

December 20, 2024

From: Michael Eichhorn  
Wold Architects & Engineers  
220 North Smith Street #310  
Palatine, Illinois 60067

To: Community Development Department  
Village of Libertyville  
200 East Cook Avenue  
Libertyville, Illinois 60048

**Re: Butterfield Road School Parking Lot and Lighting – Libertyville School District 70  
Variation Request Application**

Project Address: 1441 Lake St, Libertyville, IL 60048  
Property Owners: Board of Education, Libertyville School District 70  
Industrial Building – IB Zoning District

**Wold Architects, Eriksson Engineering, and Libertyville School District 70 presented the parking lot project for approval to the Zoning Board of Appeals and Plan Commission at the December 9, 2024, ZBA/ PC meeting. The commissioners discussed and requested additional information and revisions to the proposed plan. The following is a summary of their requests. The team has heard these comments and has made the following adjustments or clarifications to respond:**

- a. Please provide clarification on the required number of parking spaces serving the site, including both the school and district office building:
  - i. The current need for parking for the property has been calculated in the attached matrix – Exhibit A-1. It takes into account both daytime and evening parking space needs and is based on historical data that the district, school, and traffic engineers have confirmed.
  
- b. How was the final location for the parking lot selected? Were other locations explored during design?
  - i. Multiple options were explored and the final design in front of the school as presented is considered the best option given the limitation of other locations on site.
    1. The south expansion was explored and can be summarized as follows: Extending the south parking lot further south into the existing athletic field area would require extensive fill, retaining

wall and loss of student playfield use due to an approximate 10-foot grade differential and using up the fields green space. Being far from school's main entry and Lake Street it causes supervision and serious security concerns off-hours.

2. The property northwest of Butterfield School is on the corner of Butterfield Road and Lake Street and would require additional curb cut entry drives. This would complicate site exiting/entering causing traffic safety issues and nearly double the amount of in-out traffic flow points onto Lake Street. This location would be further away from the supervised entries, posing a security risk for the district. This location simply shifts the same lot just further west and creates much longer sidewalks and more supervision from the lot to the school.
3. Lot along east side of ERC is under high-voltage wires and is too narrow to provide safe vehicle traffic entry and turnaround.

c. How will concerns of light pollution be addressed?

- i. See revised lighting plan which shifts the nearest light poles from 22.5' to 40' from property line. The light fixture has a sharp cut-off shield to prevent light from spreading past the parking lot edges. See product information for the proposed light poles in the original submittal.

d. Please provide clarification on safety precautions being taken for students to cross through the new parking lot.

- i. A crossing guard will be positioned at the Lake Street crossing. The sidewalk and north entry doors are supervised by district staff during student entry and release times.

e. Please provide additional information on the existing and proposed traffic flow on the site.

- i. The site is basically divided into 4 areas: The bus drop-off, the new staff parking, the district office parking lot, and the school parking lot with student vehicular drop-off. See revised traffic study attached.
- ii. Our traffic study has been revised to describe better the circulation and demand. See more specifically pages 5 thru 7 and Exhibits 1 to 6.

f. Please consider setting back the new parking lot further from the lot line along Lake Street.

- i. In the revised design, the parking lot has been moved back from previously submitted 22.5' setback to 40' setback (at closest point) from

the property line – see attached. Which is an increased setback of 78% from previously submitted.

- ii. Constructing a new parking lot at a 50' setback was considered to avoid a zoning variance, but would be practically difficult due to a number of factors:
  - 1. The minimum width of a standard double, 90-degree parking space, lot is 64' wide. The distance available between Lake Street and the existing bus drop-off lane does not allow for a significant reduction in space. If the lot were to be setback to the above width, the proposed lot would only be 40' wide, which would not allow for the parking spaces to adhere to standards for safety of parking lots and stall sizes.
  - 2. Angled 60-degree parking was considered but would reduce the number of parking spaces available significantly. This solution does not provide the required number of parking spaces needed for school to function and provide occupants adequate parking space.

g. Please consider reductions in the number of parking spaces.

