TOWNSHIP

ADA TOWNSHIP PLANNING COMMISSION MEETING
THURSDAY, NOVEMBER 16, 2023, 5:30 P.M.
ADA TOWNSHIP OFFICE, ASSEMBLY HALL
7330 THORNAPPLE RIVER DR SE, ADA, MI

AGENDA

I. CALL TO ORDER

II. ROLL CALL

III. APPROVAL OF AGENDA

IV. APPROVAL OF MINUTES OF OCTOBER 19, 2023, REGULAR MEETING

V. PUBLIC HEARING

1. Special Use Permit to expand existing St. Robert of Newminster Catholic School, 6477 Ada Drive SE, Parcel No. 41-15-33-101-027

VI. UNFINISHED BUSINESS - none

VII. NEW BUSINESS

1. Site Plan Review, accessory building in the front yard, The Tower Revocable Living Trust/Doug Tower, 8003 Wilderness Trail NE, Parcel No. 41-15-23-351-018

VIII. COMMISSION MEMBER / STAFF REPORTS

IX. PUBLIC COMMENT

X. ADJOURNMENT

ADA TOWNSHIP PLANNING COMMISSION
MINUTES OF THE MEETING OCTOBER 19, 2023, REGULAR MEETING

DRAFT

A regular meeting of the Ada Township Planning Commission was held on Thursday, October 19, 2023, at 5:30 p.m., at the Ada Township Hall Rix Room, 7330 Thornapple River Dr., Ada, Michigan.

I. CALL TO ORDER

Chair Korth called the meeting to order at 5:30 p.m.

II. ROLL CALL

Members Present: Burton, Butterfield, Easter, Kluting, Korth, Moyer
Members Absent: Jacobs
Staff Present: Bajdek, Buckley, Said, Suchy
Others Present: 0

III. APPROVAL OF AGENDA

Moved by Easter, supported by Kluting, to approve the agenda as presented. Motion carried.

IV. APPROVAL OF MINUTES OF SEPTEMBER 21, 2023, REGULAR MEETING

Moved by Burton, supported by Easter, to approve the September 21, 2023, Regular Meeting minutes as presented. Motion carried.

V. PUBLIC HEARING - none

VI. UNFINISHED BUSINESS - none

VII. NEW BUSINESS

1. Review and Comment – September 21 Training Workshop

There was discussion among Commissioners and Planning Staff regarding the Training Workshop. Kluting shared that the workshop was very good, especially being the 'new guy', he said he feels more prepared to look at future agenda items with the power to guide through good decision making. Korth noted that it was a good idea to review good meeting practice at least once a year.

Butterfield arrived meeting at 5:37 p.m.

2. Strategic Review and Planning

a. Commission Process/Priorities – topics of discussion

- Discussion about Planning Commission responsibilities – reviewed parts of the process
- Planning Staff 's part in helping to prepare applicants for meeting expectations
- Importance of communication with applicants and developers
- Brief review of the bylaws (state law requirements vs. other township requirements)
- Consider a survey of developers for feedback on the service provided by the township

b. Goal-Setting – topics of discussion

- Educating and communicating with citizens – help others understand what is going on
- Getting more community involved
- Strong media relations/public awareness
- Good meeting practices
- Future training opportunities

c. Master Plan and Zoning Ordinance Update

Master Plan – topics of discussion:

- Initial steps in Master Plan implementation with the Zoning Ordinance rewrite process
- Consider different styles of housing, a mix of housing (like the idea of residential mix – attainable housing
- Potential changes in criteria for housing varieties; lot size and width specifications, location requirements
- Fact: 74% of homes have no one under 18 years old

Zoning Ordinance Rewrite – topics of discussion:

- New regulations for new development in the PVM Overlay District
- New regulations to include tree preservation / prohibiting certain trees
- Hire a consultant to assist in the rewrite process

Said shared some charting/figures/zoning map examples that he would like to see implemented during the Zoning Ordinance rewrite process.

VIII. COMMISSION MEMBER / STAFF REPORTS

Said mentioned that Planning Staff and Commissioner Easter attended the Michigan Association of Planning Conference in Traverse City. Each of them shared pieces of the conference they attended and enjoyed; a mobile tour, co-op housing, making spaces with trees, ethics, and a walking and bike tour.

Township Manager Suchy provided detailed updates on:

Trails – non motorized (talked about trail etiquette)
Wayfinding signage presentation – how to use the system

New Township Hall plans/process – discussing a property purchase
Multiple pedestrian bridges
Parks Director Fitzpatrick retirement event, November 14, 2023, from 3P-7P – Township hired Wesley Deason as new Parks Director

IX. PUBLIC COMMENT - none

X. ADJOURNMENT

Moved by Easter, supported by Burton, to adjourn the meeting at 7:41 p.m. Motion carried.

Respectfully submitted,

_____
Jacqueline Smith, Ada Township Clerk

eb

MEMORANDUM

Date: 11.08.23

TO: Ada Township Planning Commission
FROM: Department of Planning
RE: **November 16, 2023 – Special Use Request – Private School Expansion to add Grades 6-8 – 6477 Ada Dr. SE – St. Robert of Newminster/Roman Catholic Diocese of Grand Rapids**

Request Overview

The applicant proposes to expand the existing school to include a new wing with additional school space, with a proposed expansion in student capacity from the currently-approved 225 students to a capacity allowing for 372 students. The school will remain as a Pre-Kindergarten through Grade 8, as previously approved, with the addition of Grades 6 – 8 approved through the most recent Special Use by the Township Planning Commission in January, 2023. The school has a current enrollment of about 135 students, and projects growing to the requested 372 students over a ten-year timeframe.

The proposed additional wing, to be located along the north side of the school/church building, will contain a total of about 19,000 square feet in two floors. The existing St. Robert's Parish and School building totals +/- 83,800 square feet, along with a 6,745 square foot rectory and a 1,350 square foot maintenance building (to be removed, with new 1,120 SF one to be constructed). The subject property contains approximately 16.64 acres and is zoned R-3 Medium Density Single-Family Residential.

The proposed site plan shows the addition of two fenced play areas adjacent to the new addition. Additional play areas, one with a shade structure, are located further north on the site. With the new addition, the applicant also proposes to relocate parking to a new row extending to the north, along with some additional parking to be located along the east edge of the site. The new accessory storage building will also be placed along the east edge of the site to replace the existing one (to be removed due to the parking expansion).

As noted, the building expansion will include two floors, connecting to the existing school portion of the St. Robert building. The new wing will include six new classrooms, a commons area, meeting space, student restrooms, reception/office area, and related ancillary storage and utility areas). A new entrance will be located along the north edge of the building, and the new wing will also result in creation of a new outdoor courtyard space surrounded by the school and church. In addition to the existing school area, the church and school also share space within the building, as shown on floor plans. The student pickup-drop off area will continue to be on the west side of the school area.

Analysis

Landscaping

The applicant is adding new trees to achieve applicable parking lot landscape requirements. While new parking is being added adjacent to the east lot line, no new buffer landscaping is proposed, nor did Staff request that such be added. The adjacent site to the east, while already developed, has a wooded buffer of no less than 75 feet in width along the property line.

Lighting
The applicant has provided a lighting plan that meets applicable requirements. A condition of approval has been included specifying horizontal cutoff (downward-facing) fixtures.

Stormwater
The applicant's narrative indicates that all stormwater runoff will be managed on site, including that due to the additional impervious surface resulting from this project. A stormwater permit will be required, and the Township Engineer indicated that verification of additional volume and outlet flows from the additions will be needed. A condition of approval is included to address this topic.

School Capacity
St. Robert's written narrative notes a planned long-term expansion to 372 students. The current Special Use approval allows for a maximum of 225 students, although current enrollment is approximately 135 students. A condition of approval is included to address this item, although consideration should be given to a lower number than requested as explained further below.

Traffic
The applicant has provided a detailed traffic study to address the proposed request. The study shows that, over time, the Ada Drive and Fox Run level of service would be impacted by school expansion in this area. The study makes recommendations for improvements both on-site and off-site, including providing turn-lane designations on the exit drive of the property, and expanding Fox Hollow to include a left-turn lane. Even though the study makes recommendations concerning Ada Drive and Fox Hollow, which are under the jurisdiction of the Kent County Road Commission (KCRC), the study was not prepared in consultation with the Road Commission. So, Township Staff sent the study to the Road Commission for review and comment, and the Road Commission had the following responses:

- The traffic study was completed in an acceptable manner and the KCRC found that the expansion will not create any large negative impacts on area roadways.
- The KCRC will consider expanding Fox Hollow to provide separated right- and left-turn lanes as recommended in the study.
- There are no current plans to improve Fox Hollow, although roads are always being evaluated by the KCRC based on pavement conditions, usage/volume, and other related factors. As Fox Hollow is a local road, any such project would be partly paid for by the Township, and the KCRC would consult with the Township regarding any such plans.

As noted, the traffic study says that this school project will have only a "minor" impact on the surrounding roadway network. However, that perspective reflects a site-specific focus and does not consider the entire Ada Drive 'education corridor' in a holistic manner. A more complete review of the Ada Drive corridor is appropriate for review and consideration of all existing and potential future conditions in this area. To that end, the following comments are provided:

- St. Robert previously installed a center left-turn lane along Ada Drive for eastbound traffic entering the St. Robert site from Ada Drive with stacking for approximately 7 vehicles. Also, westbound Ada Drive pavement has a flared approach to this entrance, similar to a reduced-length right-turn lane. These conditions would seem to mitigate the need for additional improvements along Ada Drive in the near future, although in the long-term, a dedicated right-turn lane should be considered for westbound Ada Drive traffic approaching the St. Robert entry drive.

- In response to a Planning Commission request, Staff has made several attempts to coordinate a meeting of representatives from all the schools in the Ada Drive corridor. However, schedule limitations/conflicts of the various entities have prevented this from happening. In lieu of further pursuing a meeting at this time, Staff reached out to each of the schools individually to obtain the information in the attached chart.

- As the chart indicates, while overall student population for all schools in the corridor may increase somewhat in the long-term, school populations are fluctuating between decreasing and increasing numbers. Further, it should be noted that the daily schedules of the schools along the corridor do have some staggering. Given the finite time available for a typical school day, it would likely be difficult for schools to adjust their schedules much more.

- While Staff requested further data about the percentage of students either being bused or walking to the schools, only one of the schools provided this information. Based on parent/driver behavior, it is suspected that most – if not all in some cases – students are driven to school and picked up using personal vehicles, regardless of bus service or pedestrian paths to schools. While some carpooling may exist, this is a societal trend that should be expected to continue for the foreseeable future.

- Some discussion of expanding the Township trail network along Ada Drive has taken place, as a means to decrease driving along the corridor. However, the societal trend noted above, combined with the relatively longer distances from schools of student populations (especially for private schools) would likely limit potential benefits of expanding the trail network.

- Anecdotally, Staff has driven westbound on the Ada Drive corridor during the current school year at least twice monthly between 7:30 and 8:00 am. While a higher volume of vehicles was observed than is seen during other times/days, there were no major backups or traffic conflicts observed during that time. There is also a school zone speed limit during morning and afternoon pickup and drop off periods, and ongoing monitoring by the Sheriff's Department.

Based on the information noted above, the Township has a very limited opportunity to address this issue other than through the review of special use requests for school expansions. As such, similarly the Planning Commission can only review the information presented in both the Staff Report and application materials prior to providing a decision on this matter.

One strategy to address this matter is for the Commission to consider allowing a reduced number of additional students, such as 250 or 300, for this request. In this way, there can be an interim review of conditions in the area at a future date, as St. Robert would need to return to the Planning Commission to allow up to the 372 students as requested.

<u>Standards for Special Use</u>
The Zoning Ordinance allows schools as Special Uses in the R-3 zoning district. While there are no Special Use standards specific to schools, the general Special Use standards (Sec. 78-493 of the Zoning Ordinance) apply for review of this proposal; these are addressed below.

The applicable general Special Use standards are noted below along with a Staff summary note:

(1) The special use shall be designed, constructed, operated, and maintained in a manner harmonious with the character of adjacent property and the surrounding area.

(2) The special use shall not change the essential character of the surrounding area.

(3) The special use shall not be hazardous to adjacent property, or involve uses, activities, materials or equipment which will be detrimental to the health, safety or welfare of persons or property through the excessive production of traffic, noise, smoke, fumes, or glare.

(4) The special use shall not place demands on public services and facilities in excess of capacity.

In summary, it can be argued that the school's impact on traffic will affect each of the Special Use standards, and as such should be carefully reviewed by the Commission as a decision is considered for this request. Should the Planning Commission opt to support this request, a reduced increase in the number of additional students, such as 250 or 300 total, could be considered. (The applicant currently has approval for up to 225 students.)

Conclusion & Recommendation

Staff recommends that action by the Planning Commission be subject to the following conditions:

1. This Special Use approval is for the existing building, proposed addition, and related improvements only, with a limit only, specifically for expansion of the school to include a student population not to exceed (an amount to be determined by the Planning Commission, such as 250 or 300 students). Any expansion of the school building or to the student population beyond this number shall require an amended Special Use review.

2. Any other significant traffic-generating activities at the campus shall be scheduled with at least 30 minutes of separation time from the beginning and end of student drop-off and pickup times.

3. All exterior light fixtures shall be full-horizontal cutoff to control light emission.

4. Prior to the issuance of a building permit, the applicant shall obtain Township Engineer review and approval of stormwater plans, and shall obtain a stormwater permit.

Ada Drive School Information

School Address	Daily Schedule	Student Population Past – Present - Future	#/% Walking?
Ada Elementary 731 Ada Drive SE (K-4)	8:45 am-3:45 pm	380/400 – 343 – TBD	???
Notes: (future projects? Student population projections? Etc. etc.)			
Ada Vista Elem. 7192 Bradfield SE (K-4)	8:10 am-3:10 pm	470/480 – 461 – TBD	???
Notes: (future projects? Student population projections? Etc. etc.)			
St. Robert School 6477 Ada Drive SE (Pre-K-8)	8:00 am-3:00 pm	___-135-225/372	0 (and 0 buses)
Notes: Proposed school expansion, expansion to include grades 6-8 approved in Jan. 2023.			
Central Middle School 5901 Hall Street SE (7-8)	7:50 am-2:45 pm	570/609 – 510 – TBD	???
Notes: (future projects? Student population projections? Etc. etc.			
Ada Christian 6206 Ada Drive SE (Pre-K-8)	8:00 am-3:00 pm	___ - 563 – 575/600	<12 walk weather permitting 50 students bussed
Notes: (future projects? Student population projections? Etc. etc.			
Journey Academy 6025 Ada Drive SE (K-8)	8/8:30 am – 3:15 pm (all grades)	??-30/40-50/60	5-10% (2-3)
Notes: (future planned expansion to K-12)			

Kent County Road Commission

Road level of service??

TOWNSHIP

RECEIVED
OCT 19 2023
PLANNING & ZONING
ADA TOWNSHIP

APPLICATION FOR SPECIAL USE

An application for a special use must be heard before the Ada Township Planning Commission. ***Regular meetings of the Planning Commission are held on the third Thursday of each month at 5:30 p.m. at Ada Township Hall.*** After receipt of the application and payment of the fee, your request will be placed on the next Planning Commission meeting agenda for the purpose of scheduling a public hearing. The hearing will be scheduled for the next month's Planning Commission meeting for consideration, with all legal notifications being met.

A non-refundable filing fee made payable to Ada Township must accompany this application:

For a residential accessory building or Type II home occupation permit: $250.00

For all others, including commercial/industrial uses and non-residential uses in residential districts: $300.00

For subdivision plat, except PUD: $250.00

Please note that a $1,000 escrow deposit may be required, at the discretion of the Township.

Applicant Information:

Name: Roman Catholic Diocese of Grand Rapids, Michigan

Address: 360 Division Avenue South, Grand Rapids, Michigan 49503

Phone Number: (616) 475-1247 Email: mlown@grdiocese.org

Property Owner Name and Address *(if different than above)*: N/A

Property Information:

Property Address: 6477 Ada Drive SE

Parcel Number: 41- 15 - 33 - 101 - 027

Zone District Classification: R3

Proposed Use and/or Changes to the Property: See attachment 1.

7330 Thornapple River Drive, P.O. Box 370, Ada, MI 49301 | 616.676.9191 | adatownshipmi.com

In support of this application, the following items are required:

X (a) A complete to-scale site plan that complies with Sec. 78-492 (2)(b) and Sec. 78-524 of the Zoning Ordinance.

X (b) A written statement addressing the extent to which the proposed use complies with the standards set forth in Sec. 78-493 of the Zoning Ordinance.

I (we), the undersigned, do herby make application to the Ada Township Planning Commission for a Special Land Use and also herby grant permission to Ada Township and its officials and staff to enter upon the subject property for purposes of review and evaluation of this request.

Applicant's Signature(s): By Roman Catholic Diocese of Grand Rapids, Michigan Mike Lown, Chancellor and CFO Date: October 18, 2023

Signature of Property Owner(s): N/A Date: _____
(If different than above)

TO BE COMPLETED BY ADA TOWNSHIP

Application Received: 10-19-2023 Initial: eb
mm / dd / yy

App. Fee of $ 300.00 Received: 10/20/23 Initial: _____ Check # 603918 Receipt # 357661
mm / dd / yy

Escrow Deposit of $ 1000.00 Received: 10/20/23 Initial: _____ Check # 603918
mm / dd / yy Warner Norcross Judd

Updated 08/14/2023

#29395724

7330 Thornapple River Drive, P.O. Box 370, Ada, MI 49301 | 616.676.9191 | adatownshipmi.com

ATTACHMENT 1

Description of Proposed Special Use/Site Plan

Applicant requests approval for the expansion of the current approved special use for the subject property (currently for church, child-care, parish, school (pre-school through eighth grade) and related uses) to also include: (i) the expanded facilities described on the proposed Site Plan attached to this Application as *Exhibit A*; and (ii) to increase the maximum student population from 225 students to 372 students, all subject to the specific limitations set forth in this Application. Applicant also seeks approval of the Site Plan attached to this Application as *Exhibit A*. In 2018, as part of the approval for the original special use granted for Applicant's school (Pre School through 5th Grade), Applicant was required to: (i) add a center turn lane on Ada Drive (at the Eastern Campus Drive entry); (ii) widen the Western Campus Drive entry; (iii) add directional signage; and (iv) maintain a 10' separation between the Township's non-motorized trail and the Ada Drive pavement. On January 19, 2023, the Planning Commission approved an expansion of the Applicant's school (with no new physical improvements) to include grades 6th through 8th and to increase the maximum student population to 225 students. At that time, Applicant stated that it was in the process of determining the financial feasibility of renovations and new improvements to the school to enhance educational and related functions. Applicant now returns requesting approval of proposed renovations and new facilities and a corresponding increase in the maximum student population which contemplates the school operating at full capacity at each class level. Applicant intends to utilize the existing facilities and the planned new facilities in the manner depicted on the "Building Usage" plans attached to this Application as *Exhibit B*.

Traffic Impact

An important question associated with the proposed expansion of Applicant's school is whether it will create additional traffic issues along the Ada Drive corridor. Applicant engaged Progressive AE to perform a Traffic Impact Study to analyze the impact of the proposed expansion and increase in student population (see *Exhibit C* attached to this Application)("Traffic Impact Study"). The Traffic Impact Study concludes that the proposed expansion and the proposed increase in student population contemplated by this Application would only "have minor impacts" on the surrounding roadway network (See Traffic Impact Study Page 2 and Page 16 (Conclusions and Recommendations). Progressive AE recommends that additional pavement markings be added to the southbound (East) driveway approach to Ada Drive located on Applicant's property. Such additional marking will clearly define the two exit lanes (a right-turn and a left-turn) and one entry lane. Applicant agrees with such recommendation and is committed to adding such markings as part of the work associated with the planned improvements. Applicant agrees to including such obligation as a condition to any approval of this Application. Applicant notes that Progressive AE also concludes that "no additional improvements are recommended along Ada Drive as the existing eastbound left-turn lane and westbound right-turn taper will adequately serve the anticipated school volume traffic."

Progressive AE notes that existing traffic conditions do reveal "poor operations" at the Ada Drive/Fox Hollow Avenue intersection. As a result of such existing conditions, Progressive AE does recommend that certain upgrades be made to the Ada Drive/Fox Hollow Avenue intersection. It is important to note that such upgrades would be recommended with or without the approval of Applicant's expansion and that the Applicant's school is a relatively minor contributor to the overall traffic issues along Ada Drive. As the Planning Commission

knows, traffic along the Ada Drive corridor has been an issue for some time. The relatively recent redevelopment of the Ada downtown has contributed to such issue. The current student population at Applicant's school is only 135 students. The anticipated increase in the student population at Applicant's school will occur over many many years (see Projected School Enrollment attached to this Application as *Exhibit D*). Applicant does not anticipate that its school will reach the proposed maximum student population until 2032-2033. Even at full capacity as contemplated by this Application, Applicant's school will be the smallest of the four major schools located along the Ada Drive corridor---smaller than Ada Elementary and *significantly* smaller than both Ada Christian and Ada Vista (See School Enrollment Figures attached to this Application as *Exhibit E*). Thus, while Applicant acknowledges traffic issues along Ada Drive, Applicant agrees with the conclusions of the Traffic Impact Study that such issues are systemic of the existing conditions and would not result from or be materially adversely impacted by Applicant's proposed expansion. Applicant, however, remains committed to assisting the mitigation of traffic issues along the Ada Drive corridor. To promote such mitigation, Applicant also agrees to continue to work with the three other major schools located along the Ada Drive corridor to stagger start and end times such that Applicant's school start and end times are not within 10 minutes of the other schools (see School Start and End Times attached to this Application as *Exhibit F*). Such effort will reduce traffic congestion during peak times.

Storm Water

Applicant will manage all storm water from any new impervious surfaces generated by Applicant's proposed improvements in the manner required by applicable law (e.g., any applicable Township Stormwater Permit).

SEC. 78-493. - BASIS OF DETERMINATION (SPECIAL USE).

