:	3N
RANGE:	4E
SHEET	1 OF 1
JOB NO.:	GLIR00000001

P:\G\GLIR00000001\0600INFO\EC\WW\610WW Water Model\Sewer\WwMsX-GLIR00000001.dwg zjcp Jan 30, 2008 8:32:22am

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: September 29, 2016

TO: City of Scottsdale

FROM: Vicente Ruiz

SUBJECT: Water Analysis

PROJECT: LENN0019 – Scottsdale Quarter - Block L

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona
By: RICHARD SACKS
Date: 10/19/16

1. General

This memorandum was completed under a contract with Lennar and considers the projected water demands for the proposed Block L within the Scottsdale Quarter development. Scottsdale Quarter is a master planned mixed use development. A Water Basis of Design report was prepared in January 2008 for the ultimate buildout of the project. During the planning phase projected land uses where established for the proposed blocks. These projected land uses are often revised over time to meet the current market demands. This memorandum will consider the proposed land use changes for Block L and Block M and evaluate the impacts to the existing water infrastructure.

The proposed Block L will consist of several buildings containing a combination of residential dwelling units, restaurants, and retail shopping space. All of the proposed buildings will be connected to the existing water infrastructure.

2. Existing Utilities

The existing onsite utilities include underground telephone, underground electrical, underground cable, gas, sewer, and water. The existing utilities are illustrated on the Conceptual Water & Sewer Block "L", Scottsdale Quarter exhibit.

Existing water lines surround the proposed blocks. Existing water lines are located to the north, east, and west of Block L. Existing 12-inch and 8-inch water lines are located along 73rd Street to the east of Block L. An existing 12-inch water line is located to the north in North Street and connects to an existing 12-inch water line running along 73rd Place to the west.

3. Existing Master Plans and Design Reports

A basis of design report was previously prepared for Scottsdale Quarter in January 2008, by David Evans and Associates, Inc. The demands and pressures assumed for the existing water infrastructure are based on the results provided in the basis of design report prepared by DEA. An update for Block M and L was completed in 2014, and this report will further update Block L based on the latest site plan.

4. Land Use

The proposed land uses for Block L and Block M have changed as shown in the land use summary table below.

18-ZN-2013#2
09/30/16

TABLE 4.1 – LAND USE SUMMARY

	Scenario	Retail (ft^2)	Restaurant (ft^2)	Office (ft^2)	Hotel (rooms)	Residential (DUs)
BLOCK L	Original Projections	23,959	22,215	-	125	64
	Change	-4,097	-7,589	-	-125	+236
	Proposed Projections	19,862	14,626	-	0	300
BLOCK M	Original Projections	7,793	7,793	-	-	76
	Change	+21,007	-7,793	+145,400	-	+19
	Proposed Projections	28,800	-	145,400	-	95

5. Computations

To evaluate the impacts to the existing water system the revised water demands for blocks L and M were calculated using the revised land uses. These revised water demand projections were then modeled with an updated WaterCad Model and an updated fire flow test.

The projected water demands for blocks L and M have been calculated based on the revised land uses and are summarized in the table below. The unit water demands for each land use at Block L and M are based on the latest City of Scottsdale design standards. A complete water demand table is attached.

TABLE 5.1 – WATER DEMAND SUMMARY

	Original Projections			Change			Proposed Projections		
	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)
BLOCK L	141.6	283.1	495.4	-79	-157	-275	62.8	125.7	219.9
BLOCK M	32.6	65.1	114.0	56	112	197	88.8	177.6	310.8

The revised water demand projections were compared to the demands shown in the original basis of design report for the overall project. Revisiting the old demand projection calculations it was noticed that the unit demands for the residential and hotel uses were applied to the population of each use, rather than the number of dwelling units. This resulted in land uses with residential components applied with demands 2.5 times the required design demand in the original report.

The results of the water models are attached in the appendix for the Average Day, Max day plus Fire Flow, and Peak Hour flow. The original flow test used in the 2008 report modeled the flow test off of the 12 inch line in Greenway Haydon. The flow test utilized for the new modeling was taken in 73rd place on the 8 inch line during a peak hour demand window. This helps create a more conservative pressure analysis.

TABLE 5.2 – PRESSURE SUMMARY

Model Scenario	Minimum System Pressure		Maximum System Pressure	
	Original	Proposed	Original	Proposed
	psi	psi	psi	psi
Average Day	86.9	84.5	97.5	94.9
Max Day	80.1	81.4	90.7	91.9
Max Day + Fire Flow	30.0	30.0	-	-
Peak Hour	63.3	74.2	74.1	84.5

All pressures are at street level. Based on the City's criteria requiring 50 psi at the buildings' highest levels, any building requiring water above two-story may require a private booster pump system.

With the decrease in water demands proposed, the projected system pressure has sufficient capacity to support maximum day demands and fire flow event with a minimum pressure of 30 psi.

6. Summary

Based on the calculations preformed for this analysis the existing water infrastructure for Scottsdale Quarter has available capacity for the proposed increase in land use for Block L and Block M. Booster pumps will eb required to provide sufficient pressure to higher floors.

Exp 6/30/16

SCOTTSDALE QUARTER
BLOCK L AND BLOCK M
WATER DEMANDS

ORIGINAL PROJECTIONS (Januray 2008 BOD)

Block	Land Use	Area Sq. Ft.	Dwellings Served	Persons Per Dwelling	Pop.	Average Daily Demand Per Unit	Average Daily Demand (gpm)	Max. Day Factor	Maximum Daily Demand (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)
Block L	Retail	23,959				0.8	13.3	2.0	26.6	3.5	46.6
	Restaurant	22,215				0.7	10.8	2.0	21.6	3.5	37.8
	Office	0				0.6	0.0	2.0	0.0	3.5	0.0
	Hotel		125	2.5	313	446.3	96.9	2.0	193.7	3.5	339.0
	Residential		64	2.5	160	185.3	20.6	2.0	41.2	3.5	72.1
							141.6		**283.1**		**495.4**
Block M	Retail	7,793				0.8	4.3	2.0	8.7	3.5	15.2
	Restaurant	7,793				0.7	3.8	2.0	7.6	3.5	13.3
	Office	0				0.6	0.0	2.0	0.0	3.5	0.0
	Residential		76	2.5	190	185.3	24.4	2.0	48.9	3.5	85.6
							32.6		**65.1**		**114.0**

PROPOSED PROJECTIONS

Block	Land Use	Area Sq. Ft.	Dwellings Served	Persons Per Dwelling	Pop.	Average Daily Demand Per Unit	Average Daily Demand (gpm)	Max. Day Factor	Maximum Daily Demand (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)
Block L	Retail	19,862				0.8	11.0	2.0	22.1	3.5	38.6
	Restaurant	14,626				1.3	13.2	2.0	26.4	3.5	46.2
	Office	-				0.6	0.0	2.0	0.0	3.5	0.0
	Hotel		0	1.7	0	446.3	0.0	2.0	0.0	3.5	0.0
	Residential		300	1.7	510	185.3	38.6	2.0	77.2	3.5	135.1
							62.8		**125.7**		**219.9**
Block M	Retail	28,800				0.8	16.0	2.0	32.0	3.5	56.0
	Restaurant	0				1.3	0.0	2.0	0.0	3.5	0.0
	Office	145,400				0.6	60.6	2.0	121.2	3.5	212.0
	Residential		95	1.7	162	185.3	12.2	2.0	24.4	3.5	42.8
							88.8		**177.6**		**310.8**

Projection Changes

Block	Projections	Area Sq. Ft.	Dwellings Served		Pop.		Average Daily Demand (gpm)		Maximum Daily Demand (gpm)		Peak Hour Demand (gpm)
Block L	Original	46,174	189		473		142		283		495
	Proposed	34,488	300		510		63		126		220
	Change	**(11,686)**	**111**		**38**		**-79**		**-157**		**-275**

Block	Projections	Area Sq. Ft.	Dwellings Served		Pop.		Average Daily Demand (gpm)		Maximum Daily Demand (gpm)		Peak Hour Demand (gpm)
Block M	Original	15,586	76		190		33		65		114
	Proposed	174,200	95		162		89		178		311
	Change	**158,614**	**19**		**-29**		**56**		**112**		**197**

Flow Test Summary

Prior to conducting test you must contact Inspection Services at 480-312-5750 to activate permit and schedule test date and inspection.

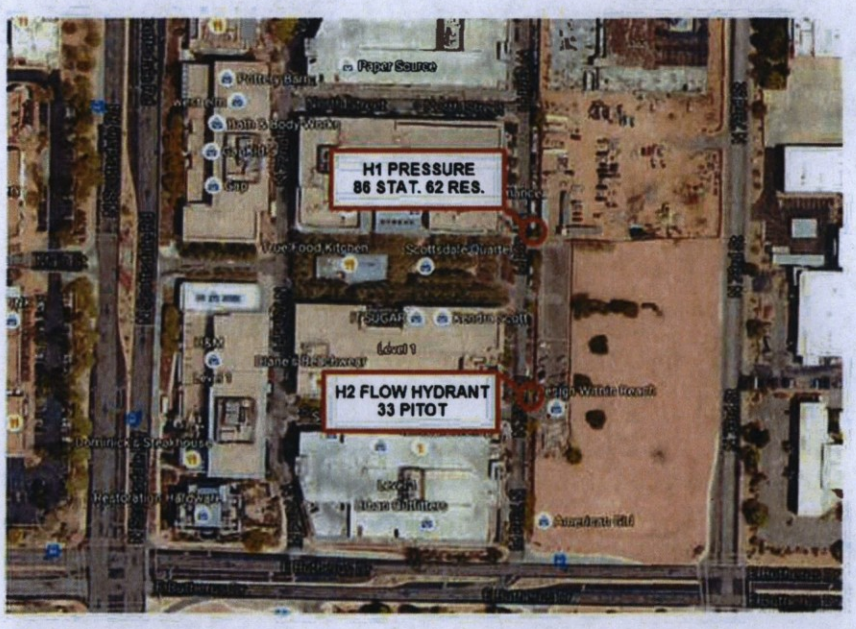
Project Address: 15125 N. SCOTTSDALE ROAD

Encroachment Permit No. C51581 **Date of Test:** 9/28/16 **Time of Test:** 7:30AM

Flow test must be conducted during periods of high water use, such as 6:00 a.m. to 8:00 a.m.

Test requires using two (2) hydrants on the water system.

1. Attach water quarter section map identifying (#1) pressure and (#2) flow hydrant used to conduct the test OR
2. Show location of pressure hydrant and flow hydrant with cross streets and distance between hydrants and main size tested below.



Test Data

Static pressure: 86 psi

Residual pressure: 62 psi

Pitot reading: 33 psi

Flow GPM: 2475 gpm

Hydrant orifice Diameter: 4

Coefficient of Discharge: .95

Contractor:
INFINITY FIRE PROTECTION

Test shall be certified by a NICET Level III or IV (Fire Sprinkler) OR a Civil/Fire Protection Engineer licensed within the State of Arizona.

Signatures of contractor's employees conducting test:

NICET Certification # or Engineers seal & signature:

Registered Professional Engineer (Fire Protection)
CERTIFICATE NO.
26512
DONALD K. NEAL
09/28/16
Date Signed
ARIZONA, U.S.A.

