March 18, 2021

Gubir Nijjar, P.Eng
Manager of Planning & Development Services
Rocky View County
262075 Rocky View Point, AB
Rocky View County, Alberta, T4A 0X2

Dear Gubir,

**Re: Springbank Development at 243125 Range Road 33**

Richard Lindseth Architecture Inc (RLA) is leading a development application effort in respect of 12 single-family residential developments with combined access to Range Road 33, in Rocky View County. As we understand it, the County is requesting a letter from a professional engineer to confirm that the proposed residential units will not cause undue traffic impacts on Range Road 33.

Bunt and Associates (Bunt) contacted Rocky View County to determine the actual scope of the letter and confirmed the following. The County advised that this letter should rely on the previous TIA completed for Springbank Sports Fields, especially the analysis of the intersection of RR 33/Springbank Road.

**Scope**:

- Determine trip generation
- Review Site Access and Range Road 33
- Review the intersection of RR 33 and Springbank Road
- Review the intersection spacing between the proposed site access and Westview Estate
- Discuss any issues between the propose site access and Hill Crest Estate.

The section below addresses each of the items in the above scope.

**Determine Trip Generation**

The proposed development will have 12 single-family residential buildings (there is one building already on the site). Using the ITE Trip Generation Manual, each dwelling unit is expected to generate 0.75 trips in the AM, 1 trip in the PM and 10 trips daily. Applying these trip rates to the 12 homes means there would be combined 8 trips in the AM, 12 trips in the PM and 120 trips daily. Trips noted are combined in out and out. These are small amounts of traffic volumes that would have little to no impacts on traffic operations in the vicinity of the site.

**Review of Bunt & Associates' 2020 TIA For Springbank Sports Fields**

In July 2020, Bunt completed a TIA[1] for a proposed sports field located south of Springbank Road west of Range Road 32 and East of Range Road 33. The TIA concluded that at the Opening Day, there would be no need for any mitigations at the intersection of Range Road 33 and Springbank Road.

Since it is expected that nearly all the trips from the proposed development would head north and come from the north via this major intersection, the addition of these marginal traffic volumes is not expected to cause any noticeable change in either volume to capacity ratio or level of service of any traffic movements at the intersection.

**Review The Intersection of RR 33 And Springbank Road**

The Bunt's 2020 TIA concluded that at the opening Day of the Sports Fields, the existing geometry and traffic control **(Figure 1)** would be adequate to accommodate the existing traffic without any need for improvements. If the traffic that would be generated by the proposed development is assigned to each of the movements at this intersection, it would not be high enough to change either the volume to capacity ratio nor the level of service currently experienced by the road users. The result of the capacity analysis in the previous TIA for existing and post development conditions are summarized in the table below.

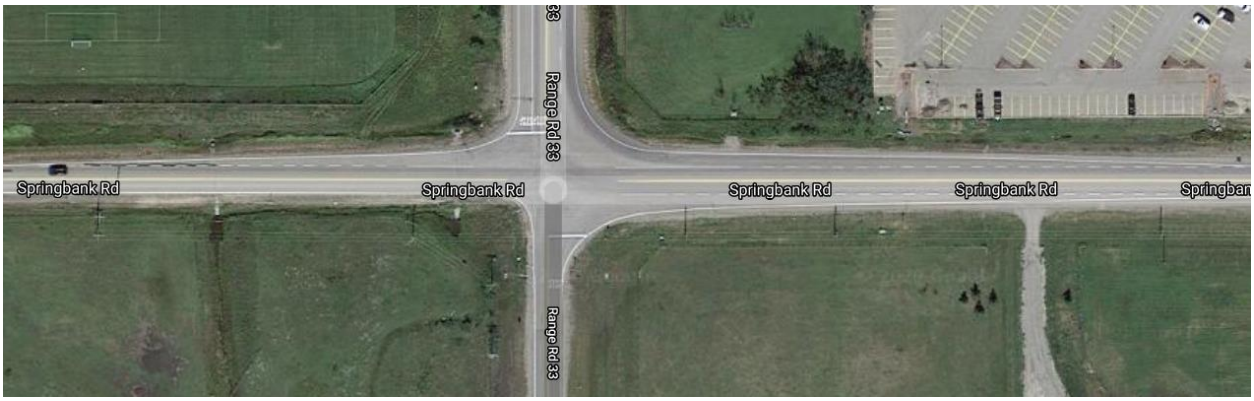



***Figure 1: Plan Layout of the Intersection of Range Road 33 and Springbank Road in 2017***

[1] Springbank Sports Fields Transportation Impact Assessment, Revised Final, July 23 , 2020, Bunt and Associates