Prior to approval of a special use, the planning commission shall review the particular circumstances of the special use under consideration and shall approve a special use only upon a finding of compliance with each of the following standards, as well as applicable standards established elsewhere in this chapter:

(1) The special use shall be designed, constructed, operated and maintained in a manner harmonious with the character of adjacent property and the surrounding area. **The existing use and planned expanded use are consistent with the use of nearby properties along the Ada Drive corridor. This stretch of Ada Drive is the home of three other primary schools: (i) Forest Hills Central Middle School (7th and 8th Grade--5810 Ada Drive), (ii) Ada Christian School (Pre School through 8th Grade--6206 Ada Drive), and Ada Elementary (Pre School through 4th Grade--731 Ada Drive). The existing use of the subject property for religious, educational and related proposes has proven to be harmonious and appropriate with the existing and intended character of the general vicinity. The current school on the subject property has operated harmoniously with the surrounding properties since its opening. The planned expansion will not adversely affect the subject property's relationship with neighboring properties.**

(2) The special use shall not change the essential character of the surrounding area. **See response to (1) above.**

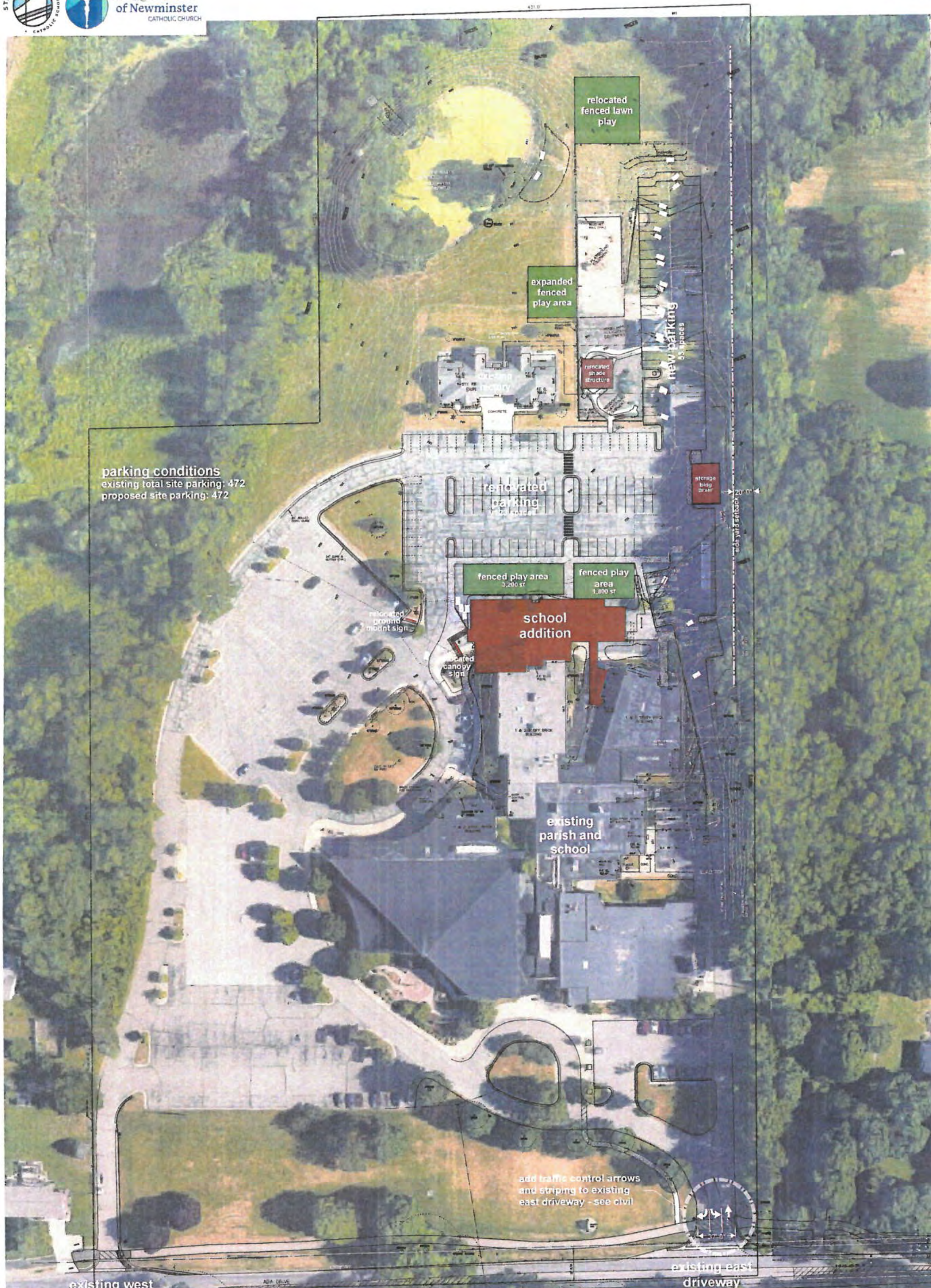
(3) The special use shall not be hazardous to adjacent property, or involve uses, activities, materials or equipment which will be detrimental to the health, safety or welfare of persons or property through the excessive production of traffic, noise, smoke, fumes or glare. **The existing use and the planned expanded use will not involve uses, activities, processes, materials, and equipment or conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors. See also Traffic Impact and Storm Water information above.**

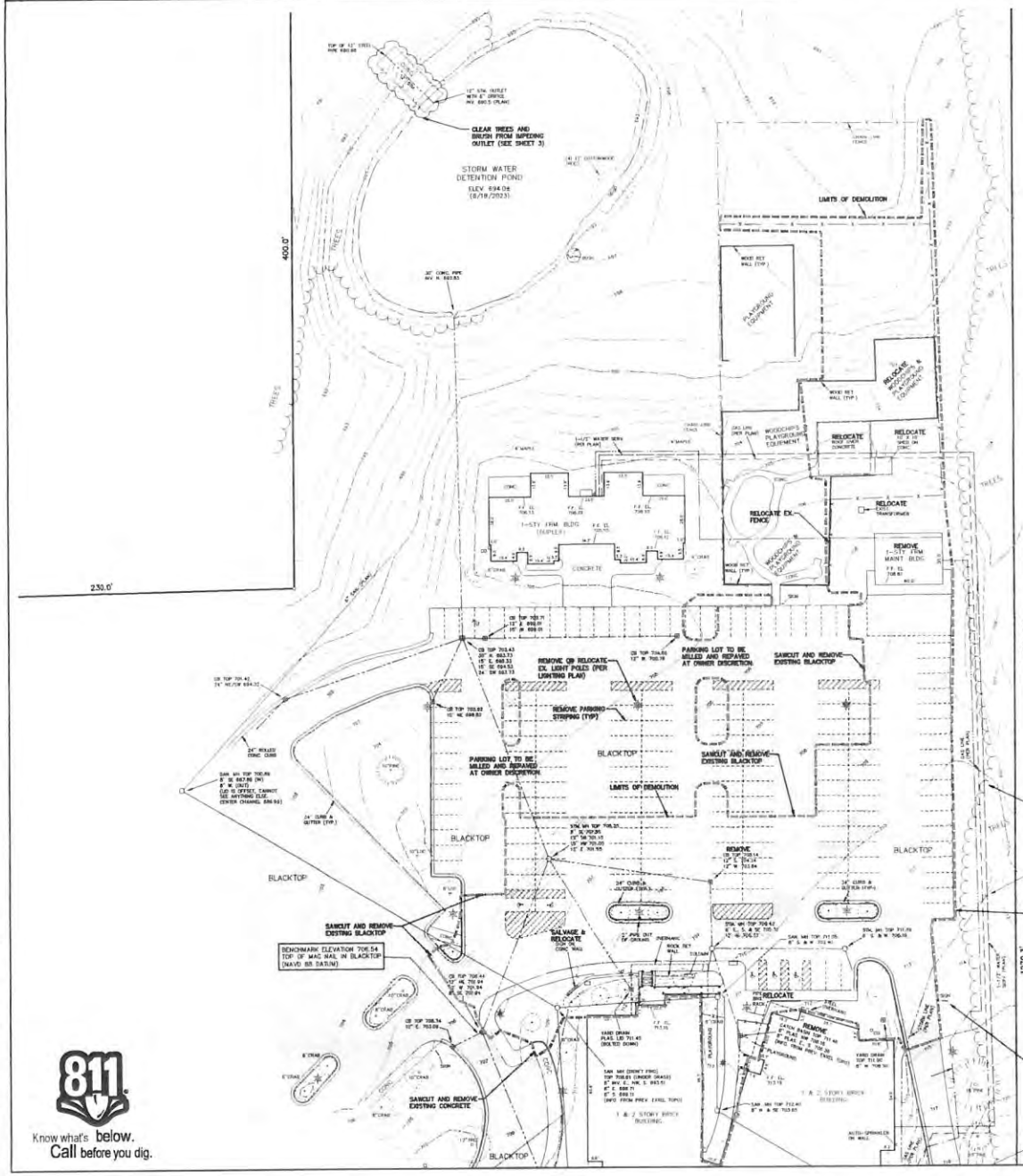
(4) The special use shall not place demands on public services and facilities in excess of capacity. **The existing use and the planned expanded use will not create excessive additional requirements at public cost for public facilities and services. See also Traffic Impact and Storm Water information above.**

Exhibit A- New Site Plan
Exhibit B-Building Usage Plan
Exhibit C-Progressive AE Traffic Study
Exhibit D-Applicant Projected School Enrollment
Exhibit E-Ada Drive Schools Enrollment Figures
Exhibit F-Ada Drive Schools Start and End Times

27709271-3

EXHIBIT A


relocated fenced lawn play
expanded fenced play area
new parking
relocated shade structure
existing rectory
parking conditions
existing total site parking: 472
proposed site parking: 472
renovated parking
storage bldg
20'-0"
fenced play area 3,200 sf
fenced play area 1,800 sf
relocated ground mount sign
school addition
relocated canopy sign
existing parish and school
add traffic control arrows and striping to existing east driveway - see civil
existing west driveway
existing east driveway



REMOVE ALL FEATURES WITHIN LIMITS OF DEMOLITION

SHEET INDEX :

1. EXISTING CONDITIONS AND DEMOLITION PLAN
2. SITE LAYOUT PLAN
3. SITE UTILITY PLAN
4. SITE GRADING AND SOIL EROSION CONTROL PLAN

SCALE: 1" = 30'
1' CONTOUR INTERVAL

LEGEND

- IRON STAKE FOUND
- LIGHT POLE
- BOLLARD
- HYDRANT
- WATERMAIN VALVE
- STOP BOX
- IRRIGATION VALVE
- CATCH BASIN
- MANHOLE
- CLEAN OUT
- FENCE LINE
- PIPE HANDRAIL
- CRAB = CRABAPPLE TREE
- MAP = MAPLE TREE
- LOC = LOCUST TREE

SITE INFORMATION

- PROPERTY DESCRIPTION: N 400 FT OF S 1270.3 FT OF W 1/2 W 1/2 NW 1/4 EX W 230 FT ALSO S 870.3 FT OF W 1/2 W 1/2 NW 1/4 * SEC 33 T7N R10W 17.14 A
- PROPERTY ADDRESS: 6477 ADA DRIVE SE
- PERMANENT PARCEL NUMBER: 41-15-33-101-027
- PARCEL SIZE: 17.14 ACRES

MAPPING

- MAPPING AND CONTOURS BASED ON SURVEY BY EXXEL ENGINEERING

ZONING

- EXISTING ZONING: R-3

EXISTING R-3 ZONE REGULATIONS (SPECIAL LAND USE)

• MINIMUM LOT AREA		43560 SQFT
• MINIMUM LOT WIDTH		200'
• MINIMUM BUILDING SETBACKS		
	FRONT YARD	30'
	SIDE YARD	25'
	REAR YARD	50'
• SIDE YARD SETBACK FOR ACCESSORY BUILDING		20'

PROPOSED LAND USE

- CHURCH AND SCHOOL

PARKING REQUIREMENTS

1. SCHOOL - ELEMENTARY: 1.5 SPACES PER CLASSROOM, PLUS AMOUNT REQUIRED FOR AUDITORIUM OR GYMNASIUM SEATING = 14 CLASSROOMS * 1.5 = 21 SPACES. NO FIXED SEATING IN GYMNASIUM REQUIRING PARKING SPACES
2. CHURCH: 1 SPACE PER 3 SEATS OR 6 FEET OF SEATING LENGTH = 1335 SEATS / 3 = 445 PARKING SPACES
3. USES ARE NON-CONCURRENT AND PARKING SPACE REQUIREMENTS DO NOT HAVE TO BE COMBINED

EXISTING ONSITE PARKING SPACES	= 472
PROPOSED ONSITE PARKING SPACES	= 472
EXISTING PARKING SPACES WITHIN LIMITS OF PROJECT	= 176 (INCLUDING 5 BARRIER FREE SPACES)
PROPOSED PARKING SPACES WITHIN LIMITS OF PROJECT	= 176 (INCLUDING 5 BARRIER FREE SPACES)

PROPOSED IMPROVEMENTS

- LIGHTING AND LANDSCAPING SHALL MEET TOWNSHIP REQUIREMENTS - SEE SEPARATE PLANS FOR DETAILS
- SANITARY SERVICES TO BE CONNECTED TO EXISTING ONSITE LATERAL
- REFER TO GEOTECHNICAL REPORT (PENDING) FOR SOIL BORING DETAILS
- WATER SERVICE AND FIRE PROTECTION TO BE PROVIDED WITH NEW TAPS ON EXISTING 16" WATERMAIN

OVERALL PROPERTY
SCALE: 1"=200'

LOCATION MAP

STATE OF MICHIGAN
JEFFREY SCOTT VANLAAR
ENGINEER
No. 6201062083
LICENSED PROFESSIONAL ENGINEER

Know what's below. Call before you dig.

EXISTING CONDITIONS/DEMO PLAN

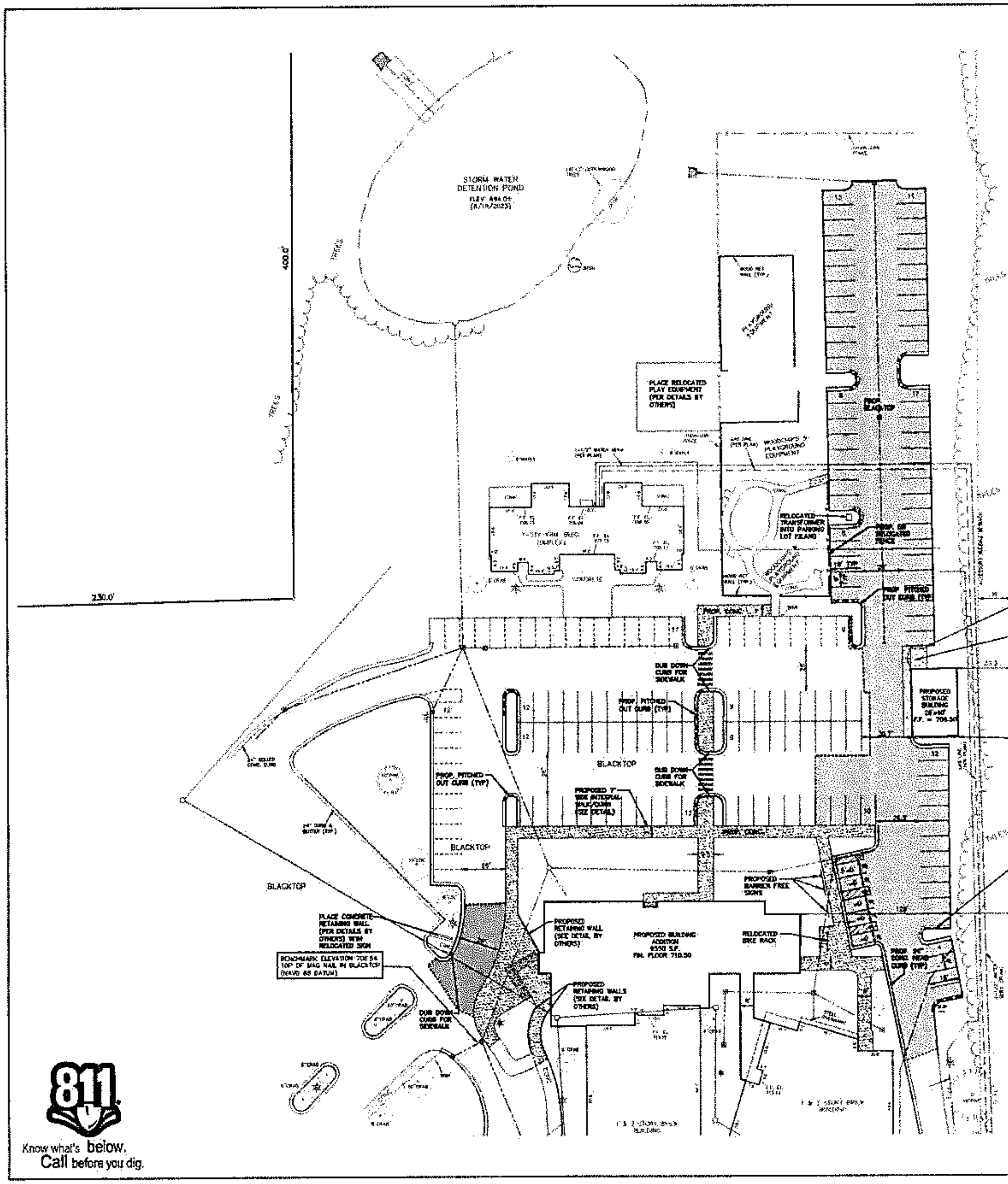
RE: 6477 ADA DRIVE SE

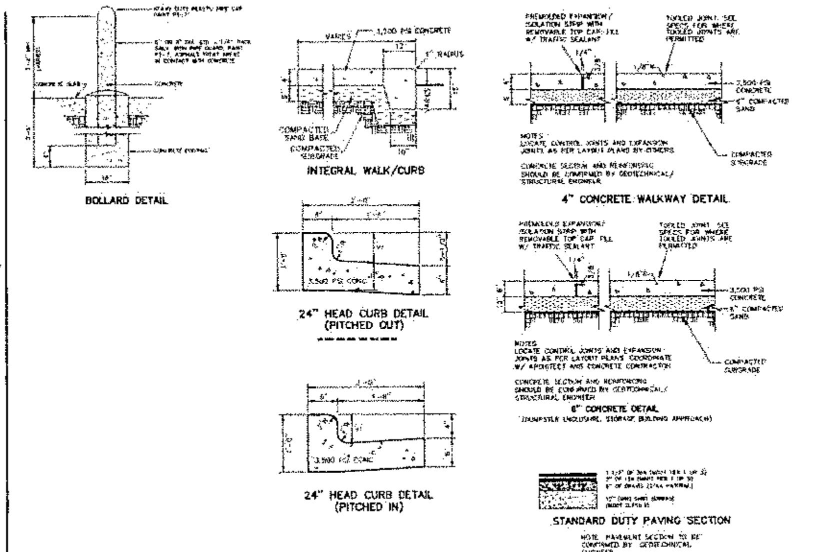
FOR: ST. ROBERTS OF NEWMINSTER
ATTN: FATHER TONY RUSSO
6477 ADA DRIVE SE
ADA, MI 49301

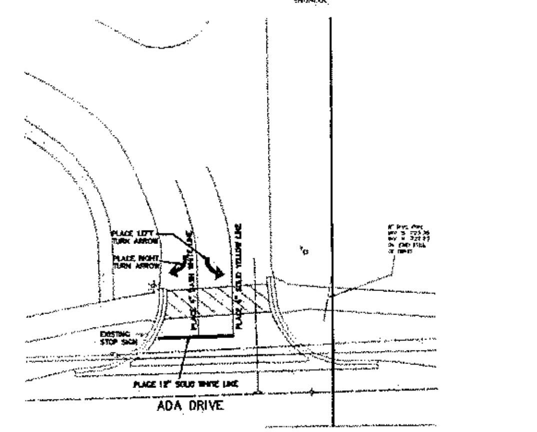
PART OF THE NW 1/4, SECTION 33, T7N, R10W, ADA TOWNSHIP, KENT COUNTY, MICHIGAN

exxel engineering, inc.
planners - engineers - surveyors
5252 Clyde Park, S.W. • Grand Rapids, MI 49509
Phone: (616) 531-3660 www.exxelengineering.com

DRAWN BY: JSE	PROJ. ENG.: JSV	SHEET	
APPROVED BY: JSV	PROJ. SURV.:	1 of 4	
EXE JOB #: 23157RE	DATE: 10/18/2023		







EAST ENTRANCE STRIPING DETAIL
SCALE: 1" = 20'

SCALE: 1" = 30'
1' CONTOUR INTERVAL

LEGEND

- = IRON STAKE FOUND
- = LIGHT POLE
- = BOLLARD
- = HYDRANT
- = WATERMAIN VALVE
- = STOP BOX
- = IRRIGATION VALVE
- = CATCH BASIN
- = MANHOLE
- = CLEAN OUT
- = FENCE LINE
- = PIPE HANDRAIL
- CRAB = CRABAPPLE TREE
- MAP = MAPLE TREE
- LOC = LOCUST TREE

SITE LAYOUT PLAN

RE: 6477 ADA DRIVE SE

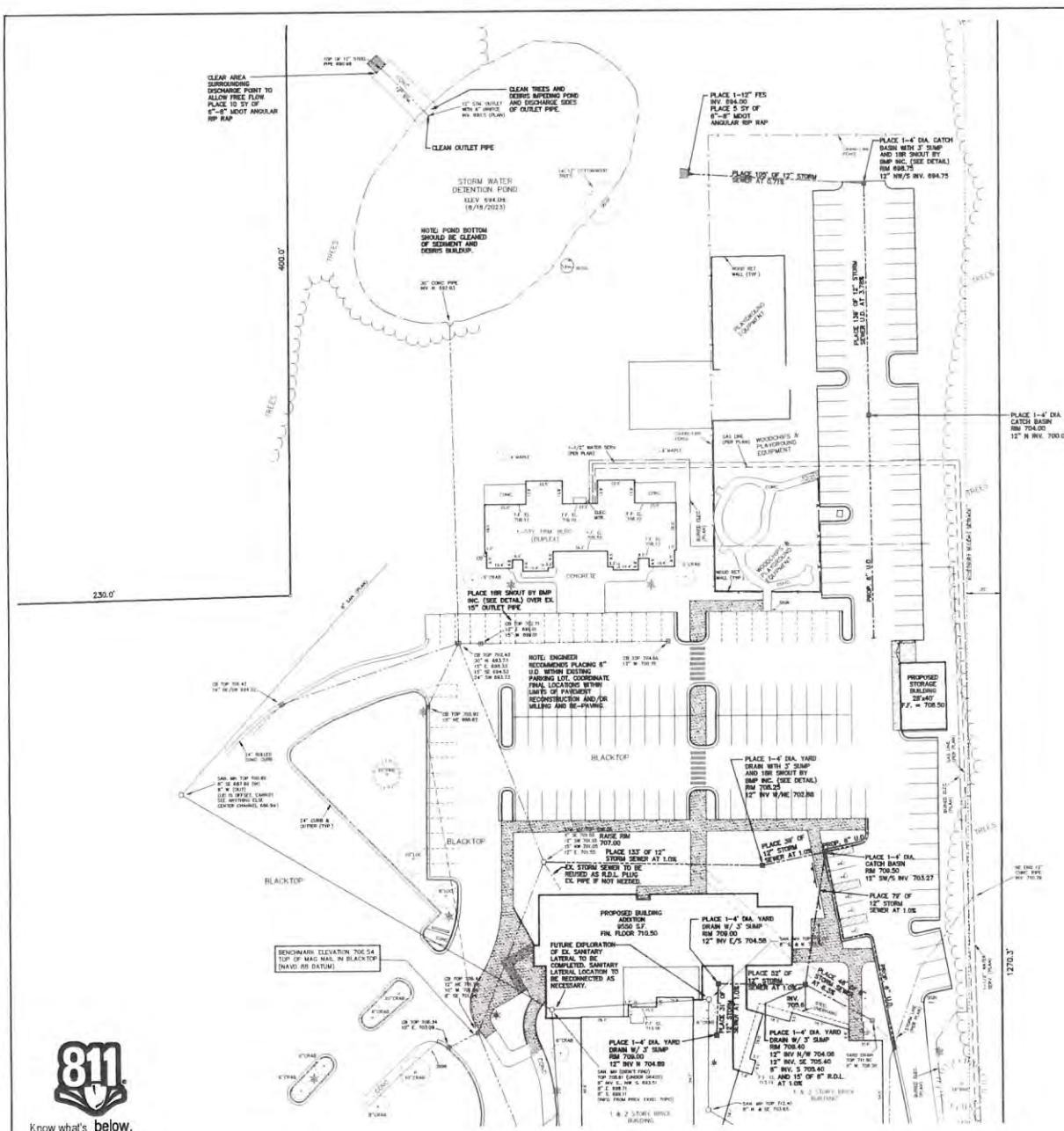
FOR: ST. ROBERTS OF NEWMINSTER
ATTN: FATHER TONY RUSSO
6477 ADA DRIVE SE
ADA, MI 49301

PART OF THE NW 1/4, SECTION 33, T7N, R10W, ADA TOWNSHIP, KENT COUNTY, MICHIGAN

exxel engineering, inc.
planners · engineers · surveyors

SHEET 2 of 4

811 Know what's below. Call before you dig.



Know what's **below.** Call before you dig.