EXPIRES 9/30/19

Planning & Development Services Department
7447 E Indian School Road, Suite 100, Scottsdale, AZ 85251 • Phone: 480-312-2500 • Fax: 480-312-7088

FIRE PROTECTION ENGINEERING SERVICES
4242 W. Topeka Dr. | Glendale, Arizona 85308
P: (623) 587-1844 | F: (623) 587-7992
E-mail: FPES@Cox.Net

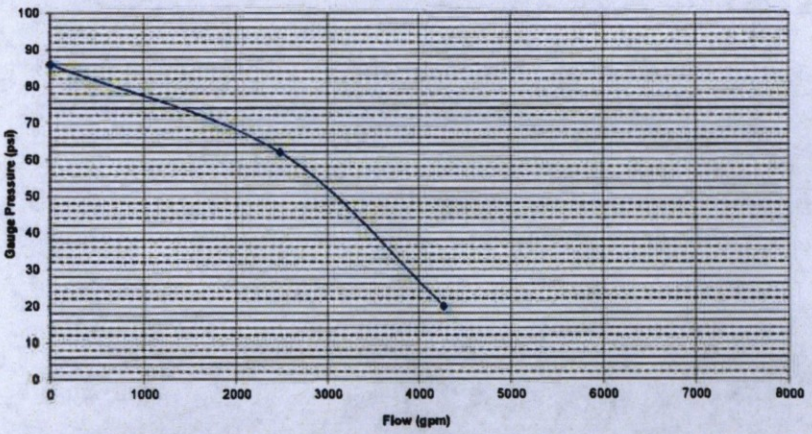
HYDRANT FLOW TEST
SUMMARY REPORT

PROJECT LOCATION: 15125 N. SCOTTSDALE ROAD

WITNESSED BY: PHIL CIPOLLA - CIVIL INSPECTOR with the CITY OF SCOTTSDALE **DATE:** 09/28/16 **TIME:** 7:30AM

Observed Test Data								
Hydrant Designation	**Hydrant Number**	**Flow Opening**	***Static Pressure**	***Residual Pressure**	**Pitot Pressure**	****Coefficient**	**Coefficient** Steamer use .83	**Flow (GPM)**
Pressure; R	Hydrant #1		86	62				
Flow, F1	Hydrant #2	4			33	0.95	0.95	2475
Flow, F2	-	0			0		0	0
							TOTAL:	2475

Note: If steamer connection was used for the flow test (without stream straighiener), An additional Coefficient must be used with a factor of .83. *Static and residual pressures must be adjusted for elevation change (+0.0 FT.) to site. **Use .95 Coefficient when stream straightener is utilized



Available flow @ 20 PSI
4274 GPM

ACCEPTED BY: _____ **DATE:** _____

Average Day Demand

FlexTable: Junction Table

Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
Building A	4.4	1,669.9	85.3	1,472.8
Building B (1)	25.4	1,669.9	85.3	1,472.8
Building B (2)	25.4	1,669.9	87.5	1,467.6
Building C (1)	24.2	1,669.9	87.7	1,467.2
Building C (2)	24.2	1,669.9	87.1	1,468.5
Building D	3.3	1,669.9	88.6	1,465.2
Building E (1)	10.1	1,669.9	84.5	1,474.6
Building E (2)	10.1	1,669.9	85.0	1,473.4
Building F	50.5	1,669.9	86.8	1,469.2
Building G	2.9	1,669.9	85.6	1,472.0
Building H	61.6	1,669.9	88.8	1,464.5
Building J	19.7	1,669.9	88.4	1,465.5
Building K1	4.2	1,669.9	85.6	1,472.0
Building K2	5.4	1,669.9	84.5	1,474.6
Building K3	35.4	1,669.9	85.1	1,473.3
Building L1	11.0	1,669.7	87.8	1,466.7
Building L2	13.2	1,669.7	87.8	1,466.6
Building L3	38.6	1,669.8	85.6	1,472.0
Building M1	28.2	1,669.9	87.8	1,466.9
Building M2	60.6	1,669.9	87.9	1,466.6
F-17	0.0	1,669.9	85.5	1,472.3
F-19	0.0	1,669.9	85.3	1,472.6
F-22	0.0	1,669.9	87.9	1,466.6
F-23	0.0	1,669.9	86.8	1,469.3
F-25	0.0	1,669.9	87.6	1,467.5
F-66	0.0	1,669.9	87.9	1,466.8
F-83	0.0	1,669.9	86.5	1,470.0
J-1	0.0	1,669.9	94.9	1,450.5
J-8	0.0	1,669.9	85.3	1,472.6
J-9	0.0	1,669.9	85.0	1,473.3
J-10	0.0	1,669.9	88.0	1,466.5
J-14	0.0	1,669.9	88.8	1,464.7
J-15	0.0	1,669.9	87.1	1,468.5
J-16	0.0	1,669.9	86.5	1,470.0
J-21	0.0	1,669.9	87.5	1,467.6
J-26	0.0	1,669.9	87.2	1,468.3
J-41	0.0	1,669.9	85.6	1,472.0
J-63	0.0	1,669.9	86.5	1,470.0
J-68	0.0	1,669.9	87.8	1,467.0
J-80	0.0	1,669.9	86.5	1,470.0
J-81	0.0	1,669.9	86.5	1,470.0
J-82	0.0	1,669.9	86.5	1,470.0
J-83	0.0	1,669.9	86.5	1,470.0
J-84	0.0	1,669.9	87.8	1,467.0
J-87	0.0	1,669.9	85.2	1,473.0
J-92	0.0	1,669.9	86.5	1,470.0
J-100	0.0	1,669.9	86.5	1,470.0
J-104	0.0	1,669.9	85.5	1,472.3

FlexTable: Junction Table

Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
J-106	0.0	1,669.9	86.3	1,470.3
J-110	0.0	1,669.9	86.5	1,470.0
J-125	0.0	1,669.9	86.5	1,470.0
J-126	0.0	1,669.9	86.5	1,470.0
J-127	0.0	1,669.9	94.9	1,450.5
J-128	0.0	1,669.9	87.3	1,468.0
J-142	0.0	1,669.9	86.5	1,470.0
J-145	0.0	1,669.9	86.4	1,470.1

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-182	47	J-63	Building L2	2.0	Ductile Iron	130.0	13.2	1.35	0.0052
P-105	41	J-68	Building L1	2.0	Ductile Iron	130.0	11.0	1.12	0.0037
P-63	40	J-145	Building L3	4.0	Ductile Iron	130.0	38.6	0.99	0.0013
P-156	216	J-83	J-82	12.0	Ductile Iron	130.0	240.8	0.68	0.0002
P-132	40	J-82	Building F	12.0	Ductile Iron	130.0	240.8	0.68	0.0002
P-138	89	J-83	Building K2	12.0	Ductile Iron	130.0	213.4	0.61	0.0001
P-58	162	Building K2	Building K3	12.0	Ductile Iron	130.0	208.0	0.59	0.0001
P-157	57	Building F	J-63	12.0	Ductile Iron	130.0	190.3	0.54	0.0001
P-185	41	J-63	J-68	12.0	Ductile Iron	130.0	177.1	0.50	0.0001
P-62	34	J-41	J-8	12.0	Ductile Iron	130.0	172.6	0.49	0.0001
P-65	26	Building K3	J-41	12.0	Ductile Iron	130.0	172.6	0.49	0.0001
P-11	57	J-8	J-87	12.0	Ductile Iron	130.0	172.6	0.49	0.0001
P-215	12	J-110	J-16	8.0	Ductile Iron	130.0	76.3	0.49	0.0002
P-104	187	J-68	J-10	12.0	Ductile Iron	130.0	166.1	0.47	0.0001
P-250	33	J-127	J-1	8.0	Ductile Iron	130.0	70.4	0.45	0.0001
P-234	68	J-10	Building H	12.0	Ductile Iron	130.0	137.9	0.39	0.0001
P-300	356	J-9	J-145	8.0	Ductile Iron	130.0	57.7	0.37	0.0001
P-165	338	J-92	J-80	8.0	Ductile Iron	130.0	44.5	0.28	0.0001
P-288	371	J-142	J-92	8.0	Ductile Iron	130.0	44.5	0.28	0.0001
EX.-70	307	J-1	Building M2	8.0	Ductile Iron	130.0	41.5	0.26	0.0001
P-210	157	Building H	J-106	12.0	Ductile Iron	130.0	76.3	0.22	0.0000
P-214	116	J-106	J-100	12.0	Ductile Iron	130.0	76.3	0.22	0.0000
P-216	70	J-100	J-110	12.0	Ductile Iron	130.0	76.3	0.22	0.0000
P-154	18	J-87	J-9	12.0	Ductile Iron	130.0	70.7	0.20	0.0000
P-251	372	J-128	J-127	12.0	Ductile Iron	130.0	70.4	0.20	0.0000
P-252	521	J-87	J-128	12.0	Ductile Iron	130.0	70.4	0.20	0.0000
EX.-17	738	J-1	J-14	8.0	Ductile Iron	130.0	28.9	0.18	0.0000
P-85	103	J-14	Building D	8.0	Ductile Iron	130.0	28.9	0.18	0.0000
P-140	19	J-10	J-84	8.0	Ductile Iron	130.0	28.2	0.18	0.0000
P-141	28	J-84	Building M1	8.0	Ductile Iron	130.0	28.2	0.18	0.0000
P-143	224	J-16	J-21	12.0	Ductile Iron	130.0	58.0	0.16	0.0000
P-206	26	J-21	Building B (2)	12.0	Ductile Iron	130.0	58.0	0.16	0.0000
P-86	22	Building D	Building J	8.0	Ductile Iron	130.0	25.6	0.16	0.0000
P-297	34	R-1	PMP-2	36.0	Ductile Iron	130.0	458.4	0.14	0.0000
P-298	40	PMP-2	J-83	36.0	Ductile Iron	130.0	458.4	0.14	0.0000
P-226	153	J-80	Building E (1)	12.0	Ductile Iron	130.0	44.5	0.13	0.0000
P-299	197	J-145	J-26	8.0	Ductile Iron	130.0	19.1	0.12	0.0000
P-164	65	J-26	Building M2	8.0	Ductile Iron	130.0	19.1	0.12	0.0000
P-21	43	J-16	J-15	8.0	Ductile Iron	130.0	18.3	0.12	0.0000
P-239	134	J-15	Building C (2)	8.0	Ductile Iron	130.0	18.3	0.12	0.0000
P-228	32	Building E (1)	Building E (2)	12.0	Ductile Iron	130.0	34.4	0.10	0.0000
P-295	19	Building B (2)	Building C (1)	12.0	Ductile Iron	130.0	32.6	0.09	0.0000
P-290	555	J-87	J-142	12.0	Ductile Iron	130.0	31.5	0.09	0.0000
P-247	258	J-9	J-126	8.0	Ductile Iron	130.0	13.0	0.08	0.0000
P-248	21	J-126	J-125	8.0	Ductile Iron	130.0	13.0	0.08	0.0000
P-289	16	J-81	J-142	8.0	Ductile Iron	130.0	13.0	0.08	0.0000
P-222	93	Building E (2)	Building A	12.0	Ductile Iron	130.0	24.3	0.07	0.0000
P-294	23	Building A	Building B (1)	12.0	Ductile Iron	130.0	19.9	0.06	0.0000

