



February 4, 2019

Mr. Rob Huff, Project Manager
Jones Studio, Inc.
205 South Wilson Street
Tempe, Arizona 85281



**RE: REVISED Parking Analysis – Valley Presbyterian Church, 6947 East McDonald Drive
Town of Paradise Valley**

Dear Mr. Huff:

Thank you for engaging CivTech to prepare this Parking Analysis for the Valley Presbyterian Church (VPC) in the Town of Paradise Valley. VPC is located at 6947 East McDonald Drive on the southwest corner of the intersection of Quail Run Road and McDonald Drive.

Background and Purpose

Originally constructed during the 1950's on the northern part of the existing site, VPC has expanded over the years to its current eight buildings.* The last major renovations were done circa 2000. CivTech was provided with plans dated 1999 for these renovations. Other documentation was also provided. VPC currently operates under a Special Use Permit (SUP) under which certain improvements were anticipated. With the latest renovations, the SUP must be amended or a new SUP issued.

VPC hosts several large events each year. Typically occurring on weekends, VPC has a joint use parking easement agreement with the Scottsdale Unified School District to make use of the parking facilities of the adjacent Kiva Elementary School to the west.

The latest renovation plans show improvements to the parking lot. Although these improvements may be delayed indefinitely until VPC raises the funding for the improvements, during a preliminary review of the project, Town staff suggested this Parking Analysis would be required to determine if the expected ultimate number of parking spaces on the VPC property itself, expected to number 355 spaces, will meet the Town's requirements.

Existing Conditions

A review of Maricopa County Assessor aerial photography reveals that VPC is on three parcels that form a rectangle with the longer frontage running along Quail Run Road. With reference to **Attachment 1**, there are currently 434 spaces on the VPC site itself in two parking zones designated Parking Zone A (with 175 spaces) and Parking Zone B (with 259 spaces). There are 173 spaces in Parking Zone C, which represents the spaces shared with the adjacent Kiva School and a park/athletic fields to the south of the school. Therefore, there are 607 parking spaces between VPC and the other adjacent uses. (**Attachment 1** shows the route of parents who drop off and pick up their children for informational purposes only.) The site has four driveways to Quail Run Road, designated from north to south as Driveways A through D for this statement.

* In 1999, a total of nine buildings were expected for the campus. A classroom building was never constructed, leaving eight buildings on the campus. Also, a 114-seat expansion of the sanctuary envisioned in 1999 was never completed.

Proposed Renovations

Renovations have been proposed for four of VPC's eight existing buildings, shown on the attachments as buildings A through H. In three of the four buildings (B, C, and D), all renovations will be under the existing roofs with no net changes in floor area. Building A will also undergo an interior renovation and a small (197-square foot) extension of the building's Music Center will be constructed. The renovations will be phased to be completed as funding becomes available.

Building A. The details of the renovations to Building A, the main sanctuary, and of the operation and interaction between the different areas/rooms of the building are noteworthy. The main sanctuary currently provides seating for up to 543 worshippers at a SUP-specified (see below) 18 inches (1½ feet) per person (41 pews at 19½ feet plus 1 pew at 14½ feet yields 814 feet of pews, divided by 1½ feet yields 542.67 seats). Using a similar methodology, the four pews on the existing stage or choir area can seat 45 choir members; the music center, which is currently open to the sanctuary and can be used for late worshippers and/or overflow seating, can seat 132; and there are 80 seats in the balcony. Therefore, there are presently pews for 800 worshippers at 18 inches per person. The renovations will close off to the sanctuary the music center, from which the pews will be removed and then outfitted with 53 new chairs. Thus, the music center, which will be expanded by 197 square feet (SF) to 924 SF, will be used only for choir practice during the week and for assembling the choir before services; it will not be used while services are in progress. The pews from the balcony will be removed, the balcony floor re-carpeted, and the pews replaced by chairs up to 165 chairs, if all available space is filled with chairs. Since CivTech understands that it is only for rare, exceptional occasions/events that the balcony is used, the assumption will be made that only the existing seating capacity of 80 worshippers will be replaced with the first phase of renovations. In addition, all of the pews on the main sanctuary floor will also be replaced by chairs, 447 chairs for worshippers and 49 chairs for the choir. Thus, after the first phase of the renovations, the seating capacity of the sanctuary, including worshippers on the floor (477 chairs) and in the balcony (80 chairs) and seating for the choir (49 chairs) is 606 seats, or 194 fewer seats than are currently available.