GENERAL STORM SEWER NOTES

YARD DRAINS

1. ALL 4' DIA. YARD DRAINS (YD) SHALL HAVE 3' DEEP SUMPS. USE E.J #1045 CASTING WITH TYPE N GRATE

CATCH BASINS

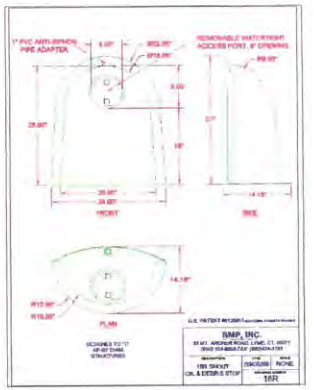
1. ALL 4' DIA. CATCH BASINS (CB) WITHIN PARKING LOT AREAS SHALL HAVE 3' SUMPS AND USE E.J. #5105 CASTING
2. ALL 4' DIA. CATCH BASINS (CB) WITHIN VALLEY GUTTER LABELED "CBL" SHALL HAVE 3' SUMPS AND USE E.J. #7030 CASTING WITH TYPE M2 GRATE AND TYPE T3 BACK
3. ALL 4' DIA. CATCH BASINS (CB) WITHIN BLACKTOP VALLEY GUTTER SHALL HAVE 3' SUMPS AND USE E.J. #7085 CASTING WITH TYPE M1 GRATE
4. ALL 4' DIA. CATCH BASINS (CB) WITHIN 2' CONC. ROLLED CURB AND GUTTER SHALL HAVE 3' SUMPS AND USE E.J. #7085 CASTING WITH TYPE M1 GRATE
5. ALL 4' DIA. CATCH BASINS (CB) WITHIN 2' CONC. HEAD CURB SHALL HAVE 3' SUMPS AND USE E.J. #7045 CASTING WITH TYPE M1 GRATE
6. ALL 4' DIA. CATCH BASINS (CB) WITHIN MDOT B2 CURB SHALL HAVE 3' SUMPS AND USE E.J. #7085 CASTING

MATERIAL TYPE

1. FOOTING DRAIN LEAD SHALL BE PVC SCH. 40 OR PVC SDR 26
2. ALL STORM LABELED "STORM SEWER" SHALL BE SMOOTH LINED CORRUGATED PLASTIC PIPE (SLCPP) WITH GASKETED SOIL TIGHT JOINTS, UNLESS OTHERWISE NOTED.
3. ALL STORM LABELED "STORM SEWER U.D." SHALL BE SMOOTH LINED CORRUGATED PLASTIC PIPE (SLCPP), PERFORATED W/ SOCK AND GASKETED SOIL TIGHT JOINTS. (ADS N-12, HANCOR H-Q OR APPROVED EQUAL)
4. ALL STORM LABELED "CONC. STORM SEWER" SHALL BE C-76-III WITH PREMIUM JOINT.
5. 6" UNDERDRAIN SHALL BE CORRUGATED PLASTIC PIPE WITH SOCK OR APPROVED EQUAL. MAINTAIN 3' MINIMUM COVER

OTHER

1. ALL 8"- 10" (SLCPP) PIPE SHALL HAVE A SILT TIGHT COUPLER
2. ALL 12"- 30" (SLCPP) PIPE SHALL HAVE A SILT TIGHT, SURE LOCK TYPE COUPLER



SCALE: 1" = 30'
1' CONTOUR INTERVAL

LEGEND

- I = IRON STAKE FOUND
- LP = LIGHT POLE
- B = BOLLARD
- HY = HYDRANT
- WV = WATERMAIN VALVE
- SB = STOP BOX
- IV = IRRIGATION VALVE
- CB = CATCH BASIN
- MH = MANHOLE
- CO = CLEAN OUT
- FENCE LINE
- PIPE HANDRAIL
- CRAB = CRABAPPLE TREE
- MAP = MAPLE TREE
- LOC = LOCUST TREE

SITE UTILITY PLAN

RE: 6477 ADA DRIVE SE

FOR: ST. ROBERTS OF NEWMINSTER
ATTN: FATHER TONY RUSSO
6477 ADA DRIVE SE
ADA, MI 49301

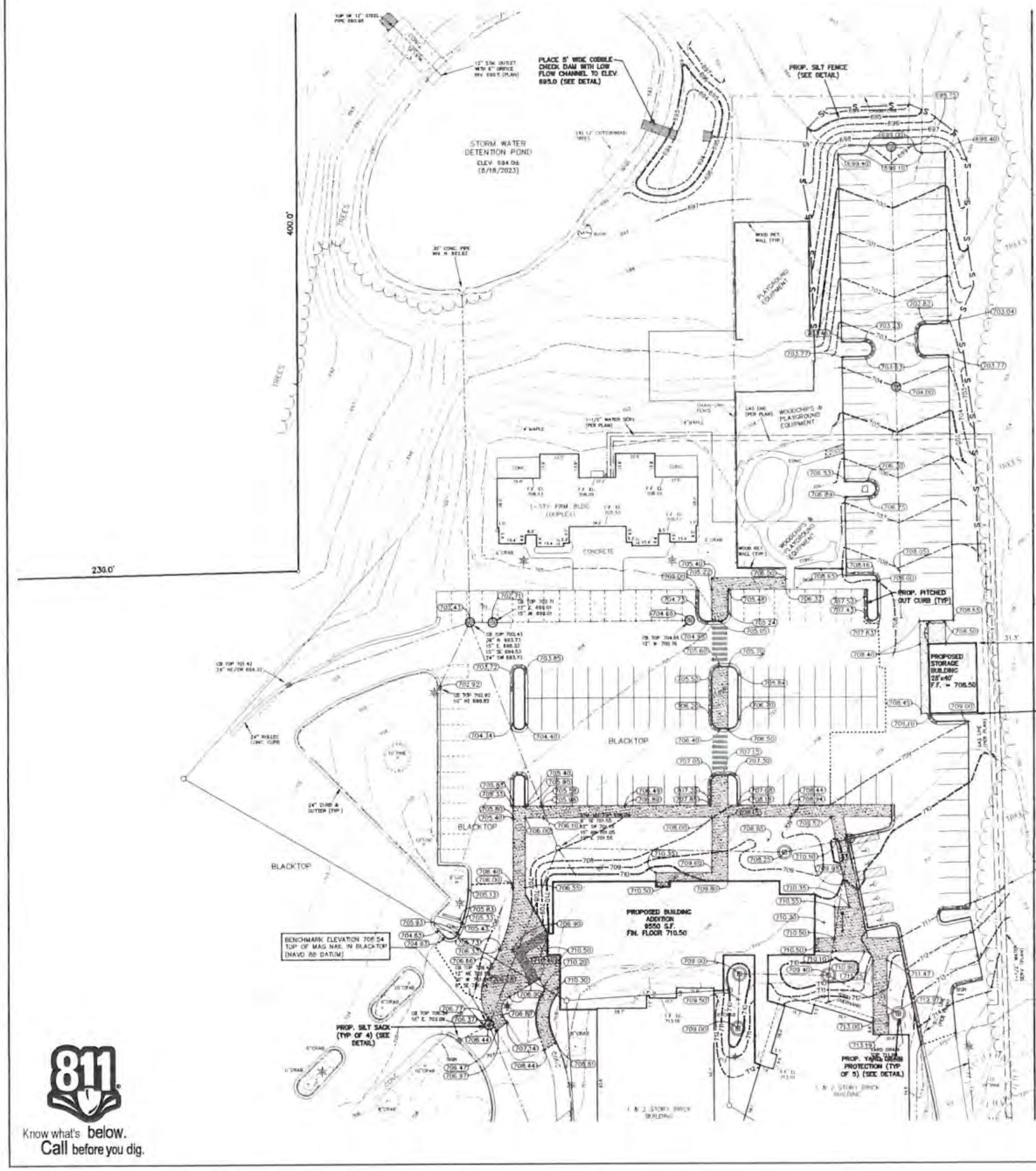
PART OF THE NW 1/4, SECTION 33, T7N, R10W, ADA TOWNSHIP, KENT COUNTY, MICHIGAN

DATE	REVISION	BY

exxel engineering, inc.
planners · engineers · surveyors
5252 Clyde Park, SW · Grand Rapids, MI 49509
Phone: (616) 531-3660 www.exxelengineering.com

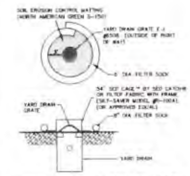
DRAWN BY: JSD | PROJ. ENG.: JSV
APPROVED BY: JSV | PROJ. SURV.:
FILE NO.: 23187ME | DATE: 10/18/2023

SHEET 3 of 4

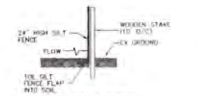


SOIL EROSION CONTROL NOTES

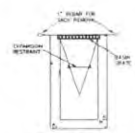
1. PROPERTY DESCRIPTION: N 400 FT OF S 1270.3 FT OF W 1/2 W 1/2 NW 1/4 EX W 230 FT ALSO S 870.3 FT OF W 1/2 W 1/2 NW 1/4 * SEC 33 T7N R10W 17.14 A
2. TOTAL AREA OF DISTURBANCE = 3.6 ACRES
3. THE OWNER SHALL OBTAIN THE SOIL EROSION CONTROL PERMIT. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SOIL EROSION CONTROL PERMIT
4. ALL SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY OTHER CONSTRUCTION AND MAINTAINED, AS NECESSARY, UNTIL THE SITE HAS BEEN PERMANENTLY STABILIZED
5. ALL DISTURBED NON-PAVED AREAS SHALL BE PERMANENTLY STABILIZED WITH AT LEAST 4" OF TOPSOIL AND BE SEEDED
6. THE CONSTRUCTION ENTRANCE IS OFF ADA DRIVE. PREVENT TRACKING SOIL OFF-SITE. IF TRACKING OCCURS, SWEEP SOIL IMMEDIATELY
7. CONTROL DUST BY DISTRIBUTING WATER REGULARLY OVER DISTURBED AREAS
8. INSPECT AND MAINTAIN ALL TEMPORARY SOIL EROSION CONTROLS DAILY AND AFTER EACH SIGNIFICANT RAINFALL EVENT
9. THE SEDIMENT SHALL BE CONTAINED ON-SITE
10. PLACE SILT SACKS ON CATCH BASINS AFFECTED BY SITE CONSTRUCTION AND REMOVE WHEN SITE IS STABILIZED. INSTALL SILT SACKS PER MANUFACTURERS RECOMMENDATIONS
11. CLEAN OUT CATCH BASIN SUMPS AND DETENTION BASIN AREAS UPON PROJECT COMPLETION
12. PLACE SILT FENCE AS SHOWN ON PLAN AND PER DETAIL AND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS
13. ALL EXCESS SPOILS ARE TO BE REMOVED FROM THE SITE. OTHERWISE STOCKPILES MUST BE PROVIDED WITH TEMPORARY AND PERMANENT SESC MEASURES
14. SILT FENCE IS REQUIRED ALONG ALL DOWNSTREAM EDGES OF THE GRADING LIMITS AND/OR PROPERTY LINES AND MUST REMAIN IN PLACE UNTIL ALL VEGETATION IS UNIFORMLY RE-ESTABLISHED. THE SILT FENCE MUST BE TOED IN A MINIMUM OF 6" ALONG ITS BASE
15. ALL SLOPES 1V : 4H OR STEEPER SHALL BE STABILIZED, AS NECESSARY, WITH AT LEAST 4" TOPSOIL AND WITH TACKIFYING MULCH AND/OR SOIL EROSION CONTROL MATTING (NAG S-150 OR EQUIVALENT OR BETTER). MATTING, ALONG WITH THE NECESSARY STAPLES OR WOOD PEGS, SHALL BE PLACED PER MANUFACTURER'S RECOMMENDATIONS WITH SEAMS PARALLEL TO THE DIRECTION OF SURFACE RUNOFF
16. ADJACENT TO THE ADACROFT COMMONS COUNTY DRAIN
17. THE SOILS ON THIS SITE CONSIST OF SILTY SAND BASED ON GEOTECHNICAL REPORT PREPARED BY MTC, DATED MAY, 2008
18. CONSTRUCTION SCHEDULE
    - a. MAY 2024 INSTALL EROSION CONTROL
    - b. JUN 2024 DEMO AND SITE GRADING
    - c. JUN 2024 BEGIN SITE WORK
    - d. JUL 2024 COMPLETE SITE WORK
    - e. JUN-JUL 2024 FINAL RESTORATION
19. THE MAINTENANCE NECESSARY FOR THE PERMANENT SOIL EROSION CONTROL MEASURES IS THE RESPONSIBILITY OF THE OWNER



YARD DRAIN PROTECTION DETAIL

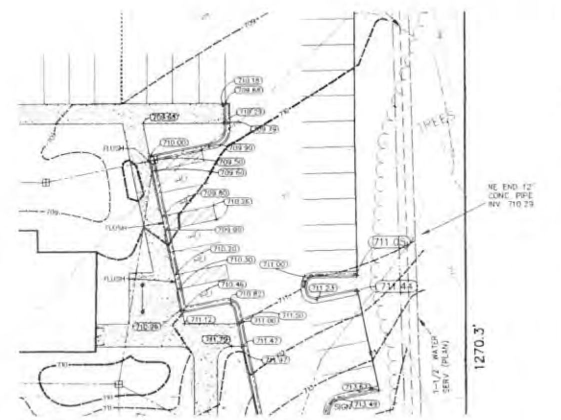


SILT FENCE DETAIL



SILT SACK DETAIL

5' WIDE COBBLE CHECK DAM



BARRIER FREE GRADING DETAIL
SCALE: 1" = 20'

SCALE: 1" = 30'
1' CONTOUR INTERVAL

LEGEND

- o = IRON STAKE FOUND
- LIGHT POLE
- BOLLARD
- HYDRANT
- WATERMAIN VALVE
- STOP BOX
- IRRIGATION VALVE
- CATCH BASIN
- MANHOLE
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- FENCE LINE
- PIPE HANDRAIL
- CRAB = CRABAPPLE TREE
- MAP = MAPLE TREE
- LOC = LOCUST TREE

SITE GRADING AND SOIL EROSION CONTROL PLAN

RE: 6477 ADA DRIVE SE

FOR: ST. ROBERTS OF NEWMINSTER
ATTN: FATHER TONY RUSSO
6477 ADA DRIVE SE
ADA, MI 49301

PART OF THE NW 1/4, SECTION 33, T7N, R10W, ADA TOWNSHIP, KENT COUNTY, MICHIGAN

exxel engineering, inc.
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Phone: (616) 531-3660 · www.exxelengineering.com

DRAWN BY: ZJD | PROJ. ENG: JSV
APPROVED BY: JSV | PROJ. SURV:
REF. NO.: 231576E | DATE: 10/18/2023

SHEET 4 of 4

811 Know what's below. Call before you dig.

required landscaping

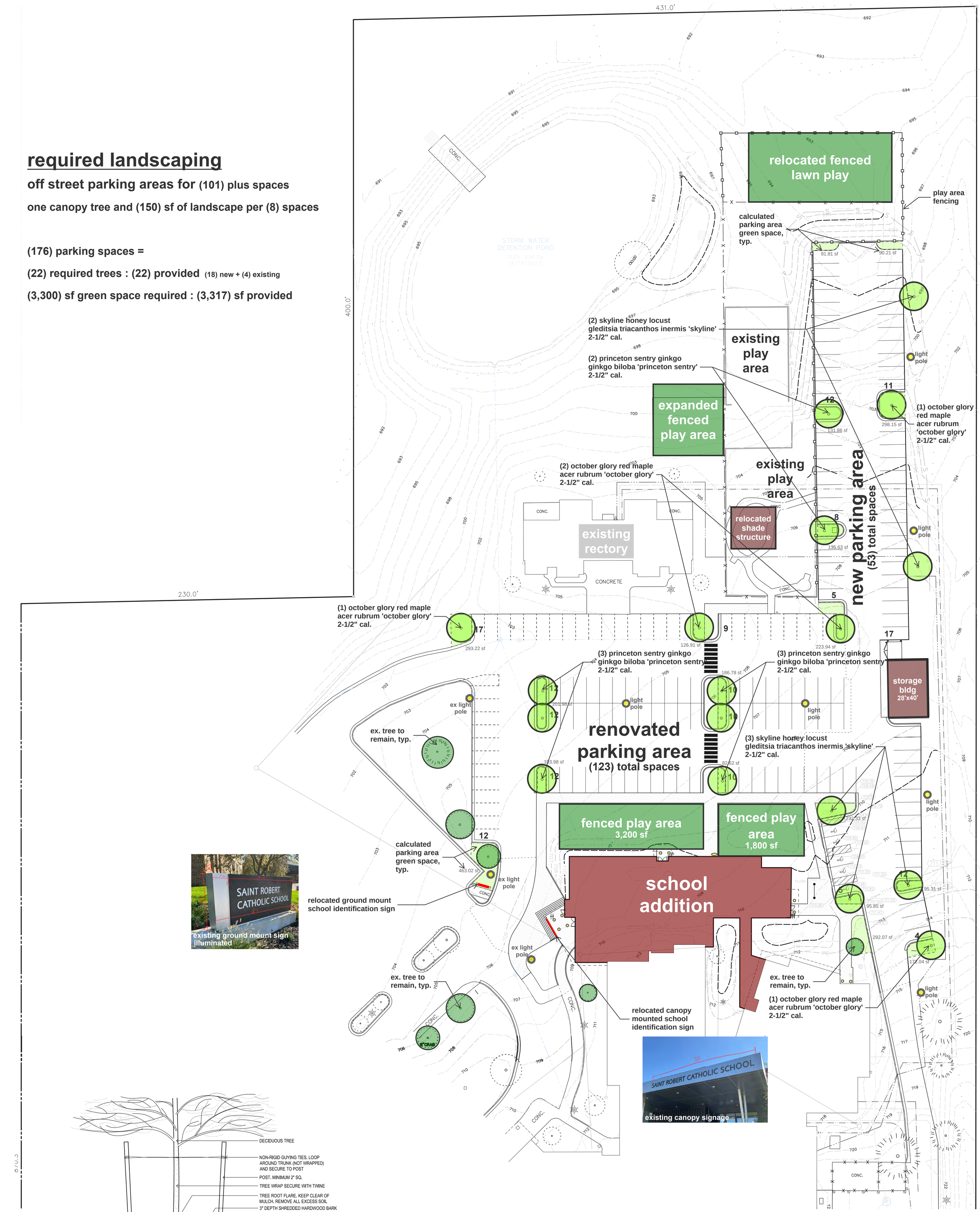
off street parking areas for (101) plus spaces

one canopy tree and (150) sf of landscape per (8) spaces

(176) parking spaces =

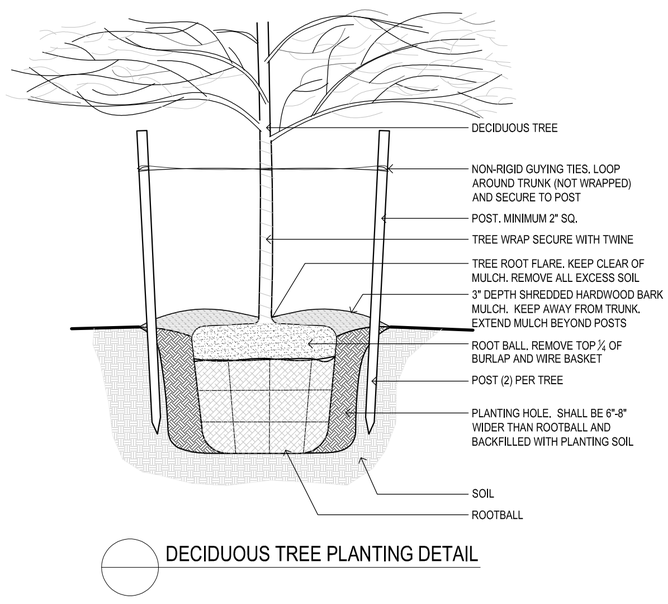
(22) required trees : (22) provided (18) new + (4) existing

(3,300) sf green space required : (3,317) sf provided



existing ground mount sign illuminated

existing canopy signage



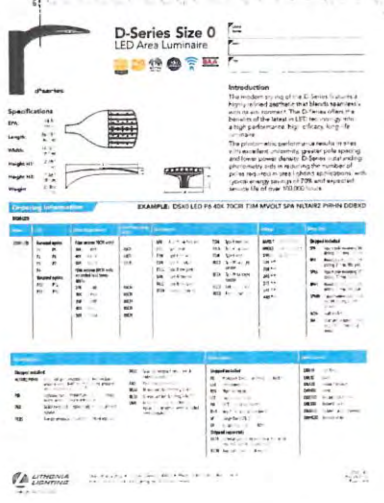
DECIDUOUS TREE PLANTING DETAIL

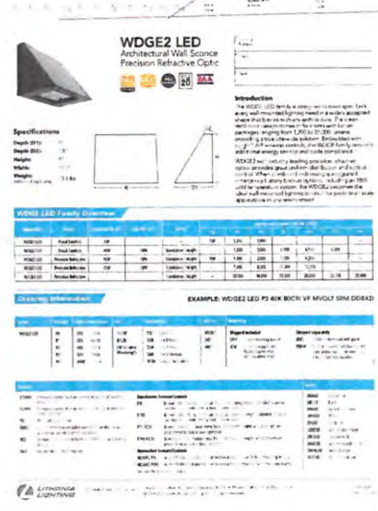
Schedule

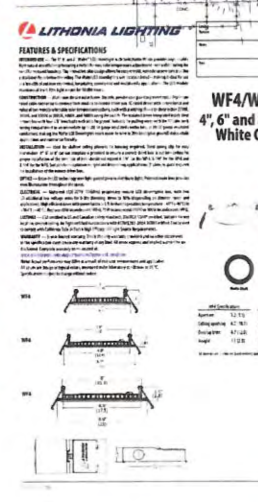
Label	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power
A	5	Lithonia Lighting	DSX0 LED P6 40K 80CRI T5M	D-Series Size 0 Area Luminaire P6 Performance Package 4000K CCT 80 CRI Type 5 Medium mounted on 22.5' pole on top of 2.5' tall base	1	16417	1	137
B	4	Lithonia Lighting	DSX0 LED P6 40K 80CRI BLC4	D-Series Size 0 Area Luminaire P6 Performance Package 4000K CCT 80 CRI Type 4 Extreme Backlight Control mounted on 22.5' pole on top of 2.5' tall base	1	11811	1	137
C	11	Lithonia Lighting	WF4 LED 40K	4" MATTE WHITE LED ULTRA-THIN WAFER DOWNLIGHT, 4000K CCT, LEXTAR LED mounted under Canopy	1	770	1	10
D	1	Lithonia Lighting	WDGE2 LED P1 40K 80CRI T4M	WDGE2 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 80CRI, TYPE 4 MEDIUM OPTIC mounted at 10' afg	1	1259	1	11.1618

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking Lot	+	1.2 fc	3.0 fc	0.3 fc	10.0:1	4.0:1







St Roberts - Expanison and Renovation

Designer

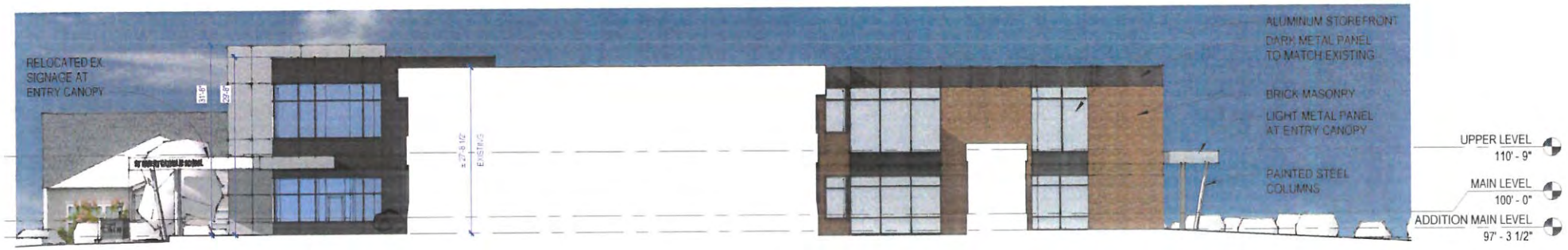
Date
10/12/2023
Scale
Not to Scale
Drawing No