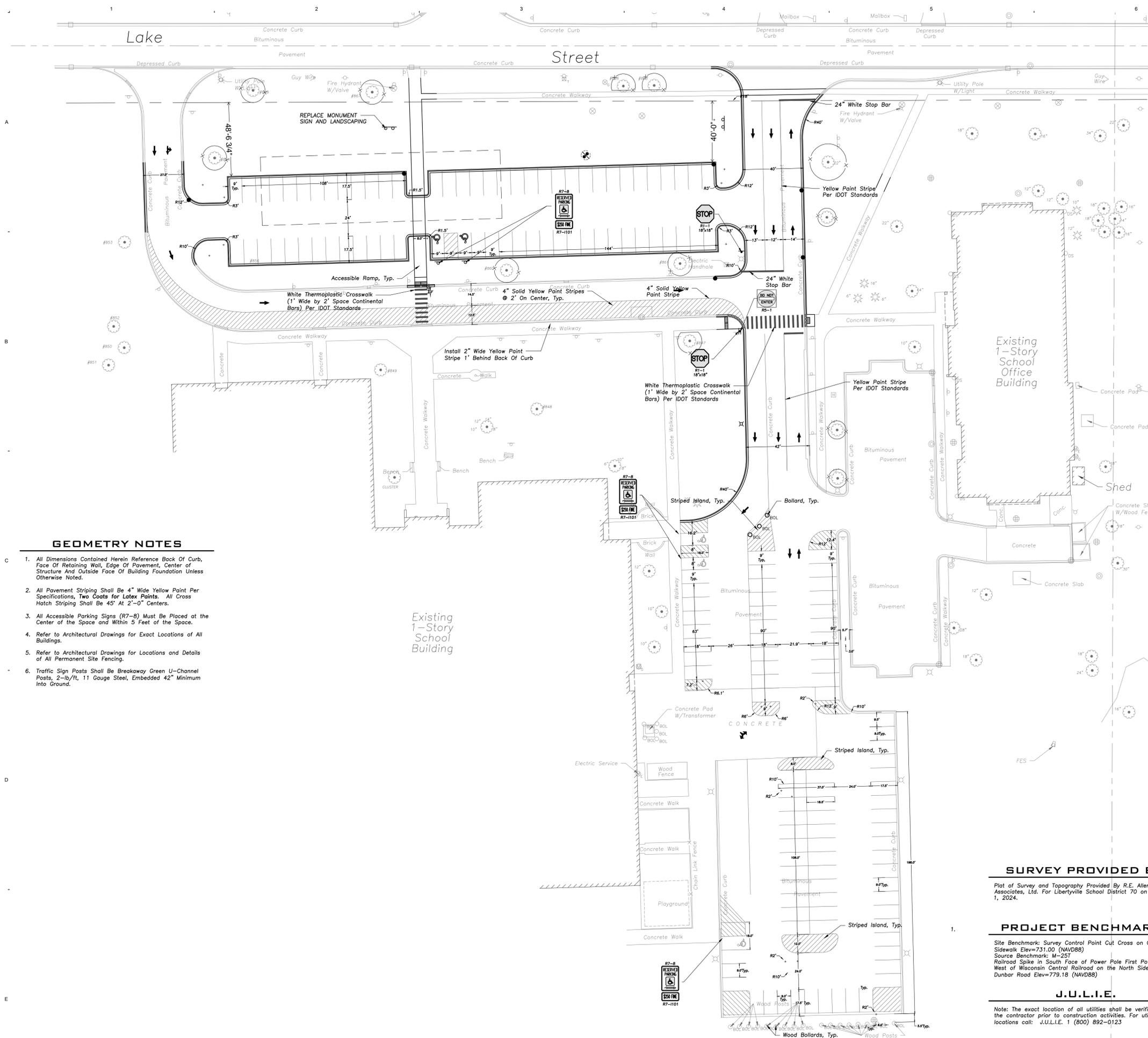
- i. The revised parking lot plan has reduced the spaces from the originally submitted 70 to 67 in the attached plan.
- ii. Daily Needs: The 67 additional spaces are a critical need as shown in the attached Exhibit A-1. The exhibit matrix demonstrates the daily daytime need to be 222 parking spots total on the site. When calculating all available spots on the attached revised plan, the total provided is 188 spaces. We are proposing the lesser amount of parking spaces, which is 34 spaces less (15% less) than the total needed on a daily basis. We have made these reductions to address some of the concerns regarding the setback and quantity of parking along Lake Street.
- iii. Evening and weekend events: Multiple events occur during off-hours and include a range of attendees with car quantities ranging from 50 – 500. See traffic study for more detail.
- iv. When the parking lots become full, visitors are forced to utilize on-street parking in the neighborhood. So, the more parking the site can hold, will reduce the amount of on-street parking in the adjacent neighborhood. Some nearby residential streets have restrictions on parking which further increases on-street parking congestion.