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-258	37	Building J	Building C (2)	8.0	Ductile Iron	130.0	5.9	0.04	0.0000
P-244	305	J-125	J-81	12.0	Ductile Iron	130.0	13.0	0.04	0.0000
P-41	28	Building C (1)	Building G	12.0	Ductile Iron	130.0	8.4	0.02	0.0000
P-92	253	Building G	J-104	12.0	Ductile Iron	130.0	5.5	0.02	0.0000
P-204	39	J-104	Building B (1)	12.0	Ductile Iron	130.0	5.5	0.02	0.0000
P-136	197	J-83	Building K1	12.0	Ductile Iron	130.0	4.2	0.01	0.0000
P-205	21	F-17	J-104	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-142	31	F-66	J-84	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-28	31	J-21	F-22	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-31	20	F-25	J-26	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-24	19	J-8	F-19	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-133	37	J-82	F-83	8.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-29	20	J-15	F-23	6.0	Ductile Iron	130.0	0.0	0.00	0.0000

Max Day Plus Fire Flow

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Flow (Total Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)
J-1	True	1,500.0	1,500.0	2,844.3	36.7	30.0	J-26
J-8	True	1,500.0	1,500.0	2,849.1	30.3	30.0	J-9
J-9	True	1,500.0	1,500.0	2,835.2	30.0	30.3	J-87
J-10	True	1,500.0	1,500.0	2,838.9	32.1	30.0	F-17
J-14	True	1,500.0	1,500.0	2,702.4	30.0	33.5	F-17
J-15	True	1,688.0	1,688.0	2,787.2	30.3	30.0	F-23
J-16	True	1,688.0	1,688.0	2,789.7	30.8	30.0	F-17
F-17	True	1,500.0	1,500.0	2,580.2	30.0	33.9	J-104
F-19	True	1,500.0	1,500.0	2,720.4	30.0	33.4	J-9
J-21	True	1,500.0	1,500.0	2,758.7	31.9	30.0	F-17
F-22	True	1,500.0	1,500.0	2,626.4	30.0	33.6	F-17
F-23	True	1,500.0	1,500.0	2,647.9	30.0	34.1	F-17
F-66	True	1,500.0	1,500.0	2,651.4	30.0	35.0	F-17
F-25	True	1,500.0	1,500.0	2,538.0	30.0	33.3	J-26
J-26	True	1,500.0	1,500.0	2,646.0	30.0	30.3	F-25
Building C (1)	True	1,500.0	1,548.5	2,721.1	32.9	30.0	Building E (1)
Building B (2)	True	1,500.0	1,550.7	2,723.4	32.8	30.0	Building E (1)
Building K2	True	1,500.0	1,510.7	2,874.6	30.0	30.1	Building E (1)
Building K3	True	1,500.0	1,570.2	2,857.7	30.1	30.0	Building E (1)
J-41	True	1,500.0	1,500.0	2,855.1	30.6	30.0	J-9
Building L3	True	1,500.0	1,577.2	1,648.4	30.0	57.5	Building E (1)
Building M2	True	1,500.0	1,621.2	2,676.0	30.0	30.5	Building L3
Building H	True	1,500.0	1,623.1	2,796.5	33.9	30.0	Building E (1)
Building A	True	1,500.0	1,508.8	2,682.9	30.7	30.0	Building E (1)
Building F	True	1,500.0	1,600.9	2,841.3	32.1	30.0	Building E (1)
Building M1	True	1,500.0	1,556.4	2,804.0	30.3	30.0	Building E (1)
J-68	True	1,500.0	1,500.0	2,862.8	32.0	30.0	F-17
Building K1	True	1,500.0	1,508.4	2,886.8	30.0	30.3	Building E (1)
J-80	True	1,500.0	1,500.0	2,729.1	30.0	30.1	F-17
J-81	True	1,500.0	1,500.0	2,832.6	30.0	30.2	J-125
J-82	True	1,500.0	1,500.0	2,884.8	30.8	30.0	J-104
F-83	True	1,500.0	1,500.0	2,840.2	30.0	31.2	J-104
J-83	True	1,500.0	1,500.0	2,921.0	31.5	30.0	J-9
J-84	True	1,500.0	1,500.0	2,839.0	30.8	30.0	F-17
J-87	True	1,500.0	1,500.0	2,839.4	30.1	30.0	J-9
J-92	True	1,500.0	1,500.0	2,674.3	30.0	33.5	F-17
J-63	True	1,500.0	1,500.0	2,868.7	30.7	30.0	J-104
J-100	True	1,500.0	1,500.0	2,804.3	30.7	30.0	F-17
J-104	True	1,750.0	1,750.0	2,719.7	30.0	30.0	F-17
J-106	True	1,500.0	1,500.0	2,815.4	30.5	30.0	F-17
Building B (1)	True	1,500.0	1,550.7	2,685.3	30.7	30.0	Building E (1)
J-110	True	1,500.0	1,500.0	2,797.7	30.7	30.0	J-104
Building E (2)	True	1,500.0	1,520.2	2,673.3	30.5	30.0	Building E (1)
Building E (1)	True	1,500.0	1,520.2	2,669.8	30.0	30.7	Building E (2)
Building G	True	1,500.0	1,505.8	2,717.9	30.9	30.0	Building E (1)
Building C (2)	True	1,500.0	1,548.5	2,704.7	30.0	31.5	Building J

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Flow (Total Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)
J-125	True	1,500.0	1,500.0	2,809.5	30.0	30.2	J-126
J-126	True	1,500.0	1,500.0	2,802.0	30.0	30.4	J-125
J-127	True	1,500.0	1,500.0	2,847.5	36.9	30.0	J-9
J-128	True	1,500.0	1,500.0	2,845.3	30.2	30.0	J-9
Building J	True	1,500.0	1,539.4	2,716.6	30.4	30.0	Building C (2)
Building D	True	1,500.0	1,506.6	2,723.0	30.1	30.0	Building C (2)
J-142	True	1,500.0	1,500.0	2,844.6	30.0	31.4	J-145
J-145	True	1,750.0	1,750.0	2,635.0	30.0	36.9	J-142
Building L2	False	1,500.0	1,546.2	327.1	30.0	77.8	Building E (1)
Building L1	False	1,500.0	1,538.6	361.4	30.0	77.4	Building E (1)

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-105	41	J-68	Building L1	2.0	Ductile Iron	130.0	26.0	2.66	0.0181
P-63	40	J-145	Building L3	4.0	Ductile Iron	130.0	77.2	1.97	0.0047
P-182	47	J-63	Building L2	2.0	Ductile Iron	130.0	18.3	1.87	0.0095
P-132	40	J-82	Building F	12.0	Ductile Iron	130.0	477.9	1.36	0.0006
P-156	216	J-83	J-82	12.0	Ductile Iron	130.0	477.9	1.36	0.0006
P-138	89	J-83	Building K2	12.0	Ductile Iron	130.0	425.5	1.21	0.0005
P-58	162	Building K2	Building K3	12.0	Ductile Iron	130.0	414.8	1.18	0.0005
P-157	57	Building F	J-63	12.0	Ductile Iron	130.0	-377.0	1.07	0.0004
P-185	41	J-63	J-68	12.0	Ductile Iron	130.0	358.7	1.02	0.0004
P-62	34	J-41	J-8	12.0	Ductile Iron	130.0	344.6	0.98	0.0004
P-65	26	Building K3	J-41	12.0	Ductile Iron	130.0	344.6	0.98	0.0004
P-11	57	J-8	J-87	12.0	Ductile Iron	130.0	344.6	0.98	0.0004
P-215	12	J-110	J-16	8.0	Ductile Iron	130.0	-153.2	0.98	0.0006
P-104	187	J-68	J-10	12.0	Ductile Iron	130.0	332.7	0.94	0.0003
P-250	33	J-127	J-1	8.0	Ductile Iron	130.0	140.6	0.90	0.0005
P-234	68	J-10	Building H	12.0	Ductile Iron	130.0	276.3	0.78	0.0002
P-300	356	J-9	J-145	8.0	Ductile Iron	130.0	-115.3	0.74	0.0003
P-165	338	J-92	J-80	8.0	Ductile Iron	130.0	-88.7	0.57	0.0002
P-288	371	J-142	J-92	8.0	Ductile Iron	130.0	-88.7	0.57	0.0002
EX.-70	307	J-1	Building M2	8.0	Ductile Iron	130.0	83.1	0.53	0.0002
P-210	157	Building H	J-106	12.0	Ductile Iron	130.0	-153.2	0.43	0.0001
P-214	116	J-106	J-100	12.0	Ductile Iron	130.0	-153.2	0.43	0.0001
P-216	70	J-100	J-110	12.0	Ductile Iron	130.0	-153.2	0.43	0.0001
P-154	18	J-87	J-9	12.0	Ductile Iron	130.0	141.3	0.40	0.0001
P-251	372	J-128	J-127	12.0	Ductile Iron	130.0	-140.6	0.40	0.0001
P-252	521	J-87	J-128	12.0	Ductile Iron	130.0	-140.6	0.40	0.0001
EX.-17	738	J-1	J-14	8.0	Ductile Iron	130.0	57.5	0.37	0.0001
P-85	103	J-14	Building D	8.0	Ductile Iron	130.0	57.5	0.37	0.0001
P-140	19	J-10	J-84	8.0	Ductile Iron	130.0	56.4	0.36	0.0001
P-141	28	J-84	Building M1	8.0	Ductile Iron	130.0	56.4	0.36	0.0001
P-206	26	J-21	Building B (2)	12.0	Ductile Iron	130.0	116.2	0.33	0.0000
P-143	224	J-16	J-21	12.0	Ductile Iron	130.0	116.2	0.33	0.0000
P-86	22	Building D	Building J	8.0	Ductile Iron	130.0	50.9	0.33	0.0001
P-297	34	R-1	PMP-2	36.0	Ductile Iron	130.0	911.8	0.29	0.0000
P-298	40	PMP-2	J-83	36.0	Ductile Iron	130.0	911.8	0.29	0.0000
P-226	153	J-80	Building E (1)	12.0	Ductile Iron	130.0	-88.7	0.25	0.0000
P-164	65	J-26	Building M2	8.0	Ductile Iron	130.0	38.1	0.24	0.0000
P-299	197	J-145	J-26	8.0	Ductile Iron	130.0	-38.1	0.24	0.0000
P-239	134	J-15	Building C (2)	8.0	Ductile Iron	130.0	-37.0	0.24	0.0000
P-21	43	J-16	J-15	8.0	Ductile Iron	130.0	-37.0	0.24	0.0000
P-228	32	Building E (1)	Building E (2)	12.0	Ductile Iron	130.0	-68.5	0.19	0.0000
P-295	19	Building B (2)	Building C (1)	12.0	Ductile Iron	130.0	65.5	0.19	0.0000
P-290	555	J-87	J-142	12.0	Ductile Iron	130.0	-62.8	0.18	0.0000
P-247	258	J-9	J-126	8.0	Ductile Iron	130.0	-26.0	0.17	0.0000
P-248	21	J-126	J-125	8.0	Ductile Iron	130.0	-26.0	0.17	0.0000
P-289	16	J-81	J-142	8.0	Ductile Iron	130.0	-26.0	0.17	0.0000
P-222	93	Building E (2)	Building A	12.0	Ductile Iron	130.0	-48.3	0.14	0.0000
P-294	23	Building A	Building B (1)	12.0	Ductile Iron	130.0	39.5	0.11	0.0000