Summary

St. Robert of Newminster CATHOLIC CHURCH

ST. ROBERT SCHOOL AND PARISH

Ada, Michigan



2 SOUTH ELEVATION

1/16" = 1'-0"

1 NORTH ELEVATION

1/16" = 1'-0"

AMDG ARCHITECTS with | First Companies

building elevations

October 18, 2023

5.1

St. Robert of Newminster CATHOLIC CHURCH

ST. ROBERT SCHOOL AND PARISH

Ada, Michigan

2 EAST ELEVATION

1/16" = 1'-0"

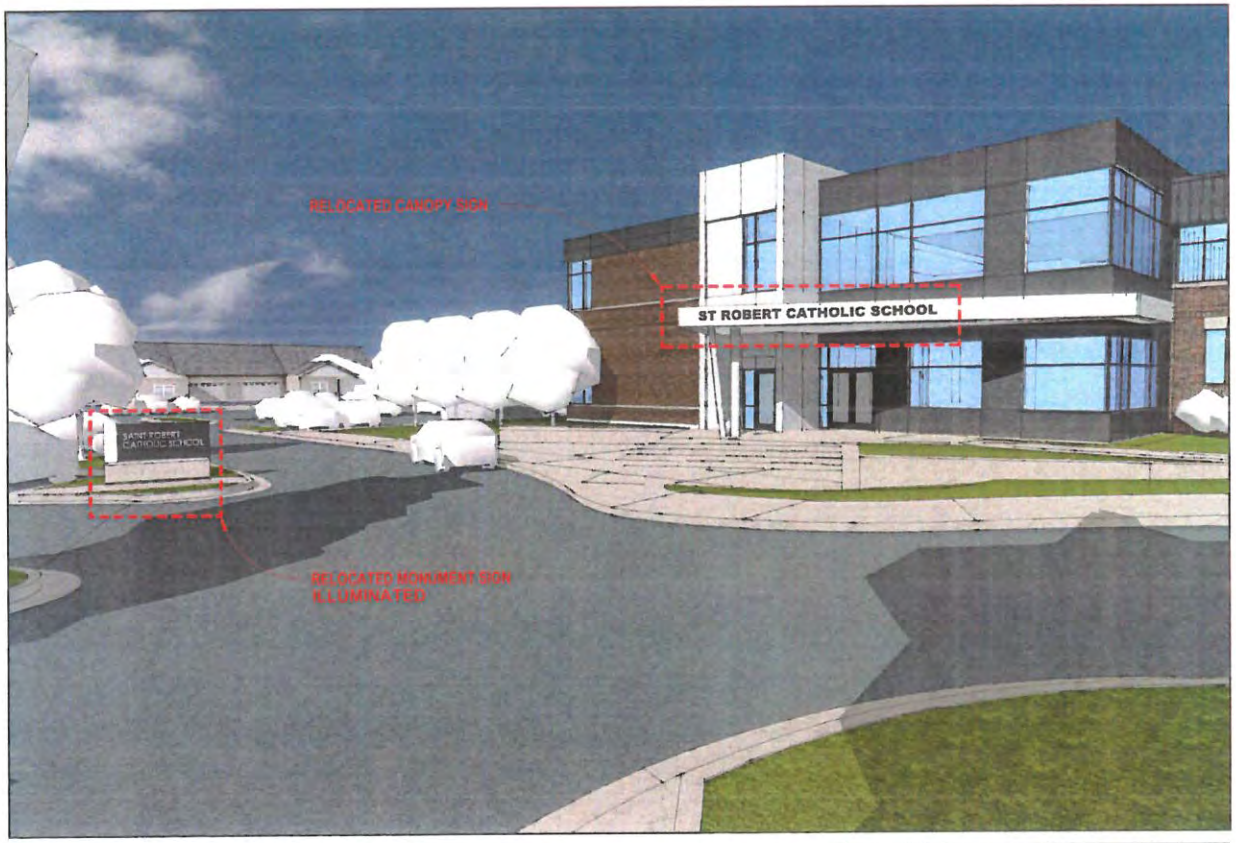
1 WEST ELEVATION

1/16" = 1'-0"

St. Robert of Newminster CATHOLIC CHURCH

ST. ROBERT SCHOOL AND PARISH

Ada, Michigan

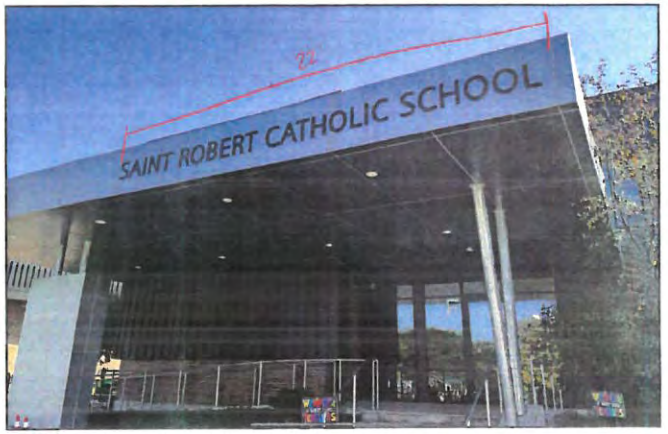


PROPOSED LOCATIONS FOR REUSED ENTRY SIGNAGE

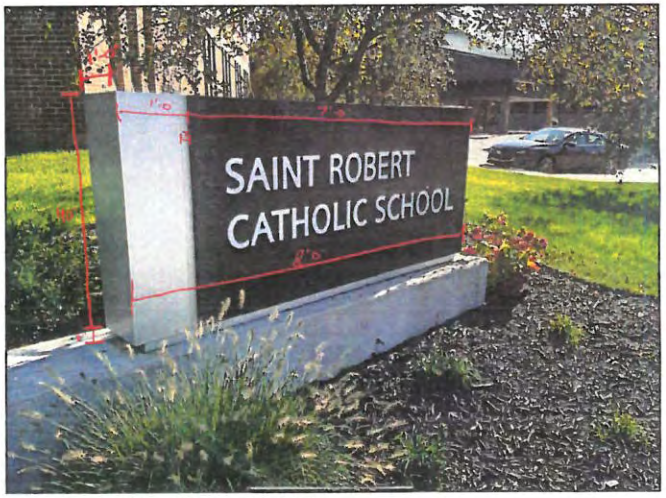
PROPOSED RELOCATED SIGNAGE

EX. RELOCATED CANOPY SIGN: 22' x 1' = 22 SF

EX. RELOCATED MONUMENT SIGN: 3'-4" x 8'-0" = 27 SF



EXISTING CANOPY SIGN TO BE RELOCATED

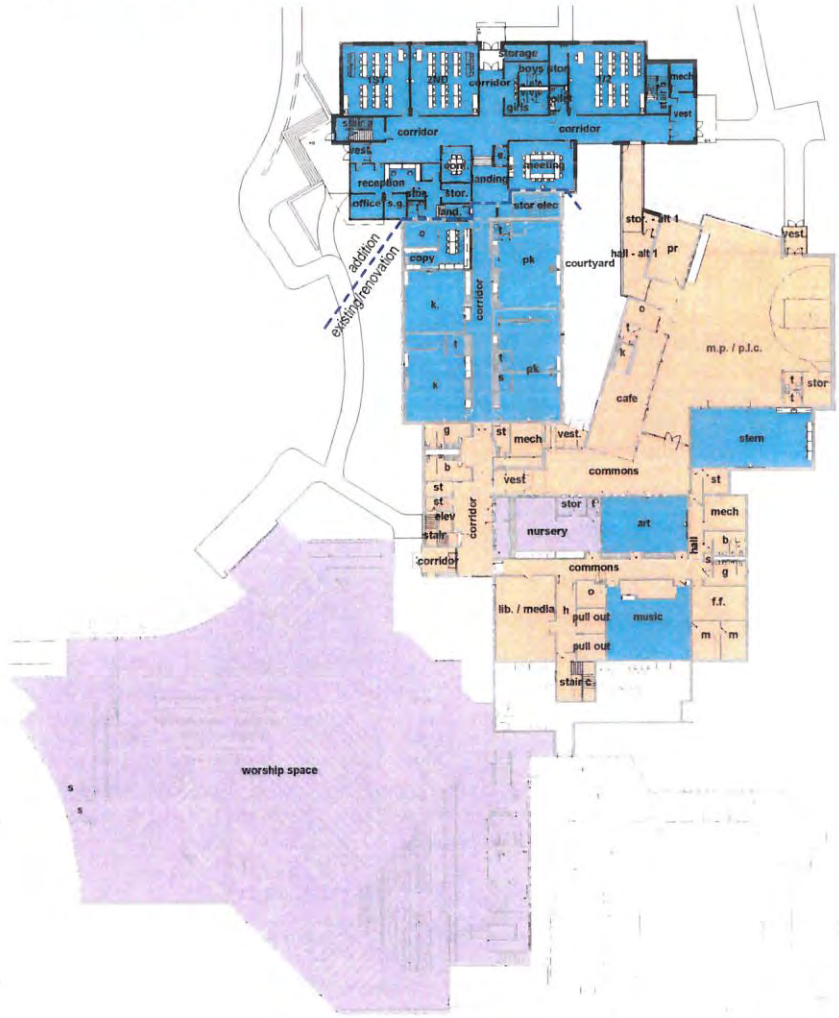


EXISTING MONUMENT SIGN TO BE RELOCATED

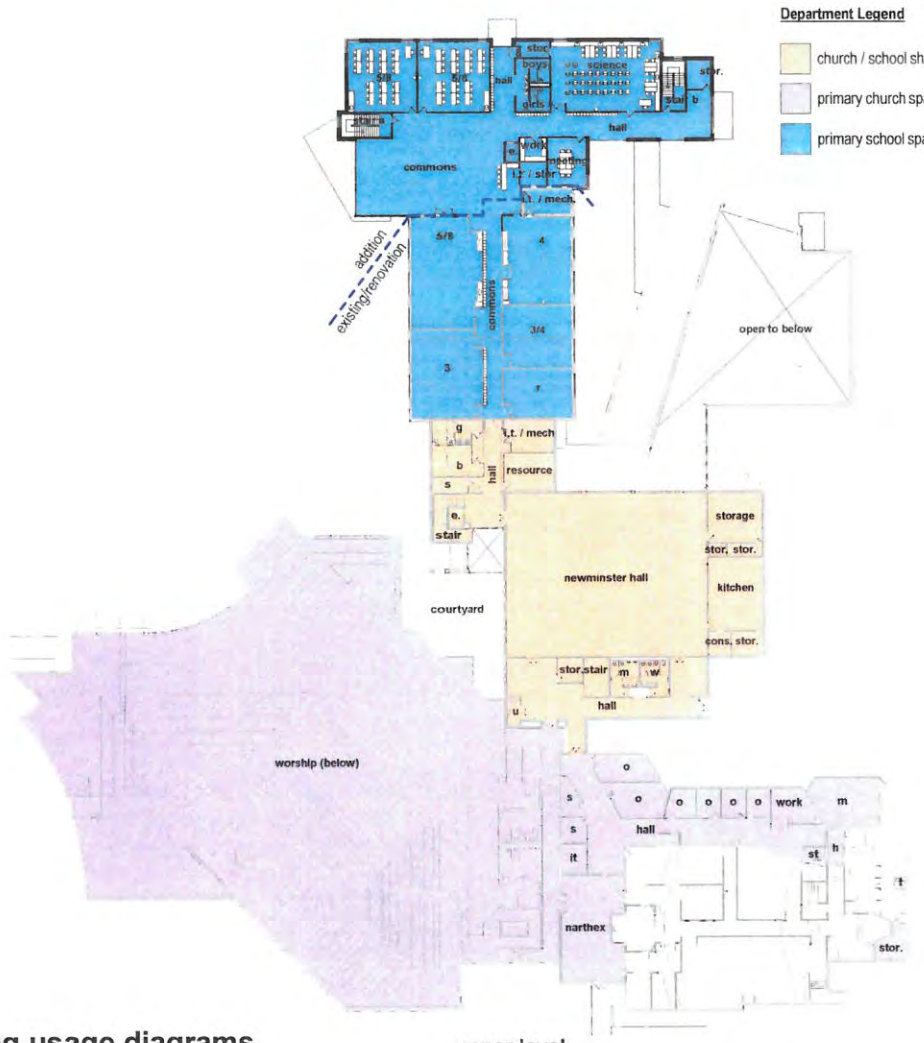
St. Robert of Newminster
CATHOLIC CHURCH

ST. ROBERT SCHOOL AND PARISH

Ada, Michigan



main level



upper level

building usage diagrams

AMDG ARCHITECTS with | First Companies

N

0' 25' 50' 100'

proposed plan (pre-k - 8th grade)

October 18, 2023

SP01

EXHIBIT B

EXHIBIT C

Traffic Impact Study
St. Robert Catholic School Expansion
Ada, Michigan

Prepared for:

AMDG Architects, Inc.
25 Commerce Drive SW
Suite 400
Grand Rapids, MI 49503

Prepared by:

Progressive AE
1811 4 Mile Road NE
Grand Rapids, MI 49525

October 2023
Project No. 96810001

Traffic Impact Study - St. Robert Catholic School Expansion

Table of Contents

Appendix

List of Figures and Tables

Figures

Tables

EXECUTIVE SUMMARY

Introduction

St. Robert Catholic School is proposing an expansion of its facilities to accommodate more students and staff. The existing school serves grades P3-6, with approximately 130 enrolled students. Based on the existing student population and planned growth, total enrollment at the proposed school will be 372 students. This study includes a maximum enrollment of 372 students in 2025 as a worst-case scenario.

Access to the existing school site is via two driveways to Ada Drive. The east driveway operates as a full-access driveway, while the west driveway serves only vehicles exiting the site during the peak school periods.

This traffic impact study aimed to analyze the potential impacts of the proposed school expansion and identify what physical and/or operational roadway system improvements may be necessary to mitigate existing or future issues and/or impacts created by the additional traffic to and from the school.

Study Area

The study area includes two stop-controlled intersections as show below:

- Ada Drive / Fox Hollow Avenue / Existing West Driveway
- Ada Drive / Existing East Driveway

Data Collection

Existing turning-movement counts at the study area intersections were collected on Thursday, August 24, 2023, during a typical school day. The turning movement counts were performed from 7:00 a.m. to 9:00 a.m. and from 2:00 p.m. to 6:00 p.m. to capture the existing school peak hours.

These counts indicated that the weekday morning and afternoon school peak hours generally occur between 7:15 a.m. to 8:15 a.m. and 2:30 p.m. to 3:30 p.m.

Analysis

Two analysis scenarios were completed for the weekday school morning and afternoon peak hours as part of the study as follows:

- Existing Conditions
- Future (2025) Conditions

An annual background traffic growth rate of 0.75-percent was applied to existing volumes to help reflect anticipated non-development traffic increases by the 2025 horizon year.

Based on the trip generation characteristics of the existing school, the school is expected to generate approximately 273 new vehicle trips (156 entering, 117 exiting) onto the roadway system during the school morning peak hour and approximately 225 new vehicle trips (106 entering, 119 exiting) onto the roadway system during the school afternoon peak hour.

For the existing and Future (2025) conditions, capacity analyses were performed to determine the impacts the proposed school expansion would have on the surrounding roadways and intersections within the study area.

Conclusions

Based on the analyses performed as part of this study, considering the existing conditions, the proposed school expansion will have minor impacts on the surrounding roadway network. The findings of this study are as follows:

Existing Conditions

The existing conditions analyses show that many of the controlled movements at the study area intersections operate acceptably at level of service (LoS) "D" or better during the school morning and afternoon peak hours, except for the northbound movement along Fox Hollow Avenue that currently operates at a LoS "E" during the school afternoon peak hour. The 95th percentile queue during the school afternoon peak hour is calculated to be 5.7 vehicles.

A review of the existing crash history at the school driveways to Ada Drive indicated that four crashes occurred within 250-feet of the existing school driveways in the past five years. Three crashes near the west driveway and one crash near the east driveway. Of those four crashes, none occurred during the school peak hours; hence, they do not appear related to the existing school driveway movements.

Future (2025) Conditions

On opening day after the completion of the proposed expansion, the traffic volumes within the study area intersections are anticipated to remain relatively the same. However, traffic volumes within the study area will increase with background traffic growth and as student enrollment increases over the next several years to the anticipated levels.

Assuming no mitigation to the surrounding roadway network to mitigate the existing conditions, the future (2025) conditions analysis results show all controlled movements at the study area intersection are anticipated to operate acceptably at LoS "D" or better during the school morning and afternoon peak hours, except for the following movements:

- The northbound approach along Fox Hollow Avenue is anticipated to operate at a LoS "F" during the school morning and afternoon peak hours. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 9.9 and 10.2 vehicles, respectively.
- The southbound approach along the existing west driveway is anticipated to operate at LoS "F" during the school morning peak hour. The 95th percentile queue during the school morning peak hour is calculated to be 4.8 vehicles.
- The southbound left-turn movement from the existing east driveway onto Ada Drive is anticipated to operate at LoS "F" and LoS "E" during the school morning and afternoon peak hours, respectively. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 4.8 and 2.6 vehicles, respectively.

Implementing the improvements outlined to mitigate existing conditions results in reduced delay and significantly reduced queuing at the Ada Drive/Fox Hollow Avenue intersection, particularly the northbound approach. A comparison of the northbound approach delay at the Ada Drive/Fox Hollow Avenue intersection shows the approach delay will be reduced from LoS "F" with 98.3-seconds of delay to LoS "D" with 29.4-seconds of delay during the morning peak hour. Similarly, the delay will be reduced from LoS "F" with 80-seconds of delay to LoS "D" with 28.0-seconds of delay during the school afternoon peak hour.

While there is expected to be some delay and queuing at the school driveways during pickup/dropoff operations, this is typical of school sites given the concentrated traffic volumes surrounding the school start and end times. These delays are also often short duration, typically 15 – 30-minutes.

Recommendations
The following recommendations would be made to improve operations within the study area once the school expansion is complete.

Existing Conditions
The existing conditions analysis and site observations revealed poor operations at the Ada Drive/Fox Hollow Avenue intersection, particularly along northbound Fox Hollow Avenue. To improve the safety and operation of the intersection, below are recommended mitigation measures that should be considered regardless of the school expansion.

- A short left-turn lane should be included on the northbound approach from Fox Hollow Avenue to Ada Drive to allow right-turning vehicles to bypass a vehicle waiting to turn left. The left-turn lane should accommodate up to two queued vehicles (50-feet). This turn lane could be developed with pavement markings should the existing pavement width allow. Minor widening on the west side of Fox Hollow Avenue may be necessary to provide adequate lane widths and lane tapers. As an alternative, minor pavement widening on the east side of the roadway would also allow right-turn vehicles to bypass queued left-turning vehicles.
- Construction of a separate westbound left-turn lane from Ada Drive to Fox Hollow Avenue should be considered based on the existing volume of westbound left-turn movements.

Given the significant concentration of schools, growth of Ada Village, and several new residential developments in the area, future capacity and operational improvements should be explored for the Ada Drive corridor. Some options to consider include:

- A continuous center turn lane through the corridor.
- Implementing travel demand management strategies, such as staggered start/dismissal times for schools and/or encouraging ridesharing and carpooling.
- Periodic review of volume and crash data at key intersections.

Future (2025) Conditions
For analysis purposes, this study used a maximum traffic approach for 2025 that presumed full enrollment for the school expansion. The more realistic expectation is that the school will gradually increase its enrollment over several years, reaching capacity in 2029-2030. As the school enrollment increases over the years to full capacity, the operation of the existing driveways slowly deteriorates to LoS "F" due to high traffic volumes during school peak hours. Below are recommended improvements to the existing school driveways to provide a reasonable traffic flow to/from the school.

- The southbound approach to the Ada Drive/East Driveway intersection provides adequate width for one entry lane and two exit lanes. A review of the existing operation at the intersection shows the exit approach currently operates as two lanes. Adding pavement markings to the approach to clearly define two exit lanes, a right-turn and left-turn lane, is recommended.
- No additional improvements are recommended along Ada Drive as the existing eastbound left-turn lane and westbound right-turn taper will adequately serve the anticipated school traffic volumes.
- Vehicular delays, queuing, and safety at the existing school driveways should be monitored as school enrollment increases. Should significant delay, queuing, or safety issues develop at the existing driveways, additional mitigation may be required. These mitigation measures may include revising existing site circulation.

CHAPTER 1

INTRODUCTION

St. Robert Catholic School is proposing an expansion of its facilities to accommodate more students and staff. The existing school serves grades P3-6, with approximately 130 enrolled students. Based on the existing student population and planned growth, total enrollment at the proposed school will be 372 students. This study includes a maximum enrollment of 372 students in 2025 as a worst-case scenario.

Access to the existing school site is via two driveways to Ada Drive. The east driveway operates as a full-access driveway, while the west driveway serves only vehicles exiting the site during the peak school periods.

This traffic impact study aimed to analyze the potential impacts of the proposed school expansion and identify what physical and/or operational roadway system improvements may be necessary to mitigate existing or future issues and/or impacts created by the additional traffic to/from the school. Tasks undertaken to complete the analyses include:

1. ***Data Collection.*** Applicable information regarding the existing operating conditions of the adjacent roadways was obtained in August 2023 on a typical weekday. Morning and afternoon peak hour turning movement counts were completed at the existing study area intersections. Information regarding lane configurations, speed limits, traffic controls, and other related data for the study area roadways was also collected.

2. ***Background Growth.*** An annual background traffic growth rate of 0.75-percent was applied to existing volumes to help reflect anticipated non-development traffic increases by the 2025 horizon year.

3. ***Trip Generation/Distribution.*** The number of trips the proposed school is expected to generate during peak hours was identified. These trips were then assigned to the adjacent street system based on the patterns followed by existing traffic and engineering judgment.

Figure 1. Location Map and Study Area

4. ***Levels of Service.*** Capacity calculations were completed at the study area key intersections and the existing site driveways to identify existing and future peak hour operational characteristics.

5. ***Mitigation.*** Roadway/intersection improvements were identified, when applicable, that will enable the adjacent roadways and study area intersections to maintain equal and/or acceptable levels of operation under future conditions upon adding background traffic growth and/or due to the anticipated development traffic.

Pre-study coordination was completed with Ada Township staff to help identify the required study area, study parameters, and any specific areas of concern. The following chapters outline the results of analyses completed during the study process.

CHAPTER 2

EXISTING CONDITIONS

The first step in identifying potential traffic impacts is determining how well the adjacent streets operate under current conditions. The existing conditions provide a comparison to subsequent future conditions analyses. This chapter summarizes the data collection and existing operating conditions analysis procedures.

Ada Drive at East Driveway

NB Fox Hollow Avenue at Ada Drive

Key Study Area Roadways

Ada Drive

Ada Drive is a primary east-west, minor arterial roadway within the study area under Kent County Road Commission (KCRC) jurisdiction. It is a two-lane roadway with a speed limit of 30-miles-per-hour (mph) during school peak hours. Weekday 24-hour traffic volumes along Ada Drive east of Fox Hollow Avenue average approximately 4,700 vehicles per day based on a 2021 Average Daily Traffic (ADT) count by Grand Valley Metropolitan Council (GVMC).

Fox Hollow Avenue

Fox Hollow Avenue is a north-south roadway within the study area under KCRC jurisdiction. It is a two-lane roadway with a speed limit of 30-mph. Weekday 24-hour traffic volumes along Fox Hollow Avenue south of Ada Drive are estimated to average approximately 2,500-3,500 vehicles per day based on the existing peak hour traffic data.

Existing Intersections

The study area includes two stop-controlled intersections, as listed in Table 1. The existing Ada Drive intersection with Fox Hollow Avenue and east driveway includes one-lane approaches in all directions with no separate turn lanes. The existing west driveway to Ada Drive includes an eastbound left-turn lane, a westbound right-turn taper, and two exit lanes (unmarked).