***Table 1: Opening Day Background Intersection Analysis (source Bunt's 2020 TIA report 02-20-0067)***

| INTERSECTION | MOVEMENT & LANES | | PM PEAK HOUR | | | |
|---|---|---|---|---|---|---|
| | | | v/c | LOS | Delay | Queue |
| Range Road 33 & Springbank Road *(NB-SB Stop)* | EB | 1 | <0.02 | A | 4 | <5 |
| | WBLT | 1 | <0.02 | A | 1 | <5 |
| | WBR | 1 | 0.10 | A | 0 | <5 |
| | NB | 1 | 0.03 | B | 10 | <5 |
| | SBLT | 1 | 0.10 | B | 10 | <5 |
| | SBR | 1 | 0.02 | A | 9 | <5 |
| | *Overall* | | - | *A* | *3.3* | - |

***Table 2: Opening Day After Development Intersection Analysis (source Bunt's 2020 TIA report 02-20-0067)***

| INTERSECTION | MOVEMENT & LANES | | PM PEAK HOUR | | | |
|---|---|---|---|---|---|---|
| | | | v/c | LOS | Delay | Queue |
| Range Road 33 & Springbank Road *(NB-SB Stop)* | EB | 1 | <0.02 | A | 3 | <5 |
| | WBLT | 1 | <0.02 | A | 1 | <5 |
| | WBR | 1 | 0.11 | A | 0 | <5 |
| | NB | 1 | 0.03 | B | 11 | <5 |
| | SBLT | 1 | 012 | B | 10 | <5 |
| | SBR | 1 | 0.02 | A | 9 | <5 |
| | *Overall* | | - | *A* | *3.5* | - |

As can be seen from both **Tables 1 and 2**, the intersection of RR33 and Springbank Road will operate acceptably with the sports field's traffic. Bunt is of the opinion that this acceptable capacity and level of service conditions would continue to be the same with the addition of 8 trips in the morning and 12 trips in the afternoon. No further quantitative or qualitative analysis is required to confirm this conclusion.

**Review Site Access and Range Road 33**

The site access forms a T-intersection with RR33. It will serve all the 12 dwellings at this site. As indicated earlier, the access will accommodate 8 trips in the morning and 12 in the afternoon (in + out). The existing PM peak hour traffic on RR33 is approximately 40 vehicles per hour. Given the traffic volumes on both RR33 and the access road are less than 100, there will be no need to complete any capacity analysis at this intersection. However, we completed a review of time gaps along RR33. We note that this access is expected to be a Type 1 intersection.

**Time gap analysis**: The intent of this exercise is to determine how many time gaps exists within the traffic stream on RR33 that are greater than the time needed to get onto RR33 from a stop sign. Critical gap is often taken as 5.5 seconds to make a left turn from a stop sign. In this analysis, we have assumed 8 seconds to make a left turn from the site access to northbound on RR33. Assuming the flow on RR33 is Poisson distributed (low flow), there would be maximum of 39 gaps in one hour (40-1). Since a gap is considered a time when no vehicles arrived, the frequency of this gap is:

(V-1)(exp -(Lambda t/3600)

Where V is the traffic volume in volumes per hour, Lambda is the arrival rate per second and t is time in seconds. Applying this formular to RR33 would yield,

(40-1)/exp (8x40/3600) = 35.

That is, there would be 35 time gaps in the peak hour that are greater than 8 seconds along RR33. This number of gaps is greater than the hourly traffic generated by the proposed development (12 max). Even if higher volumes were assumed on the main road, there would still be enough time gaps in excess of 8 seconds to accommodate traffic turning onto RR33. Therefore, drivers from the site will be able to make left turns from the access to north on RR33 even if it takes them 8 seconds to do so.

**Review The Intersection Spacing Between The Proposed Site Access and Westview Estate**

The site plan shows that the proposed Site Access will be located approximately 139 metres north of the Westview Estate's access along RR33. Based on the draft of South Springbank ASP, RR33 south of Springbank Road is classified as Neighbourhood Arterial and requires intersection separation of 400 metres. The stated 400 metres is not consistent with current intersection spacings south of Springbank Road, nor is it achievable under current conditions. The existing access separation is shown in **Figure 2**.

It can be noted that RR33 (south) turns into Mountain River Estate and ends in a cul-de-sac. That is, in spite of the Draft ASP, lower traffic volumes are expected on this portion of the road and may continue to operate as a country road for the foreseeable future.