**In summary, we have documented the concerns expressed and questions asked by the ZBA commissioners at the December 9, 2024, meeting. School District 70 and the design team have responded with a proposed solution with adjustments made and with considerations to creating a comprehensive site plan that takes into account multiple factors. We look forward to providing beneficial and added parking functions to the site and improving the traffic flow, drop-off and pick-up safety, supervision of parking areas, and security of the site.**

Exhibit A-1		12-20-2024
<b>Butterfield Elementary School Site - New Parking Lot Project - Parking Spaces Required</b>		
By: Libertyville School District 70, Wold Architects, Eriksson Engineering		
<b>Category</b>	<b>Current Need</b>	<b>Notes:</b>
Daily Staff (BES) - permanent	101	BES - Butterfield Elem School
Daily Staff (BES) - traveling	5	
Daily Visitors (BES)	16	
Daily Staff (ERC) - daytime	25	Center (District Office)
Weekly Staff Training and Daily Visitors (ERC) - daytime	40	
Other School Events - Daily - daytime	35	Currently overflows to neighboring on-street and firelane.
<b>TOTAL - Daily Parking Needed =</b>	<b>222</b>	
<b>Proposed Design (see attachments) - Parking Lot Spaces:</b>		
Current Spaces before restriping	127	
Current Lots after restriping	121	
Proposed new at Lake Street addition	67	
<b>Net Total with all reno of existing lots and new adds</b>	<b>188</b>	
Deficient	34	15% lower than needed daily
<b>Other Events Public - evening or weekend</b>	<b>50-1000</b>	See Narrative for event types and frequency
<b>Notes:</b>		
<i>BES - Butterfield Elementary School</i>		
<i>ERC - Educational Resource Center (District Office) -</i>		
<i>Other Events daytime: Field day, Teacher Conferences, grade holiday event</i>		

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**GEOMETRY NOTES**

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2. All Pavement Striping Shall Be 4" Wide Yellow Point Per Specifications, Two Coats For Latex Paints. All Cross Hatch Striping Shall Be 45° At 2'-0" Centers.
3. All Accessible Parking Signs (R7-B) Must Be Placed at the Center of the Space and Within 5 Feet of the Space.
4. Refer to Architectural Drawings for Locations and Details of All Buildings.
5. Refer to Architectural Drawings for Locations and Details of All Permanent Site Fencing.
6. Traffic Sign Posts Shall Be Breakaway Green U-Channel Posts, 2-1/2" Dia, 11 Gauge Steel, Embedded 42" Minimum Into Ground.

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Overhead Wires	Overhead Wires
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Fire Hydrant	Fire Hydrant
Post Indicator Valve	Post Indicator Valve
Valve Vault	Valve Vault
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Bollard	Bollard
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Gas Meter	Gas Meter
Electric Meter	Electric Meter
Electric Manhole	Electric Manhole
Hand Hole	Hand Hole
Light Pole	Light Pole
Utility Pole	Utility Pole
Telephone Pedestal	Telephone Pedestal
Telephone Manhole	Telephone Manhole
Sign	Sign
Fence	Fence
Accessible Parking Stall	Accessible Parking Stall
Curb & Gutter	Curb & Gutter
Depressed Curb	Depressed Curb
Curb Elevation	Curb Elevation
Gutter Elevation	Gutter Elevation
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Top of Retaining Wall Elevation	Top of Retaining Wall Elevation
Contour Line	Contour Line
Deciduous Tree	Deciduous Tree
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Tree Protection Fencing at Drip Line	Tree Protection Fencing at Drip Line

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6. These Drawings Assume That The Contractor Will Utilize An Electronic Drawing File (DWG) to Stake All Site Improvements Accordingly. Contractor Shall Re-Establish Horizontal Control. Horizontal Control Points Not Provided.
7. No Person May Utilize The Information Contained Within These Drawings Without Written Approval From Eriksson Engineering Associates, Ltd.
8. The Engineer Is Furnishing These Drawings For Construction Purposes As A Convenience To The Owner, Architect, Surveyor, or Contractor. Prior To The Use Of These Drawings For Construction Purposes, The User Of This Media Shall Verify All Dimensions And Locations Of Buildings With The Foundation Drawings And Architectural Site Plan, and Coordinate All Dimensions and Locations of All Site Items. If Conflicts Exist The User Of This Information Shall Contact The Engineer Immediately.
9. Provide An As-built Survey Prepared By A Licensed Professional Land Surveyor In Accordance With The Authorities Having Jurisdiction Which Shall Include As A Minimum All Detention Basins and Best Management Practices, Include All Storm and Sanitary Sewers, Structure Locations, Sizes, Rim and Invert Elevations, Final Detention Volume Calculations For The Basin(s), Watermain and Valve and Appurtenance Locations. Provide Photograph Of Restrictor Plate(s) Including Ruler Across Opening For Verification Of Restrictor Diameter.
10. The Illinois Department Of Transportation Standard Specifications For Road And Bridge Construction Latest Edition, And All Addenda Thereof, Shall Govern The Earthwork And Paving Work Under This Contract Unless Noted Otherwise.

**SURVEY PROVIDED BY:**

Plot of Survey and Topography Provided By R.E. Allen and Associates, Ltd. For Libertyville School District 70 on October 1, 2024.