Table 1. Existing Intersections

Intersection	Traffic Control
Ada Drive / Fox Hollow Avenue / Existing West Driveway	Two-Way Stop
Ada Drive / Existing East Driveway	Two-Way Stop

Data Collection

Existing turning movement counts at the study area intersections were collected on Thursday, August 24, 2023, during a typical school day. The turning movement counts were performed from 7:00 a.m. to 9:00 a.m. and 2:00 p.m. to 6:00 p.m. to capture the existing school peak hours. Detailed printouts of the count reports are included in the Appendix.

These counts indicated that the weekday morning and afternoon school peak hours generally occur between 7:15 a.m. to 8:15 a.m. and 2:30 p.m. to 3:30 p.m. Figure 2 shows the existing morning and afternoon school peak hour volumes at the study area intersections.

Crash Analysis
A review of the existing crash history at the existing school driveways to Ada Drive was performed based on information provided by the Michigan Traffic Crash Facts website. This review shows four crashes occurred within 250-feet of the existing school driveways in the past five years. Three crashes near the west driveway and one crash near the east driveway. Of those four crashes, none occurred during the school peak hours; hence, they do not appear related to the existing school driveway movements.

Existing Conditions Capacity Analysis
Intersection level of service calculations were completed to evaluate the existing operational efficiency of the study area intersections. These calculations were completed using techniques outlined in the Highway Capacity Manual, published by the Transportation Research Board. Per Ada Township (Township) requirements, *Synchro*® traffic analysis software, version 11, based on the Highway Capacity Manual methodologies, was used in the analysis.

Levels of service at signalized and unsignalized intersections relate to the delay, traffic volumes, and intersection geometry. Levels of service are expressed in a range from "A" to "F," with "A" denoting the highest or best operating conditions. Generally, a LoS "D" rating is considered the minimum acceptable service level for signalized and unsignalized intersections in most areas, although a LoS "E" or LoS "F" can be deemed acceptable at times in downtown/urban areas or during the peak hours. The criteria for determining the LoS at signalized and unsignalized intersections are outlined in the Appendix of this report.

The existing school morning and afternoon peak hours were analyzed at the study area intersections. Copies of the *Synchro*® analyses are included in the Appendix.

Levels of service for the controlled movements at the study area intersections are shown in Table 2 and Figure 2. Many of these movements operate acceptably at LoS "D" or better during the school morning and afternoon peak hours, except for the following movement:

- The northbound movement along Fox Hollow Avenue currently operates at a LoS "E" during the school afternoon peak hour. The 95th percentile queue during the school afternoon peak hour is calculated to be 5.7 vehicles.

Table 2. Existing Levels of Service and Delay

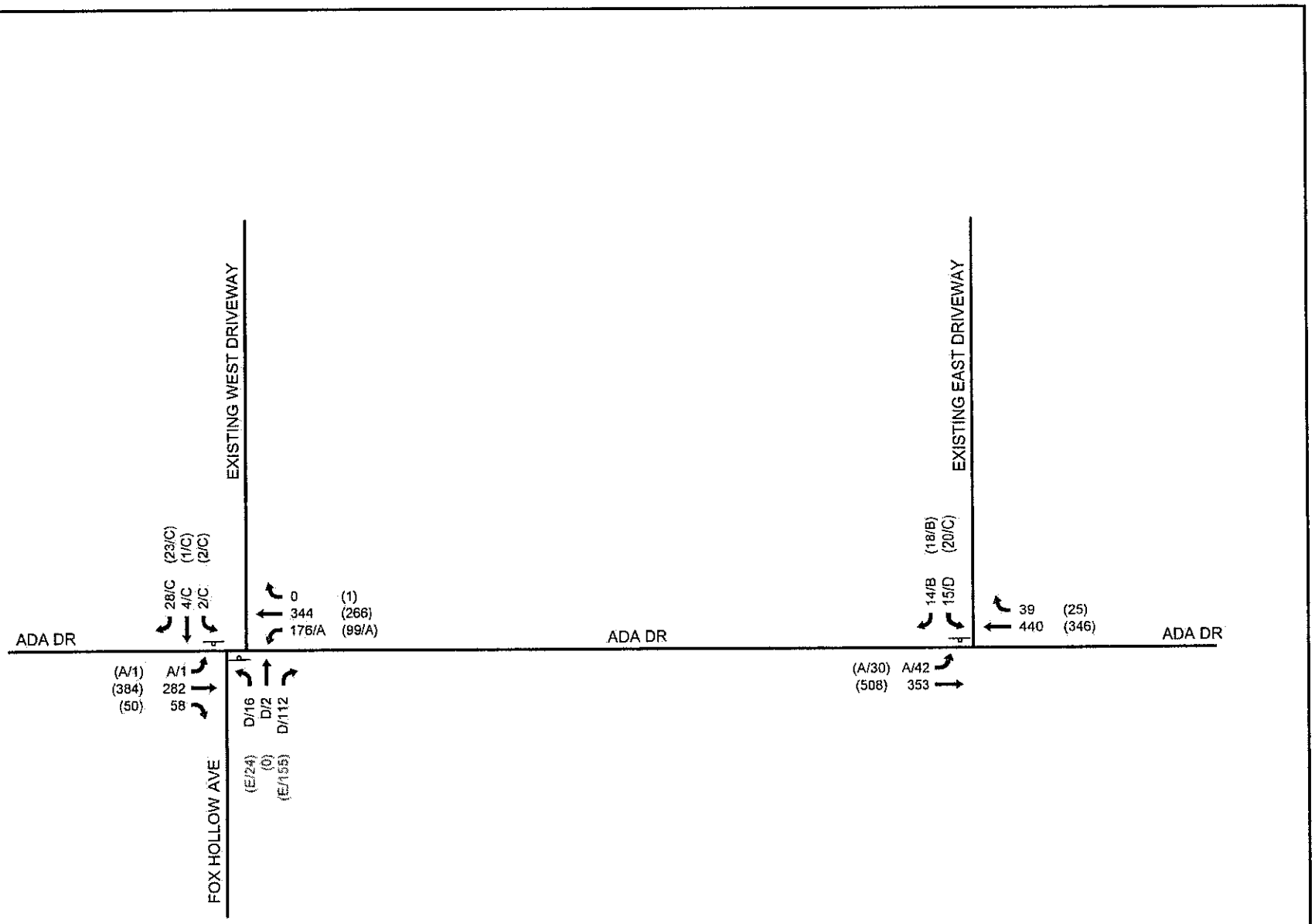
Intersection / Movement	Existing Conditions			
	A.M.		P.M.	
	LoS	Delay(s)	LoS	Delay(s)
Ada Drive / Fox Hollow Avenue / Existing West Driveway[1]				
EBL	A	8.1	A	7.8
WBL	A	9.3	A	9.3
NB	D	30.6	**E**	**36.5**
SB	C	19	C	15
Ada Drive / Existing East Driveway[1]				
EBL	A	9.1	A	9.1
SBL	D	32	D	32
SBR	B	12.6	B	12.6

[1]Unsignalized intersection, critical/worst movement(s) shown.
Source: Progressive AE, August 2023

Existing Conditions Improvements
Reviewing the video data from the Ada Drive/Fox Hollow Avenue intersection shows long queues tend to form along northbound Fox Hollow Avenue during the peak hours due to the high volume of right-turn movements, particularly when a vehicle is waiting to make the northbound left-turn movement. While some vehicles are able to slip past a queued northbound left-turning vehicle, the lane is often blocked resulting in longer northbound queues. Vehicles were observed waiting over 2-minutes to complete the northbound left-turn movement.

Based on reviewing the existing traffic volumes at the study area intersections, existing operations, and results of the capacity analysis, the following improvements should be considered to be implemented by the KCRC or Township at the Ada Drive/Fox Hollow Avenue intersection:

- A short left-turn lane should be included on the northbound approach to allow right-turning vehicles to bypass a vehicle waiting to turn left. The left-turn lane should accommodate up to two queued vehicles (50-feet). This turn lane could be developed with pavement markings, should the existing pavement width allow. Minor widening on the west side of Fox Hollow Avenue may be necessary to provide adequate lane widths and lane tapers. As an alternative, minor pavement widening on the east side of the roadway would also allow right-turn vehicles to bypass queued left-turning vehicles.
- Based on the existing volume of traffic at the intersection, particularly the volume of westbound left-turn movements, the construction of a separate westbound left-turn lane should be considered.



ST ROBERTS SCHOOL EXPANSION TRAFFIC IMPACT STUDY

LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
Ⓢ = SIGNALIZED INTERSECTION
—p— = STOP-CONTROLLED

EXISTING PEAK-HOUR VOLUMES
+ LEVELS-OF-SERVICE

N
No Scale

FIGURE
2

CHAPTER 3

FUTURE (2025) CONDITIONS

The purpose of this chapter is to summarize the anticipated future (2025) traffic conditions within the study area with background traffic growth and the completion of the proposed school expansion. These analyses provide the before/after comparison of future conditions and help define the timing and applicability of any potential 2025 roadway improvements necessary to mitigate the impact of the proposed school expansion.

Background Traffic Volumes

An annual traffic growth rate of 0.75-percent was applied to the existing peak hour volumes to determine background (2025) peak hour volumes. A separate analysis of the background traffic conditions was not completed as part of this study as the results would be largely the same as existing conditions with only slightly more delay due to the minor increase in traffic volumes.

Proposed Development

St. Robert Catholic School is proposing an expansion of its facilities located on the north side of Ada Drive in Ada Township, Michigan to accommodate more students and staff. Currently, the school has approximately 130 students enrolled. The school serves young-fives to 6th grade. In addition, it also provides daycare services to younger ages. The expansion is expected to increase the school's capacity to accommodate more students and employees. Based on the existing student population and planned growth, total enrollment at the proposed high school will be 372 students. This represents an increase of 242 students.

Site Access

Access to the existing school site is via two driveways to Ada Drive. The east driveway operates as a full-access driveway, while the west driveway opposes Fox Hollow Avenue and serves only vehicles exiting the site during the school peak time periods (7:00 a.m. to 9:00 a.m. and 2:00 p.m. to 4:00 p.m.).

Trip Generation

Trips for the proposed school expansion were calculated for the typical school morning and afternoon peak hours based on the number of existing trips entering and exiting the existing school site. The traffic count data at the existing site driveway was utilized to calculate the trip generation rate per student at the existing school. In addition, the entering and exiting percentages were calculated for the existing school. Table 3 shows the results of the existing trip generation analysis. As shown, the existing school generates 1.13 trips/student during the school morning peak hour and 0.93 trips/student during the school afternoon peak hour. These rates are consistent with rates provided within the ITE Trip Generation Manual, Eleventh Edition.

Table 3. Existing School Trip Generation Rate

Time / Period	Total Students	Total Existing Trips (Vehicles)			Trip Generation (Trips / Student)		
		Enter	Exit	Total	Rate	% Enter	% Exit
A.M. Peak (7:15 – 8:15 a.m.)	130	84	63	147	1.13	57%	43%
School P.M. Peak (2:30 – 3:30 p.m.)		57	64	121	0.93	47%	53%

Source: Progressive AE, August 2023

For this study, the trip generation rates calculated for the existing school were utilized to estimate the future trip generation of the proposed school expansion. Table 4 shows the typical school morning and afternoon peak hour trips anticipated to be generated by the proposed school expansion.

Table 4. Proposed School Trip Generation Summary

Time / Period	Additional Students	Trip Generation (Trips / Student)			Total Trips (Vehicles)		
		Rate	% Enter	% Exit	Enter	Exit	Total
A.M. Peak	242	1.13	57%	43%	156	117	273
School P.M. Peak		0.93	47%	53%	106	119	225

Source: Progressive AE, August 2023

Upon full enrollment after the proposed school expansion, the school is expected to generate approximately 273 new vehicle trips (156 entering, 117 exiting) onto the roadway system during the school morning peak hour and approximately 225 new vehicle trips (106 entering, 119 exiting) onto the roadway system during the school afternoon peak hour.

Trip Distribution
The directional distribution of the new trips to/from the school was based on the existing travel patterns within the study area and engineering judgment. Figure 3 shows the total anticipated school morning and afternoon peak hour trips for the proposed site upon full completion of the expansion and enrollment.

The anticipated site trips were added to the background (2025) peak hour volumes to depict the estimated total Future (2025) volumes during the school morning and afternoon peak hours. Figure 4 shows the total anticipated Future (2025) volumes.

Future (2025) Capacity Analysis (No Mitigation)
Intersection level of service calculations were completed to evaluate the future (2025) school morning and afternoon peak hour conditions at study area intersections, assuming no improvements to the surrounding roadway network. Levels of service for the individual movements at all study area intersections for unimproved conditions are shown in Table 5. Many of these movements are anticipated to operate acceptably at LoS "D" or better during the school morning and afternoon peak hours, except for the following movements:

- The northbound approach along Fox Hollow Avenue is anticipated to operate at a LoS "F" during the school morning and afternoon peak hours. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 9.9 and 10.2 vehicles, respectively.
- The southbound approach along the existing west driveway is anticipated to operate at LoS "F" during the school morning peak hour. The 95th percentile queue during the school morning peak hour is calculated to be 4.8 vehicles.
- The southbound left-turn movement from the existing east driveway onto Ada Drive is anticipated to operate at LoS "F" and LoS "E" during the school morning and afternoon peak hours, respectively. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 4.8 and 2.6 vehicles, respectively.

The future (2025) conditions analyses show that the left-turn movements from the existing school driveways and the northbound movements from Fox Hollow Avenue onto Ada Drive will experience some delay and queuing during the morning and afternoon peak hours. This can be expected due to the typical pickup/dropoff operations at school sites and the concentrated traffic volumes surrounding the school start and end times.

Table 5. Existing and Future (2025) Levels of Service and Delay (No Mitigation)

Intersection / Movement	Existing Conditions				Future (2025) Conditions (Without Mitigation)			
	A.M.		P.M.		A.M.		P.M.	
	LoS	Delay(s)	LoS	Delay(s)	LoS	Delay(s)	LoS	Delay(s)
Ada Drive / Fox Hollow Avenue / Existing West Driveway[1]								
EBL	A	8.1	A	7.8	A	8.1	A	7.9
WBL	A	9.3	A	9.3	A	9.8	A	9.6
NB	D	30.6	**E**	**36.5**	**F**	**98.3**	**F**	**80**
SB	C	19	C	15	**F**	**54.1**	D	25.2
Ada Drive / Existing East Driveway[1]								
EBL	A	9.1	A	9.1	B	10.4	A	8.8
SBL	D	32	D	32	**F**	**172.2**	**E**	**44**
SBR	B	12.6	B	12.6	B	14.1	B	12.3

[1]Unsignalized intersection, critical/worst movement(s) shown.
Source: Progressive AE, August 2023

Future (2025) Capacity Analysis (With Mitigation)
On opening day after the completion of the proposed expansion, the traffic volumes within the study area intersections are anticipated to remain relatively the same. However, traffic volumes within the study area will increase as student enrollment increases over the next several years to the anticipated levels in Table 5.

Intersection level of service calculations were completed to evaluate the future (2025) school morning and afternoon peak hour conditions at study area intersections, assuming the proposed improvements to mitigate existing conditions were implemented. Levels of service for the individual movements at all study area intersections for the mitigated conditions are shown in Table 6 and Figure 4. Many of these movements are anticipated to operate acceptably at LoS "C" or better during the school morning and afternoon peak hours, except for the following movements:

- The northbound left-turn movement from Fox Hollow Avenue onto Ada Drive is anticipated to operate at a LoS "F" during the school morning and afternoon peak hours. However, this is a low volume movement and the 95th percentile queues during the school morning and afternoon peak hours are anticipated to decrease to 1.8 and 1.5 vehicles, respectively.

- The southbound approach along the existing west driveway is anticipated to improve and operate at LoS "E" during the school morning peak hour. The 95th percentile queue during the school morning peak hour is calculated to be 4.4 vehicles.

- As with unmitigated conditions, the southbound left-turn movement from the existing east driveway onto Ada Drive is anticipated to continue operating at LoS "F" and LoS "E" during the school morning and afternoon peak hours, respectively.

A comparison of the northbound approach delay at the Ada Drive/Fox Hollow Avenue intersection shows the approach delay will be reduced from LoS "F" with 98.3-seconds of delay to LoS "D" with 29.4-seconds of delay during the morning peak hour. Similarly, the delay will be reduced from LoS "F" with 80-seconds of delay to LoS "D" with 28.0-seconds of delay during the school afternoon peak hour.

Table 6. Existing and Future (2025) Levels of Service and Delay (With Mitigation)

Intersection / Movement	Existing Conditions				Future (2025) Conditions (Without Mitigation)				Future (2025) Conditions (With Mitigation)			
	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)
Ada Drive / Fox Hollow Avenue / Existing West Driveway[1]												
EBL	A	8.1	A	7.8	A	8.1	A	7.9	A	8.1	A	7.9
WBL	A	9.3	A	9.3	A	9.8	A	9.6	A	9.8	A	9.6
NBL	D	30.6	**E**	**36.5**	**F**	**98.3**	**F**	**80.0**	**F**	**117.8**	**F**	**59.5**
NBR									C	19.4	C	23.6
SB	C	19	C	15	**F**	**54.1**	D	25.2	**E**	**47.6**	C	24.8
Ada Drive / Existing East Driveway[1]												
EBL	A	9.1	A	9.1	B	10.4	A	8.8	B	10.4	A	8.8
SBL	D	32	D	32	**F**	**172.2**	**E**	**44**	**F**	**172.2**	**E**	**44**
SBR	B	12.6	B	12.6	B	14.1	B	12.3	B	14.1	B	12.1

[1]Unsignalized intersection, critical/worst movement(s) shown.
Source: Progressive AE, August 2023

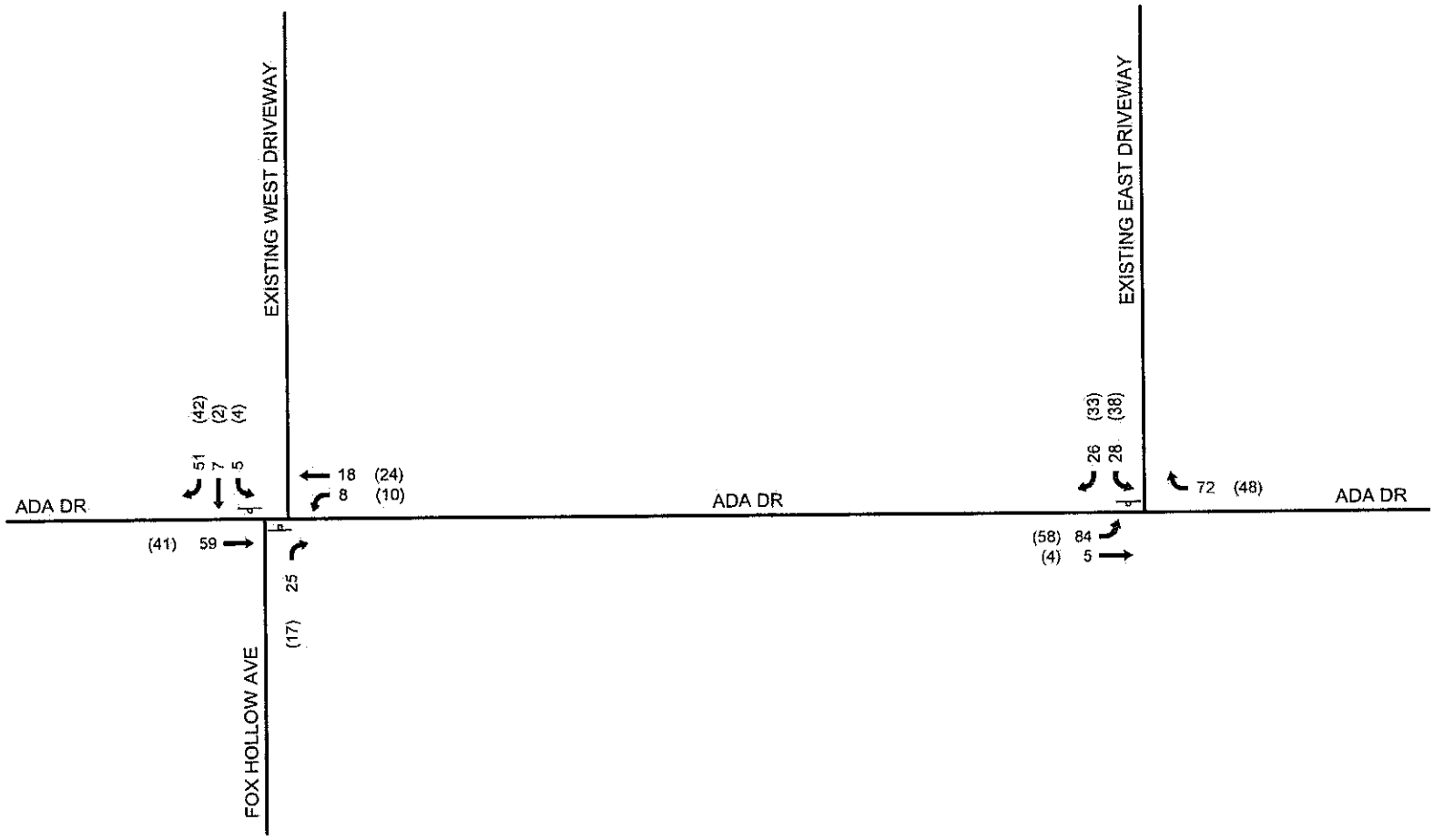
A comparison of calculated queues between the Future (2025) conditions with and without mitigation is provided in Table 7. The analysis shows that the proposed improvements will improve the calculated queues of the critical movements as follows.

- The 95th percentile queues on the northbound left-turn movement are anticipated to decrease from 9.9 to 1.8 vehicles and from 10.2 to 1.8 vehicles during the school morning and afternoon peak hours, respectively.
- The 95th percentile queue on the southbound movement along the existing west driveway is anticipated to decrease from 4.8 to 4.4 vehicles during the school morning peak hour.