The Westview Access on RR33 will be stop controlled, that is, any vehicle coming out of the estate will stop before turning onto RR33. Given that the speed on RR33 is 80km/h, the Design Guide indicates a 130m sight distance is adequate for passenger vehicles. A vehicle travelling at 80km/h would require at least 6.5 seconds to cover 139 metres, that's enough time for a stopped vehicle to turn onto RR33. Also, there is an unobstructed sightline between the two intersections, which implies that any vehicle travelling south by this development's site access will clearly see a vehicle stopped at Westview Estate and can comfortably come to a stop if required. The same is for a stopped vehicle at the Westview intersection having visual access to vehicles travelling south on RR33 and able to judge whether to access RR33 or not. The Design Guide recommends 170 to 190 metres intersection sight distance for 80-90Km/h design speed. The sightline available at the intersection is in excess of 200 metres. The key therefore, is visual access coupled with ability to stop. The space between the two intersections meets these two criteria.

Though the 139 metres separation is less than the proposed 400 metres, it is adjudged adequate to allow both stopped vehicle and travelling vehicle to see each other and react appropriately. The proposed site access is shown in **Figure 3.**

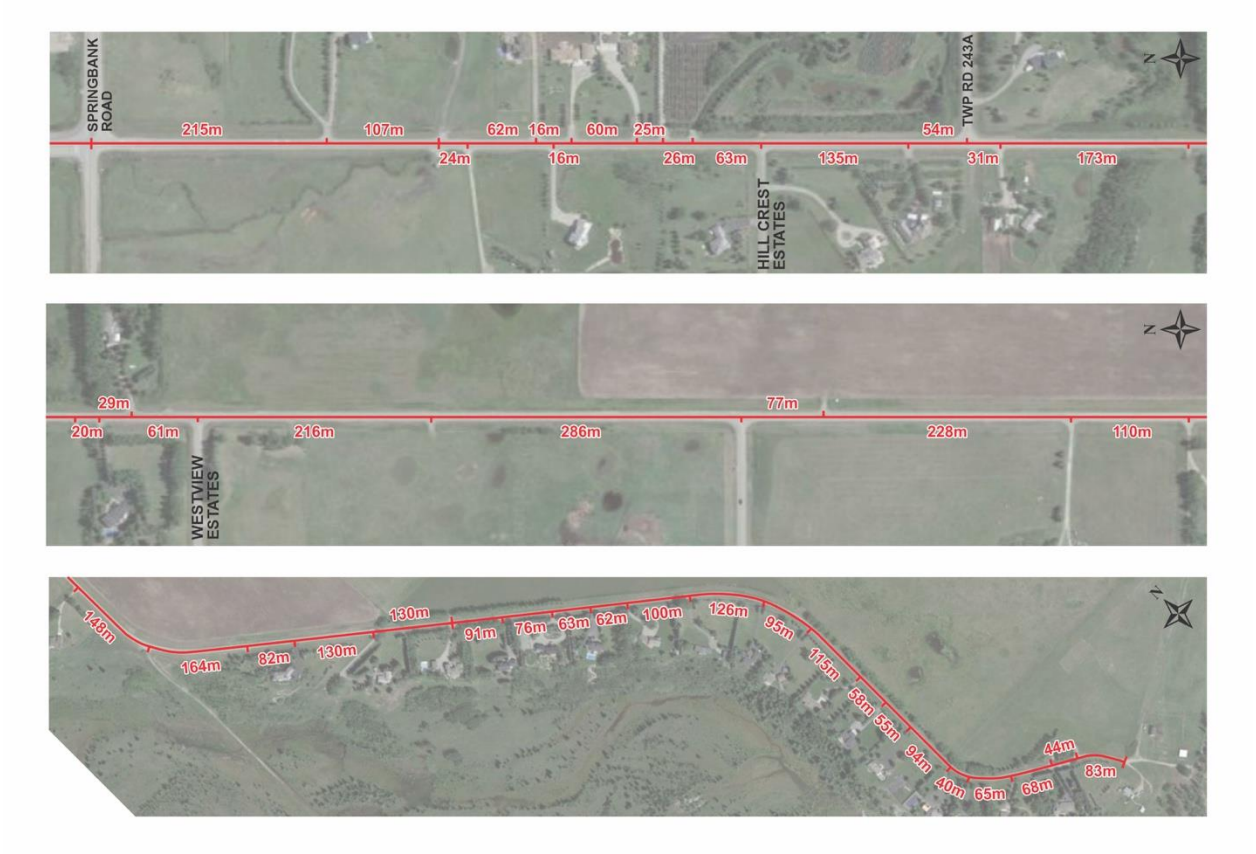



**Figure 2: Existing Access Spacing on Range Road 33**

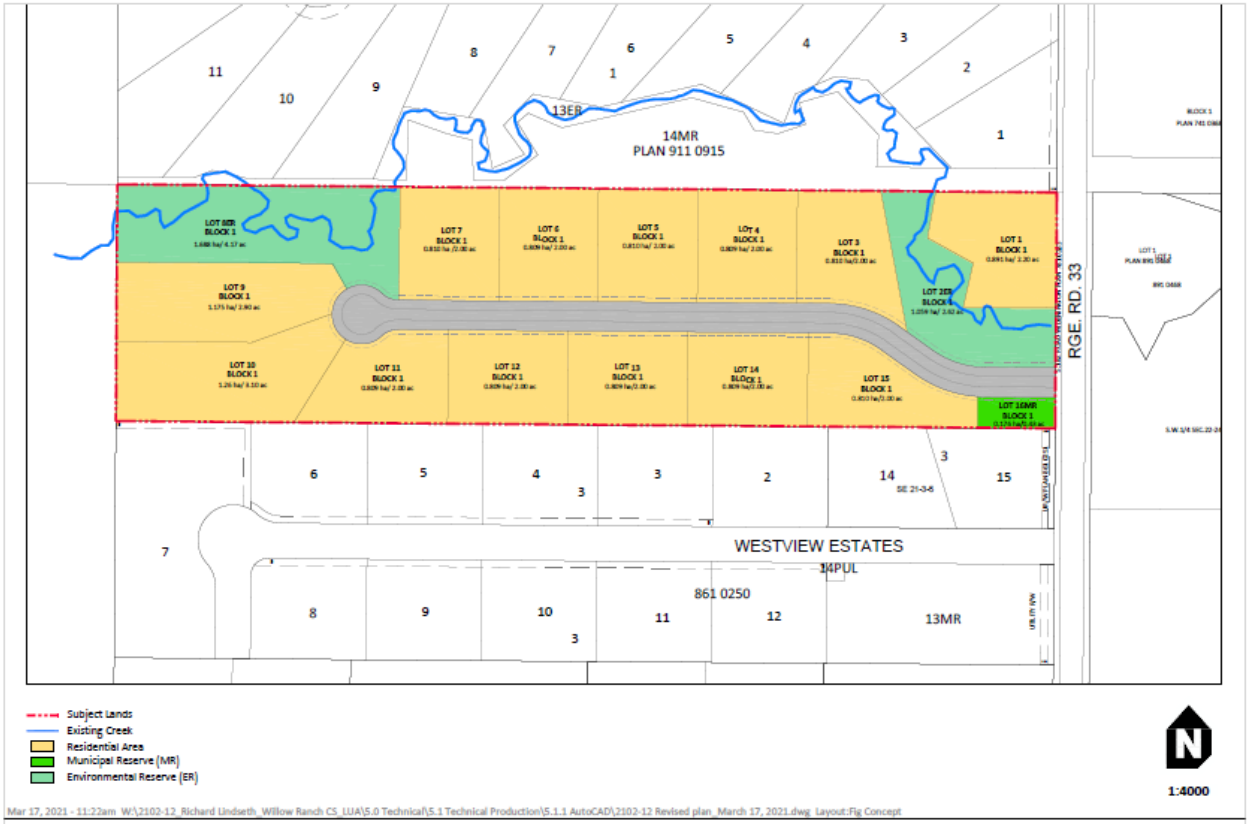



**Figure 3: Site Access Separation From Westview Estate**

**Discuss Any Issues Between The Propose Site Access And Hill Crest Estate**.

The Site Access and Hill Crest Estate access are T-intersections on the west side of RR33. They are spaced approximately 380 metres apart. Between them and on the east side of RR33 is Township Road 243A, which is approximately 170 metres north of the site access and 190 metres south of Hill Crest Estate. There are currently two other minor accesses to RR33 between the proposed Site Access and Hill Crest Estate, both are on the west side of the road.

The proposed Site access will process between 8 and 12 trips during the AM and PM peak hours and the Hill Crest Estate is expected to generate similar trips during the peak hours. The minor accesses are expected to generate maximum of 2 trips each during the peak hours. These trips are cumulatively small and coupled with the low traffic volumes on RR33, they are not expected to affect traffic operations along the corridor.

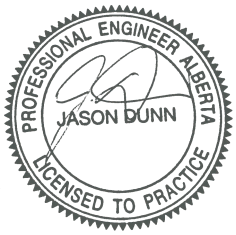
**Conclusions**

The proposed development will generate minimal traffic during the AM (8 trips) and PM (12 trips) peak hours. The current traffic on RR33 is small (approximately 40) providing enough acceptable time gap that would allow traffic from the site to safely get onto the main road. The proposed access spacing (171 metres south of Twp Road 243A and 139 metres north of Westview Estate) is typical of the existing access spacings along RR33 south of Springbank Road, therefore the separation is considered adequate from points of view of sight distance.

Please call if you have any questions or wish to discuss any issues in further detail.

Yours truly,
**Bunt & Associates**

Ezekiel Dada, Ph.D., P.Eng. l Principal

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