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-244	305	J-125	J-81	12.0	Ductile Iron	130.0	-26.0	0.07	0.0000
P-258	37	Building J	Building C (2)	8.0	Ductile Iron	130.0	11.5	0.07	0.0000
P-41	28	Building C (1)	Building G	12.0	Ductile Iron	130.0	-17.0	0.05	0.0000
P-92	253	Building G	J-104	12.0	Ductile Iron	130.0	11.2	0.03	0.0000
P-204	39	J-104	Building B (1)	12.0	Ductile Iron	130.0	11.2	0.03	0.0000
P-136	197	J-83	Building K1	12.0	Ductile Iron	130.0	-8.4	0.02	0.0000
P-29	20	J-15	F-23	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-31	20	F-25	J-26	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-205	21	F-17	J-104	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-142	31	F-66	J-84	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-24	19	J-8	F-19	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-28	31	J-21	F-22	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-133	37	J-82	F-83	8.0	Ductile Iron	130.0	0.0	0.00	0.0000

FlexTable: Junction Table

Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
Building A	8.8	1,662.8	82.2	1,472.8
Building B (1)	50.7	1,662.8	82.2	1,472.8
Building B (2)	50.7	1,662.8	84.4	1,467.6
Building C (1)	48.5	1,662.8	84.6	1,467.2
Building C (2)	48.5	1,662.8	84.1	1,468.5
Building D	6.6	1,662.8	85.5	1,465.2
Building E (1)	20.2	1,662.8	81.4	1,474.6
Building E (2)	20.2	1,662.8	82.0	1,473.4
Building F	100.9	1,663.0	83.8	1,469.2
Building G	5.8	1,662.8	82.5	1,472.0
Building H	123.1	1,662.8	85.8	1,464.5
Building J	39.4	1,662.8	85.4	1,465.5
Building K1	8.4	1,663.1	82.7	1,472.0
Building K2	10.7	1,663.1	81.5	1,474.6
Building K3	70.2	1,663.0	82.1	1,473.3
Building L1	26.0	1,662.2	84.6	1,466.7
Building L2	18.3	1,662.5	84.7	1,466.6
Building L3	77.2	1,662.6	82.5	1,472.0
Building M1	56.4	1,662.8	84.8	1,466.9
Building M2	121.2	1,662.8	84.9	1,466.6
F-17	0.0	1,662.8	82.4	1,472.3
F-19	0.0	1,663.0	82.3	1,472.6
F-22	0.0	1,662.8	84.9	1,466.6
F-23	0.0	1,662.8	83.7	1,469.3
F-25	0.0	1,662.8	84.5	1,467.5
F-66	0.0	1,662.8	84.8	1,466.8
F-83	0.0	1,663.0	83.5	1,470.0
J-1	0.0	1,662.9	91.9	1,450.5
J-8	0.0	1,663.0	82.3	1,472.6
J-9	0.0	1,662.9	82.0	1,473.3
J-10	0.0	1,662.9	84.9	1,466.5
J-14	0.0	1,662.8	85.7	1,464.7
J-15	0.0	1,662.8	84.1	1,468.5
J-16	0.0	1,662.8	83.4	1,470.0
J-21	0.0	1,662.8	84.4	1,467.6
J-26	0.0	1,662.8	84.2	1,468.3
J-41	0.0	1,663.0	82.6	1,472.0
J-63	0.0	1,662.9	83.5	1,470.0
J-68	0.0	1,662.9	84.8	1,467.0
J-80	0.0	1,662.8	83.4	1,470.0
J-81	0.0	1,662.9	83.5	1,470.0
J-82	0.0	1,663.0	83.5	1,470.0
J-83	0.0	1,663.1	83.6	1,470.0
J-84	0.0	1,662.8	84.7	1,467.0
J-87	0.0	1,662.9	82.2	1,473.0
J-92	0.0	1,662.9	83.4	1,470.0
J-100	0.0	1,662.8	83.4	1,470.0
J-104	0.0	1,662.8	82.4	1,472.3

FlexTable: Junction Table

Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
J-106	0.0	1,662.8	83.3	1,470.3
J-110	0.0	1,662.8	83.4	1,470.0
J-125	0.0	1,662.9	83.5	1,470.0
J-126	0.0	1,662.9	83.5	1,470.0
J-127	0.0	1,662.9	91.9	1,450.5
J-128	0.0	1,662.9	84.3	1,468.0
J-142	0.0	1,662.9	83.5	1,470.0
J-145	0.0	1,662.8	83.4	1,470.1

Peak Hour Demand

FlexTable: Junction Table

Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
Building A	15.3	1,645.4	74.7	1,472.8
Building B (1)	88.7	1,645.4	74.7	1,472.8
Building B (2)	88.7	1,645.4	76.9	1,467.6
Building C (1)	84.8	1,645.4	77.1	1,467.2
Building C (2)	84.8	1,645.5	76.6	1,468.5
Building D	11.6	1,645.5	78.0	1,465.2
Building E (1)	35.4	1,645.5	73.9	1,474.6
Building E (2)	35.4	1,645.5	74.5	1,473.4
Building F	176.6	1,645.9	76.5	1,469.2
Building G	10.2	1,645.4	75.0	1,472.0
Building H	215.5	1,645.6	78.3	1,464.5
Building J	69.0	1,645.5	77.9	1,465.5
Building K1	14.7	1,646.4	75.4	1,472.0
Building K2	18.8	1,646.2	74.2	1,474.6
Building K3	123.8	1,646.0	74.7	1,473.3
Building L1	45.4	1,643.7	76.6	1,466.7
Building L2	31.9	1,644.6	77.0	1,466.6
Building L3	135.1	1,645.0	74.9	1,472.0
Building M1	98.8	1,645.6	77.3	1,466.9
Building M2	212.0	1,645.5	77.4	1,466.6
F-17	0.0	1,645.4	74.9	1,472.3
F-19	0.0	1,646.0	75.0	1,472.6
F-22	0.0	1,645.5	77.4	1,466.6
F-23	0.0	1,645.5	76.2	1,469.3
F-25	0.0	1,645.5	77.0	1,467.5
F-66	0.0	1,645.6	77.4	1,466.8
F-83	0.0	1,646.0	76.1	1,470.0
J-1	0.0	1,645.7	84.4	1,450.5
J-8	0.0	1,646.0	75.0	1,472.6
J-9	0.0	1,645.9	74.7	1,473.3
J-10	0.0	1,645.6	77.5	1,466.5
J-14	0.0	1,645.5	78.2	1,464.7
J-15	0.0	1,645.5	76.6	1,468.5
J-16	0.0	1,645.5	75.9	1,470.0
J-21	0.0	1,645.5	76.9	1,467.6
J-26	0.0	1,645.5	76.7	1,468.3
J-41	0.0	1,646.0	75.3	1,472.0
J-63	0.0	1,645.8	76.1	1,470.0
J-68	0.0	1,645.8	77.4	1,467.0
J-80	0.0	1,645.5	75.9	1,470.0
J-81	0.0	1,645.9	76.1	1,470.0
J-82	0.0	1,646.0	76.1	1,470.0
J-83	0.0	1,646.4	76.3	1,470.0
J-84	0.0	1,645.6	77.3	1,467.0
J-87	0.0	1,645.9	74.8	1,473.0
J-92	0.0	1,645.7	76.0	1,470.0
J-100	0.0	1,645.5	75.9	1,470.0
J-104	0.0	1,645.4	74.9	1,472.3

FlexTable: Junction Table

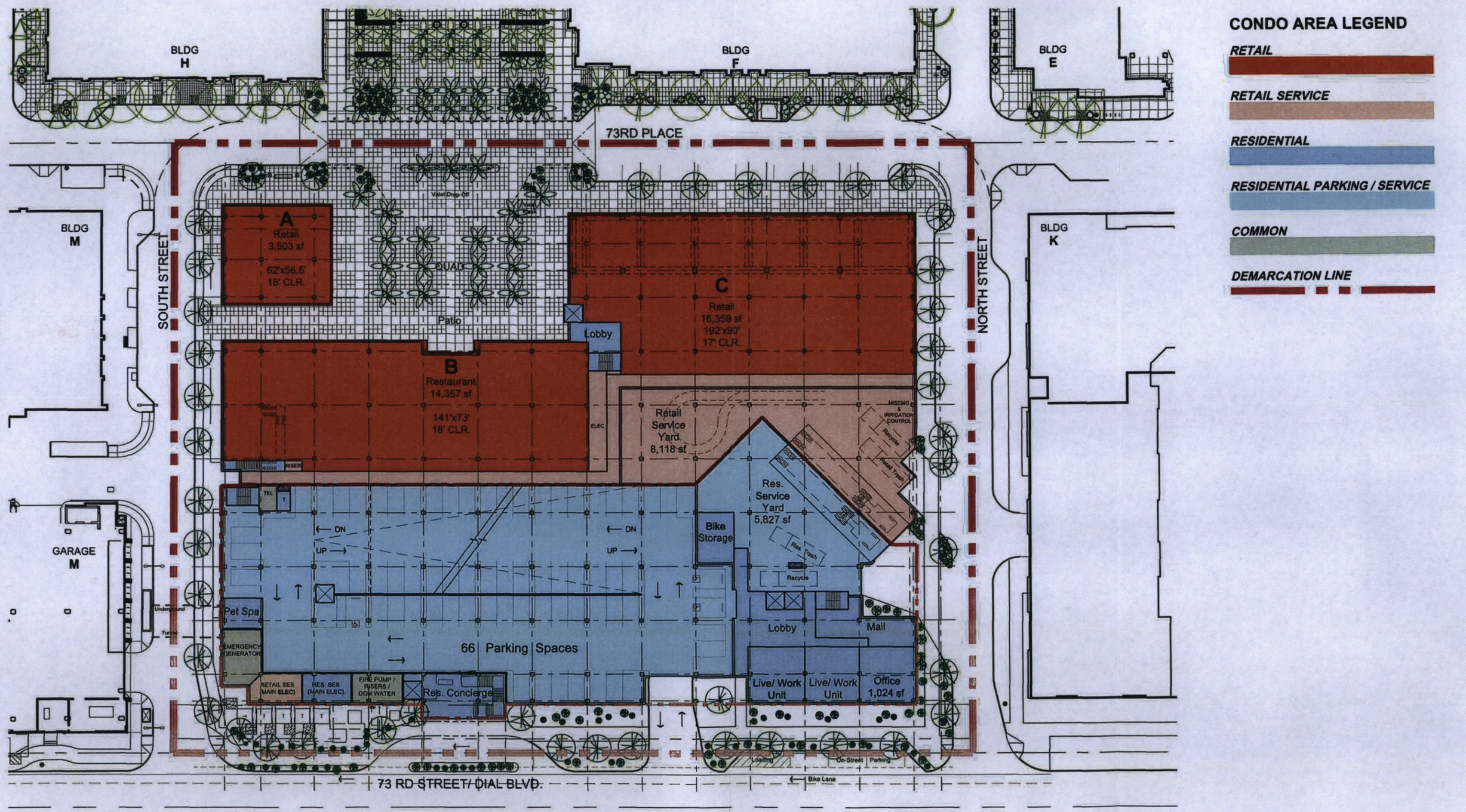
Label	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Elevation (ft)
J-106	0.0	1,645.5	75.8	1,470.3
J-110	0.0	1,645.5	75.9	1,470.0
J-125	0.0	1,645.9	76.1	1,470.0
J-126	0.0	1,645.9	76.1	1,470.0
J-127	0.0	1,645.7	84.5	1,450.5
J-128	0.0	1,645.8	76.9	1,468.0
J-142	0.0	1,645.9	76.1	1,470.0
J-145	0.0	1,645.6	75.9	1,470.1