Table 7. Existing, Unimproved and Improved Future (2025) 95th Percentile Queues

Intersection / Movement	Existing Conditions		Future (2025) Conditions (Without Mitigation)		Future (2025) Conditions (With Mitigation)	
	A.M. Queue	P.M. Queue	A.M. Queue	P.M. Queue	A.M. Queue	P.M. Queue
Ada Drive / Fox Hollow Avenue / Existing West Driveway						
EBL	0	0	0	0	0	0
WBL	0.7	0.4	0.8	0.5	0.8	0.5
NBL	3.9	5.7	9.9	10.2	1.8	1.5
NBR	3.9	5.7	9.9	10.2	2.6	3.8
SB	0.6	0.4	4.8	1.9	4.4	1.9
Ada Drive / Existing East Driveway						
EBL	0.2	0.1	0.9	0.3	0.9	0.3
SBL	0.5	0.5	4.8	2.6	4.8	2.6
SBR	0.1	0.2	0.5	0.5	0.5	0.5

Source: Progressive AE, August 2023



ST ROBERTS SCHOOL EXPANSION TRAFFIC IMPACT STUDY

LEGEND

XX (XX) = AM (PM) GENERATED TRIPS

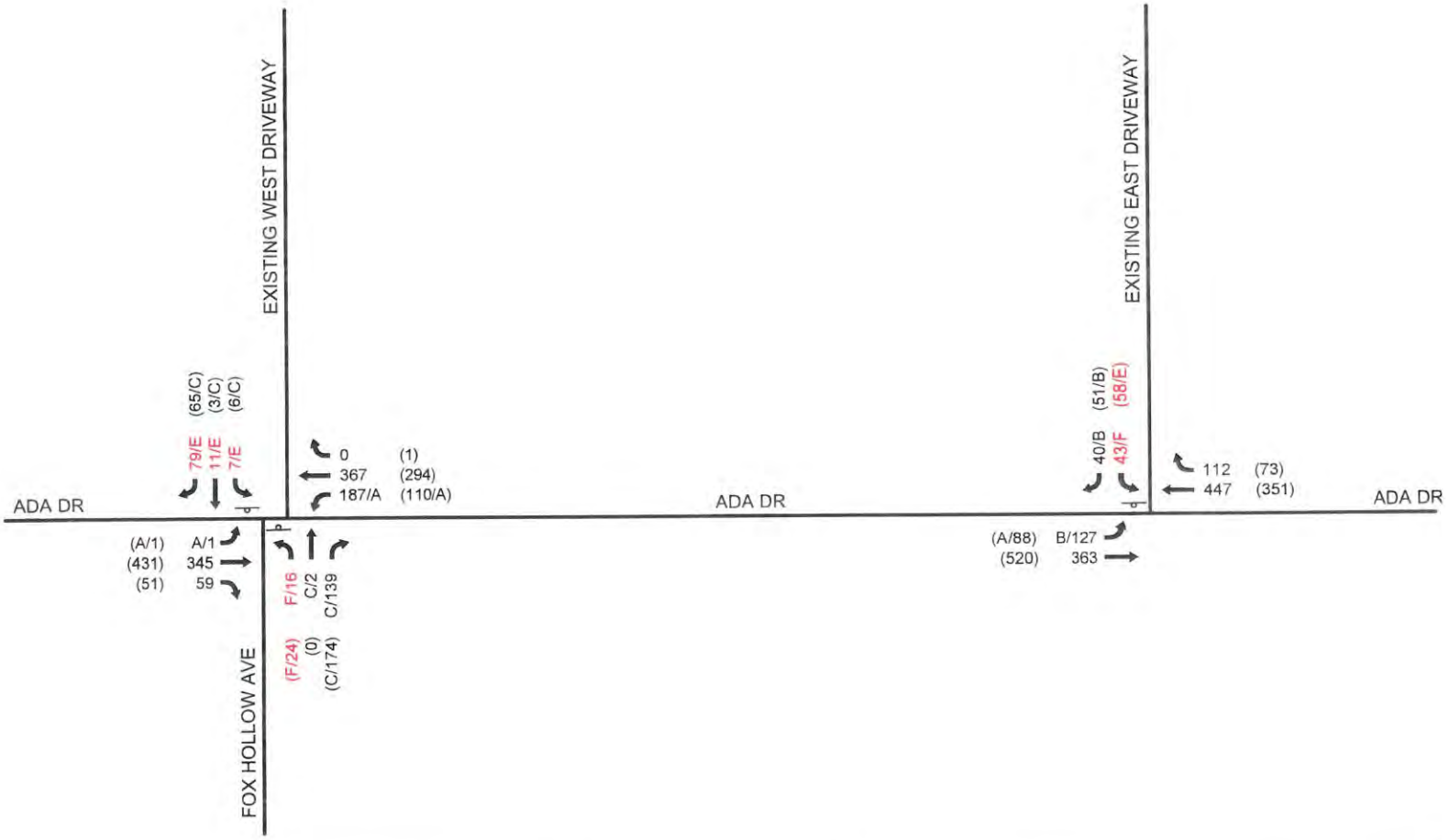
FUTURE (2025) TRIP DISTRIBUTION
+ TRAFFIC ASSIGNMENT

N

No Scale

FIGURE

3



ST ROBERTS SCHOOL EXPANSION TRAFFIC IMPACT STUDY

LEGEND

XX (XX) = AM (PM)
A = LEVEL-OF-SERVICE
(S) = SIGNALIZED INTERSECTION
—p— = STOP-CONTROLLED

FUTURE (2025) PEAK-HOUR VOLUMES
+ LEVELS-OF-SERVICE

N
No Scale

FIGURE
4

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

Based on the analyses performed as part of this study, considering the existing conditions, the proposed school expansion will have minor impacts on the surrounding roadway network. The findings of this study are as follows:

Conclusions

Existing Conditions

The existing conditions analyses show that many of the controlled movements at the study area intersections operate acceptably at LoS "D" or better during the school morning and afternoon peak hours, except for the northbound movement along Fox Hollow Avenue that currently operates at a LoS "E" during the school afternoon peak hour. The 95th percentile queue during the school afternoon peak hour is calculated to be 5.7 vehicles.

A review of the existing crash history at the school driveways to Ada Drive indicated that four crashes occurred within 250-feet of the existing school driveways in the past five years. Three crashes near the west driveway and one crash near the east driveway. Of those four crashes, none occurred during the school peak hours; hence, they do not appear related to the existing school driveway movements.

Future (2025) Conditions

On opening day after the completion of the proposed expansion, the traffic volumes within the study area intersections are anticipated to remain relatively the same. However, traffic volumes within the study area will increase with background traffic growth and as student enrollment increases over the next several years to the anticipated levels.

Assuming no mitigation to the surrounding roadway network to mitigate the existing conditions, the future (2025) conditions analysis results show all controlled movements at the study area intersection are anticipated to operate acceptably at LoS "D" or better during the school morning and afternoon peak hours, except for the following movements:

- The northbound approach along Fox Hollow Avenue is anticipated to operate at a LoS "F" during the school morning and afternoon peak hours. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 9.9 and 10.2 vehicles, respectively.
- The southbound approach along the existing west driveway is anticipated to operate at LoS "F" during the school morning peak hour. The 95th percentile queue during the school morning peak hour is calculated to be 4.8 vehicles.
- The southbound left-turn movement from the existing east driveway onto Ada Drive is anticipated to operate at LoS "F" and LoS "E" during the school morning and afternoon peak hours, respectively. The 95th percentile queues during the school morning and afternoon peak hours are calculated to be 4.8 and 2.6 vehicles, respectively.

Implementing the improvements outlined to mitigate existing conditions results in reduced delay and significantly reduced queuing at the Ada Drive/Fox Hollow Avenue intersection, particularly the northbound approach. A comparison of the northbound approach delay at the Ada Drive/Fox Hollow Avenue intersection shows the approach delay will be reduced from LoS "F" with 98.3-seconds of delay to LoS "D" with 29.4-seconds of delay during the morning peak hour. Similarly, the delay will be reduced from LoS "F" with 80-seconds of delay to LoS "D" with 28.0-seconds of delay during the school afternoon peak hour.

While there is expected to be some delay and queuing at the school driveways during pickup/dropoff operations, this is typical of school sites given the concentrated traffic volumes surrounding the school start and end times. These delays are also often short duration, typically 15 – 30-minutes.

Recommendations
The following recommendations would be made to improve operations within the study area once the school expansion is complete.

Existing Conditions
The existing conditions analysis and site observations revealed poor operations at the Ada Drive/Fox Hollow Avenue intersection, particularly along northbound Fox Hollow Avenue. To improve the safety and operation of the intersection, below are recommended mitigation measures that should be considered regardless of the school expansion.

- A short left-turn lane should be included on the northbound approach from Fox Hollow Avenue to Ada Drive to allow right-turning vehicles to bypass a vehicle waiting to turn left. The left-turn lane should accommodate up to two queued vehicles (50-feet). This turn lane could be developed with pavement markings should the existing pavement width allow. Minor widening on the west side of Fox Hollow Avenue may be necessary to provide adequate lane widths and lane tapers. As an alternative, minor pavement widening on the east side of the roadway would also allow right-turn vehicles to bypass queued left-turning vehicles.
- Construction of a separate westbound left-turn lane from Ada Drive to Fox Hollow Avenue should be considered based on the existing volume of westbound left-turn movements.

Given the significant concentration of schools, growth of Ada Village, and several new residential developments in the area, future capacity and operational improvements should be explored for the Ada Drive corridor. Some options to consider include:

- A continuous center turn lane through the corridor.
- Implementing travel demand management strategies, such as staggered start/dismissal times for schools and/or encouraging ridesharing and carpooling.
- Periodic review of volume and crash data at key intersections.

Future (2025) Conditions
For analysis purposes, this study used a maximum traffic approach for 2025 that presumed full enrollment for the school expansion. The more realistic expectation is that the school will gradually increase its enrollment over several years, reaching capacity in 2029-2030. As the school enrollment increases over the years to full capacity, the operation of the existing driveways slowly deteriorates to LoS "F" due to high traffic volumes during school peak hours. Below are recommended improvements to the existing school driveways to provide a reasonable traffic flow to/from the school.

- The southbound approach to the Ada Drive/East Driveway intersection provides adequate width for one entry lane and two exit lanes. A review of the existing operation at the intersection shows the exit approach currently operates as two lanes. Adding pavement markings to the approach to clearly define two exit lanes, a right-turn and left-turn lane, is recommended.
- No additional improvements are recommended along Ada Drive as the existing eastbound left-turn lane and westbound right-turn taper will adequately serve the anticipated school traffic volumes.
- Vehicular delays, queuing, and safety at the existing school driveways should be monitored as school enrollment increases. Should significant delays, queuing, or safety issues develop at the existing driveways, additional mitigation may be required. These mitigation measures may include revising existing site circulation.

Technical Appendix

St Roberts School Expansion TIS

- Level of Service Definitions
- Glossary
- Site Plan
- Traffic Count Data
- Synchro Analyses Results

Level of Service Definitions
Signalized Intersections

Level of Service A: Describes operations with very low average stopped delay, i.e., less than 10.0 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of Service B: Describes operations with an average stopped delay in the range of 10.0 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level of Service C: Describes operations with an average stopped delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of Service D: Describes operations with an average stopped delay in the range of 35.1 to 55.0 seconds per vehicle. At Level of Service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c (volume/capacity) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E: Describes operations with an average stopped delay in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay in many cases. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.

Level of Service F: Describes operations with an average stopped delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Level of Service Definitions
Unsignalized Intersections

Level of Service A:	Average delay per vehicles for impeded movements is less than 10 seconds. There is little or no delay with typically low side street and/or main street traffic.
Level of Service B:	Average stopped delays from 10.1 seconds to 15.0 seconds. Short delays, many acceptable gaps in main street traffic stream.
Level of Service C:	Average delay per vehicle ranges from 15.1 to 25.0 seconds. Average traffic delays with frequent gaps in main street traffic.
Level of Service D:	Average delays from 25.1 to 35.0 seconds for impeded movements. Long traffic delays for impeded movements due in part to a limited number of acceptable gaps.
Level of Service E:	Average delays in the 35.1 to 50.0 second range. May experience very long delays for impeded movements with a very small number of acceptable gaps in the traffic stream.
Level of Service F:	Average vehicle delays of over 50.0 seconds. Extreme traffic delays with virtually no acceptable gaps in main street traffic.

Glossary

Approach: A set of lanes accommodating all left-turn, through, and right-turn movements arriving at an intersection from a given direction.

Arterial: Signalized streets that serve primarily through traffic and provide access to abutting properties as a secondary function.

Average Stopped Delay: The total time vehicles are stopped in an intersection approach or lane group during a specified time interval divided by the volume departing from the approach or lane group during the same time period, in seconds per vehicle.

Background Traffic: Traffic volumes that will be on the roadway network without the presence of the proposed development.

Bypass Lane: A one-lane widening on a two-lane roadway that allows through traffic to pass by waiting left-turn traffic.

Capacity: The maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions; usually expressed as vehicles per hour or persons per hour.

Conflicting Traffic Volume: The volume of traffic which conflicts with a specific movement at an intersection.

Corridor: A lineal study area aligned with a roadway facility in which traffic, land use, right-of-way, environmental, and other factors are evaluated to determine future transportation facility needs.

Cycle: Any complete sequence of traffic signal indications.

Cycle Length: The total time for a traffic signal to complete one cycle.

Design Hour Volume: The traffic volume for the design hour, usually a forecast of the relevant peak hour volume, in vehicles per hour.

Diverted Linked Trips: Trips from the traffic volume on roadways within the vicinity of the generator but which requires a diversion from that roadway to another roadway to gain access to the site.

Driveway Offset: Distance between driveways on opposite sides of a roadway, measured parallel to roadway.

Freeway: A multi-lane divided highway having a minimum of two lanes for exclusive use of traffic in each direction and full control of access and egress.

Gaps (Critical Gap): The median time headway between vehicles in a major traffic stream which will permit side-street vehicles to cross through or merge with the major traffic stream.

Green Time: The actual length of the "green" indication for a given movement at a signalized intersection.

Level of Service: A qualitative measure describing operational conditions within a traffic stream; generally described in terms of such factors as speed and travel time, delay, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Operational Analysis: A use of capacity analysis to determine the prevailing level of service on an existing or projected facility, with known or projected traffic, roadway, and control conditions. This analysis can involve a particular location, such as an intersection or a corridor.

Pass-by Trips: Trips made as intermediate stops on the way from an origin to a primary trip destination.

Peak Hour (AM): The one hour period in the morning representing the highest hourly volume of traffic flow on the adjacent public street system.

Peak Hour (PM): The one hour period in the afternoon or evening representing the highest hourly volume of traffic flow on the adjacent public street system.

Peak Hour Factor: The hourly volume during the maximum volume hour of the day divided by four times the peak 15-minute flow within the peak hour; a measure of traffic demand fluctuation within the peak hour.

Phase: The part of the signal cycle allocated to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

Roadway Conditions: Geometric characteristics of a street or highway, including the type of facility, number and width of lanes (by direction), shoulder widths and lateral clearances, design speed, etc.

Service Drive: A roadway (usually private) that provides internal access to two or more uses.

Site Traffic: Existing or projected vehicular traffic generated by the development.

Study Area: The geographic area containing site access points and critical intersections (and connecting highway segments) which are impacted by the site-traffic generated by the development, and should be evaluated.

System Improvements: Added lanes, signal improvements, and other roadway improvements not considered site-related improvements.

Traffic Impact: The adverse impact on intersection Level of Service and/or street and highway safety and operations as determined by the criteria and procedures set forth in this handbook.

Trip (Directional Trip): A single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside a study site.

Trip Distribution: The distribution or assignment of site traffic into site driveways and study area roadways/intersections based upon expected direction of approach and departure.

Unsignalized Intersection: Any intersection not controlled by traffic signals.

Volume: The number of persons or vehicles passing a point on a lane or roadway during some time interval, such as one hour or during an average day.

Volume-to-Capacity Ratio (V/C): The ratio of demand flow rate to capacity for a traffic facility.

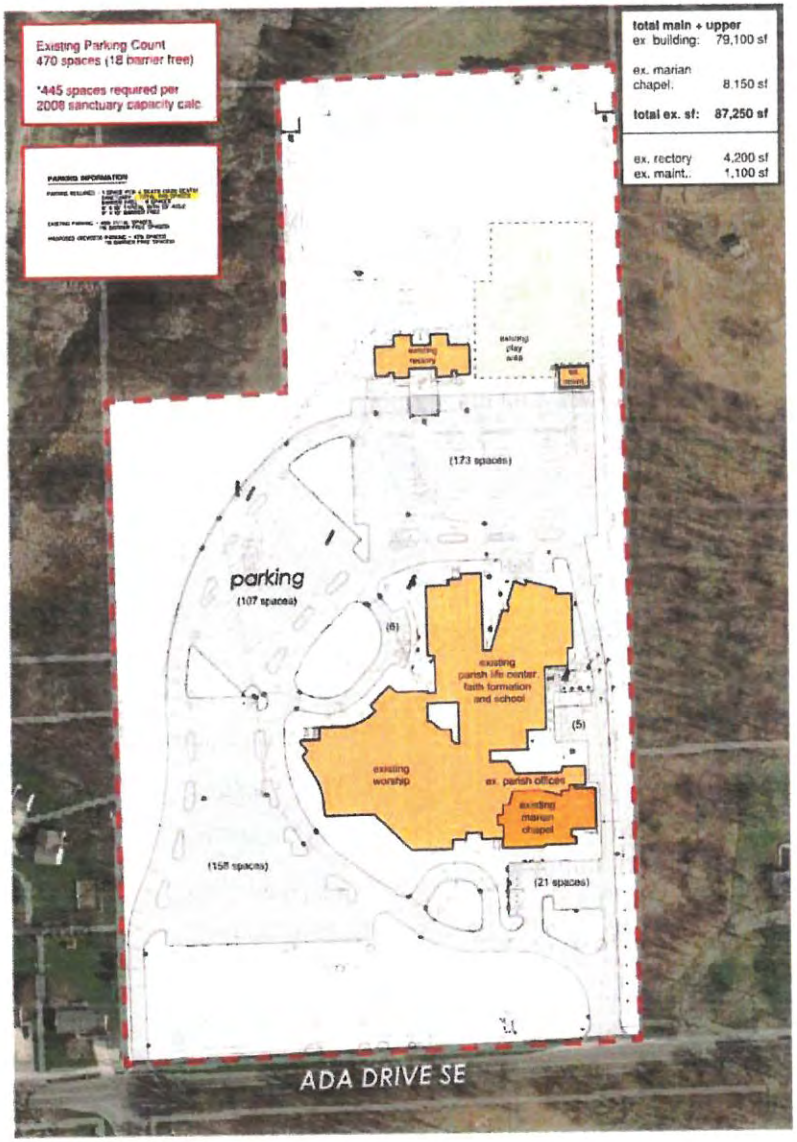
Site Plan

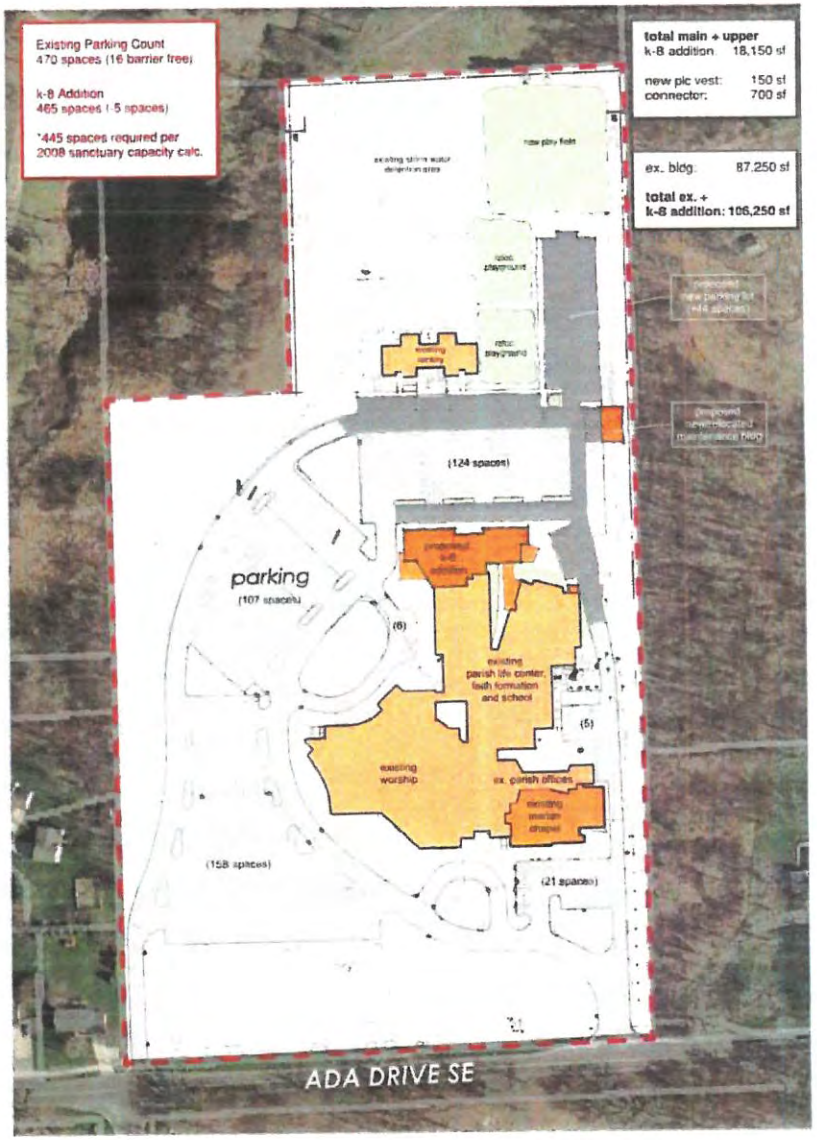
ST. ROBERT CATHOLIC SCHOOL

site plan

existing

proposed





AMDG ARCHITECTS

Traffic Count Data

progressive AE

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Ada Dr SE & W Driveway
Site Code:
Start Date: 08/24/2023

Turning Movement Data

Start Time	Ada Dr SE Eastbound					Ada Dr SE Westbound					Fox Hollow Ave Northbound					W Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:00 AM	2	24	4	0	30	7	22	0	0	29	2	0	1	0	3	0	0	0	0	0	62
7:15 AM	0	39	21	0	60	51	74	0	0	125	0	0	9	0	9	0	0	1	0	1	195
7:30 AM	0	85	19	2	104	58	77	0	0	135	4	1	31	0	36	1	0	0	3	1	276
7:45 AM	0	118	17	2	135	55	91	0	0	146	12	1	59	0	72	1	1	23	1	25	378
Hourly Total	2	266	61	4	329	171	264	0	0	435	18	2	100	0	120	2	1	24	4	27	911
8:00 AM	1	40	1	0	42	12	102	0	0	114	0	0	13	0	13	0	3	4	2	7	176
8:15 AM	1	54	2	0	57	8	52	0	0	60	2	0	10	0	12	0	1	0	1	1	130
8:30 AM	3	58	7	0	68	14	82	1	0	97	1	1	8	0	10	0	1	1	4	2	177
8:45 AM	10	39	3	1	52	19	55	0	0	74	2	4	3	0	9	0	0	0	0	0	135
Hourly Total	15	191	13	1	219	53	291	1	0	345	5	5	34	0	44	0	5	5	7	10	618
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	2	31	2	0	35	11	43	0	0	54	3	0	6	0	9	0	0	0	0	0	98
2:15 PM	1	35	0	0	36	10	44	0	0	54	2	0	9	0	11	0	0	1	4	1	102
2:30 PM	1	52	9	0	62	24	68	1	0	93	1	0	12	1	13	0	0	0	0	0	168
2:45 PM	0	139	22	0	161	43	48	0	0	91	3	0	50	0	53	0	0	3	2	3	308
Hourly Total	4	257	33	0	294	88	203	1	0	292	9	0	77	1	86	0	0	4	6	4	676
3:00 PM	0	116	17	0	133	21	62	0	0	83	12	0	58	0	70	0	1	16	0	17	303
3:15 PM	0	77	2	0	79	11	88	0	0	99	8	0	35	0	43	2	0	4	0	6	227
3:30 PM	0	65	1	0	66	5	66	0	0	71	9	1	15	0	25	0	0	2	0	2	164
3:45 PM	3	59	2	0	64	12	111	0	0	123	6	0	13	0	19	1	0	2	0	3	209
Hourly Total	3	317	22	0	342	49	327	0	0	376	35	1	121	0	157	3	1	24	0	28	903
4:00 PM	0	53	1	0	54	8	50	0	0	58	6	0	8	0	14	0	0	4	0	4	130
4:15 PM	0	48	4	0	52	13	36	0	0	49	2	0	15	0	17	0	0	2	1	2	118
4:30 PM	0	52	1	0	53	10	37	0	0	47	4	0	10	0	14	0	1	2	1	3	117
4:45 PM	1	61	3	0	65	12	52	0	0	64	2	0	26	0	28	0	0	0	0	0	157
Hourly Total	1	212	9	0	222	43	175	0	0	218	14	0	59	0	73	0	1	8	2	9	522
5:00 PM	4	69	3	0	76	7	76	0	0	83	7	0	22	0	29	1	0	3	2	4	192
5:15 PM	2	59	1	0	62	7	55	0	0	62	1	1	21	0	23	0	0	2	0	2	149
5:30 PM	2	65	5	0	72	4	47	0	0	51	6	0	16	0	22	1	0	1	0	2	147
5:45 PM	0	50	1	0	51	5	34	0	0	39	2	0	11	0	13	0	0	0	0	0	103
Hourly Total	8	243	10	0	261	23	212	0	0	235	16	1	70	0	87	2	0	6	2	8	591
Grand Total	33	1486	148	5	1667	427	1472	2	0	1901	97	9	461	1	567	7	8	71	21	86	4221
Approach %	2.0	89.1	8.9	-	-	22.5	77.4	0.1	-	-	17.1	1.6	81.3	-	-	8.1	9.3	82.6	-	-	-
Total %	0.8	35.2	3.5	-	39.5	10.1	34.9	0.0	-	45.0	2.3	0.2	10.9	-	13.4	0.2	0.2	1.7	-	2.0	-
Lights	33	1467	144	-	1644	401	1450	2	-	1853	91	8	444	-	543	7	8	71	-	86	4126
% Lights	100.0	98.7	97.3	-	98.6	93.9	98.5	100.0	-	97.5	93.8	88.9	96.3	-	95.8	100.0	100.0	100.0	-	100.0	97.7
Mediums	0	18	4	-	22	26	22	0	-	48	4	1	17	-	22	0	0	0	-	0	92
% Mediums	0.0	1.2	2.7	-	1.3	6.1	1.5	0.0	-	2.5	4.1	11.1	3.7	-	3.9	0.0	0.0	0.0	-	0.0	2.2
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	2	0	0	-	2	0	0	0	-	0	3
% Articulated Trucks	0.0	0.1	0.0	-	0.1	0.0	0.0	0.0	-	0.0	2.1	0.0	0.0	-	0.4	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	1	-	-	-	-	21	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

progressive AE

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Ada Dr SE & W Driveway
Site Code:
Start Date: 08/24/2023