Attachment 2 shows the Phase 1 renovations to the buildings, the hardscape, and Parking Zone A are expected to reduce to 128 the parking spaces in the zone, a net loss of 47 spaces. The Phase 1 renovations include providing 21 new parking spaces in their ultimate configuration along the south side of the campus, the reconfiguration of two rows of existing spaces in Zone A to accommodate the hardscape renovations, and the elimination of a pocket of four spaces along the east side of Building C as that area is redeveloped into a pedestrian area. A drop-off/pick-up area will be provided along Quail Run Road for the Administration Building, Building C.

Attachment 3 shows that, ultimately, Parking Zones A and B will be reconfigured and a small parking area on the west side of Building D will be eliminated to provide a loading/delivery zone for large trucks bringing audio-visual and other equipment to the large events hosted by VPC. Renovated Parking Zone A will provide 154 spaces, a reduction of 21 spaces from the existing, and Parking Zone B will be reduced by 58 spaces, for a net reduction in 79 spaces to a total of 355 spaces on VPC property.

ADA Compliance

VPC currently provides 50 spaces for the disabled, several times the required number of Americans with Disabilities Act of 1990 (ADA) compliant parking spaces. Basing ADA requirements on the entire existing 607 parking spaces, Table 208.2 of the *2010 ADA Standards for Accessible Design* that at facilities that provide from 601 to 1,000 parking spaces, two percent

(2%) of the total number of parking spaces (in this case, 13 when rounded up to nearest whole number) must be ADA-compliant spaces. Within Parking Zone A alone, 44 ADA-compliant spaces will be provided on-site after the Phase 1 renovations. This is more than seven percent of the existing total of 607 spaces between all users and more than twelve percent of the ultimate total of the VPC-only spaces. Thus, VPC will continue to provide a sufficient number of ADA-compliant parking spaces.

Parking Requirements

Section 6 of the Town of Paradise Valley's Special Use Permit (SUP) Guidelines apply to Religious Facilities as well as several other uses. Item 3a specifies that 1 parking space is to be provided for every 3 seats (or every 54 inches of total pew length, or 18 inches—1 ½ feet—per worshipper), for each classroom, and for each 300 SF of office space. Item 3b allows that these requirements can be modified by a traffic and parking analysis such as this document.

However, since four of the buildings and certain areas of the other buildings will remain as-is, Town staff indicated to CivTech that the parking for these buildings can remain as required under the existing SUP and that the parking only needs to be updated for the renovated areas of the four buildings. **Attachment 4** is parking matrix taking this hybrid approach, with detailed parking calculations based on the uses expected to generate the need for parking in the renovated buildings and the parking required per the 1999 SUP for all of the buildings and areas that will not be renovated.

The 1999 Special Use Permit requires a total of 447 spaces. A review of **Attachment 4** reveals that 389 spaces are required per the proposed SUP requirements. As noted above, 355 spaces are to be provided upon ultimate build-out of the site. Thus, after additional phases of improvements are constructed and the VPC site is built out, VPC could then have a deficit of 34 parking spaces on its own property. It is important to note that, with the exception of the minor 197-SF expansion of the music center, there is no net increase in floor area and net seating in the sanctuary is actually being reduced by as many as 194 seats, which, at 1 space for every 3 seats, implies that the parking could be reduced by 64 spaces (more than eighty percent of the total proposed reduction of 79 spaces) without affecting the operation or adequacy of the parking.

Deceleration Lane Warrant and Queuing Analyses

Deceleration Lane Warrant Analysis. The Town of Paradise Valley has adopted method for determining if a right turn lane is warranted at a site driveway. The method is based on Table 6-3 of the 1988 Institute of Transportation Engineers' (ITE) publication, *Transportation and Land Development*, with local adaptations. The Town's method indicates that a right turn deceleration lane is generally deemed warranted approaching a driveway when three of the following four conditions are satisfied:

1. *At least 5,000 vehicles per day are using or are expected in the near future (five years after the development is built-out) to be using the adjacent street.*
2. *The posted speed limit is 35 mph or the 85th percentile speed limit is greater than 35 mph.*
3. *At least 1,000 vehicles per day are using or are expected to use the driveway(s) for the development or adjacent development(s) (existing or future).*
4. *At least 90 vehicles are expected to make right turns into the driveway(s) for a one-hour period for the development or adjacent developments (existing or future).*