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-105	41	J-68	Building L1	2.0	Ductile Iron	130.0	45.4	4.64	0.0510
P-63	40	J-145	Building L3	4.0	Ductile Iron	130.0	135.1	3.45	0.0131
P-182	47	J-63	Building L2	2.0	Ductile Iron	130.0	31.9	3.26	0.0265
P-156	216	J-83	J-82	12.0	Ductile Iron	130.0	836.3	2.37	0.0018
P-132	40	J-82	Building F	12.0	Ductile Iron	130.0	836.3	2.37	0.0018
P-138	89	J-83	Building K2	12.0	Ductile Iron	130.0	745.5	2.11	0.0015
P-58	162	Building K2	Building K3	12.0	Ductile Iron	130.0	726.7	2.06	0.0014
P-157	57	Building F	J-63	12.0	Ductile Iron	130.0	659.7	1.87	0.0012
P-185	41	J-63	J-68	12.0	Ductile Iron	130.0	627.8	1.78	0.0011
P-215	12	J-110	J-16	8.0	Ductile Iron	130.0	268.1	1.71	0.0016
P-62	34	J-41	J-8	12.0	Ductile Iron	130.0	602.9	1.71	0.0010
P-65	26	Building K3	J-41	12.0	Ductile Iron	130.0	602.9	1.71	0.0010
P-11	57	J-8	J-87	12.0	Ductile Iron	130.0	602.9	1.71	0.0010
P-104	187	J-68	J-10	12.0	Ductile Iron	130.0	582.4	1.65	0.0009
P-250	33	J-127	J-1	8.0	Ductile Iron	130.0	245.9	1.57	0.0014
P-234	68	J-10	Building H	12.0	Ductile Iron	130.0	483.6	1.37	0.0007
P-300	356	J-9	J-145	8.0	Ductile Iron	130.0	201.8	1.29	0.0009
P-165	338	J-92	J-80	8.0	Ductile Iron	130.0	155.2	0.99	0.0006
P-288	371	J-142	J-92	8.0	Ductile Iron	130.0	155.2	0.99	0.0006
EX.-70	307	J-1	Building M2	8.0	Ductile Iron	130.0	145.3	0.93	0.0005
P-210	157	Building H	J-106	12.0	Ductile Iron	130.0	268.1	0.76	0.0002
P-214	116	J-106	J-100	12.0	Ductile Iron	130.0	268.1	0.76	0.0002
P-216	70	J-100	J-110	12.0	Ductile Iron	130.0	268.1	0.76	0.0002
P-154	18	J-87	J-9	12.0	Ductile Iron	130.0	247.2	0.70	0.0002
P-251	372	J-128	J-127	12.0	Ductile Iron	130.0	245.9	0.70	0.0002
P-252	521	J-87	J-128	12.0	Ductile Iron	130.0	245.9	0.70	0.0002
EX.-17	738	J-1	J-14	8.0	Ductile Iron	130.0	100.6	0.64	0.0003
P-85	103	J-14	Building D	8.0	Ductile Iron	130.0	100.6	0.64	0.0003
P-140	19	J-10	J-84	8.0	Ductile Iron	130.0	98.8	0.63	0.0003
P-141	28	J-84	Building M1	8.0	Ductile Iron	130.0	98.8	0.63	0.0002
P-143	224	J-16	J-21	12.0	Ductile Iron	130.0	203.3	0.58	0.0001
P-206	26	J-21	Building B (2)	12.0	Ductile Iron	130.0	203.3	0.58	0.0001
P-86	22	Building D	Building J	8.0	Ductile Iron	130.0	89.0	0.57	0.0002
P-297	34	R-1	PMP-2	36.0	Ductile Iron	130.0	1,596.5	0.50	0.0000
P-298	40	PMP-2	J-83	36.0	Ductile Iron	130.0	1,596.5	0.50	0.0000
P-226	153	J-80	Building E (1)	12.0	Ductile Iron	130.0	155.2	0.44	0.0001
P-164	65	J-26	Building M2	8.0	Ductile Iron	130.0	66.7	0.43	0.0001
P-299	197	J-145	J-26	8.0	Ductile Iron	130.0	66.7	0.43	0.0001
P-21	43	J-16	J-15	8.0	Ductile Iron	130.0	64.8	0.41	0.0001
P-239	134	J-15	Building C (2)	8.0	Ductile Iron	130.0	64.8	0.41	0.0001
P-228	32	Building E (1)	Building E (2)	12.0	Ductile Iron	130.0	119.8	0.34	0.0000
P-295	19	Building B (2)	Building C (1)	12.0	Ductile Iron	130.0	114.6	0.33	0.0000
P-290	555	J-87	J-142	12.0	Ductile Iron	130.0	109.8	0.31	0.0000
P-247	258	J-9	J-126	8.0	Ductile Iron	130.0	45.4	0.29	0.0001
P-248	21	J-126	J-125	8.0	Ductile Iron	130.0	45.4	0.29	0.0001
P-289	16	J-81	J-142	8.0	Ductile Iron	130.0	45.4	0.29	0.0001
P-222	93	Building E (2)	Building A	12.0	Ductile Iron	130.0	84.4	0.24	0.0000
P-294	23	Building A	Building B (1)	12.0	Ductile Iron	130.0	69.1	0.20	0.0000

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-244	305	J-125	J-81	12.0	Ductile Iron	130.0	45.4	0.13	0.0000
P-258	37	Building J	Building C (2)	8.0	Ductile Iron	130.0	20.0	0.13	0.0000
P-41	28	Building C (1)	Building G	12.0	Ductile Iron	130.0	29.8	0.08	0.0000
P-92	253	Building G	J-104	12.0	Ductile Iron	130.0	19.6	0.06	0.0000
P-204	39	J-104	Building B (1)	12.0	Ductile Iron	130.0	19.6	0.06	0.0000
P-136	197	J-83	Building K1	12.0	Ductile Iron	130.0	14.7	0.04	0.0000
P-24	19	J-8	F-19	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-28	31	J-21	F-22	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-133	37	J-82	F-83	8.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-29	20	J-15	F-23	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-31	20	F-25	J-26	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-205	21	F-17	J-104	6.0	Ductile Iron	130.0	0.0	0.00	0.0000
P-142	31	F-66	J-84	6.0	Ductile Iron	130.0	0.0	0.00	0.0000



CONDO AREA LEGEND

- *RETAIL*
- *RETAIL SERVICE*
- *RESIDENTIAL*
- *RESIDENTIAL PARKING / SERVICE*
- *COMMON*
- *DEMARCATION LINE*

NELSEN PARTNERS
ARCHITECTS & PLANNERS

WASHINGTON PRIME GROUP

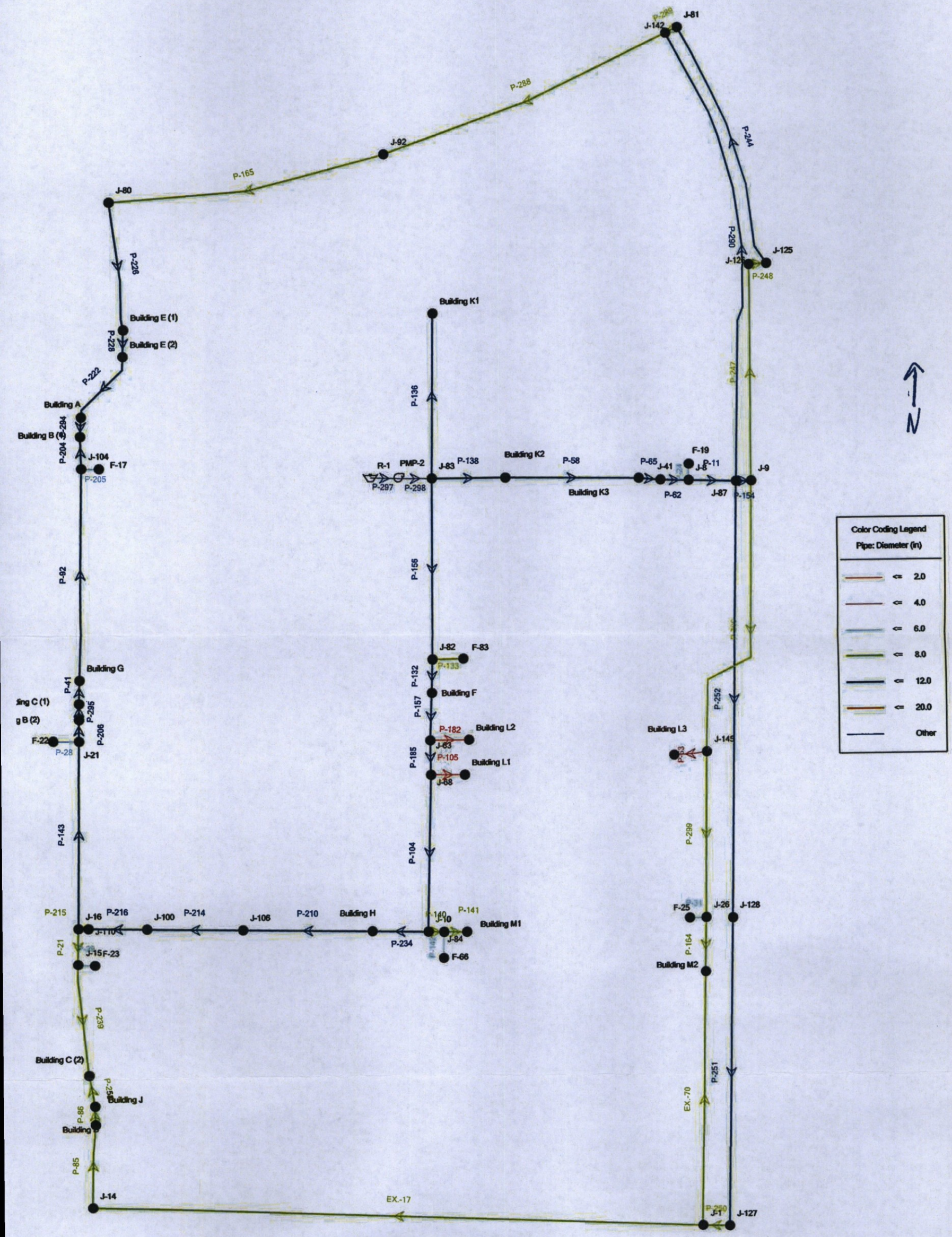
LENNAR
MULTIFAMILY COMMUNITIES

Scottsdale Quarter - Block L

SCOTTSDALE, AZ | #315036 | 29 SEPTEMBER 2016

SITE PLAN / LEVEL 1

SCALE: 1" = 50' 0 25' 50'


J-81
J-142
P-289
P-288
J-92
P-165
J-80
P-244
P-290
J-125
J-12
P-248
P-226
Building E (1)
P-228
Building E (2)
P-222
Building A
P-294
Building B (1)
P-204
J-104
F-17
P-205
Building K1
P-136
P-138
Building K2
P-58
P-65
J-41
F-19
P-11
J-9
R-1
PMP-2
J-83
P-297
P-298
Building K3
P-62
J-87
P-154
P-247
N
Color Coding Legend
Pipe: Diameter (in)
<= 2.0
<= 4.0
<= 6.0
<= 8.0
<= 12.0
<= 20.0
Other
P-92
P-156
J-82
F-83
P-133
P-132
Building F
P-157
P-182
Building L2
J-83
P-185
P-105
Building L1
J-88
Building G
P-41
P-295
P-206
F-22
P-28
J-21
P-252
Building L3
J-145
P-143
P-104
P-299
P-215
J-16
P-216
J-100
P-214
J-106
P-210
Building H
P-140
P-141
J-10
Building M1
J-84
P-234
F-66
F-25
J-26
J-128
P-164
Building M2
P-21
J-15
F-23
P-239
Building C (2)
P-251
P-85
Building J
P-86
Building I
EX.-70
P-85
J-14
EX.-17
P-250
J-1
J-127

Bryan

Please find attached the first submittal for the Water and Sewer Basis of design Block L Scottsdale Quarter with comments that need to be addressed.