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Ada Dr SE Eastbound					Ada Dr SE Westbound					Fox Hollow Ave Northbound					W Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
7:15 AM	0	39	21	0	60	51	74	0	0	125	0	0	9	0	9	0	0	1	0	1	195
7:30 AM	0	85	19	3	104	58	77	0	0	135	4	1	31	0	36	1	0	0	3	1	276
7:45 AM	0	118	17	2	135	55	91	0	0	146	12	1	59	0	72	1	1	23	1	25	378
8:00 AM	1	40	1	0	42	12	102	0	0	114	0	0	13	0	13	0	3	4	2	7	176
Total	1	282	58	4	341	176	344	0	0	520	16	2	112	0	130	2	4	28	6	34	1025
Approach %	0.3	82.7	17.0	-	-	33.8	66.2	0.0	-	-	12.3	1.5	86.2	-	-	5.9	11.8	82.4	-	-	-
Total %	0.1	27.5	5.7	-	33.3	17.2	33.6	0.0	-	50.7	1.6	0.2	10.9	-	12.7	0.2	0.4	2.7	-	3.3	-
PHF	0.250	0.597	0.690	-	0.631	0.759	0.843	0.000	-	0.890	0.333	0.500	0.475	-	0.451	0.500	0.333	0.304	-	0.340	0.678
Lights	1	280	58	-	339	170	339	0	-	509	15	1	108	-	124	2	4	28	-	34	1006
% Lights	100.0	99.3	100.0	-	99.4	96.6	98.5	-	-	97.9	93.8	50.0	96.4	-	95.4	100.0	100.0	100.0	-	100.0	98.1
Mediums	0	2	0	-	2	6	5	0	-	11	1	1	4	-	6	0	0	0	-	0	19
% Mediums	0.0	0.7	0.0	-	0.6	3.4	1.5	-	-	2.1	6.3	50.0	3.6	-	4.6	0.0	0.0	0.0	-	0.0	1.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	4	-	-	-	-	0	-	-	-	-	0	-	-	-	-	6	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (2:30 PM)

Start Time	Ada Dr SE Eastbound					Ada Dr SE Westbound					Fox Hollow Ave Northbound					W Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
2:30 PM	1	52	9	0	62	24	68	1	0	93	1	0	12	1	13	0	0	0	0	0	168
2:45 PM	0	139	22	0	161	43	48	0	0	91	3	0	50	0	53	0	0	3	2	3	308
3:00 PM	0	116	17	0	133	21	62	0	0	83	12	0	58	0	70	0	1	16	0	17	303
3:15 PM	0	77	2	0	79	11	88	0	0	99	8	0	35	0	43	2	0	4	0	6	227
Total	1	384	50	0	435	99	266	1	0	366	24	0	155	1	179	2	1	23	2	26	1006
Approach %	0.2	88.3	11.5	-	-	27.0	72.7	0.3	-	-	13.4	0.0	86.6	-	-	7.7	3.8	88.5	-	-	-
Total %	0.1	38.2	5.0	-	43.2	9.8	26.4	0.1	-	36.4	2.4	0.0	15.4	-	17.8	0.2	0.1	2.3	-	2.6	-
PHF	0.250	0.691	0.568	-	0.675	0.576	0.756	0.250	-	0.924	0.500	0.000	0.668	-	0.639	0.250	0.250	0.359	-	0.382	0.817
Lights	1	380	49	-	430	99	264	1	-	364	23	0	147	-	170	2	1	23	-	26	990
% Lights	100.0	99.0	98.0	-	98.9	100.0	99.2	100.0	-	99.5	95.8	-	94.8	-	95.0	100.0	100.0	100.0	-	100.0	98.4
Mediums	0	4	1	-	5	0	2	0	-	2	1	0	8	-	9	0	0	0	-	0	16
% Mediums	0.0	1.0	2.0	-	1.1	0.0	0.8	0.0	-	0.5	4.2	-	5.2	-	5.0	0.0	0.0	0.0	-	0.0	1.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Ada Dr SE Eastbound					Ada Dr SE Westbound					Fox Hollow Ave Northbound					W Driveway Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
4:45 PM	1	61	3	0	65	12	52	0	0	64	2	0	26	0	28	0	0	0	0	0	157
5:00 PM	4	69	3	0	76	7	76	0	0	83	7	0	22	0	29	1	0	3	2	4	192
5:15 PM	2	59	1	0	62	7	55	0	0	62	1	1	21	0	23	0	0	2	0	2	149
5:30 PM	2	65	5	0	72	4	47	0	0	51	6	0	16	0	22	1	0	1	0	2	147
Total	9	254	12	0	275	30	230	0	0	260	16	1	85	0	102	2	0	6	2	8	645
Approach %	3.3	92.4	4.4	-	-	11.5	88.5	0.0	-	-	15.7	1.0	83.3	-	-	25.0	0.0	75.0	-	-	-
Total %	1.4	39.4	1.9	-	42.6	4.7	35.7	0.0	-	40.3	2.5	0.2	13.2	-	15.8	0.3	0.0	0.9	-	1.2	-
PHF	0.563	0.920	0.600	-	0.905	0.625	0.757	0.000	-	0.783	0.571	0.250	0.817	-	0.879	0.500	0.000	0.500	-	0.500	0.840
Lights	9	253	12	-	274	25	229	0	-	254	15	1	85	-	101	2	0	6	-	8	637
% Lights	100.0	99.6	100.0	-	99.6	83.3	99.6	-	-	97.7	93.8	100.0	100.0	-	99.0	100.0	-	100.0	-	100.0	98.8
Mediums	0	1	0	-	1	5	1	0	-	6	0	0	0	-	0	0	0	0	-	0	7
% Mediums	0.0	0.4	0.0	-	0.4	16.7	0.4	-	-	2.3	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	0.0	1.1
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	6.3	0.0	0.0	-	1.0	0.0	-	0.0	-	0.0	0.2
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

progressive AE

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Ada Dr SE & E Driveway
Site Code:
Start Date: 08/24/2023

Turning Movement Data

Start Time	Ada Dr SE Eastbound				Ada Dr SE Westbound					E Driveway Southbound				
	Left	Thru	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:00 AM	2	22	0	24	0	29	1	0	30	0	0	2	0	54
7:15 AM	2	44	0	46	0	79	5	0	84	0	0	0	0	130
7:30 AM	12	101	0	113	0	117	7	0	124	0	0	2	0	237
7:45 AM	25	158	0	183	0	133	23	0	156	11	11	2	22	361
Hourly Total	41	325	0	366	0	358	36	0	394	11	11	6	22	782
8:00 AM	3	50	0	53	1	111	4	0	116	4	3	2	7	176
8:15 AM	2	61	0	63	0	60	2	0	62	2	0	1	2	127
8:30 AM	3	66	0	69	0	99	3	0	102	0	0	6	0	171
8:45 AM	4	41	0	45	0	71	9	0	80	0	0	0	0	125
Hourly Total	12	218	0	230	1	341	18	0	360	6	3	9	9	599
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:00 PM	1	38	0	39	0	55	0	0	55	2	0	0	2	96
2:15 PM	3	42	0	45	0	52	0	0	52	0	1	0	1	98
2:30 PM	7	53	0	60	0	93	6	0	99	2	1	1	3	162
2:45 PM	19	167	0	186	1	89	13	0	103	0	0	3	0	289
Hourly Total	30	300	0	330	1	289	19	0	309	4	2	4	6	645
3:00 PM	3	171	0	174	0	71	5	0	76	13	14	0	27	277
3:15 PM	1	117	0	118	0	93	1	0	94	5	3	0	8	220
3:30 PM	2	77	0	79	0	72	0	0	72	1	0	0	1	152
3:45 PM	5	68	0	73	1	117	0	0	118	1	5	0	6	197
Hourly Total	11	433	0	444	1	353	6	0	360	20	22	0	42	846
4:00 PM	2	58	0	60	0	56	1	0	57	2	2	0	4	121
4:15 PM	0	62	0	62	0	49	0	0	49	0	0	1	0	111
4:30 PM	0	60	0	60	0	45	1	0	46	0	1	1	1	107
4:45 PM	2	86	0	88	1	64	3	0	68	0	0	0	0	156
Hourly Total	4	266	0	270	1	214	5	0	220	2	3	2	5	495
5:00 PM	0	89	0	89	0	80	0	0	80	2	4	2	6	175
5:15 PM	1	79	0	80	0	61	3	0	64	4	1	0	5	149
5:30 PM	1	81	0	82	0	50	1	0	51	1	1	0	2	135
5:45 PM	1	63	0	64	0	39	0	0	39	2	0	0	2	105
Hourly Total	3	312	0	315	0	230	4	0	234	9	6	2	15	564
Grand Total	101	1854	0	1955	4	1785	88	0	1877	52	47	23	99	3931
Approach %	5.2	94.8	-	-	0.2	95.1	4.7	-	-	52.5	47.5	-	-	-
Total %	2.6	47.2	-	49.7	0.1	45.4	2.2	-	47.7	1.3	1.2	-	2.5	-
Lights	101	1818	-	1919	4	1735	88	-	1827	50	47	-	97	3843
% Lights	100.0	98.1	-	98.2	100.0	97.2	100.0	-	97.3	96.2	100.0	-	98.0	97.8
Mediums	0	35	-	35	0	50	0	-	50	2	0	-	2	87
% Mediums	0.0	1.9	-	1.8	0.0	2.8	0.0	-	2.7	3.8	0.0	-	2.0	2.2
Articulated Trucks	0	1	-	1	0	0	0	-	0	0	0	-	0	1
% Articulated Trucks	0.0	0.1	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	23	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

progressive AE

Progressive AE
1811 4 Mile Rd NE

Grand Rapids, Michigan, United States 49525
(616) 361-2664

Count Name: Ada Dr SE & E Driveway
Site Code:
Start Date: 08/24/2023

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Ada Dr SE Eastbound				Ada Dr SE Westbound					E Driveway Southbound				
	Left	Thru	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
7:15 AM	2	44	0	46	0	79	5	0	84	0	0	0	0	130
7:30 AM	12	101	0	113	0	117	7	0	124	0	0	2	0	237
7:45 AM	25	158	0	183	0	133	23	0	156	11	11	2	22	361
8:00 AM	3	50	0	53	1	111	4	0	116	4	3	2	7	176
Total	42	353	0	395	1	440	39	0	480	15	14	6	29	904
Approach %	10.6	89.4	-	-	0.2	91.7	8.1	-	-	51.7	48.3	-	-	-
Total %	4.6	39.0	-	43.7	0.1	48.7	4.3	-	53.1	1.7	1.5	-	3.2	-
PHF	0.420	0.559	-	0.540	0.250	0.827	0.424	-	0.769	0.341	0.318	-	0.330	0.626
Lights	42	348	-	390	1	429	39	-	469	14	14	-	28	887
% Lights	100.0	98.6	-	98.7	100.0	97.5	100.0	-	97.7	93.3	100.0	-	96.6	98.1
Mediums	0	5	-	5	0	11	0	-	11	1	0	-	1	17
% Mediums	0.0	1.4	-	1.3	0.0	2.5	0.0	-	2.3	6.7	0.0	-	3.4	1.9
Articulated Trucks	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (2:30 PM)

Start Time	Ada Dr SE Eastbound				Ada Dr SE Westbound					E Driveway Southbound				
	Left	Thru	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
2:30 PM	7	53	0	60	0	93	6	0	99	2	1	1	3	162
2:45 PM	19	167	0	186	1	89	13	0	103	0	0	3	0	289
3:00 PM	3	171	0	174	0	71	5	0	76	13	14	0	27	277
3:15 PM	1	117	0	118	0	93	1	0	94	5	3	0	8	220
Total	30	508	0	538	1	346	25	0	372	20	18	4	38	948
Approach %	5.6	94.4	-	-	0.3	93.0	6.7	-	-	52.6	47.4	-	-	-
Total %	3.2	53.6	-	56.8	0.1	36.5	2.6	-	39.2	2.1	1.9	-	4.0	-
PHF	0.395	0.743	-	0.723	0.250	0.930	0.481	-	0.903	0.385	0.321	-	0.352	0.820
Lights	30	497	-	527	1	344	25	-	370	20	18	-	38	935
% Lights	100.0	97.8	-	98.0	100.0	99.4	100.0	-	99.5	100.0	100.0	-	100.0	98.6
Mediums	0	11	-	11	0	2	0	-	2	0	0	-	0	13
% Mediums	0.0	2.2	-	2.0	0.0	0.6	0.0	-	0.5	0.0	0.0	-	0.0	1.4
Articulated Trucks	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Ada Dr SE Eastbound				Ada Dr SE Westbound					E Driveway Southbound				
	Left	Thru	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
4:45 PM	2	86	0	88	1	64	3	0	68	0	0	0	0	156
5:00 PM	0	89	0	89	0	80	0	0	80	2	4	2	6	175
5:15 PM	1	79	0	80	0	61	3	0	64	4	1	0	5	149
5:30 PM	1	81	0	82	0	50	1	0	51	1	1	0	2	135
Total	4	335	0	339	1	255	7	0	263	7	6	2	13	615
Approach %	1.2	98.8	-	-	0.4	97.0	2.7	-	-	53.8	46.2	-	-	-
Total %	0.7	54.5	-	55.1	0.2	41.5	1.1	-	42.8	1.1	1.0	-	2.1	-
PHF	0.500	0.941	-	0.952	0.250	0.797	0.583	-	0.822	0.438	0.375	-	0.542	0.879
Lights	4	334	-	338	1	249	7	-	257	7	6	-	13	608
% Lights	100.0	99.7	-	99.7	100.0	97.6	100.0	-	97.7	100.0	100.0	-	100.0	98.9
Mediums	0	1	-	1	0	6	0	-	6	0	0	-	0	7
% Mediums	0.0	0.3	-	0.3	0.0	2.4	0.0	-	2.3	0.0	0.0	-	0.0	1.1
Articulated Trucks	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	0	-	-	-	-	0	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Synchro Analysis Results

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	282	58	176	344	0	16	2	112	2	4	28
Future Vol, veh/h	1	282	58	176	344	0	16	2	112	2	4	28
Conflicting Peds, #/hr	6	0	0	0	0	6	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	89	89	89	60	60	60	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	448	92	198	387	0	27	3	187	3	7	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	393	0	0	540	0	0	1312	1287	494	1382	1333	397
Stage 1	-	-	-	-	-	-	498	498	-	789	789	-
Stage 2	-	-	-	-	-	-	814	789	-	593	544	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1177	-	-	1039	-	-	137	166	579	122	155	657
Stage 1	-	-	-	-	-	-	558	548	-	387	405	-
Stage 2	-	-	-	-	-	-	375	405	-	496	522	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1170	-	-	1039	-	-	99	125	579	65	116	651
Mov Cap-2 Maneuver	-	-	-	-	-	-	99	125	-	65	116	-
Stage 1	-	-	-	-	-	-	557	547	-	384	305	-
Stage 2	-	-	-	-	-	-	257	305	-	333	521	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.1	30.6	19
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	350	1170	-	-	1039	-	-	314
HCM Lane V/C Ratio	0.619	0.001	-	-	0.19	-	-	0.18
HCM Control Delay (s)	30.6	8.1	0	-	9.3	0	-	19
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	3.9	0	-	-	0.7	-	-	0.6

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	353	440	39	15	14
Future Vol, veh/h	42	353	440	39	15	14
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	77	77	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	70	588	571	51	25	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	628	0	-	0	1331	603
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	728	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	964	-	-	-	172	503
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	958	-	-	-	158	500
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	507	-
Stage 2	-	-	-	-	479	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	22.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	958	-	-	-	158	500
HCM Lane V/C Ratio	0.073	-	-	-	0.158	0.047
HCM Control Delay (s)	9.1	-	-	-	32	12.6
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	0.1

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	384	50	99	266	1	24	0	155	2	1	23
Future Vol, veh/h	1	384	50	99	266	1	24	0	155	2	1	23
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	92	92	92	64	64	64	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	6	0	0	0	0	0
Mvmt Flow	1	565	74	108	289	1	38	0	242	3	2	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	640	0	0	1131	1113	603	1233	1150	292
Stage 1	-	-	-	-	-	-	605	605	-	508	508	-
Stage 2	-	-	-	-	-	-	526	508	-	725	642	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1281	-	-	954	-	-	177	210	503	155	200	752
Stage 1	-	-	-	-	-	-	478	491	-	551	542	-
Stage 2	-	-	-	-	-	-	528	542	-	420	472	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	953	-	-	149	181	503	72	172	751
Mov Cap-2 Maneuver	-	-	-	-	-	-	149	181	-	72	172	-
Stage 1	-	-	-	-	-	-	477	490	-	549	468	-
Stage 2	-	-	-	-	-	-	432	468	-	218	471	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.5	36.5	15
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	381	1279	-	-	953	-	-	405
HCM Lane V/C Ratio	0.734	0.001	-	-	0.113	-	-	0.107
HCM Control Delay (s)	36.5	7.8	0	-	9.3	0	-	15
HCM Lane LOS	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	5.7	0	-	-	0.4	-	-	0.4

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	508	346	25	20	18
Future Vol, veh/h	30	508	346	25	20	18
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	82	82	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	32	535	422	30	33	30

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	456	0	-	0	1040	441
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1115	-	-	-	257	621
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1111	-	-	-	247	619
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	551	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1111	-	-	-	247	619
HCM Lane V/C Ratio	0.028	-	-	-	0.135	0.048
HCM Control Delay (s)	8.3	-	-	-	21.8	11.1
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	21.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	345	59	187	367	0	16	2	139	7	11	79
Future Vol, veh/h	1	345	59	187	367	0	16	2	139	7	11	79
Conflicting Peds, #/hr	6	0	0	0	0	6	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	89	89	89	60	60	60	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	548	94	210	412	0	27	3	232	12	18	132

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	418	0	0	642	0	0	1510	1437	595	1555	1484	422
Stage 1	-	-	-	-	-	-	599	599	-	838	838	-
Stage 2	-	-	-	-	-	-	911	838	-	717	646	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1152	-	-	952	-	-	100	135	508	93	126	636
Stage 1	-	-	-	-	-	-	492	494	-	364	384	-
Stage 2	-	-	-	-	-	-	331	384	-	424	470	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1145	-	-	952	-	-	52	96	508	38	89	630
Mov Cap-2 Maneuver	-	-	-	-	-	-	52	96	-	38	89	-
Stage 1	-	-	-	-	-	-	491	493	-	361	273	-
Stage 2	-	-	-	-	-	-	174	273	-	228	469	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.3	98.3	54.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	261	1145	-	-	952	-	-	224
HCM Lane V/C Ratio	1.003	0.001	-	-	0.221	-	-	0.722
HCM Control Delay (s)	98.3	8.1	0	-	9.8	0	-	54.1
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	9.9	0	-	-	0.8	-	-	4.8

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	127	363	447	112	43	40
Future Vol, veh/h	127	363	447	112	43	40
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	77	77	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	212	605	581	145	72	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	732	0	-	0	1689	660
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	1029	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	882	-	-	-	104	467
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	348	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	877	-	-	-	78	464
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	346	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	96
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	877	-	-	-	78	464
HCM Lane V/C Ratio	0.241	-	-	-	0.919	0.144
HCM Control Delay (s)	10.4	-	-	-	172.2	14.1
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.9	-	-	-	4.8	0.5

Intersection	
Int Delay, s/veh	18.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	431	51	110	294	1	24	0	174	6	3	65
Future Vol, veh/h	1	431	51	110	294	1	24	0	174	6	3	65
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	92	92	92	64	64	64	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	6	0	0	0	0	0
Mvmt Flow	1	634	75	120	320	1	38	0	272	10	5	108

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	323	0	0	710	0	0	1292	1238	673	1373	1275	323
Stage 1	-	-	-	-	-	-	675	675	-	563	563	-
Stage 2	-	-	-	-	-	-	617	563	-	810	712	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1248	-	-	899	-	-	137	177	459	124	168	723
Stage 1	-	-	-	-	-	-	437	456	-	514	512	-
Stage 2	-	-	-	-	-	-	471	512	-	377	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1246	-	-	898	-	-	99	148	459	44	140	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	99	148	-	44	140	-
Stage 1	-	-	-	-	-	-	436	455	-	512	428	-
Stage 2	-	-	-	-	-	-	331	428	-	154	438	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	80	25.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	319	1246	-	-	898	-	-	299
HCM Lane V/C Ratio	0.97	0.001	-	-	0.133	-	-	0.412
HCM Control Delay (s)	80	7.9	0	-	9.6	0	-	25.2
HCM Lane LOS	F	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	10.2	0	-	-	0.5	-	-	1.9

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	88	520	351	73	58	51
Future Vol, veh/h	88	520	351	73	58	51
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	82	82	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	93	547	428	89	97	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	521	0	-	0	1210	477
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	733	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1056	-	-	-	204	592
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1052	-	-	-	185	590
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	29.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1052	-	-	-	185	590
HCM Lane V/C Ratio	0.088	-	-	-	0.523	0.144
HCM Control Delay (s)	8.8	-	-	-	44	12.1
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.6	0.5

Intersection	
Int Delay, s/veh	10.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑		↰	↑			↕	
Traffic Vol, veh/h	1	345	59	187	367	0	16	2	139	7	11	79
Future Vol, veh/h	1	345	59	187	367	0	16	2	139	7	11	79
Conflicting Peds, #/hr	6	0	0	0	0	6	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	63	63	63	89	89	89	60	60	60	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	548	94	210	412	0	27	3	232	12	18	132

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	418	0	0	642	0	0	1510	1437	595	1555	1484	422
Stage 1	-	-	-	-	-	-	599	599	-	838	838	-
Stage 2	-	-	-	-	-	-	911	838	-	717	646	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1152	-	-	952	-	-	100	135	508	93	126	636
Stage 1	-	-	-	-	-	-	492	494	-	364	384	-
Stage 2	-	-	-	-	-	-	331	384	-	424	470	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1145	-	-	952	-	-	56	104	508	41	97	630
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	104	-	41	97	-
Stage 1	-	-	-	-	-	-	491	493	-	361	297	-
Stage 2	-	-	-	-	-	-	191	297	-	228	469	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.3	29.4	47.6
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	56	481	1145	-	-	952	-	-	237
HCM Lane V/C Ratio	0.476	0.489	0.001	-	-	0.221	-	-	0.682
HCM Control Delay (s)	117.8	19.4	8.1	0	-	9.8	-	-	47.6
HCM Lane LOS	F	C	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	1.8	2.6	0	-	-	0.8	-	-	4.4

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	127	363	447	112	43	40
Future Vol, veh/h	127	363	447	112	43	40
Conflicting Peds, #/hr	6	0	0	6	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	77	77	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	212	605	581	145	72	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	732	0	-	0	1689	660
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	1029	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	882	-	-	-	104	467
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	348	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	877	-	-	-	78	464
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	346	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	96
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	877	-	-	-	78	464
HCM Lane V/C Ratio	0.241	-	-	-	0.919	0.144
HCM Control Delay (s)	10.4	-	-	-	172.2	14.1
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	0.9	-	-	-	4.8	0.5

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱		↰	↱		↕	
Traffic Vol, veh/h	1	431	51	110	294	1	24	0	174	6	3	65
Future Vol, veh/h	1	431	51	110	294	1	24	0	174	6	3	65
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	92	92	92	64	64	64	60	60	60
Heavy Vehicles, %	0	0	0	0	0	0	6	0	0	0	0	0
Mvmt Flow	1	634	75	120	320	1	38	0	272	10	5	108

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	323	0	0	710	0	0	1292	1238	673	1373	1275	323
Stage 1	-	-	-	-	-	-	675	675	-	563	563	-
Stage 2	-	-	-	-	-	-	617	563	-	810	712	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.16	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.554	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1248	-	-	899	-	-	137	177	459	124	168	723
Stage 1	-	-	-	-	-	-	437	456	-	514	512	-
Stage 2	-	-	-	-	-	-	471	512	-	377	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1246	-	-	898	-	-	102	153	459	45	145	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	102	153	-	45	145	-
Stage 1	-	-	-	-	-	-	436	455	-	512	442	-
Stage 2	-	-	-	-	-	-	343	442	-	154	438	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	28	24.8
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	102	459	1246	-	-	898	-	-	303
HCM Lane V/C Ratio	0.368	0.592	0.001	-	-	0.133	-	-	0.407
HCM Control Delay (s)	59.5	23.6	7.9	0	-	9.6	-	-	24.8
HCM Lane LOS	F	C	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	1.5	3.8	0	-	-	0.5	-	-	1.9

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	88	520	351	73	58	51
Future Vol, veh/h	88	520	351	73	58	51
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	75	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	82	82	60	60
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	93	547	428	89	97	85

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	521	0	-	0	1210	477
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	733	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1056	-	-	-	204	592
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1052	-	-	-	185	590
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	29.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1052	-	-	-	185	590
HCM Lane V/C Ratio	0.088	-	-	-	0.523	0.144
HCM Control Delay (s)	8.8	-	-	-	44	12.1
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.3	-	-	-	2.6	0.5

EXHIBIT D

		# of families
18/19	42	
. . .		
22/23	106	70
23/24	130	86 (est.)
24/25	160	106 (est.)
25/26	200	132 (est.)
26/27	245	162 (est.)
27/28	300	198 (est.)
. . .		
32/33	372	246 (est.)

school enrollment

EXHIBIT E

Ada Drive Schools Enrollment Figures

	Ada Elementary	Ada Christian	Ada Vista
# of Enrolled Students	380 (approx.)	556 (approx.)	458 (approx.)