Table 1 – Right-Turn Lane Warrant Analysis Summary

Intersection	Highest Right-Turn Peak Hour Volume	Deceleration Lane Warrant Criteria				Warrant met?
		1. Street $\geq$ 35 mph	2. Driveway $>$ 1,000 vpd	3. Rights in $\geq$ 40	4. Street $>$ 5,000 ADT	
Pull-Out on Quail Run Road	2-3 (max, est.)	No	No	No	No	No

CivTech applied these conditions to the proposed pull-out area on Quail Run Road intended as a drop-off/pick-up area to serve the Administration Building, Building C. The pull-out area can be seen on **Attachment 2**. The speed limit posted on Quail Run Road adjacent to VPC is 25 mph. This pull-out area is not an access to the main parking lot; therefore, it is highly unlikely that 1,000 vehicles would pass through it on any given day or that 90 or more vehicles would use it in an hour. Quail Run Road is classified by the Town as a local road. Per Table 4 of the Town's May 2015 *Traffic Impact Analysis (TIA) Criteria*, with a volume of just 2,000 vehicles per day, Quail Run Road could be expected to operate at an expected Level of Service E (LOS E); therefore, it is also highly unlikely that there is a volume two-and-a-half times as great as the LOS E volume (i.e., 5,000 vehicles per day) on Quail Run Road, even on the short segment north of Driveway A, where the concentration of entering and exiting site traffic could expect to be the greatest. Since none of the Town's four warranting conditions for a right turn lane approaching a proposed 96-foot long pull-out area on Quail Run Road serving the Administration Building, Building C, is expected to be met, a right turn lane is not warranted approaching this pull-out. **Table 1** summarizes the results of the right-turn lane warrant analysis for the pull-out.

Queuing Analysis. A queuing analysis of pull-out area was conducted to address the potential for vehicles to queue back into Quail Run Road from the pull-out area. As shown on **Attachment 2**, the pull-out area intended to serve Building C will provide 96 feet of queue storage or "stacking."

Traffic engineers typically assume that a passenger vehicle occupies 23 to 25 feet of space in a queue, that is, in a line of slow-moving or stop-and-go vehicles not in a traffic stream. Assuming a queued vehicle occupied 24 linear feet in each queue, 4 vehicles can occupy the proposed pull-out area (4 vehicles x 24 feet = 96 feet).

CivTech is unaware of a method of estimating the queue storage for a pull-out area primarily intended for the convenience for those who are handicapped. Thus, CivTech will adapt a methodology described on pages 714-715 in the American Association of Highway and Transportation Officials (AASHTO) of its publication, *Geometric Design of Highways and Streets* ("AASHTO Green Book"), which indicates that storage length for a turn lane approaching an unsignalized intersection or driveway (or, by extension, the proposed pull-out area), exclusive of taper, should usually be required to hold the average number of arriving vehicles per two minutes. The formulas used for this calculation is as follows: Storage Length (L) = [vehicles per hour $\div$ 30 two-minute periods per hour] x 25 feet.

Since the number of uses by the disabled the pull-out may receive each day or in an hour is unknown (but expected to be low), CivTech worked "backwards" from the equation, applying the storage length of 96 feet and an estimated per vehicle length of 24 feet to determine that as many as 120 vehicles could be accommodated in an hour with an average per-vehicle wait/processing time of two minutes. Recognizing that assisting a disabled person out of or into a vehicle, removing a wheelchair or walker from the back seat or a trunk, etc., takes additional time and that a two-minute wait/processing time per such vehicles could be very optimistic, CivTech doubled the wait/processing time to four minutes. With a four-minute wait/processing time, only 60

vehicles per hour could be accommodated by the proposed pull-out. A tripled, six-minute time would reduce the capacity to 40 vehicles per hour. Since fewer than 40 vehicles per day carrying a disabled person are expected to use the proposed pull-out, CivTech would conclude that the 96-foot long pull-out area for dropping off and picking up disabled persons at Building C, the Administration Building, is sufficient as proposed.

Conclusions and Recommendations

From the above, the following can be concluded:

- Proposed modifications to the parking area of the Valley Presbyterian Church (VPC) in conjunction with Phase 1 renovations to four of the campus's eight buildings would reduce the number of parking spaces on VPC property from 434 spaces to 387 spaces, a net reduction of 47 spaces. Future campus renovations and parking lot modifications could further reduce the total number of spaces on VPC property to 355 spaces, or a total reduction of 79 spaces.
- A required total of 389 spaces was calculated using a hybrid method of maintaining the parking counts from the 1999 Special Use Permit under which VPC is operating for the four buildings that are remaining as-is and by applying current Town SUP requirements to the four buildings being renovated. With only 355 spaces provided upon ultimate build-out of the site, after additional phases of improvements are constructed and the VPC site is built out, VPC could then have a deficit of 34 parking spaces on its own property. It is important to note that, with the exception of the minor 197-SF expansion of the music center, there is no net increase in floor area and net seating in the sanctuary is actually being reduced by as much as 194 seats, which, at 1 space for every 3 seats, implies that the parking could be reduced by 64 spaces (more than eighty percent of the total proposed reduction of 79 spaces) without affecting the operation or adequacy of the parking.
- Since none of the Town's four warranting conditions for a right turn lane approaching a proposed 96-foot long pull-out area on Quail Run Road serving the Administration Building, Building C, is expected to be met, a right turn lane is not warranted approaching this pull-out.
- Assuming an average wait or processing time of up to six minutes per vehicle, CivTech estimated that as many as 40 vehicles per hour could be processed at the proposed pull-out on Quail Run Road. Since fewer than this number of vehicles carrying a disabled person are expected over the course of a day, CivTech would conclude that the 96-foot long pull-out area for dropping off and picking up disabled persons at Building C, the Administration Building, is sufficient as proposed.
- If VPC, which has been operating under the 1999 SUP for nearly 20 years with no issues reported to the Town, were allowed to continue to operate under the 1999 SUP requirements, Buildings A, B, and C, instead of requiring 289 parking spaces would require only 212 parking spaces, 77 fewer spaces than under current SUP requirements, resulting in a surplus of two spaces on the VPC property instead of a deficit of 75 spaces.

Thank you for allowing CivTech to assist you with this Parking Analysis. Please contact me with any questions you may have on this analysis.