I've worked on the original Master Plan for the Quarter and the other Phaseas so Doug thought I should wrap this thing up.

Richard Sacks
Water Resources

SEE BLU COMMENTS
PLEASE REVISE &
RESUBMIT
R. SACKS

DAVID EVANS
AND ASSOCIATES INC.

COMMENTS ON
WASTEWATER GENERATION
SUMMARY & DESIGN TABLE

MEMORANDUM

DATE: August 16, 2016

TO: City of Scottsdale

FROM: Vicente Ruiz

SUBJECT: **Wastewater Letter of Conformance**

PROJECT: LENN0019 – Scottsdale Quarter - Block L

Registered Professional Engineer (Civil)
CERTIFICATE NO.
54749
VICENTE
RUIZ
DATE SIGNED 8/17/16
ARIZONA U.S.A.

Exp 6/30/19

1. General

This memorandum was completed under contract with Lennar and considers the wastewater flows projections proposed for Block L within the Scottsdale Quarter development. Scottsdale Quarter is a master planned mixed use development. A Wastewater Basis of Design report was prepared in January 2008 for the ultimate buildout of the project. During the planning phase projected land uses where established for the proposed blocks. These projected land uses are often revised over time to meet the current market demands. This memorandum will consider the proposed land use changes for Block L and evaluate the impacts to the existing wastewater infrastructure.

The proposed Block L will consist of several buildings containing a combination of residential dwelling units, restaurants, and retail shopping space. All of the proposed buildings will discharge to the existing Scottsdale Quarter on-site private sewer infrastructure.

2. Existing Utilities

The existing on-site utilities include underground telephone, underground electrical, underground cable, gas, sewer, and water. The existing utilities are illustrated on the Conceptual Water & Sewer Block "L", Scottsdale Quarter exhibit.

Existing sewer lines surround the proposed blocks. Existing sewer lines are located to the north, east and west of Block L. An existing public 8-inch sewer line is located east of Block L in 73rd Street. No connections to this existing sewer main are proposed for Block L. An existing private 6-inch sewer line is located north of Block L in North Street and flows east to an existing public 8-inch sewer line in 73rd Street. The existing private 8-inch sewer line in 73rd Place runs south along the western boundary of Block L.

3. Existing Master Plans and Design Reports

A basis of design report was previously prepared for Scottsdale Quarter in January 2008, by David Evans and Associates, Inc. The flows and capacities assumed for the existing on-site sewer infrastructure are based on the results provided in the basis of design report prepared by DEA. No certified flow tests were conducted specifically for this project. A Basis of Design Report was prepared for Lot K by Kimley Horn in 2013 and amended in February 2014.

4. Land Use

The proposed land uses for Block L has changed as shown in the land use summary table below.

TABLE 4.1 – LAND USE SUMMARY

	Scenario	Retail (ft^2)	Restaurant (ft^2)	Office (ft^2)	Hotel (rooms)	Residential (DUs)
BLOCK L	Original Projections	23,959	22,215	-	125	64
	Change	+28,546	-11,182	+10,957	-125	+242
	Proposed Projections	52,505	11,033	10,957	0	306

5. Computations

To evaluate the impacts to the existing on-site sewer lines the revised wastewater generations for each block were calculated using the revised land uses. These revised wastewater flow projections were then modeled through the existing sewer lines to calculate the change in capacity and pipe velocity.

The projected wastewater generations for each proposed block has been prepared based on the revised land uses and are summarized in the table below. The unit wastewater flow rates are based on the City of Scottsdale design standards utilized in the original design report in 2008 for each land use. A complete wastewater generation table is attached.

TABLE 5.1 – WASTEWATER GENERATION SUMMARY

	Original Projections		Change		Proposed Projections	
	ADWF (mgd)	Peak Flow (mgd)	ADWF (mgd)	Peak Flow (mgd)	ADWF (mgd)	Peak Flow (mgd)
BLOCK L	65,799	263,194	+43,832	+175,328	109,631	438,523

All on-site sewer lines are smaller than 12 inches. A Peak Factor of 4.0 was used for all onsite flow estimations.

The existing sewer model had 3 segments over the maximum d/D ratio, or capacity, of 0.65 (65%) full during the ultimate peak flow condition. The highest ratio was 0.69 in the 10 inch sewer near the site discharge point. The city guidelines allow a maximum of 0.70 for 12 inch sewer. If the City will not allow the depth exceeding 0.65, a portion of the discharge can be All of the sewer lines on-site are private and also meet the Arizona Administrative Code requirements and the Uniform Plumbing Code requirements. Table 5.2 summarizes the percent capacity results for the existing on-site sewer mains which will serve Block L.

TABLE 5.2 – PERCENT CAPACITY SUMMARY

	Original Projections		Proposed Projections	
	Maximum Capacity (%)	Maximum Capacity Pipe	Maximum Capacity (%)	Maximum Capacity Pipe
BLOCK L	61.3	P-2 & P-39	69.6	P-2 & P-39

[1]Pipe capacities only include sewer lines which will receive flow from Block L

The City requires a minimum mean full flow velocity of 2.5 ft/s and a maximum velocity of 10.0 ft/s at the estimated peak flow. Table 5.3 summarizes the full flow velocities for the on-site collection system.

TABLE 5.3 – VELOCITY SUMMARY

	Minimum Full Flow Velocity (fps)		Maximum Peak Flow Velocity (fps)		Minimum Full Flow Velocity (fps)		Maximum Peak Flow Velocity (fps)	
BLOCK L	3.3	Multi	5.17	P-23	3.3	Multi	5.2	P-23

[1]Pipe velocities only include sewer lines which will receive flow from Block L and Block M.

The downstream impacts to the existing off-site public wastewater system due to the proposed improvements were not analyzed. The wastewater from the proposed development flows to the existing City of Scottsdale SW Pump Back.

6. Summary

Based on the calculations preformed for this analysis the existing private on-site sewer infrastructure for Scottsdale Quarter has capacity for the proposed increase in land use for Block L.

Worksheet for Pipe P-2 after Lot K, and L update

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	10.00	in
Discharge	848632.00	gal/day

Results

Normal Depth	0.58	ft
Flow Area	0.41	ft²
Wetted Perimeter	1.65	ft
Hydraulic Radius	0.25	ft
Top Width	0.77	ft
Critical Depth	0.51	ft
Percent Full	69.6	%
Critical Slope	0.00739	ft/ft
Velocity	3.24	ft/s
Velocity Head	0.16	ft
Specific Energy	0.74	ft
Froude Number	0.79	
Maximum Discharge	1.70	ft³/s
Discharge Full	1.58	ft³/s
Slope Full	0.00359	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	69.63	%
Downstream Velocity	Infinity	ft/s

Worksheet for Pipe P-38 after Lot K, and L update

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00520	ft/ft
Diameter	10.00	in
Discharge	824632.00	gal/day

Results

Normal Depth	0.57	ft
Flow Area	0.40	ft^2
Wetted Perimeter	1.62	ft
Hydraulic Radius	0.24	ft
Top Width	0.78	ft
Critical Depth	0.50	ft
Percent Full	68.1	%
Critical Slope	0.00731	ft/ft
Velocity	3.22	ft/s
Velocity Head	0.16	ft
Specific Energy	0.73	ft
Froude Number	0.80	
Maximum Discharge	1.70	ft^3/s
Discharge Full	1.58	ft^3/s
Slope Full	0.00339	ft/ft
Flow Type	SubCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	68.11	%
Downstream Velocity	Infinity	ft/s

GLIR0000-0004

USE POPULATION OF 1.7 PERSONS/DU @ FLOW OF 80 GPCD

SCOTTSDALE QUARTER
BLOCK L
WASTEWATER GENERATION SUMMARY

Printed: 8/17/2016

Block Number	Land Use	Area (ft^2)	Dwelling Units (DU)	Persons / DU	Population / Equivalent Population	Unit Wastewater Flow	Average Daily Flow (GPD)	Peak Factor	Peak Flow (GPD)
ORIGINAL PROJECTIONS (January 2008 BOD)									
Block L	Retail	23,959			96	0.40	9,584	4.0	38,334
	Restaurant	22,215			222	1.0	22,215	4.0	88,860
	Office	-			0	0.10	0	4.0	0
	Hotel		125	2.5	180	144	18,000	4.0	72,000
	Residential		64	2.5	160	100	16,000	4.0	64,000
							65,799		**263,194**
PROPOSED PROJECTIONS									
Block L	Retail	52,505			210	0.40	21,002	4.0	84,008
	Restaurant	11,033			110	1.0	11,033	4.0	44,132
	Office	10,957			11	0.10	1,096	4.0	4,383
	Hotel		-	2.5	0	144	0	4.0	0
	Residential		306	2.5	765	100	76,500	4.0	306,000
							109,631		**438,523**
PROJECTION CHANGES									
Building Number		Area (ft^2)	Dwelling Units (DU)		Population / Equivalent Population		Average Daily Flow (GPD)		Peak Flow (GPD)
Block L	Original Projections	46,174	189		658		65,799		263,194
	Proposed Projections	74,495	306		1,096		109,631		438,523
	Change	**28,321**	**117**		**438**		**43,832**		**175,328**
Block K	Original Projections	15,586	76		299		29,910		119,641
	Proposed Projections	174,200	279		698		46,620		209,790
	Change	158,614	203		**398**		**16,710**		**90,149**