EXHIBIT F

Ada Drive Schools Start and End Times

Ada Elementary

- Start time – 8:45am
- End Time – 3:45pm

Ada Christian

- Start time – 8:00am
- End time – 3:00pm

Ada Vista

- Start time – 8:10am
- End time – 3:10pm

MEMORANDUM

Date: 11.07.23

TO: Ada Township Planning Commission
FROM: Department of Planning
RE: **November 16, 2023 – Site Plan Review – Proposed Front Yard Accessory Building – 8003 Wilderness Trail, Parcel No. 41-15-23-351-018, Doug Tower/Nathan Vandenbroek**

Request Overview

The applicant seeks approval for construction of an accessory building in the front yard of the subject property located at 8003 Wilderness Trail. The proposed accessory structure will contain about 1,440 square feet on the +/- 3.175 acre property; the structure's proposed dimensions are approximately 22.5 x 66 feet.

Analysis

Project Details

The proposed accessory structure will be located southwest of the principle structure (home) on the property and will match the existing home. The home is located about 112 feet from the front property line, whereas the proposed accessory structure will be placed about 50 feet from the front lot line (along Wilderness Trail), and about 50 feet from the side lot line (along Honey Creek). Existing trees along both road frontages, combined with the curvature of Wilderness Trail, should help to minimize the visual impact of the accessory building from adjacent views; a condition of approval is included regarding the trees.

As the Planning Commission will recall, the Zoning Ordinance was recently amended to require all front yard accessory structures to obtain Planning Commission approval. Those accessory structures that match the home appearance are required to obtain Site Plan approval, while those that do not match the home appearance require the additional step of obtaining Special Use approval.

Review Criteria

Section 78-525 of the Zoning Ordinance identifies the following standards applicable to Planning Commission site plan review:

(1) Ingress and egress to property and proposed structures thereon with particular reference to motor vehicle and pedestrian safety and convenience, traffic flow and control and access in cases of fire or emergency.
(2) Off-street parking and loading areas with particular attention to noise, glare and odor effects of each use in the plan on adjoining properties and properties in the proposed development.
(3) Sewer, water, and storm drainage.
(4) Screening and buffering with reference to type, dimensions and character.
(5) Signs, if any, and their proposed lighting relative to glare, traffic safety, economic effect, and compatibility and harmony with adjoining properties.
(6) Required yards.
(7) General compatibility with adjacent properties.

(8) The general purposes and spirit of this chapter and the comprehensive plan of the township.

Staff believes that the proposed use complies with these standards.

Conclusion & Recommendation

Given the applicable standards for site plan review, Staff has no objections to approval of the proposed athletic facility, subject to the following condition of approval:

1. The owner shall retain a buffer of existing trees along the road frontages of Wilderness Trail and Honey Creek to help visually screen the accessory building from adjacent views. Should the trees die or be removed, the owner shall install new trees to maintain the visual buffer.

TOWNSHIP

SITE PLAN REVIEW APPLICATION

RECEIVED
OCT 18 2023
PLANNING & ZONING
ADA TOWNSHIP

Applicant: Doug Tower Telephone No: 616 481 1495

Contact Name: Nathan Vandenbroek Email: nathan@hygge db.com

Mailing Address: 8695 Conservation Ada MI 49301

Property Owner: Doug Tower Telephone No: 1310 403 2288
(If different than applicant)

Mailing Address: 8003 Wilderness Trail Ada MI 49301

Permanent Parcel No.(s) of subject property: Zoning District: RR
41 15-23-351-018 41 ___-___-___-___
41 ___-___-___-___ 41 ___-___-___-___

Address of subject property: 8003 Wilderness Trail

Name of Project: Tower Breezeway & Accessory Building

Type of Project:

- ☐ PVM District Development Plan
- ☐ Retail, Office, Industrial or other Non-Residential Development
- ☐ Open Space Preservation Development, Preliminary Plan
- ☐ Parking Area, 10 or fewer spaces (*Administrative/Staff review)
- ☐ Site Condominium (fee $25 per unit +site plan fee)
- ☐ Open Space Preservation Devel. Final Plan
- ☐ Parking area, 11 or more spaces (*Planning Commission Review)

Summary project description: Reconfiguration of residential buildings to add accessory building.

This application must be accompanied by the following:
(1) All items called for by Article XXII of the Zoning Regulations or, for PVM District plan, all items required by Article XX-A.

The undersigned hereby grants permission to Ada Township and its officials and staff to enter upon the subject property for purposes of review and evaluation of this request.

Signature of Applicant: Doug Tower Date: 10-17-23

Signature of Owner, if different than applicant: _____ Date: _____
or attach letter of consent, signed by owner.

****APPLICATION FEE: Planning Commission Review $500.00 - Administrative/Staff Review $250.00**

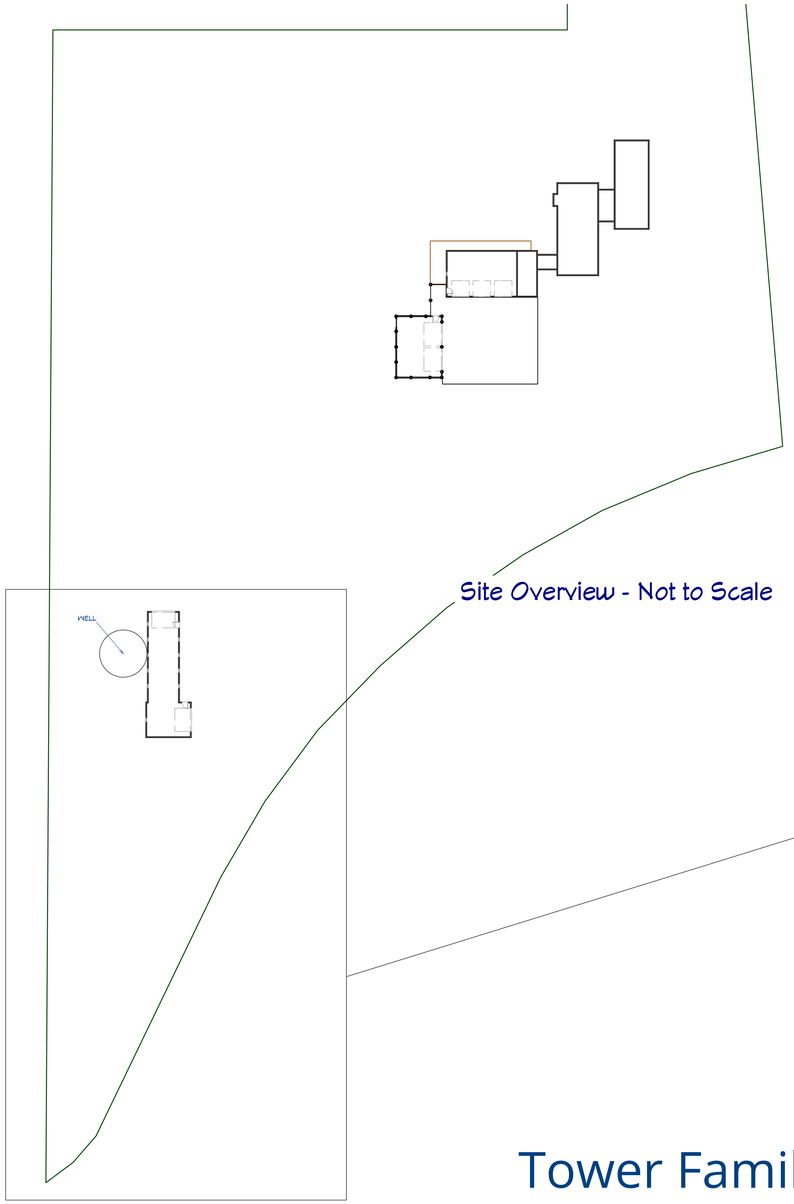
TO BE COMPLETED BY ADA TOWNSHIP PLANNING DEPARTMENT

Application received: 10-18-2023 (mm/dd/yy) by: eb

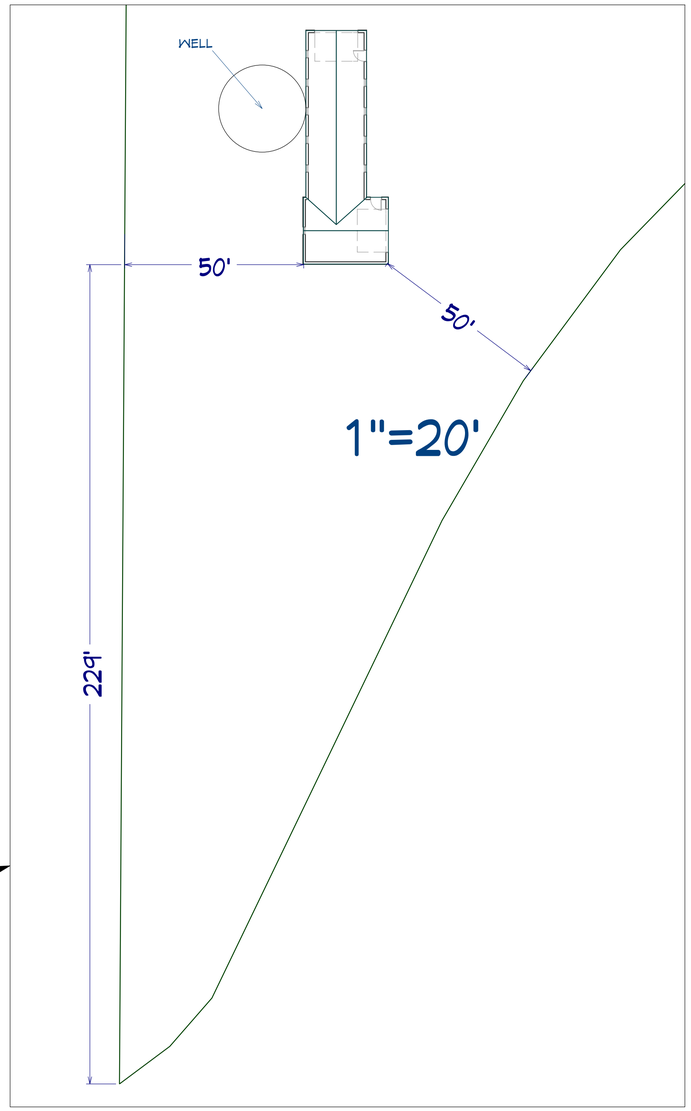
Application fee of $ 500.00 received 10/18/23 (mm/dd/yy) by [illegible] Check # 2850 Receipt # 357598

Escrow deposit of $_____ received _____ (mm/dd/yy) by _____ Check # _____ Receipt # _____

Updated 08/14/2023 (f:users/planzone/app&forms/app templates/siteplan review app)



Site Overview - Not to Scale



Site Plan View: 1"=20'

Tower Family Breezeway & Accessory Building

Address: 8003 Wilderness Trail, Ada MI, 49301

Total Sqft: 1199 sq.ft.

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Tower Accessory Building

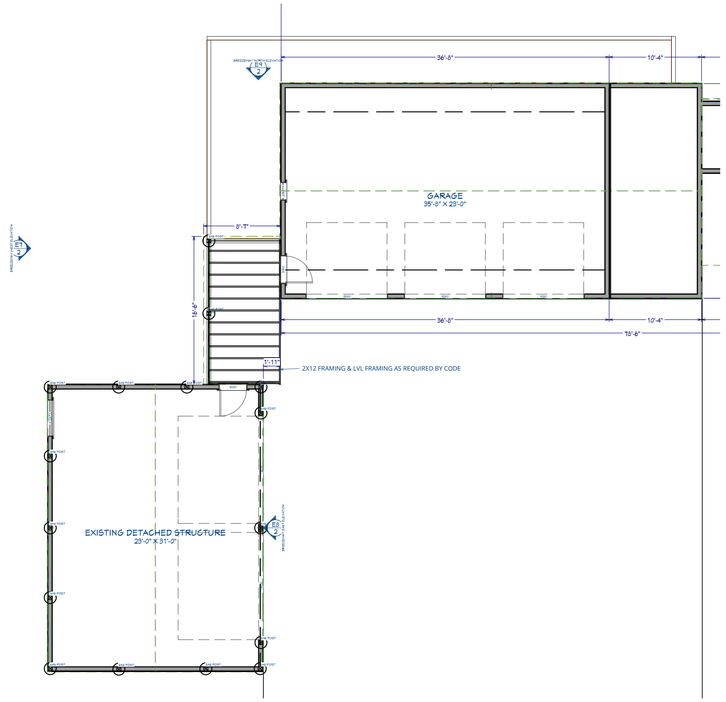
DRAWINGS PROVIDED BY:
Hygge Design + Build
Nathan Vandenbroek
616-481-1495

DATE:
10/17/2023

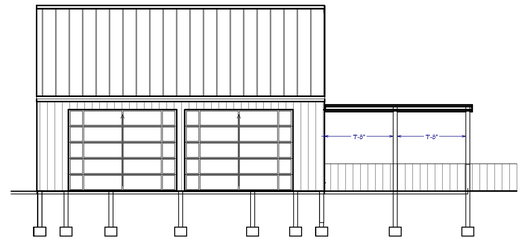
SCALE:

SHEET:

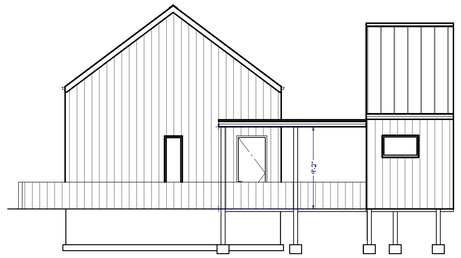
Construction of a breezeway to connect existing detached building to main structure will be completed in conjunction with construction of new detached accessory building.



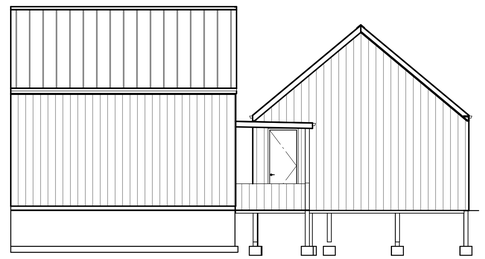
Breezeway Floor Plan



Breezeway East Elevation



Breezeway West Elevation



Breezeway North Elevation

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Tower Accessory Building

DRAWINGS PROVIDED BY:
Hygge Design + Build
Nathan Vandenbroek
616-481-1495

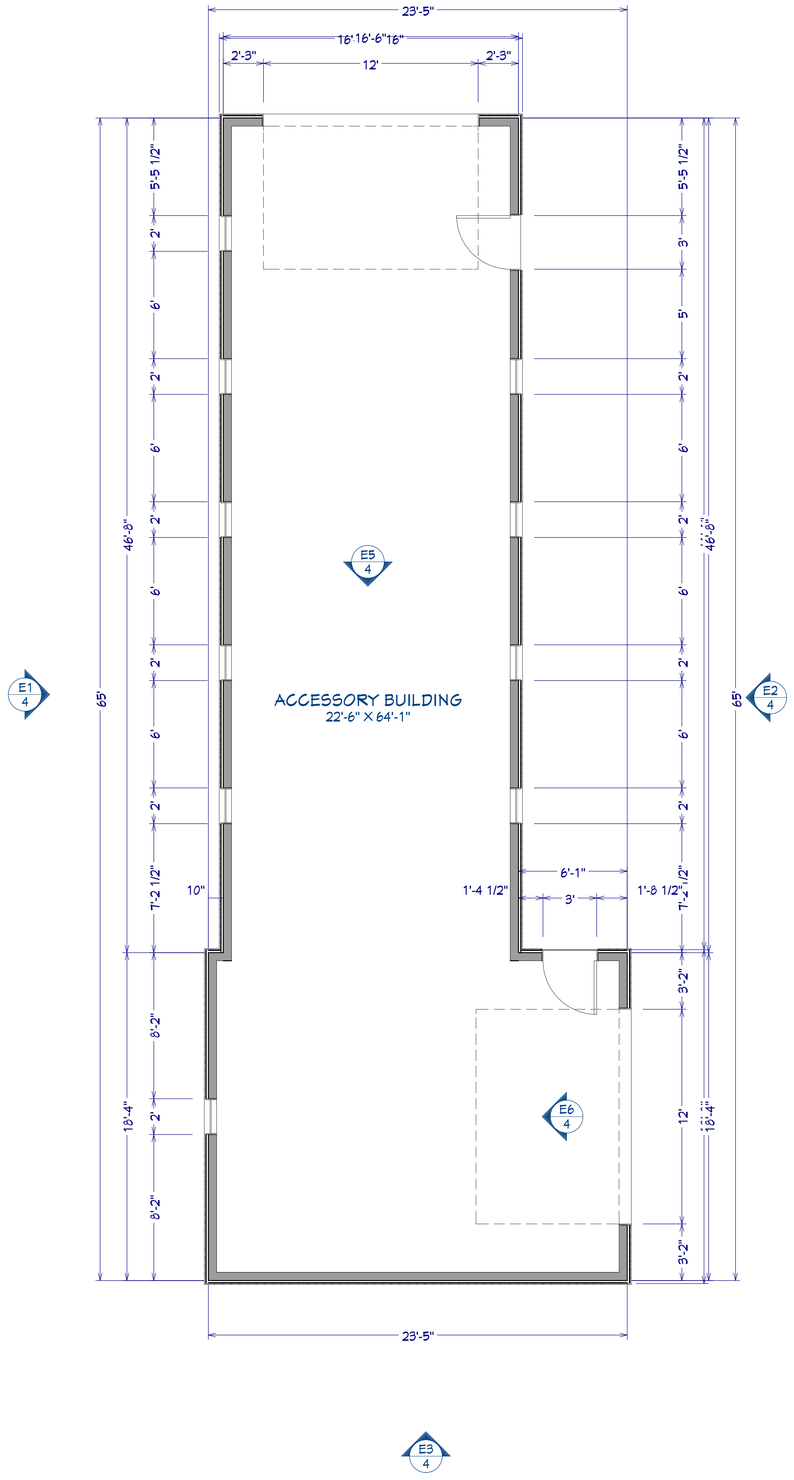
DATE:
10/17/2023

SCALE:

SHEET:

Notes:

- Total square footage: 1199 sq.ft.
- Post Frame Construction
- Siding: Black stained cedar
- Roof : Standing Seam (Galvanized)



REVISION TABLE

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616-481-1495

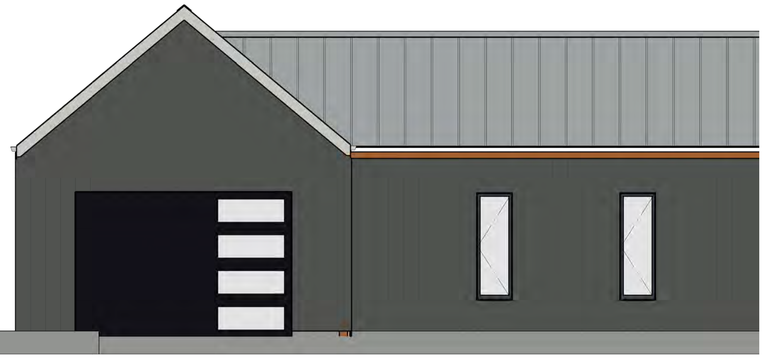
DATE:
10/17/2023

SCALE:

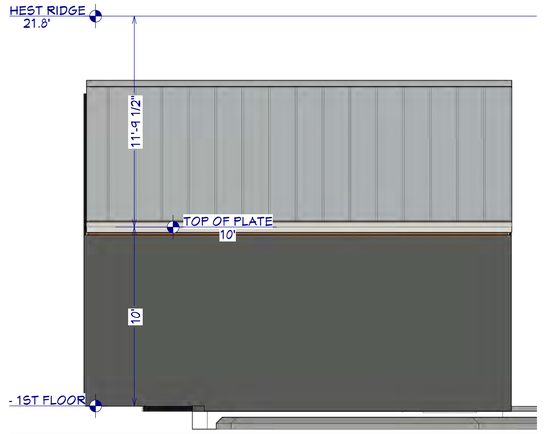
SHEET:

West Elevation

North Elevation

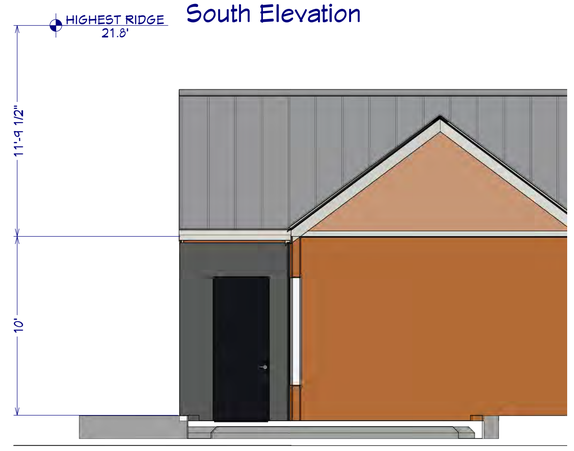


East Elevation



South Elevation

Cross Section 1



Cross Section 2

REVISION TABLE

NUMBER	DATE	REVISED BY	DESCRIPTION

Tower Accessory Building

DRAWINGS PROVIDED BY:
Hygge Design + Build
Nathan Vandenbroek
616-481-1495

DATE:
10/17/2023

SCALE:

SHEET: