

CITY OF GREAT FALLS
PLANNING & COMMUNITY DEVELOPMENT DEPT.
P.O. Box 5021, GREAT FALLS, MT, 59403 5021
406.455.8430 • WWW.GREATFALLSMT.NET

LAND USE APPLICATION

Silver Stone Apartments

Name of Project (if applicable):

NE Corner of 38th St/2nd Ave. N. Intersection

Project Address:

Silver Stone Enterprises

Applicant/Owner Name:

4104 15th Ave. S., Great Falls, MT 59405

Mailing Address:

406-868-5614

trace.silverstone@gmail.com

Phone:

Email:

Kevin May, P.E. - Big Sky Civil & Environmental, Inc.

Representative Name:

406-727-2185

kmay@bigskyce.com

Phone:

Email:

LEGAL DESCRIPTION:

Tracts 1 & 2

Lot/Block/Subdivision:

NW 1/4 of Section 9, Township 20 North, Range 4 East

Section/Township/Range:

ZONING (ZONING MAP AMENDMENT ONLY):

C-1/R-3/County C C-1 & R-6

Current:

Proposed:

LAND USE (CONDITIONAL USE ONLY):

Vacant R-6 Res/C-1 Com

Current:

Proposed:

I (We), the undersigned, understand that the filing fee accompanying this application is not refundable. I (We) further understand that the fee pays for the cost of processing, and the fee does not constitute a payment for approval of the application. I (We) further understand that public hearing notice requirements and associated costs for land development projects are my (our) responsibility. I (We) further understand that other fees may be applicable per City Ordinances. I (We) also attest that the above information is true and correct to the best of my (our) knowledge.

Applicant/Owner's Signature:

Date:

8/8/2022

Representative's Signature:

Date:

8/9/2022

August 8, 2022

Mr. Lonnie Hill
City of Great Falls
Planning & Community Development Department
PO Box 5021
Great Falls, MT 59403

RE: Silver Stone Enterprises – Silver Stone Apartments
Annexation & Zoning Application – Project Narrative

Dear Mr. Hill,

We are pleased to submit the Silver Stone Apartments application for Annexation & Zoning Map Amendment. The proposed project consists of the construction of twelve (12) separate 36-unit apartment buildings for a total unit count of 432 living units. In addition to the apartment buildings, the project will also include an office/clubhouse building to support the development. Individual apartment buildings will be 3 story buildings (above-ground) and will include basement storage areas.

The subject development site is approximately 16.348 acres and includes a 0.684 acre parcel that is currently annexed into the City of Great Falls with split zoning (C-1 & R-3) as well as a 15.665 acre undeveloped and un-annexed property that currently lies within the Cascade County Commercial zoning district. The property sits along the northern boundary of 2nd Avenue North between 38th St. N. & 42nd St. N. as detailed in the attached vicinity maps.

The proposed project will include a Boundary Line Adjustment survey to relocate the common property boundary to create a 4.574 acre southern parcel with proposed C-1 zoning along with an 11.774 acre northern parcel with proposed R-6 zoning to allow for the development of the proposed apartment complex. The proposed C-1 zoning along the southern property boundary will maintain consistency with the adjacent commercial zoning and allows flexibility for future apartment development or commercial development if deemed financially feasible. The northern property with proposed R-6 zoning is consistent with the adjacent R-6 zoning and allows for the proposed apartment development. The site and development have been extensively discussed with City Planning staff to help ensure all required design criteria are met in the enclosed proposal.

Traffic Impacts

As detailed in the attached Traffic Impact Study (TIS) report, the proposed development is expected to generate approximately 1,971 vehicular trips per day with peak AM and peak PM trips of 138 and 177 trips respectively. The addition of the vehicular trips detailed above will have impacts to the existing intersections at 3rd Ave. N./38th St. N., 2nd Ave. N./38th St. N., and Central Ave./38th St. N. As detailed within the report, the anticipated traffic generation from the development will impact existing Level of Service for various turning movements; however, the overall intersections will continue to operate at acceptable levels following development.

The Central Avenue/38th St. N. intersection will likely require traffic mitigating features to alleviate LOS concerns at the intersection; however, these traffic concerns exist prior to the

development of the apartment complex. Refer to the attached TIS report for additional information.

Compliance with Stormwater Regulations

The proposed apartment complex will be required to comply with City of Great Falls storm drainage regulations associated with water quality and water quantity. As detailed within the attached preliminary storm drainage calculations, storm drainage improvements associated with the development will include approximately 20,000 cubic feet of retention storage (water quality requirements) and will include additional detention storage in order to comply with the City’s discharge standards. It is anticipated that the required retention and detention storage will be located within the NW corner of the development as shown in the attached exhibits where collected runoff will be treated and detained prior to discharge into the existing City of Great Falls storm drainage infrastructure adjacent to the development. It is anticipated that additional stormwater storage and treatment will be provided within landscaped areas throughout the development and a new underground piping system will be utilized to convey collected storm water to the new pond structure(s). Please refer to the preliminary infrastructure plans for additional information.

Conceptual Public Infrastructure Plans

As detailed within the attached preliminary infrastructure plans, a new water main will be extended through the property to connect to existing City of Great Falls infrastructure at three (3) separate locations to provide water service to each of the new buildings along with hydrant coverage throughout the development. The proposed water main looping will provide adequate hydraulic capacity for the development, will provide additional reliability within the City’s existing system, and will eliminate an existing dead end water main on 3rd Ave. North. Additionally, existing hydrant flow information provided by the CoGF shows adequate hydraulic capacity to serve the proposed development.

Existing sewer mains will be extended as shown on the preliminary plans to provide sewer service connections for the internal buildings (buildings 7-12 & Clubhouse) while buildings along the northern property boundary (buildings 1-6) will be directly connected to existing gravity sewer mains within the City alley. Preliminary wastewater generation and water demand estimates are included below.

New water and sewer mains will be located within dedicated utility easements as required by the City of Great Falls and as shown within the preliminary BLA survey.

Anticipated Water Demand/Wastewater Generation Calculations

Wastewater Generation	
Domestic WW Generation	108,000 gpd
Average Flow Rate	75 gpm
Peak Hourly Flow Rate	284 gpm
Water Demand	
Total Water Demand (includes summer irrigation demand)	144,000 gpd
Average Domestic Flow Rate	75 gpm
Peak Hourly Domestic	284 gpm
Irrigation Demand	50 gpm
Hydrant Flow Rate	1,500 gpm

Preliminary Soils/Geotechnical Information

A new geotechnical report is currently being drafted for the proposed development; however, a preliminary report was written for Neighborworks Great Falls (NWGF) by TD&H Engineering in 2013 that is attached for reference.

As detailed in the draft NWGF report, the site generally consists of surficial native clays and sands overlying weathered sandstone which was encountered at depths ranging from 7-12 feet throughout the site. The proposed apartment complex which utilizes basements will effectively remove the expansive clay materials and will allow the buildings to bear on the native sandstones. It does not appear as though groundwater was encountered within the original borings and it is not anticipated that groundwater will impact the proposed construction of the apartments or public utilities.

Project Phasing

It is currently anticipated that the project will be constructed in three separate phases with four apartment buildings per phase; however, project phasing is subject to change based on material availability and other financial factors.

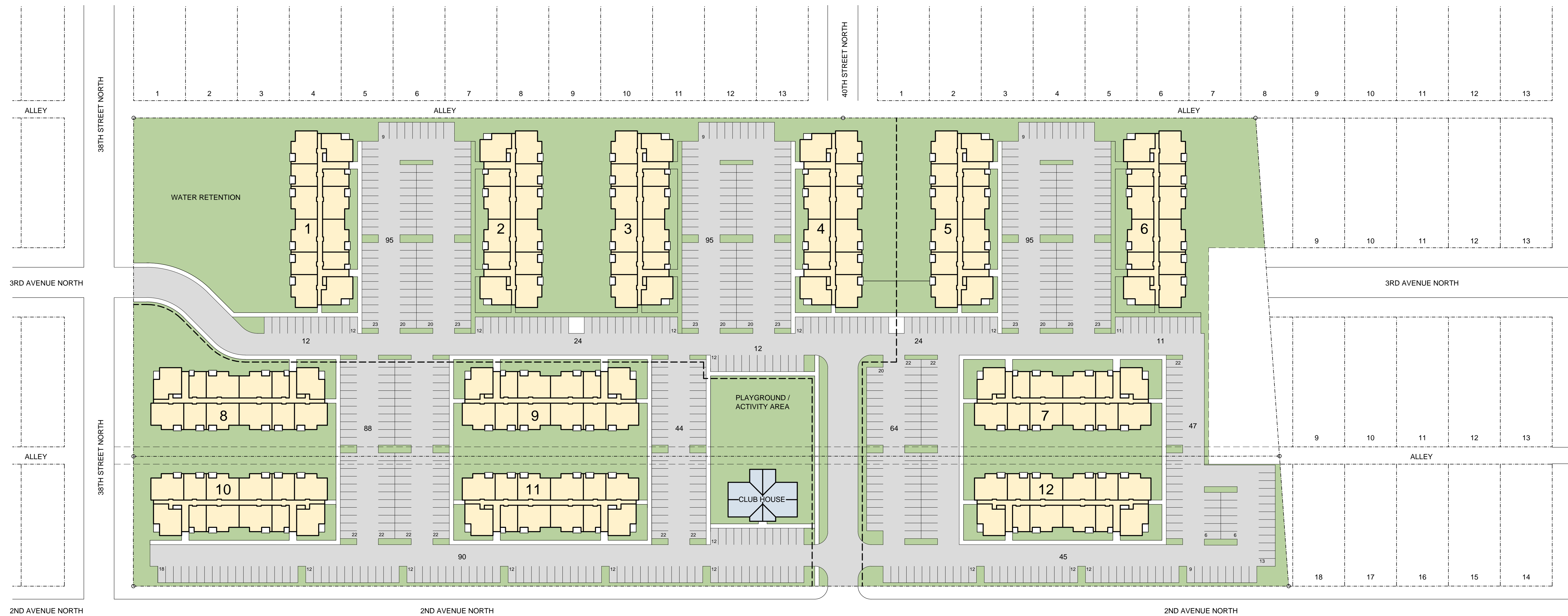
Summary

The proposed site layout provides ample landscaping throughout the parcel to ensure an attractive development which meets the City's landscaping codes and the new construction will include the installation of sidewalks along 2nd Ave. North adjacent to MDT R/W. Pedestrian access will be enhanced throughout the project area as well as within the development to allow for ADA access throughout the area. Onsite parking lot and building lighting will be downward facing to help minimize offsite impacts and will be designed to meet CoGF standards.

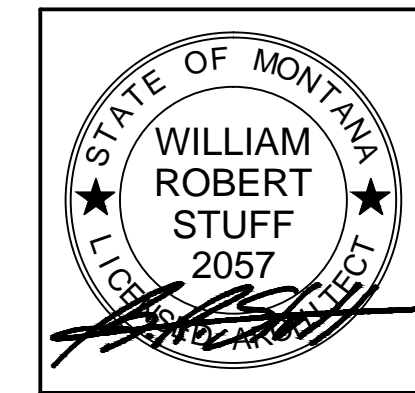
Included with this application are an existing site plan, proposed site plan, preliminary infrastructure plans, architectural site plan, building elevations, preliminary geotechnical analysis; preliminary stormwater, water demand, and wastewater generation calculations; and Traffic Impact Study for your review. Please feel free to call me or our representatives at Big Sky Civil & Environmental with any questions or comments you may have related to this submittal. Thank you for your continued cooperation on this project.

Sincerely,

Trace Timmer
Silver Stone Enterprises



FUSION | architecture + design
 1922 Cherry Drive
 P. 406 | 315-3618
 Great Falls, Montana 59404
 E-Mail: bill@fusion-and.com

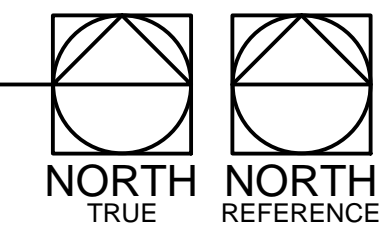


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SILVERSTONE APARTMENTS

GREAT FALLS, MONTANA

OVERALL SITE PLAN - PHASE ONE, TWO, & THREE
 SCALE: 1" = 60'-0"
 0 10 20 30 60 120



BUILDING UNIT SUMMARY													
DESCRIPTION	BUILDING #1	BUILDING #2	BUILDING #3	BUILDING #4	BUILDING #5	BUILDING #6	BUILDING #7	BUILDING #8	BUILDING #9	BUILDING #10	BUILDING #11	BUILDING #12	TOTAL
STUDIO	6	6	6	6	6	6	6	6	6	6	6	6	72
1 BEDROOM	6	6	6	6	6	6	6	6	6	6	6	6	72
2 BEDROOM	18	18	18	18	18	18	18	18	18	18	18	18	216
2 BEDROOM (CORNER)	6	6	6	6	6	6	6	6	6	6	6	6	72
TOTAL UNITS	36	36	36	36	36	36	36	36	36	36	36	36	432
APARTMENT AREA - SF	37,956	37,956	37,956	37,956	37,956	37,956	37,956	37,956	37,956	37,956	37,956	37,956	455,472
BASEMENT AREA - SF	12,652	12,652	12,652	12,652	12,652	12,652	12,652	12,652	12,652	12,652	12,652	12,652	151,824
TOTAL BUILDING AREA	50,608	50,608	50,608	50,608	50,608	50,608	50,608	50,608	50,608	50,608	50,608	50,608	607,296
ACTUAL PARKING	62.5	62.5	62.5	62.5	62	62	62	62	62	62	62	62	746

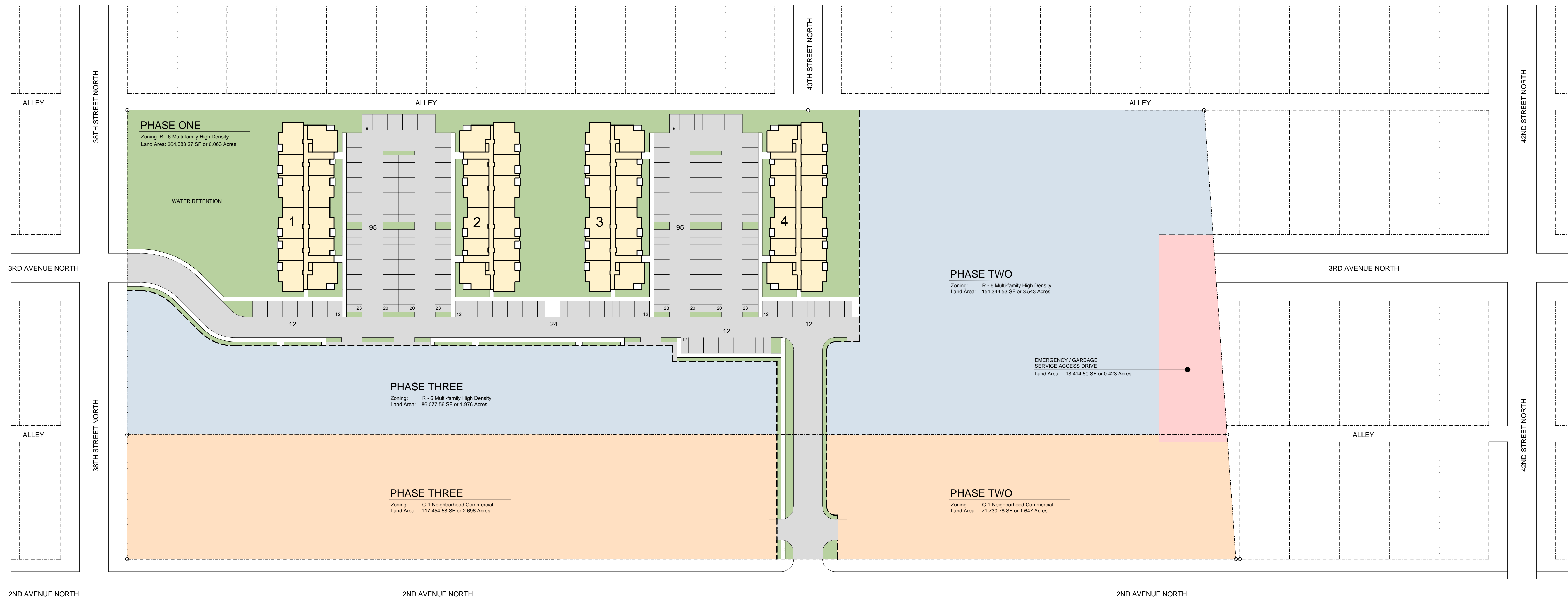
PARKING CALCULATION			
UNIT TYPE	# OF UNITS	RATIO	PARKING STALLS
STUDIO	72	1 PER UNIT	72
1 BEDROOM	72	1.35 PER UNIT	98
2 BEDROOM	216	2 PER UNIT	432
2 BEDROOM (CORNER)	72	2 PER UNIT	144
TOTAL PARKING			746

LEGEND	
	ASPHALT PAVING
	LANDSCAPE - INSIDE PROPERTY
	LANDSCAPE - R.O.W.

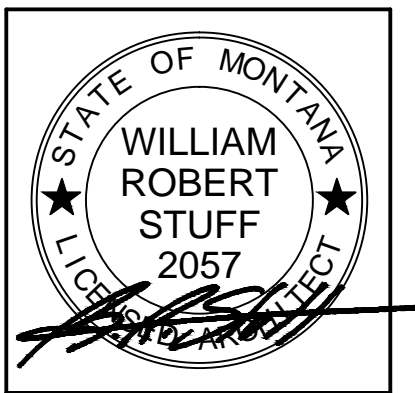
ZONING REQUIREMENTS																		
LEGAL DESCRIPTION:	LOT ACREAGE:	SETBACKS:	LANDSCAPE REQUIREMENTS:															
TO BE DETERMINED	TOTAL PROPERTY: 16.348 ACRES or 712,119 SF	<table border="1"> <thead> <tr> <th></th> <th>REQUIRED</th> <th>ACTUAL</th> </tr> </thead> <tbody> <tr> <td>FRONT YARD SETBACK:</td> <td>???</td> <td></td> </tr> <tr> <td>SIDE YARD SETBACK:</td> <td>???</td> <td></td> </tr> <tr> <td>REAR YARD SETBACK:</td> <td>???</td> <td></td> </tr> <tr> <td>SIDE YARD SETBACK:</td> <td>???</td> <td></td> </tr> </tbody> </table>		REQUIRED	ACTUAL	FRONT YARD SETBACK:	???		SIDE YARD SETBACK:	???		REAR YARD SETBACK:	???		SIDE YARD SETBACK:	???		REQUIRED: 15% (0.15) OF TOTAL LOT AREA REQUIRED: 684,066 SF x 0.15 = 102,610 SF PROVIDED: TOTAL LANDSCAPE AREA: 228,367 SF 228,367 SF DIVIDED BY 712,119 = 0.321 OR 32.1%
	REQUIRED	ACTUAL																
FRONT YARD SETBACK:	???																	
SIDE YARD SETBACK:	???																	
REAR YARD SETBACK:	???																	
SIDE YARD SETBACK:	???																	
PROPERTY ADDRESS:	ZONING & LAND USE:	BUILDING COVERAGE:																
TO BE DETERMINED	R-6 MULTI-FAMILY HIGH DENSITY 11.774 ACRES or 712,119 SF C-1 NEIGHBORHOOD COMMERCIAL 4.574 ACRES or 199,243 SF	APARTMENT BUILDINGS (FOOTPRINTS - 12 BUILDINGS) 151,824 SF OFFICE / CLUBHOUSE / MAINTENANCE BUILDING 4,800 SF TOTAL FOOTPRINTS 156,624 SF 152,064 SF DIVIDED BY 712,119 SF = 0.214 or 21.4%																

GENERAL NOTES	
1. ACTUAL FINISHED FLOOR OF PROPOSED BUILDING TO BE 100.0'	
2. SEE CIVIL DRAWINGS FOR INFORMATION RELATING TO SITE DEVELOPMENT, SITE GRADING, SITE UTILITIES, ASPHALT PAVING, CONCRETE CURBS & APRONS, CONCRETE DRIVES, AND CONCRETE SIDEWALKS, ETC.	
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4. ALL CONCRETE CURB-CUTS, CURBS & APRONS, SIDEWALKS, AND DRIVES TO MEET THE MDT & CITY OF GREAT FALLS BUILDING STANDARDS.	
5. ALL FINAL PARKING LOT STRIPPING TO BE COORDINATED WITH OWNER PRIOR TO APPLICATION.	
6. SEE CIVIL & STRUCTURAL DRAWINGS & SPECIFICATIONS FOR CONTROL JOINT & EXPANSION JOINT LOCATIONS IN NEW CONCRETE SITE ELEMENTS.	

Project Info.	
Project No.	22FAD03
Date	August 6, 2022
Revisions	
Drawn By	WRS
Sheet Title	
overall site plan	
Sheet Number	
A1.00	



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 Great Falls, Montana 59404
 E-Mail: bill@fusion-and.com



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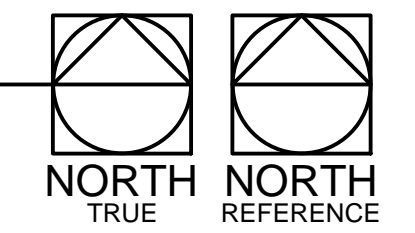
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SILVERSTONE APARTMENTS

GREAT FALLS, MONTANA

Project Info.	
Project No.	22FAD03
Date	August 6, 2022
Revisions	
Drawn By	WRS
Sheet Title	
phase one site plan	
Sheet Number	
A1.10	

PHASE ONE - SITE PLAN
 SCALE: 1" = 60'-0"
 0 10 20 30 60 120



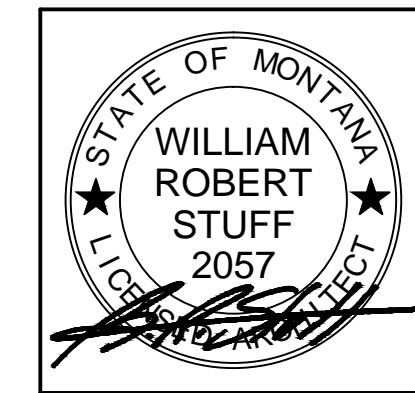
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STUDIO	6	6	6	6	---	---	---	---	---	---	---	---	24
1 BEDROOM	6	6	6	6	---	---	---	---	---	---	---	---	24
2 BEDROOM	18	18	18	18	---	---	---	---	---	---	---	---	72
2 BEDROOM (CORNER)	6	6	6	6	---	---	---	---	---	---	---	---	24
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ACTUAL PARKING	62.5	62.5	62.5	62.5	---	---	---	---	---	---	---	---	250

UNIT TYPE	# OF UNITS	RATIO	PARKING STALLS
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	ASPHALT PAVING
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	EMERGENCY / GARBAGE SERVICE ACCESS

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SILVERSTONE APARTMENTS

GREAT FALLS, MONTANA



PARTIAL EXTERIOR ELEVATION - SOUTH
 SCALE: 1/4" = 1'-0"
 0 1 2 4 8

GENERAL NOTES	
1.	ACTUAL FINISHED FLOOR LEVEL TO BE 100'-0" OR
2.	ALL DIMENSIONS TO FACE OF STUDS UNLESS NOTED OTHERWISE
3.	GENERAL CONTRACTOR TO VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO FABRICATION.
4.	GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATE THE WORK OF ALL TRADES INVOLVED IN THE PROJECT AS PART OF THE CONTRACT.
5.	GENERAL CONTRACTOR SHALL VERIFY ALL CONDITIONS AT THE SITE AND REPORT ALL DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
6.	GENERAL CONTRACTOR SHALL PROVIDE A COMPLETE AND PROPER EXECUTION OF THE WORK AS INDICATED ON ALL DRAWINGS. IF ERRORS IN LAYOUT DIMENSIONS OR DETAILS ARE FOUND BETWEEN ARCHITECTURAL, STRUCTURAL, MECHANICAL, OR ELECTRICAL DRAWINGS CONTACT THE ARCHITECT IMMEDIATELY.
7.	GENERAL CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO COORDINATE WITH THE OWNERS WORK AND/OR SUPPLIED ITEMS THAT ARE "OWNER FURNISHED CONTRACTOR INSTALLED" (O.F.C.I.) OR ARE "NOT IN CONTRACT" (N.I.C.) BUT ARE ATTACHED TO THE CONTRACTOR'S WORK.
8.	ALL LARGE SCALE DRAWINGS & DETAILS GOVERN OR SUPERSEDE ALL SMALLER SCALE DRAWINGS & DETAILS.

EXTERIOR FINISH LEGEND							
ROOF MATERIALS		WALL MATERIALS		MISC. MATERIALS			
R1	PREMANUFACTURED METAL ROOF PANELS FACTORY FINISH STYLE: LOW SLOPE STANDING SEAM ROOF PANEL COLOR: METAL SALES - WEATHERED COPPER (W50)	CWP1	COMPOSITE WALL PANELS STYLE: NICHIIA - VINTAGE WOOD COLOR - BARK SIZE: 17 7/8" H x 6'-0" & 10'-0" LENGTHS	SV1	STONE VENEER - FIELD STYLE: CULTURED STONE - PRO-FIT LEDGESTONE COLOR - ECHO RIDGE	SSC1	STEEL SHADING CANOPY - 5'-0" W COLOR - VERIFY W/ OWNER & ARCHITECT SEE DETAILS ON SHEET A??? PAINT FINISH - VERIFY COLOR W/ OWNER & ARCHITECT
R2	METAL FASCIA & ROOF EDGE FLASHING FACTORY FINISH COLOR: METAL SALES - WEATHERED COPPER (W50)	CWP2	COMPOSITE WALL PANELS STYLE: NICHIIA - TUFF BLOCK COLOR - PEWTER SIZE: 17 7/8" H x 6'-0" & 10'-0" LENGTHS	SV2	PRECAST CONCRETE SILL CAP STYLE / COLOR - VERIFY W/ OWNER & ARCHITECT	SSC2	STEEL SHADING CANOPY - 6'-0" WIDE COLOR - VERIFY W/ OWNER & ARCHITECT SEE DETAILS ON SHEET A??? PAINT FINISH - VERIFY COLOR W/ OWNER & ARCHITECT
R3	METAL GUTTER & DOWNSPOUT - PREFINISHED FACTORY FINISH COLOR: METAL SALES - WEATHERED COPPER (W50) SEE ROOF PLAN FOR ADDITIONAL INFORMATION	MP1	PRE-MANUFACTURED METAL PANEL & TRIM STYLE: T10-D - VERTICAL PLACEMENT COLOR: METAL SALES - WEATHERED COPPER (W50)				
R4	METAL PARAPET CAP - PREFINISHED FACTORY FINISH COLOR: METAL SALES - WEATHERED COPPER (W50)	MP2	PRE-MANUFACTURED METAL PANEL & TRIM STYLE: ??? COLOR: METAL SALES - ???				

Project Info.	
Project No.	22FAD03
Date	August 6, 2022
Revisions	
Drawn By	WRS

Sheet Title
 exterior elevations

Sheet Number
 A6.10



ENGINEERING, REIMAGINED

TRAFFIC IMPACT STUDY

Silverstone Apartments
Great Falls, MT

August 2022

Prepared For:
Big Sky Civil & Environmental, Inc.
P.O. Box 3625
Great Falls, MT 59403



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Proposed Development

The proposed development is comprised of 12 three-story buildings with 36 units in each. It is located to the north of 2nd Ave N and to the east of 38th St N in Great Falls, MT. Currently, the land is undeveloped, but the first phase of building will begin in the spring of 2023, with the first four buildings being complete by the spring of 2024. Each phase will see four of the twelve buildings completed. The next phase of buildings will be ready for occupancy in the fall of 2025, with the last phase being completed in the spring of 2027.

Figure 2 - Proposed Development (Source: Fusion Architecture + Design)



Existing Conditions

Study Intersection Configurations

Intersection of 3rd Ave N with 38th St N

The intersection of 3rd Ave N with 38th St N is currently a T-intersection controlled by stop control with one stop on the 3rd Ave N approach to 38th St N. The existing lane configuration of the intersection includes:

- » Northbound: One shared left/thru/right-turn lane
- » Southbound: One shared left/thru/right-turn lane
- » Eastbound: One shared left/thru/right-turn lane
- » Westbound: No westbound approach currently exists. A westbound access to the site will be added with the completion of the development. The lane configuration is expected to be one shared left/thru/right-turn lane with two-way stop control.

Figure 3 - Study Intersections



Source: MDT, KLJ, ESRI

July 2022

Intersection of 2nd Ave N with 38th St N

The intersection of 2nd Ave N with 38th St N is currently controlled by an actuated traffic signal. The existing lane configuration of the intersection includes:

- » Northbound: One shared left/thru/right-turn lane
- » Southbound: One shared left/thru/right-turn lane
- » Eastbound: One left turn, one thru-lane, and one shared thru/right turn lane
- » Westbound: One left turn, one thru-lane, and one shared thru/right turn lane.

Intersection of Central Ave with 38th St N

The intersection of Central Ave with 38th St N is currently controlled by All-way Stop. The existing lane configuration of the intersection includes:

- » Northbound: One shared left/thru/right-turn lane
- » Southbound: One shared left/thru/right-turn lane
- » Eastbound: One shared left/thru/right-turn lane
- » Westbound: One shared left/thru/right-turn lane

schools: Montana School for the Deaf and Blind; Lewis Clark Elementary School; and East Middle School. Traffic counts were collected during the last week of schools being in session. The existing daily traffic volumes in the study area are shown in **Figure 5**. The raw traffic volume profiles of the study intersections are included in **Appendix A**. Minor corridor volume discrepancies existed between the study intersections. For these reasons, the intersection volumes were balanced to mitigate these minor discrepancies. The *AM peak* was observed between 7:15AM and 8:15AM, and *PM peak* was observed between 4:30 PM and 5:30 PM. The existing intersection level traffic volumes in the study area for *AM* and *PM peak* are shown in **Table 1**.

Figure 5 - Existing Daily Traffic



Source: MDT, KLJ, ESRI

July 2022

Table 1 – Existing 2022 Traffic Volumes

Intersection	Peak	Traffic Control	NB Approach			SB Approach			EB Approach			WB Approach		
			L	T	R	L	T	R	L	T	R	L	T	R
38 th St N & 3 rd Ave	AM	SSS	1	261	-	-	320	3	4	-	3	-	-	-
	PM		5	356	-	-	362	2	5	-	2	-	-	-
38 th St N & 2 nd Ave	AM	Signalized	45	171	50	86	195	42	8	235	79	35	284	83
	PM		75	246	49	82	235	47	10	193	88	63	312	105
38 th St N & Central Ave	AM	AWSC	37	199	57	55	238	16	25	199	36	39	144	42
	PM		14	310	46	15	330	41	31	68	82	14	39	29
Access on 2nd Ave	AM	SSS	-	-	-	-	-	-	-	371	-	-	402	-
	PM		-	-	-	-	-	-	-	324	-	-	480	-

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; L – Left; T – Through; R – Right; SSS – Side Street Stop; AWSC – All Way Stop Control

Crash History

Reviewing historic crash information can help identify existing deficiencies that can be addressed through this study. Five years of crash records between January 1, 2016, through December 31, 2020, were requested from MDT for the study intersections. There were 22 crashes reported at the intersection of 38th St N with 2nd Ave N between 2016 and 2020. This corresponds to about five crashes per year. Most crashes (27%) were observed during the AM peak. Right angle crashes (50-percent) were the most prominent type of crashes. This included five crashes interacted by vehicles travelling southbound and eastbound. There were no fatal, serious injury, pedestrian, or bicycle related crashes reported during the analysis period. There were no crashes reported at the intersection of 38th St N with 3rd Ave N.

Future Conditions

Background Growth

A key component of traffic forecasting is using regional travel demand models. The Average Annual Daily Traffic (AADT) in the study area has varied between 2006 and 2021. In the absence of travel demand models, a conservative annual traffic volume growth rate of one-percent was applied on all approaches of the study intersections to project background traffic volumes in 2027. The projected background traffic volumes at the study intersections in 2027 are summarized in Table 2.

Table 2 – Projected 2027 Background Traffic Volumes

Intersection	Peak	Traffic Control	NB Approach			SB Approach			EB Approach			WB Approach		
			L	T	R	L	T	R	L	T	R	L	T	R
38 th St N & 3 rd Ave	AM	SSS	1	274	-	-	336	3	4	-	3	-	-	-
	PM		5	374	-	-	380	2	5	-	2	-	-	-
38 th St N & 2 nd Ave	AM	Signalized	47	180	53	90	205	44	8	247	83	37	298	87
	PM		79	259	51	86	247	49	11	203	92	66	328	110
38 th St N & Central Ave	AM	AWSC	39	209	60	58	250	17	26	209	38	41	151	44
	PM		15	326	48	16	347	43	33	71	86	15	41	30
Access on 2nd Ave	AM	SSS	-	-	-	-	-	-	-	390	-	-	423	-
	PM		-	-	-	-	-	-	-	341	-	-	504	-

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; L – Left; T – Through; R – Right; SSS – Side Street Stop; AWSC – All Way Stop Control

Trip Generation

To account for future vehicular trips generated by the proposed development, *ITE Trip Generation Manual*, 10th Edition was utilized to calculate trips generated based on the land use characteristics that most closely fit the proposed development. The number of vehicular trips the development will generate during the following time periods were calculated for weekday *AM* and *PM peak*. The estimated trips generated by the proposed development is summarized in **Table 3**. The proposed development is expected to generate 138, 177, and 2,350 vehicular trips in the daily *AM peak*, *PM peak*, and *daily*, respectively.

Table 3 - Proposed Development Trip Generation

Facility Type	Variable	#	ITE Land Use	In (AM)	Out (AM)	In (PM)	Out (PM)	In (Daily)	Out (Daily)
Apartment	Dwelling Unit	432	221	38	100	106	71	1175	1175
				138		177		2,350	

Trip Distribution and Assignment

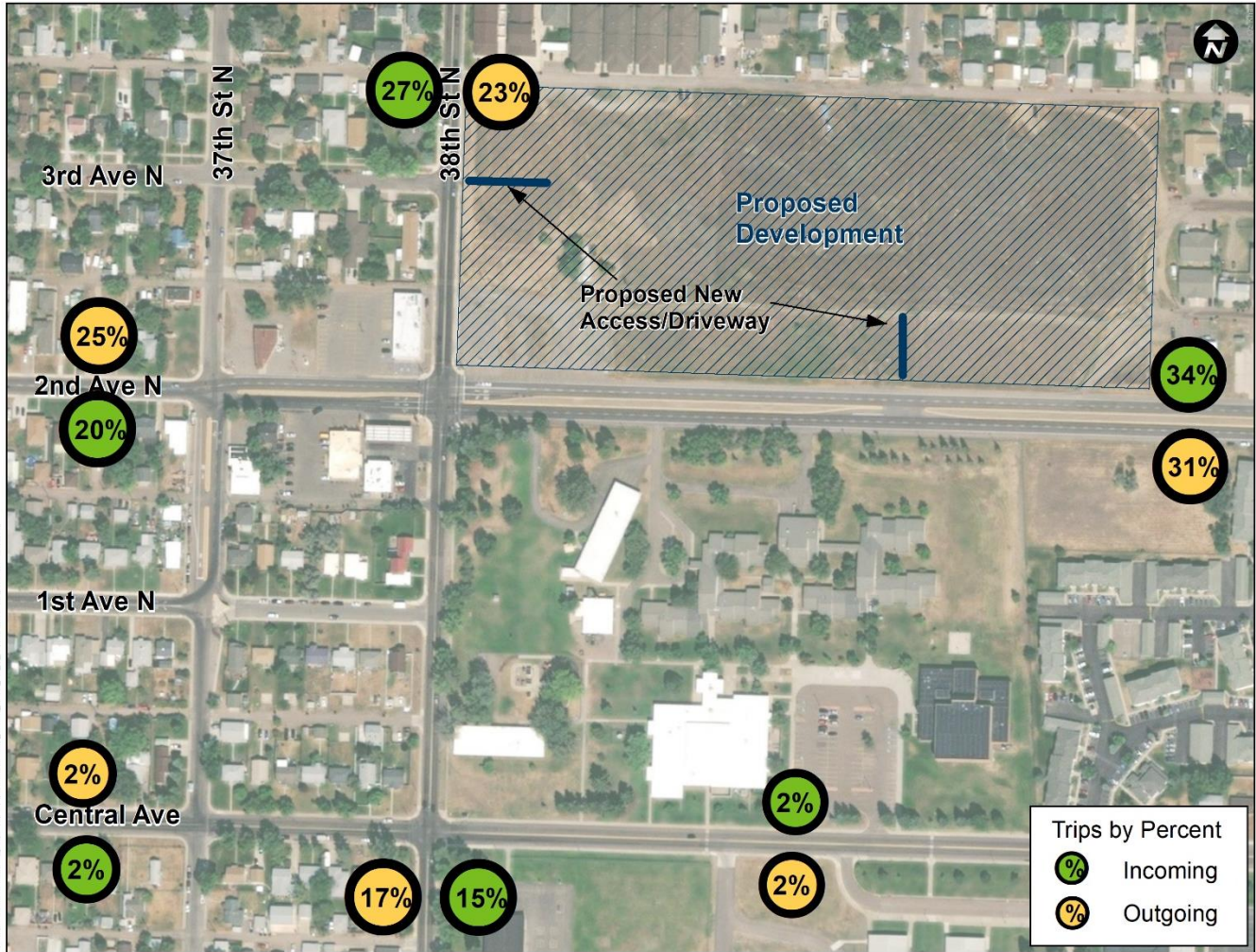
The origins and destinations of site-generated traffic were estimated based on prevailing travel patterns and trips being assigned to the roadway network using engineering judgment, estimating the most ideal and reasonable route between origins and destination (illustrated in **Figure 6**). The *peak hour* trips generated by the proposed development is illustrated in **Table 4**.

Table 4 - Projected Trip Distribution

Intersection	Peak	Traffic Control	NB Approach			SB Approach			EB Approach			WB Approach		
			L	T	R	L	T	R	L	T	R	L	T	R
38 th St N & 3 rd Ave	AM	SSS	0	13	9	7	3	0	0	0	0	20	0	10
	PM		0	9	24	20	8	0	0	0	0	14	0	7
38 th St N & 2 nd Ave	AM	Signalized	0	6	2	9	6	8	0	7	0	15	17	16
	PM		0	16	4	13	4	6	1	20	0	11	12	17
38 th St N & Central Ave	AM	AWSC	0	6	0	2	17	2	1	0	0	0	0	1
	PM		0	16	0	1	12	1	2	0	0	0	0	2
Access on 2 nd Ave	AM	SSS	-	-	-	25	-	45	12	6	-	-	3	10
	PM		-	-	-	18	-	32	33	4	-	-	7	29

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; L – Left; T – Through; R – Right; SSS – Side Street Stop; AWSC – All Way Stop Control
Green – Incoming; **Red** – Outgoing; **Blue** – Incoming and Outgoing

Figure 6 - Trip Distribution by Percent



Source: MDT, KLJ, ESRI

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Traffic Volumes

The Build traffic volumes for the AM and PM peak are illustrated in Table 5.

Table 5 - Projected 2027 Build Volumes

Intersection	Peak	Traffic Control	NB Approach			SB Approach			EB Approach			WB Approach		
			L	T	R	L	T	R	L	T	R	L	T	R
38 th St N & 3 rd Ave	AM	SSS	1	287	9	7	339	3	4	0	3	20	0	10
	PM		5	383	24	20	388	2	5	0	2	14	0	7
38 th St N & 2 nd Ave	AM	Signalized	47	186	55	99	211	52	8	254	83	52	315	103
	PM		79	275	55	99	251	55	12	223	92	77	340	127
38 th St N & Central Ave	AM	AWSC	39	215	60	60	267	19	27	209	38	41	151	45
	PM		15	342	48	17	359	44	35	71	86	15	41	32
Access on 2 nd Ave	AM	SSS	-	-	-	25	-	45	12	396	-	-	426	10
	PM		-	-	-	18	-	32	33	345	-	-	511	29

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; L – Left; T – Through; R – Right; SSS – Side Street Stop; AWSC – All Way Stop Control

Traffic Operations Analysis

Traffic Operations Methodology

The traffic conditions in the network will be affected by the proposed development. Traffic operational and queuing analysis results are described as a *Level of Service* (LOS) ranging from "A to F" with "A" operating with the least delay and "F" indicating a breakdown in operations. LOS is determined based on methodology in the *Highway Capacity Manual* (HCM), which defines the LOS based on control delay. LOS "E" or worse is considered poor or unacceptable, in accordance with the Montana Department of Transportation (MDT) standards. The LOS and its associated intersection delay for unsignalized and signalized intersections as defined by HCM are shown in **Table 6**.

Table 6 - Intersection Delay and LOS Thresholds

LOS	Control Delay Per Vehicle (sec.)	
	Unsignalized Intersection	Signalized Intersection
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

For signalized intersections, the LOS is based on the average stopped delay per vehicle. The procedures used to evaluate signalized intersections use detailed information on geometry, lane use, signal timing, peak hour volumes, arrival types, and other parameters. This information is then used to calculate delay and determine the capacity of each intersection. LOS for a two-way stop-controlled intersection is undefined by HCM. For two-way stop-controlled intersections, the through traffic on the major (uncontrolled) street generally experiences no delay at the intersection. Conversely, vehicles turning left or crossing the major street from the minor street experience more delay than other movements, at times experiencing significant delay. Vehicles turning right on the minor street experience less delay than those turning left from the same approach. Due to this scenario, the LOS assigned to a two-way stop-controlled intersection in this study is based on the average delay experienced by left turn vehicles of all approaches, and delay experienced by minor approach vehicles crossing the major approach.

Queuing of vehicles at intersections can have serious traffic safety implications if expected queues exceed available storage. For example, if projected queuing for a left turning movement exceeds available storage in the turn lane, the queue can extend into the through lane and cause safety concerns with potential rear end crashes. Excessive queuing can also impede business, other private, or public access to and from the road. Queuing analyses can determine whether queues are expected to dissipate during a signal cycle or on stop condition approaches, which can inform on the potential need for additional through lanes or other improvements. The following criteria was used to identify "queuing issues" for movements.

A queuing issue was identified if any of the five conditions were met:

- » Condition 1: 95th percentile queue length exceeds storage length, and the movements operate worse than LOS D.
- » Condition 2: Average queue length exceeds storage length.
- » Condition 3: 95th percentile queue length blocks upstream full access intersection.
- » Condition 4: 95th percentile queue length exceeds 500 feet on a stop-controlled approach.

- » Condition 5: 95th percentile through lane queue blocks access to the turn lane bay.

All four study intersections were reviewed for queuing analysis. This includes the storage lengths of turn and through lanes. Special attention was given to the eastbound left turn lane queue experience for vehicles entering the proposed site along 2nd Ave.

Traffic Models

Traffic operations analysis was completed using *Synchro V10* software, which included geometry such as number of lanes, storage lengths, link distances, speed limits, traffic volumes, and existing signal timing plan. The results of the synchro analysis are displayed as *Measures of Effectiveness* (MOE). The primary MOEs that are used in the study are *delay* and *Level of Service* (LOS).

The following scenarios were modeled for the *AM* and *PM peak* periods:

1. No-Build Scenario – “*No-Build*” refers to the conditions without the proposed development scenario. This option includes no geometric improvements at the proposed site accesses, and the existing traffic counts projected to the facilities opening year traffic volumes.
2. Build Scenario – “*Build*” refers to the conditions of the proposed development scenario. This option pertains to geometric improvements that include the addition of a westbound approach at the intersection of 3rd Ave N and 38th St N. The trips generated by the proposed site were included in the build scenario traffic volumes.

Traffic Operation Results

The traffic operation results for the *No-Build* and *Build* scenarios at the study intersections are illustrated in **Table 7**. For detailed synchro results, please reference **Appendix B**.

Table 7 - Traffic Operation Results 2027

Intersection	Scenario	Level of Service (AM Peak)					Level of Service (PM Peak)				
		EB	WB	NB	SB	Int	EB	WB	NB	SB	Int
3rd Ave N & 38th St N	No-Build	B	-	A	A	B	B	-	A	A	B
	Build	B	B	A	A	B	C↓	C	A	A	B
2nd Ave N & 38th St N	No-Build	B	C	A	A	B	B	C	B	B	B
	Build	B	C	A	B↓	B	B	C	B	B	B
Central Ave & 38th St N	No-Build	C	C	D	D	C	B	B	C	C	C
	Build	D↓	C	D	E↓	D↓	B	B	C	C	C
2nd Ave Driveway	No-Build	A	A	-	-	NA	A	A	-	-	NA
	Build	A	A	-	B	B	A	A	-	B	B

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; Int - Intersection

The southbound approach of Central Ave and 38th St N is expected to experience unacceptable *delay* and *LOS E* in the *AM Peak* under *Build* conditions. However, the overall intersection is expected to operate with acceptable *delay* and *LOS D*. All other intersections and their approaches are expected to operate with acceptable *delay* and *LOS* with no intersections operating worse than *LOS C* during the *peak* hours.

The following intersections and/or their approaches experience *LOS* drops from *No-Build* to *Build* conditions, but operates with acceptable *delay* and *LOS* in 2027:

-
- » The *eastbound* approach of the 3rd Ave N and 38th St N intersection will experience a LOS drop from *LOS B* to *LOS C* in *PM Peak*. The increase in *delay* between *No-Build* and *Build* scenario is 2.7 seconds per vehicle.
 - » The *southbound* approach of the 2nd Ave N and 38th St N intersection will experience a LOS drop from *LOS A* to *LOS B* in *AM Peak*. The increase in *delay* between *No-Build* and *Build* scenario is 1.5 seconds per vehicle.
 - » The intersection of Central Ave and 38th St N will experience a LOS drop from *LOS C* to *LOS D* in *AM Peak*. The increase in delay between *No-Build* and *Build* scenario is 4.4 seconds per vehicle.
 - The *eastbound* approach of the Central Ave and 38th St N intersection experiences a LOS drop from *LOS C* to *LOS D*. The increase in *delay* between *No-Build* and *Build* scenario is 2.7 seconds per vehicle.
 - The *southbound* approach of the Central Ave and 38th St N intersection experiences a LOS drop from *LOS D* to *LOS E*. The increase in *delay* between *No-Build* and *Build* scenario is 7.7 seconds per vehicle.

Queuing Results

Based on queuing analysis methodology previously identified, no significant queuing issues were identified in the No-Build and Build conditions. Existing storage space within the dedicated left-turn bays of 2nd Ave N were found to be adequate within the No-Build and Build conditions. See **Appendix B** for complete Synchro/SimTraffic queuing analysis result.

Access Spacings

The spacing between adjacent driveways is based on *stopping sight distance* described in the AASHTO Green Book 2018 7th Edition. The minimum driveway spacings for 30-mph and 25-mph roadway is 200 and 155 feet, respectively. The proposed locations of the accesses along 2nd Ave N and 38th St N is more than the minimum spacing requirements.

Warrant Analysis

TRAFFIC SIGNAL

The *Manual on Uniform Traffic Control Devices* (MUTCD) provides guidance and standards for the installation of traffic control methods. Intersection traffic control warrant analysis was conducted at the unsignalized study intersections. Based on the review of the traffic volume data collected at the intersections, it was determined that the projected traffic volumes warrant the installation of a traffic signal (meets Signal Warrant 1A) at the Central Ave and 38th St N intersection under *No-Build* and *Build* scenarios. The signal warrant analysis results are included in **Appendix C**.

TURN LANE

MDT has established guidelines for the consideration of turn-lanes at intersections. Turn lane needs at the proposed access via 2nd Ave N and 38th St N were analyzed according to MDT turn lane guidance. The projected 2027 *No-Build* and *Build* volumes for dedicated left turn or right turn lanes at the two accesses should *not* be considered.

Summary

This study has been prepared to evaluate the traffic impacts associated with the proposed development of the multifamily residential apartment complex in Great Falls, MT. The study investigated the *No-Build* and *Build* traffic operations in the transportation network near the proposed development. Key points of the study are summarized below:

Trip Generation

The proposed development is expected to generate 138, 177, and 1,961 vehicular trips in the daily *AM peak*, *PM peak*, and *daily*, respectively.

Traffic Operations

- » The southbound approach of Central Ave and 38th St N is expected to experience unacceptable *delay* and *LOS E* in the *AM Peak* under *Build* conditions. However, the overall intersection is expected to operate with acceptable *delay* and *LOS*.
- » All other study intersections are expected to operate with acceptable *delay* and *LOS* during the year of opening, with no intersections operating worse than *LOS B* during the *peaks*.
- » Based on queuing analysis methodology previously identified, no significant queuing issues were identified in the No-Build and Build conditions.
- » Existing storage space within the dedicated left-turn bays of 2nd Ave N were found to be adequate within the No-Build and Build conditions

Safety Analysis

- » From 2016 to 2020, 22 crashes were reported at the intersection of 38th St N and 2nd Ave N.
 - Most crashes (27%) were observed during the *AM peak*
 - Right angle crashes (50-percent) were the most prominent type of crashes
 - There were no fatal, serious injury, pedestrian, or bicycle related crashes
- » From 2016 to 2020, there were no crashes reported at the intersection of 38th St N and 3rd Ave N.

Recommendation

Re-evaluate Signal Warrant Analysis at Central Ave and 38th St N Intersection

The southbound approach of Central Ave and 38th St N is expected to experience unacceptable *delay* and *LOS E* in the *AM Peak* under *Build* conditions. However, the overall intersection is expected to operate with acceptable *delay* and *LOS*. The intersection is currently controlled by All-way Stops. The projected 2027 background traffic volume is expected to meet traffic signal warrant 1A. It is recommended to re-evaluate signal warrant analysis closer to the year of opening of the development with updated traffic volumes to evaluate installation of a traffic signal. In 2027, assuming signal warrants are met at the intersection of Central Ave and 38th Street N, it is expected that the signal control or a roundabout at the intersection could mitigate the operation issues identified and improve the intersection to acceptable operations.

Side Street Stop at the new proposed approach

The development's new proposed approach, aligned with 3rd Ave N on 38th St N, is recommended to be stop controlled and no other recommendations were deemed necessary.