DS & PM PF = 6

PF = 4.5

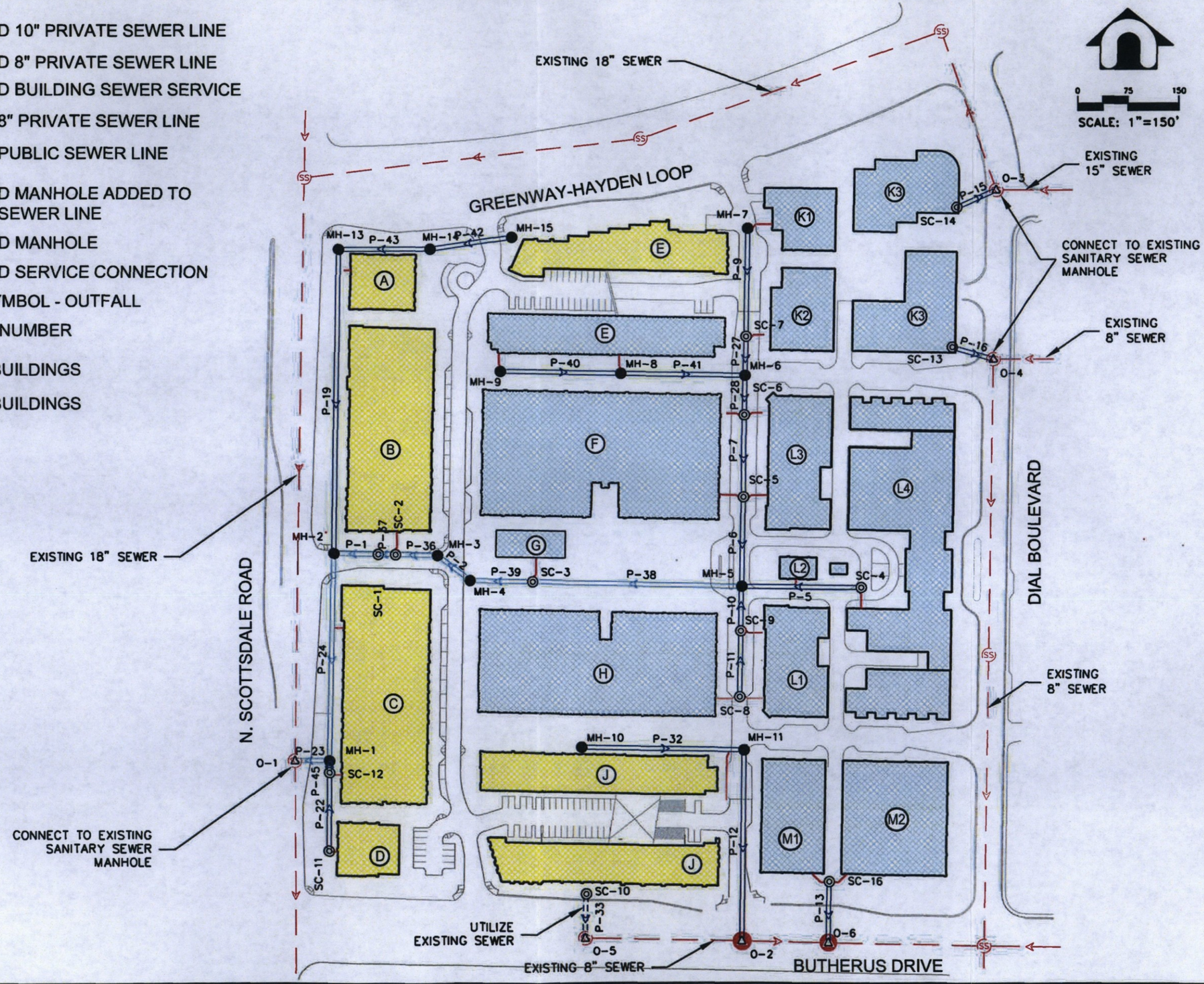
SANITARY SEWER DESIGN TABLE
SCOTTSDALE QUARTER
BLOCK L

	Modeling Results from Scottsdale Quarter Wastewater Basis of Design, January 2008, by DEA								Revised Calculations				
	Pipe Run	Total Flow (gpd)	Slope (ft/ft)	Pipe Size (in)	Capacity (%)	Peak Daily Flow Velocity (ft/s)	Full Flow Velocity (fps)	Pipe Full Flow Capacity 65%	Pipe Available Capacity (gpd)	Proposed Increase Peak Flow (gpd)	Remaining Available Capacity (gpd)	Revised Cumulative Peak Flow (gpd)	Revised Capacity (%)	Revised Peak Flow Velocity (fps)
BLOCK L	P-1	877,043	0.01	10	57	4.23	4.6	1,065,000	187,957	139,520	48,437	1,016,563	62.7	4.4
	P-2	709,112	0.0052	10	61.3	3.13	3.3	770,000	60,888	139,520	-78,632	848,632	69.6	3.2
	P-5	138,790	0.0202	8	23.9	3.36	5.6	840,000	701,210	139,520	561,690	278,310	25.1	3.5
	P-6	366,042	0.0077	8	51.9	3.09	3.5	515,000	148,958	7,372	141,587	373,414	52.6	3.1
	P-7	247,913	0.0077	8	41.6	2.8	3.5	515,000	267,087	14,743	252,344	262,656	42.9	2.8
	P-23	988,561	0.0157	10	53.3	5.17	5.7	1,340,000	351,439	139,520	211,919	1,128,081	54.3	5.2
	P-24	952,716	0.0157	10	52.1	5.13	5.7	1,340,000	387,284	139,520	247,764	1,092,236	53.1	5.2
	P-36	709,112	0.01	10	50	4.02	4.6	1,065,000	355,888	139,520	216,368	848,632	51.3	4.1
	P-37	803,588	0.01	10	53.9	4.14	4.6	1,065,000	261,412	139,520	121,892	943,108	55.1	4.2
	P-38	685,112	0.0052	10	59.9	3.11	3.3	770,000	84,888	139,520	-54,632	824,632	68.1	3.2
	P-39	709,112	0.0052	10	61.3	3.13	3.3	770,000	60,888	139,520	-78,632	848,632	69.6	3.2

SHOW NEW FLOWS & d/D W/REVISED DATA

LEGEND

- PROPOSED 10" PRIVATE SEWER LINE
- PROPOSED 8" PRIVATE SEWER LINE
- PROPOSED BUILDING SEWER SERVICE
- EXISTING 8" PRIVATE SEWER LINE
- EXISTING PUBLIC SEWER LINE
- PROPOSED MANHOLE ADDED TO EXISTING SEWER LINE
- PROPOSED MANHOLE
- PROPOSED SERVICE CONNECTION
- MODEL SYMBOL - OUTFALL
- BUILDING NUMBER
- PHASE 1 BUILDINGS
- PHASE 2 BUILDINGS



DRAWN BY: DCHO
CHECKED BY: WDR
DATE: 01/2008

BY	REVISION	DATE

DAVID EVANS AND ASSOCIATES INC.
2141 East Highland Avenue, Suite 200
Phoenix Arizona 85016
Phone: 602.678.5151

ULTIMATE BUILD OUT SEWERCAD MODEL SCOTTSDALE QUARTER

SCALE: 1"=150'
SECTION: 2&11
TWNSHP: 3N
RANGE: 4E
SHEET 1 OF 1
JOB NO.: GLIR00000001

P:\G\GLIR00000001\0600INFO\EC\WW\610WW Water Model\Sewer\WwMsX-GLIR00000001.dwg zjcp Jan 30, 2008 8:32:22am

SEE COMMENTS
PLEASE REVISE &
RESUBMIT
B. SACKS

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: August 17, 2016
TO: City of Scottsdale

Registered Professional Engineer (Civil) CERTIFICATE NO. 54749 VICENTE RUIZ DATE SIGNED 8/11/16 ARIZONA U.S.A.

Exp 6/30/19

FROM: Vicente Ruiz
SUBJECT: **Water Analysis**
PROJECT: LENN0019 – Scottsdale Quarter - Block L

1. General

This memorandum was completed under a contract with Lennar and considers the projected water demands for the proposed Block L within the Scottsdale Quarter development. Scottsdale Quarter is a master planned mixed use development. A Water Basis of Design report was prepared in January 2008 for the ultimate buildout of the project. During the planning phase projected land uses where established for the proposed blocks. These projected land uses are often revised over time to meet the current market demands. This memorandum will consider the proposed land use changes for Block L and Block M and evaluate the impacts to the existing water infrastructure.

The proposed Block L will consist of several buildings containing a combination of residential dwelling units, office space, restaurants, and retail shopping space. All of the proposed buildings will be connected to the existing water infrastructure.

2. Existing Utilities

The existing onsite utilities include underground telephone, underground electrical, underground cable, gas, sewer, and water. The existing utilities are illustrated on the Conceptual Water & Sewer Block "L", Scottsdale Quarter exhibit.

Existing water lines surround the proposed blocks. Existing water lines are located to the north, east and west of Block L. Existing 12-inch and 8-inch water lines are located along 73rd Street to the east of Block L. An existing 12-inch water line is located to the north in North Street and connects to an existing 12-inch water line running along 73rd Place to the west. Existing 12-inch and 8-inch water line are located in 73rd Street to the east, an existing 12-inch water line to the west in 73rd Place and an existing 8-inch water line in Butherus Drive to the south.

3. Existing Master Plans and Design Reports

A basis of design report was previously prepared for Scottsdale Quarter in January 2008, by David Evans and Associates, Inc. The demands and pressures assumed for the existing water infrastructure are based on the results provided in the basis of design report prepared by DEA. No flow tests were conducted specifically for this project.

↑ WILL NEED UPDATED FIRE FLOW TEST. SUGGEST PRESSURE HYDRANT ALONG 73RD PLACE.

4. Land Use

The proposed land uses for Block L and Block M have changed as shown in the land use summary table below.

TABLE 4.1 – LAND USE SUMMARY

	Scenario	Retail (ft^2)	Restaurant (ft^2)	Office (ft^2)	Hotel (rooms)	Residential (DUs)
BLOCK L	Original Projections	23,959	22,215	-	125	64
	Change	+28,546	-11,182	+10,957	-125	+242
	Proposed Projections	52,505	11,033	10,957	0	306
BLOCK M	Original Projections	7,793	7,793	-	-	76
	Change	+21,007	-7,793	+145,400	-	+19
	Proposed Projections	28,800	-	145,400	-	95

5. Computations

To evaluate the impacts to the existing water system the revised water demands for each block were calculated using the revised land uses. These revised water demand projections were then evaluated against the original water system curve to determine projected system pressures.

The projected water demands for each proposed block have been calculated based on the revised land uses and are summarized in the table below. The unit water demands for each land use are based on the City of Scottsdale design standards originally used in the approved Basis of design report completed in 2008. A complete water demand table is attached.

TABLE 5.1 – WATER DEMAND SUMMARY

	Original Projections			Change			Proposed Projections		
	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)	Average Day (gpm)	Max Day (gpm)	Peak Hour (gpm)
BLOCK L	141.6	283.1	495.4	-4	-8	-14	137.5	275.1	481.4
BLOCK M	32.6	65.1	114.0	75	149	261	107.1	214.3	375

The revised water demand projections were compared to the water system curve developed from the water model created for the original basis of design report for the overall project. Using this water system curve and the revised

VERIFY REQUIRED FF

water demand projections the corresponding system pressures can be calculated. The system pressures are summarized below in Table 5.2. Additional system pressure calculations are attached.

TABLE 5.2 – PRESSURE SUMMARY

Model Scenario	Minimum System Pressure		Maximum System Pressure	
	Original psi	Proposed psi	Original psi	Proposed psi
Average Day	86.9	86.2	97.5	96.8
Max Day	80.1	76.6	90.7	88.1
Max Day + Fire Flow	30.0	24.2	-	-
Peak Hour	63.3	53.2	74.1	66.7

All pressures are at street level. Calculated pressures during the Peak Hour scenario are reduced by approximately 10 psi. The lowest pressure available in the system during the Peak Hour Scenario is 53 psi. Based on the City's criteria requiring 50 psi at the buildings' highest levels, any building requiring water above a single story may require a private booster pump system. Existing pressures for existing buildings should be verified to determine the impacts of any possible pressure reduction as a result of the increased water demand.

With the increase in water demands proposed, the projected system pressure may drop below 30 psi during a fire flow event. Additional water modeling based on updated hydrant flow tests would be required to improve the accuracy of projected system pressures.

SUBMIT UPDATED MODEL BASED ON CURRENT DATA

6. Summary

Based on the calculations preformed for this analysis the existing water infrastructure for Scottsdale Quarter has available capacity for the proposed increase in land use for Block L and Block M. However, system pressures may fall below City required minimums during a fire flow event. Additional flow tests and modeling are recommended to improve the accuracy of the projected system pressures.

LENN-0019

SCOTTSDALE QUARTER
BLOCK L AND BLOCK M
WATER DEMANDS

Printed: 8/17/2016

ORIGINAL PROJECTIONS (Januray 2008 BOD)

Block	Land Use	Area Sq. Ft.	Dwellings Served	Persons Per Dwelling	Pop.	Average Daily Demand Per Unit	Average Daily Demand (gpm)	Max. Day Factor	Maximum Daily Demand (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)
Block L	Retail	23,959				0.8	13.3	2.0	26.6	3.5	46.6
	Restaurant	22,215				0.7	10.8	2.0	21.6	3.5	37.8
	Office	0				0.6	0.0	2.0	0.0	3.5	0.0
	Hotel		125	2.5	313	446.3	96.9	2.0	193.7	3.5	339.0
	Residential		64	2.5	160	185.3	20.6	2.0	41.2	3.5	72.1
							141.6		**283.1**		**495.4**
Block M	Retail	7,793				0.8	4.3	2.0	8.7	3.5	15.2
	Restaurant	7,793				0.7	3.8	2.0	7.6	3.5	13.3
	Office	0				0.6	0.0	2.0	0.0	3.5	0.0
	Residential		76	2.5	190	185.3	24.4	2.0	48.9	3.5	85.6
							32.6		**65.1**		**114.0**

PER DS & PM
1.3 GAL/FT² W/INSIDE & OUTSIDE USE

PROPOSED PROJECTIONS

Block	Land Use	Area Sq. Ft.	Dwellings Served	Persons Per Dwelling	Pop.	Average Daily Demand Per Unit	Average Daily Demand (gpm)	Max. Day Factor	Maximum Daily Demand (gpm)	Peak Hour Factor	Peak Hour Demand (gpm)
Block L	Retail	52,505				0.8	29.2	2.0	58.3	3.5	102.1
	Restaurant	11,033				0.7	5.4	2.0	10.7	3.5	18.8
	Office	10,957				0.6	4.6	2.0	9.1	3.5	16.0
	Hotel		0	2.5	0	446.3	0.0	2.0	0.0	3.5	0.0
	Residential		306	2.5	765	185.3	98.4	2.0	196.9	3.5	344.5
							137.5		**275.1**		**481.4**
Block M	Retail	28,800				0.8	16.0	2.0	32.0	3.5	56.0
	Restaurant	0				0.7	0.0	2.0	0.0	3.5	0.0
	Office	145,400				0.6	60.6	2.0	121.2	3.5	212.0
	Residential		95	2.5	238	185.3	30.6	2.0	61.1	3.5	107.0
							107.1		**214.3**		**375.0**

IF NO OUTSIDE USE - SUBTRACT 0.1 GAL/FT²

Projection Changes

Block	Projections	Area Sq. Ft.	Dwellings Served		Pop.		Average Daily Demand (gpm)		Maximum Daily Demand (gpm)		Peak Hour Demand (gpm)
Block L	Original	46,174	189		473		142		283		495
	Proposed	74,495	306		765		138		275		481
	Change	**28,321**	**117**		**293**		**-4**		**-8**		**-14**

Block	Projections	Area Sq. Ft.	Dwellings Served		Pop.		Average Daily Demand (gpm)		Maximum Daily Demand (gpm)		Peak Hour Demand (gpm)
Block M	Original	15,586	76		190		33		65		114
	Proposed	174,200	95		238		107		214		375
	Change	**158,614**	**19**		**48**		**75**		**149**		**261**

SCOTTSDALE QUARTER
WATER SYSTEM CURVE CALCUATIONS
Scottsdale Quarter Water Basis of Design Report, January 2008

ULTIMATE BUILDOUT SCENARIO

ORIGINAL WATER DEMANDS

Scenario	Demand gpm	Pressure psi	Pressure ft	Hydrant Elevation (est.) ft	HGL ft
Average Day	477	83.0	192	1,485.0	1,676.7
Max Day	954	76.5	177		1,661.7
Max Day + FF	2,454	33.6	78		1,562.5
Peak Hour	1,669	60.3	139		1,624.3

PROPOSED WATER DEMANDS

Scenario	Demand gpm	Pressure psi	Pressure ft	Hydrant Elevation (est.) ft	HGL ft
Average Day	548	82.2	190	1,485.0	1,674.9
Max Day	1,095	73.9	171		1,655.7
Max Day + FF	2,595	27.8	64		1,549.2
Peak Hour	1,916	52.9	122		1,607.2

CHANGE IN OVERALL SYSTEM PRESSURE

	Original HGL ft	Original HGL ft	Drop in HGL ft	Drop in System Pressure psi
Average Day	1,676.7	1,674.9	1.7	0.7
Max Day	1,661.7	1,655.7	6.0	2.6
Max Day + FF	1,562.5	1,549.2	13.4	5.8
Peak Hour	1,624.3	1,607.2	17.1	7.4

PROJECTED SYSTEM PRESSURES

Model Scenario	Minimum System Pressure		Maximum System Pressure	
	Original psi	Proposed psi	Original psi	Proposed psi
Average Day	86.9	86.2	97.5	96.8
Max Day	80.1	77.5	90.7	88.1
Max Day + Fire Flow	30	**24.2**	-	-
Peak Hour	63.3	55.9	74.1	66.7

Notes:

1. The projected system pressure may drop below 30 psi during fire flow event.
2. Additional modeling and updated fire hydrant flow tests may be required to improve the accuracy of system pressures.

CONCEPTUAL WATER & SEWER PLAN
FOR BLOCK 'L' OF
SCOTTSDALE QUARTER
CITY OF SCOTTSDALE, ARIZONA

DEVELOPER/OWNER

GLIMCHER
180 EAST BROAD STREET
COLUMBUS, OH 43215
(614) 887-5690

SITE ARCHITECT

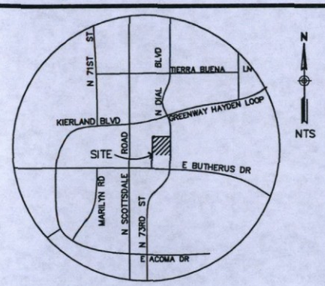
NELSEN ARCHITECTS
15044 NORTH SCOTTSDALE ROAD, SUITE 200
SCOTTSDALE, AZ 85254
CONTACT: GWEN JARICK
PHONE: (480) 949-6800

ENGINEER

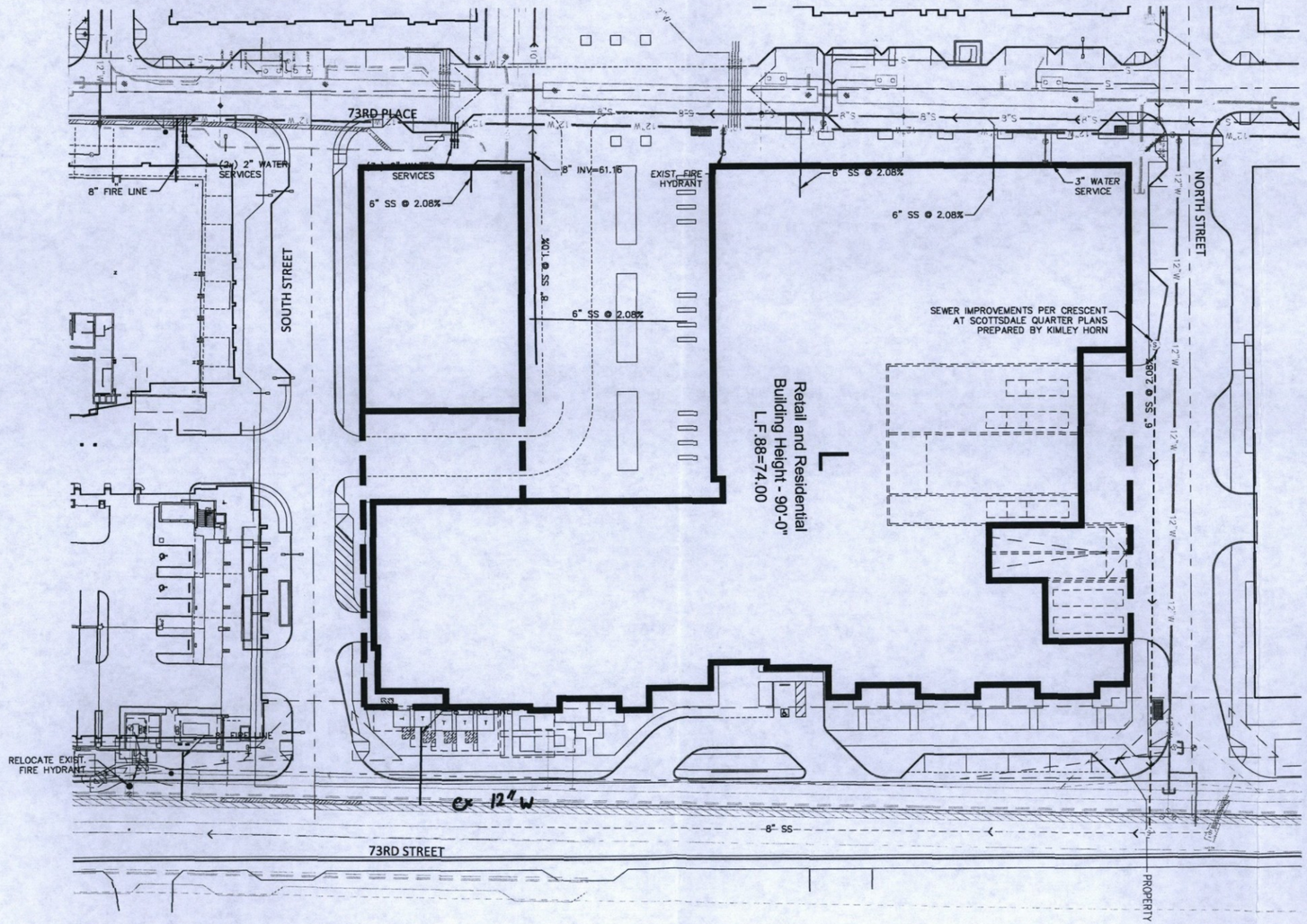
DAVID EVANS AND ASSOCIATES, INC.
4600 EAST WASHINGTON STREET, SUITE 430
PHOENIX, AZ 85034
CONTACT: RAMZI GEORGES
PHONE: (602) 678-5151

LEGEND

- EXISTING SEWER MANHOLE
- 8"S — EXISTING SEWER LINE
- 10"W — EXISTING WATER LINE
- PROPOSED WATER OR SEWER SERVICE AS NOTED



VICINITY MAP
N.T.S.



SCALE
30 0 15 30 60
(FEET)
1 INCH = 30 FT.

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.

DRAWN BY:	DESIGN BY:	CHECKED BY:	DATE: 08/2016
JCF	DER	RYG	

DAVID EVANS AND ASSOCIATES INC.
4600 E. Washington Street, Suite 430
Phoenix, Arizona 85034
Phone: 602.678.5151

Registered Professional Engineer
CERTIFICATE NO.
37287
RAMZI GEORGES
Date Signed
ARIZONA U.S.A.
EXPIRES: 3/31/2017

NOT FOR CONSTRUCTION

CONCEPT WATER & SEWER
BLOCK "L", SCOTTSDALE QUARTER
SCOTTSDALE, ARIZONA

	BY
	REVISION
	DATE

SECTION: 11
TWNSHP: 3N
RANGE: 4E

JOB NO.:
LENN-0019

SHEET
1 OF 1

P:\LVLENN00000019\04000AD\ECV\EXHIBITS\EC-FG-001-CONCEPT W AND S.dwg vrr Aug 17, 2016 3:34:03pm