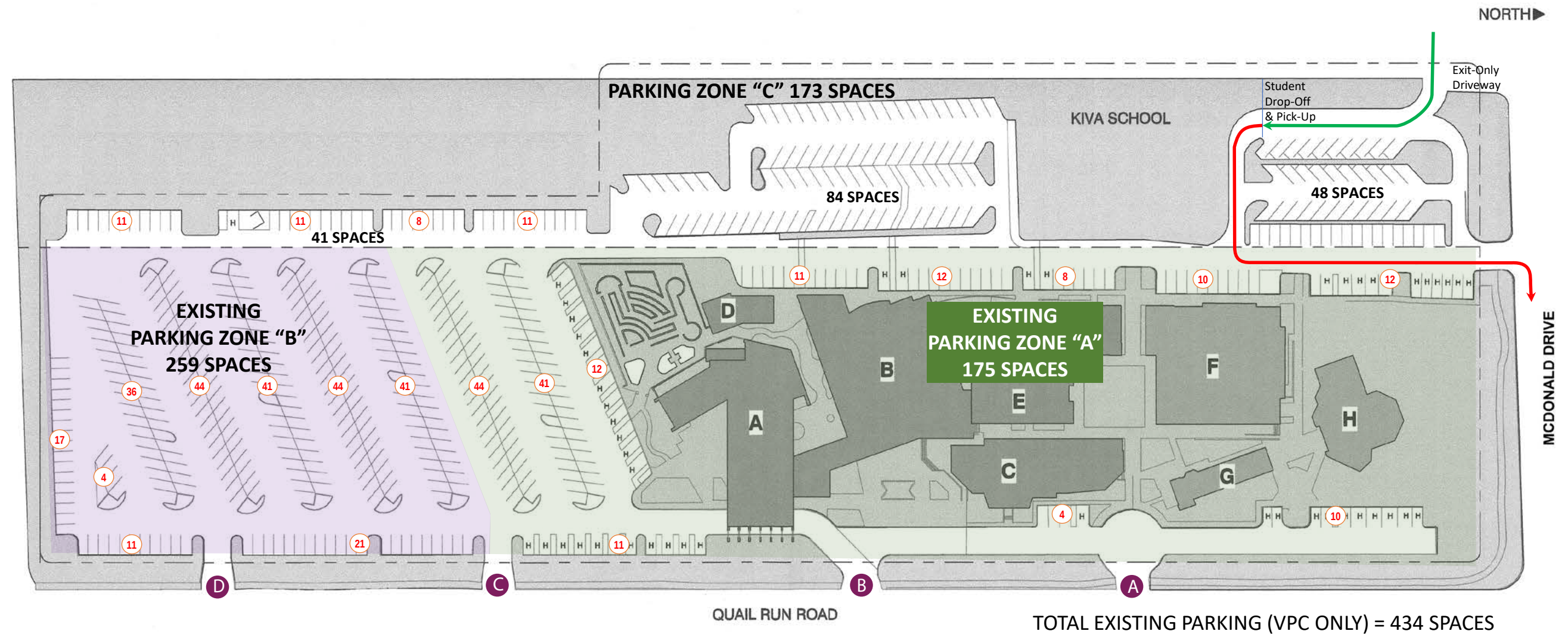
Sincerely,

CivTech



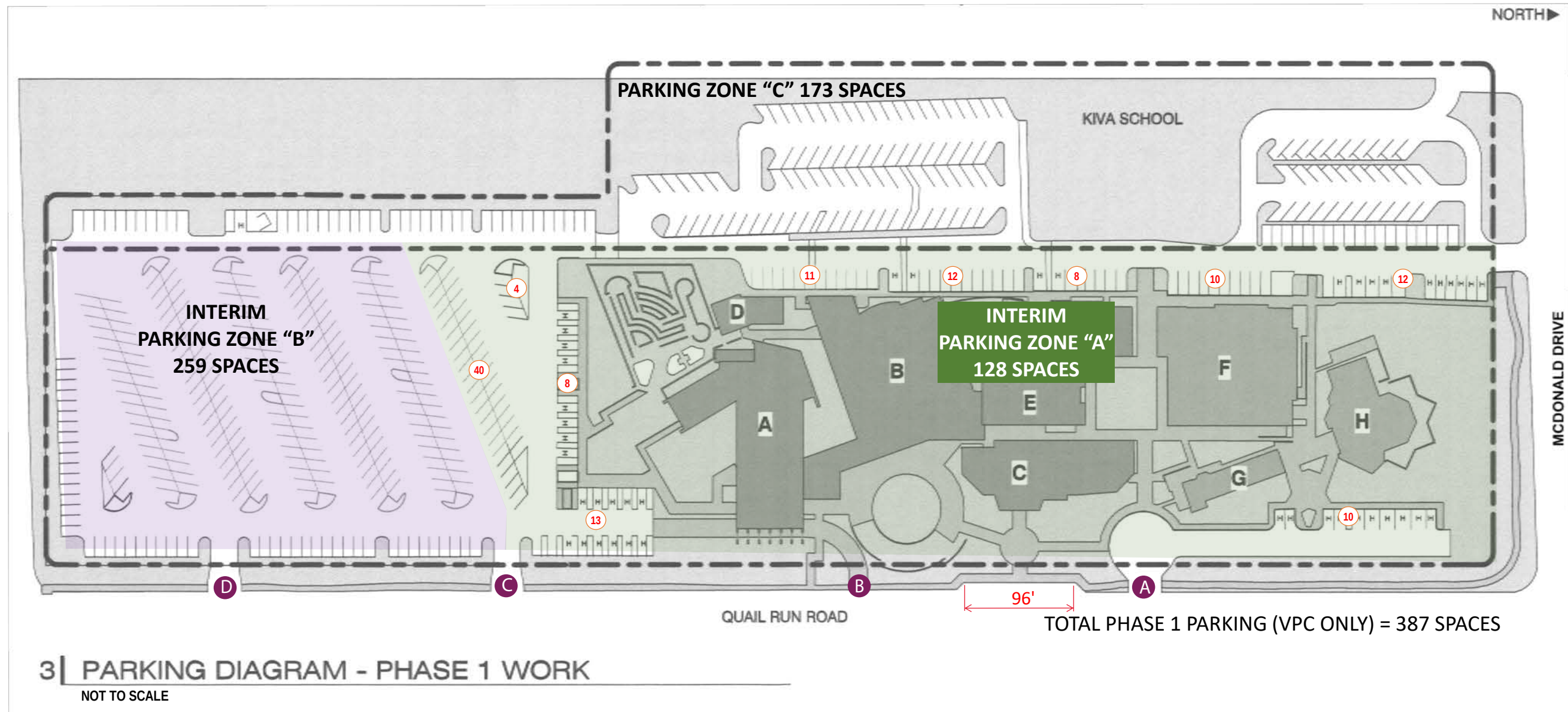
Joseph F. Spadafino, P.E., PTOE, PTP
Project Manager/Senior Traffic Engineer

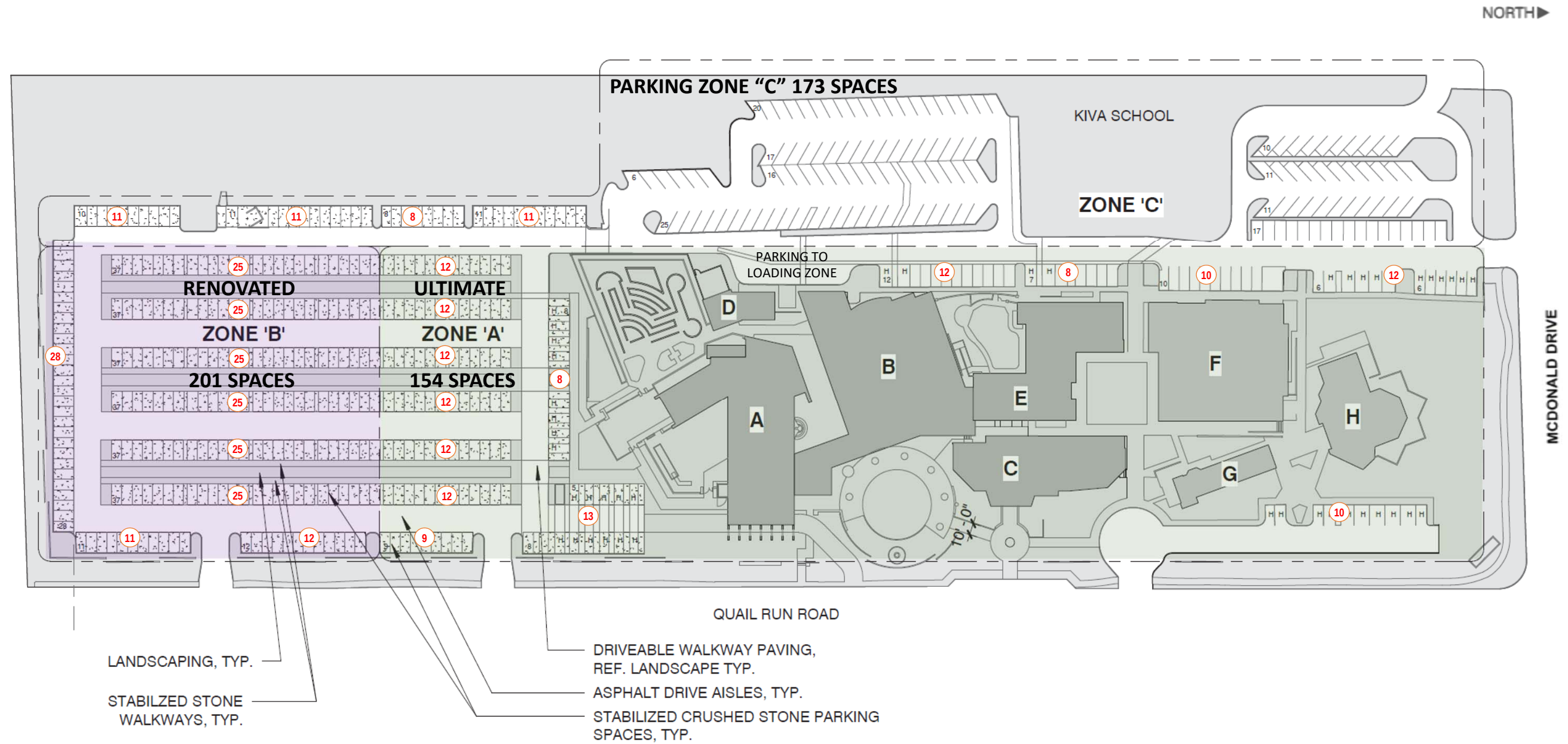
Attachments (4)



2 | PARKING DIAGRAM - EXISTING PARKING LOT (SHOWING ROUTE OF STUDENT DROP-OFF AND PICK-UP OPERATION AT KIVA ELEMENTARY SCHOOL)

NOT TO SCALE





4 | PARKING DIAGRAM - ALL PHASES COMPLETED

NOT TO SCALE

BUILDING NAME	SPACE DESCRIPTION	AREA (SF)	SUP QUANTITY	SUP UNIT	SUP PARKING RATIO PER SUP PARKING	REQUIRED SPACES
SANCTUARY (A) - First Floor and Balcony Undergoing Renovation (plus 197 SF Music Center Expansion)						
FIRST FLOOR	FOYER	1,261	1,261	SF	1/300	4.21
	SEATING	4,913	477	Seats	1/3	159.00
	STAGE [CHOIR AREA]	1,453	49	Seats	1/3	16.34
	MUSIC CENTER	727	727	SF	1/300	2.43
	ORGAN ROOM	124				-
	DIRECTOR'S OFFICE	201	201	SF	1/300	0.67
	STORAGE/UTILITY (12)	632				-
	MUSIC CENTER EXPANSION	197	197	SF	1/300	0.66
	BALCONY	1,509	80	Seats	1/3	26.67
	BUILDING TOTALS	11,017		SF		209.98
SOUTH CLASSROOM BUILDING (B) - Entire Building Undergoing Renovation						
FIRST FLOOR	CAFÉ	1,656	1,656	SF	1/300	5.52
	TEEN MINISTRY	1,376	1,376	SF	1/300	4.59
	TEEN PERFORMANCE	1,004	1,004	SF	1/300	3.35
	TEEN BREAKOUT	215	215	SF	1/300	0.72
	ADULT CLASSROOM	1,194	1,194	SF	1/300	3.98
	CHILDREN'S CLASSROOM (8)	1,727	8	Rooms	1	8.00
	NURSERY (1)	898				-
	MOTHERS' LOUNGE	56	56	SF	1/300	0.19
	ELECTRICAL ROOM	56				-
	STORAGE ROOM (2)	80				-
	MECHANICAL ROOM (2)	185				-
	RESTROOMS	441	441	SF	1/300	1.47
	CENTRAL BREEZEWAY	928				-
	BUILDING TOTALS	9,816				27.82
ADMINISTRATION BUILDING (C) - Part of First Floor Undergoing Renovation						
FIRST FLOOR	<u>SPACES TO BE RENOVATED:</u>					-
	COMMUNITY ROOM	880	880	SF	1/300	2.94
	RECEPTION	488	488	SF	1/300	1.63
	CONFERENCE ROOM	496	496	SF	1/300	1.66
	CHILDREN'S MINISTRY	239	239	SF	1/300	0.80
	OFFICES (4)	710	710	SF	1/300	2.37
	HALLWAYS	620				-
	MECHANICAL ROOM	59				-
	BUILDING TOTALS	3,492				9.40
FACILITIES BUILDING (D) - Part of Building Undergoing Renovation (No change to building footprint)						
FIRST FLOOR	WORKSHOP	549	549	SF	1/300	1.83
	OFFICE	133	133	SF	1/300	0.45
	STORAGE	71				-
	MECHANICAL ROOM	565				-
	BUILDING TOTALS	1,318				2.28
The following buildings or areas/floors of buildings are not in the scope of Phase 1 and parking is per 1999 SUP or prior.						
SANCTUARY (A)	BASEMENT					-
ADMINISTRATION (C)	BASEMENT					7.21
ADMINISTRATION (C)	FIRST FLOOR NOT BEING RENOVATED					4.39
ADMINISTRATION (C)	SECOND FLOOR					9.17
DAY SCHOOL (E)		13,107				24.83
LANDES CENTER (F)		26,159				39.93
THE CROSSING (G)		1,958				4.50
KILGORE CHAPEL (H)		4,500				49.00
	BUILDING TOTALS	45,724				139.04
TOTAL PARKING SPACES REQUIRED (8 BUILDINGS)		71,367				389
PARKING PROVIDED						
ZONE A						154
ZONE B						201
TOTAL PARKING PROVIDED						355
SURPLUS(DEFICIT)						(34)

Attachment 4 - Parking Requirement Calculations