**PROJECT BENCHMARKS**

Site Benchmark: Survey Control Point Cut Cross on Concrete Sidewalk Elev=731.00 (NAVD88)  
Source Benchmark: M-257  
Railroad Spike in South Face of Power Pole First Power Pole West of Wisconsin Central Railroad on the North Side of Dunbar Road Elev=779.18 (NAVD88)

**J.U.L.I.E.**

Note: The exact location of all utilities shall be verified by the contractor prior to construction activities. For utility locations call: J.U.L.I.E. 1 (800) 892-0123

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1441 Lake Street  
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**Libertyville School District #70**  
1381 W Lake Street  
Libertyville, Illinois 60048



**WOLD ARCHITECTS AND ENGINEERS**  
220 N. Smith Street, Suite 310  
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woldaec.com | 847 241 6100

Revisions		
Description	Date	Num
Village Submittal	10.25.24	
Revisions	12.20.24	

Comm: 243118  
Date: 12/20/24  
Drawn: MO  
Check: KC



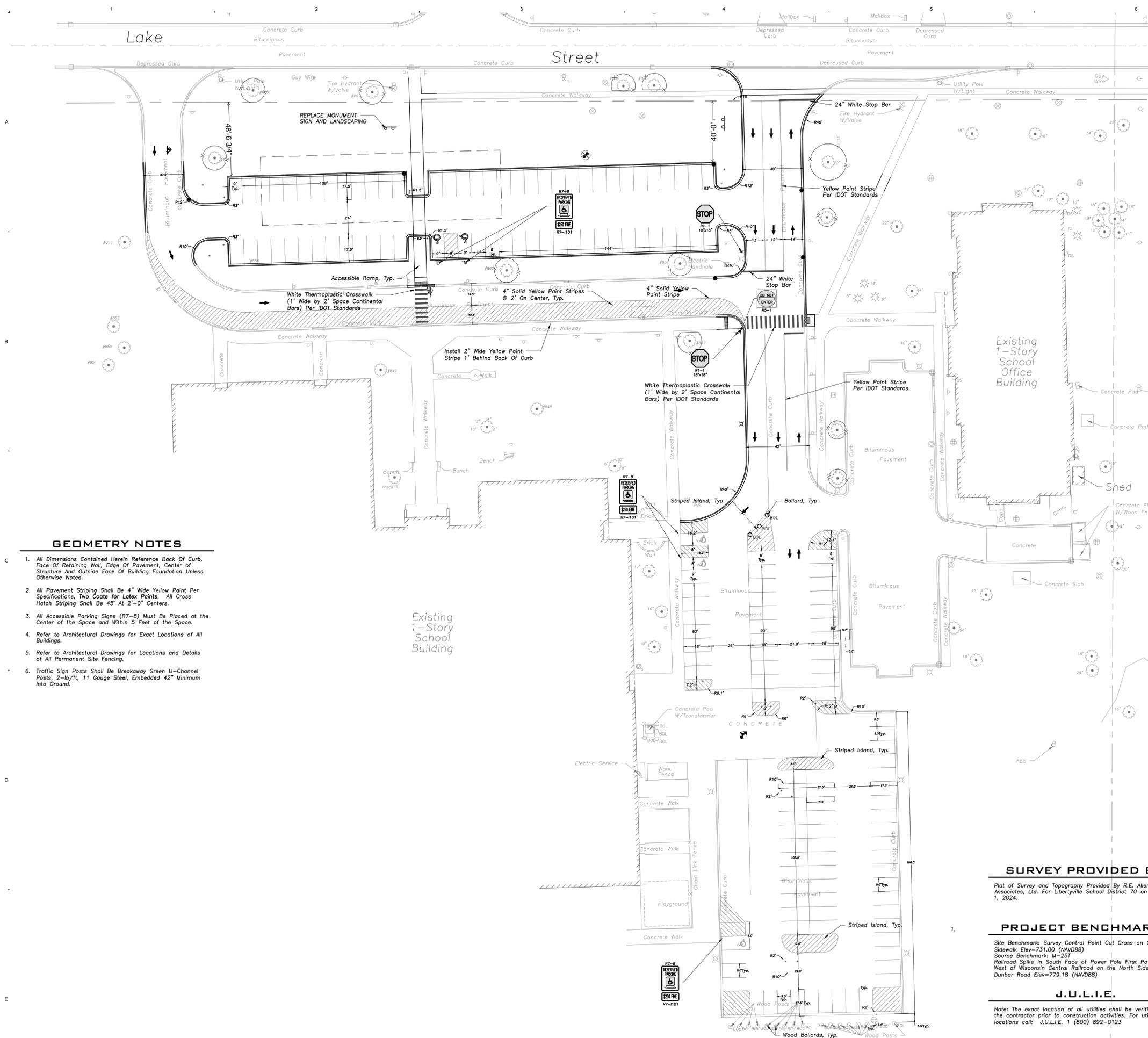
**SITE GEOMETRY PLAN**

Scale:  
**C2.01**



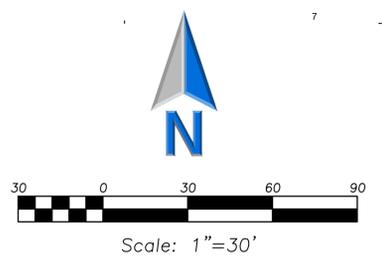
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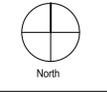
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Revisions		
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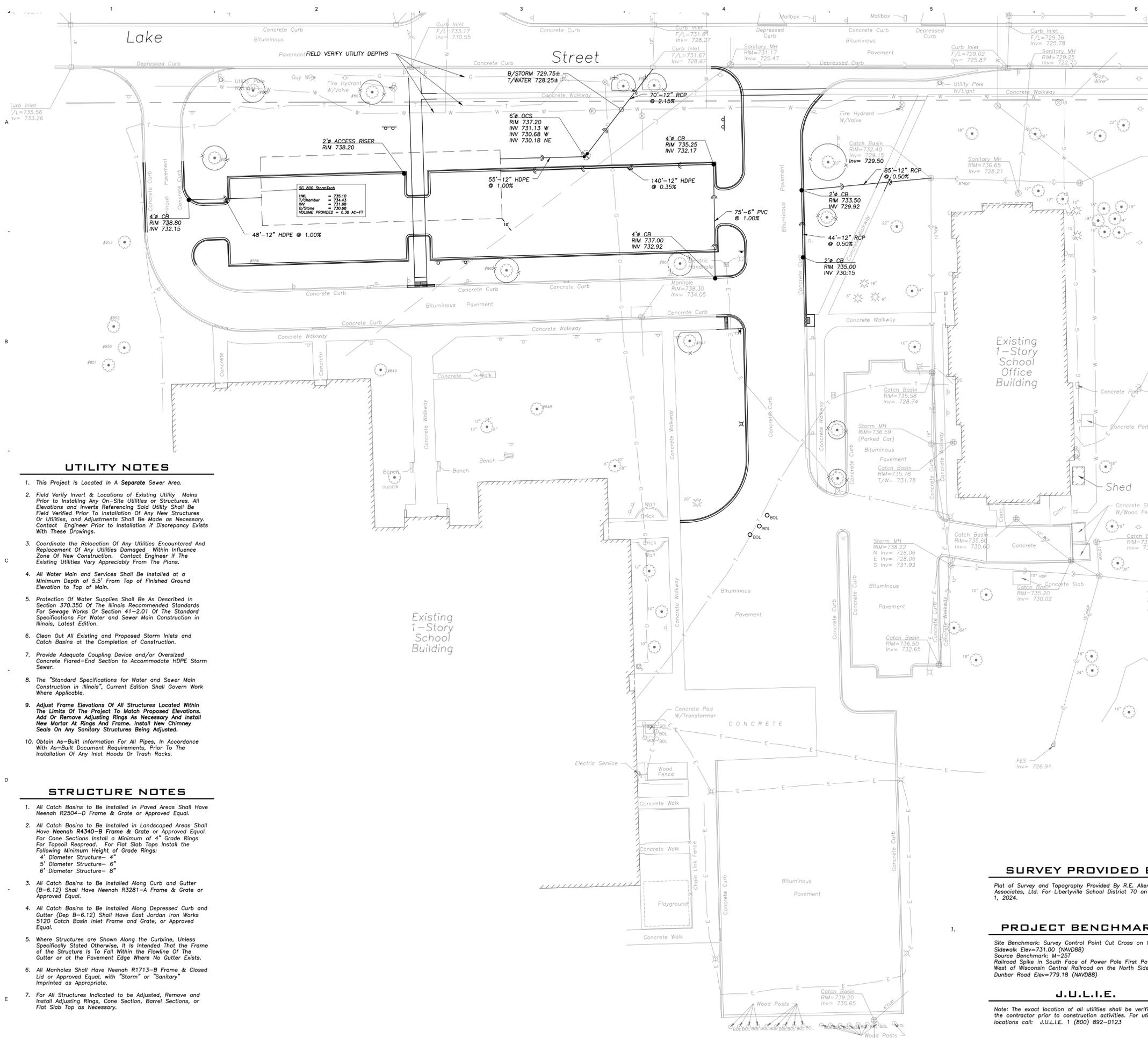


**SITE GEOMETRY PLAN**

Scale:  
**C2.01**

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UTILITY NOTES

- This Project is Located In A Separate Sewer Area.
- Field Verify Invert & Locations of Existing Utility Mains Prior to Installing Any On-Site Utilities or Structures. All Elevations and Inverts Referencing Said Utility Shall Be Field Verified Prior to Installation of Any New Structures Or Utilities, and Adjustments Shall Be Made as Necessary. Contact Engineer Prior to Installation if Discrepancy Exists With These Drawings.
- Coordinate the Relocation Of Any Utilities Encountered And Replacement Of Any Utilities Damaged Within Influence Zone Of New Construction. Contact Engineer If The Existing Utilities Vary Appreciably From The Plans.
- All Water Main and Services Shall Be Installed at a Minimum Depth of 5.5' From Top of Finished Ground Elevation to Top of Main.
- Protection Of Water Supplies Shall Be As Described In Section 370.350 Of The Illinois Recommended Standards For Sewage Works Or Section 41-2.01 Of The Standard Specifications For Water and Sewer Main Construction in Illinois, Latest Edition.
- Clean Out All Existing and Proposed Storm Inlets and Catch Basins at the Completion of Construction.
- Provide Adequate Coupling Device and/or Oversized Concrete Flared-End Section to Accommodate HDPE Storm Sewer.
- The "Standard Specifications for Water and Sewer Main Construction in Illinois", Current Edition Shall Govern Work Where Applicable.
- Adjust Frame Elevations Of All Structures Located Within The Limits Of The Project To Match Proposed Elevations. Add Or Remove Adjusting Rings As Necessary And Install New Mortar At Rings And Frame. Install New Chimney Seals On Any Sanitary Structures Being Adjusted.
- Obtain As-Built Information For All Pipes, in Accordance With As-Built Document Requirements, Prior To The Installation Of Any Inlet Hoods Or Trash Racks.

STRUCTURE NOTES

- All Catch Basins to Be Installed in Paved Areas Shall Have Neenah R2504-D Frame & Grate or Approved Equal.
- All Catch Basins to Be Installed in Landscaped Areas Shall Have Neenah R4340-B Frame & Grate or Approved Equal. For Cone Sections Install a Minimum of 4" Grade Rings For Topsoil Respread. For Flat Slab Tops install the Following Minimum Height of Grade Rings: 4" Diameter Structure- 4" 5" Diameter Structure- 6" 6" Diameter Structure- 8"
- All Catch Basins to Be Installed Along Curb and Gutter (B-6.12) Shall Have Neenah R3281-A Frame & Grate or Approved Equal.
- All Catch Basins to Be Installed Along Depressed Curb and Gutter (Dep B-6.12) Shall Have East Jordan Iron Works 5120 Catch Basin Inlet Frame and Grate, or Approved Equal.
- Where Structures are Shown Along the Curbside, Unless Specifically Stated Otherwise, It is Intended That the Frame of the Structure is To Fall Within the Flowline Of The Gutter or at the Pavement Edge Where No Gutter Exists.
- All Manholes Shall Have Neenah R1713-B Frame & Closed Lid or Approved Equal, with "Storm" or "Sanitary" Imprinted as Appropriate.
- For All Structures Indicated to be Adjusted, Remove and Install Adjusting Rings, Cone Section, Barrel Sections, or Flat Slab Top as Necessary.



Scale: 1"=30'

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Revisions		
Description	Date	Num
Village Submittal	10.25.24	
Revisions	12.20.24	

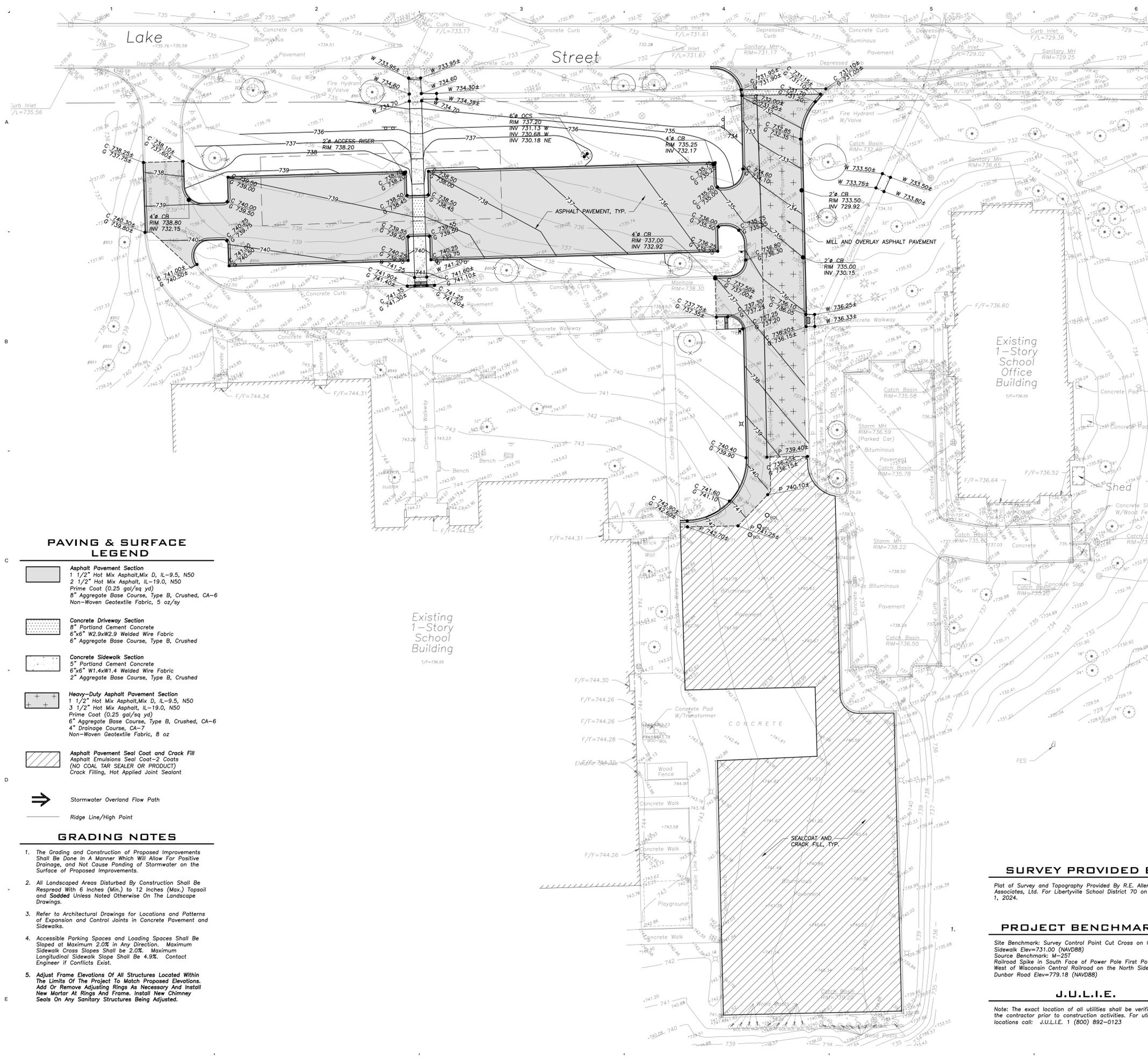
Comm: 243118  
 Date: 12/20/24  
 Drawn: MO  
 Check: KC



**SITE UTILITY PLAN**

Scale:  
**C3.01**

IL



Scale: 1"=30'

**LEGEND**

EXISTING	PROPOSED
Manhole	Manhole
Catch Basin	Catch Basin
Inlet	Inlet
Area Drain	Area Drain
Clean Out	Clean Out
Storm Sewer	Storm Sewer
Sanitary Sewer	Sanitary Sewer
Combined Sewer	Combined Sewer
Water Main	Water Main
Gas Line	Gas Line
Overhead Wires	Overhead Wires
Electrical Cable (Buried)	Electrical Cable (Buried)
Telephone Line	Telephone Line
Fire Hydrant	Fire Hydrant
Post Indicator Valve	Post Indicator Valve
Valve Vault	Valve Vault
Buffalo Box	Buffalo Box
Downspout	Downspout
Bollard	Bollard
Gas Valve	Gas Valve
Gas Meter	Gas Meter
Electric Meter	Electric Meter
Electric Manhole	Electric Manhole
Hand Hole	Hand Hole
Light Pole	Light Pole
Utility Pole	Utility Pole
Telephone Pedestal	Telephone Pedestal
Telephone Manhole	Telephone Manhole
Sign	Sign
Fence	Fence
Accessible Parking Stall	Accessible Parking Stall
Curb & Gutter	Curb & Gutter
Depressed Curb	Depressed Curb
Curb Elevation	Curb Elevation
Gutter Elevation	Gutter Elevation
Pavement Elevation	Pavement Elevation
Sidewalk Elevation	Sidewalk Elevation
Ground Elevation	Ground Elevation
Top of Retaining Wall Elevation	Top of Retaining Wall Elevation
Contour Line	Contour Line
Deciduous Tree	Deciduous Tree
Coniferous Tree	Coniferous Tree
Brushline	Brushline
Tree Protection	Tree Protection
Fencing at Drip Line	Fencing at Drip Line

**GENERAL NOTES**

- The Location of Existing Underground Utilities, Such As Watermains, Sewers, Gas Lines, Etc., As Shown On The Plans, Has Been Determined From The Best Available Information and Is Given For The Convenience of The Contractor. However, The Owner and The Engineer Do Not Assume Responsibility In The Event That During Construction, Utilities Other Than Those Shown May Be Encountered, and That The Actual Location of Those Which Are Shown May Be Different From The Location As Shown On The Drawings. Contact Engineer Immediately If Surface and/or Subsurface Features Are Different Than Shown On The Drawings.
- Notify The Engineer Without Delay of Any Discrepancies Between the Drawings and Existing Field Conditions.
- Contractor Shall Provide Private Utility Locating Services for the Project Area.
- Notify The Owner, Engineer and The Village of Libertyville A Minimum of 48 Hours In Advance of Performing Any Work.
- All Areas, On or Off Site, Disturbed During Construction Operations and Not Part of the Work As Shown Hereon Shall Be Restored to Original Condition to the Satisfaction of the Owner at No Additional Cost to the Owner. It is Incumbent Upon Contractor to Show That Damaged Areas Were Not Disturbed By Construction Operations.
- These Drawings Assume That The Contractor Will Utilize An Electronic Drawing File (DWG) to Stake All Site Improvements Accordingly. Contractor Shall Re-Establish Horizontal Control. Horizontal Control Points Not Provided.
- No Person May Utilize The Information Contained Within These Drawings Without Written Approval From Eriksson Engineering Associates, Ltd.
- The Engineer Is Furnishing These Drawings For Construction Purposes As A Convenience To The Owner, Architect, Surveyor, or Contractor. Prior To The Use Of These Drawings For Construction Purposes, The User Of This Media Shall Verify All Dimensions And Locations Of Buildings With The Foundation Drawings And Architectural Site Plan, and Coordinate All Dimensions and Locations of All Site Items. If Conflicts Exist The User Of This Information Shall Contact The Engineer Immediately.
- Provide An As-built Survey Prepared By A Licensed Professional Land Surveyor In Accordance With The Authorities Having Jurisdiction Which Shall Include As A Minimum All Detention Basins and Best Management Practices, Include All Storm and Sanitary Sewers, Structure Locations, Sizes, Rim and Invert Elevations, Final Detention Volume Calculations For The Basin(s), Watermain and Valve and Appurtenance Locations. Provide Photograph Of Restrictor Plate(s) Including Ruler Across Opening For Verification Of Restrictor Diameter.
- The Illinois Department Of Transportation Standard Specifications For Road And Bridge Construction, Latest Edition, And All Addenda Thereof, Shall Govern The Earthwork And Paving Work Under This Contract Unless Noted Otherwise.

**PAVING & SURFACE LEGEND**

	<b>Asphalt Pavement Section</b> 1 1/2" Hot Mix Asphalt, Mix D, IL-9.5, N50 2 1/2" Hot Mix Asphalt, IL-19.0, N50 Prime Coat (0.25 gal/sq yd) 8" Aggregate Base Course, Type B, Crushed, CA-6 Non-Woven Geotextile Fabric, 5 oz/sy
	<b>Concrete Driveway Section</b> 6" Portland Cement Concrete 6"x6" W2.9xW2.9 Welded Wire Fabric 6" Aggregate Base Course, Type B, Crushed
	<b>Concrete Sidewalk Section</b> 5" Portland Cement Concrete 6"x6" W1.4xW1.4 Welded Wire Fabric 6" Aggregate Base Course, Type B, Crushed
	<b>Heavy-Duty Asphalt Pavement Section</b> 1 1/2" Hot Mix Asphalt, Mix D, IL-9.5, N50 3 1/2" Hot Mix Asphalt, IL-19.0, N50 Prime Coat (0.25 gal/sq yd) 6" Aggregate Base Course, Type B, Crushed, CA-6 4" Drainage Course, CA-7 Non-Woven Geotextile Fabric, 8 oz
	<b>Asphalt Pavement Seal Coat and Crack Fill</b> Asphalt Emulsions Seal Coat-2 Coats (NO COAL TAR SEALER OR PRODUCT) Crack Filling, Hot Applied Joint Sealant
	Stormwater Overland Flow Path
	Ridge Line/High Point

**GRADING NOTES**

- The Grading and Construction of Proposed Improvements Shall Be Done in A Manner Which Will Allow For Positive Drainage, and Not Cause Ponding of Stormwater on the Surface of Proposed Improvements.
- All Landscaped Areas Disturbed By Construction Shall Be Respread With 6 Inches (Min.) to 12 Inches (Max.) Topsoil and Sodded Unless Noted Otherwise On The Landscape Drawings.
- Refer to Architectural Drawings for Locations and Patterns of Expansion and Control Joints in Concrete Pavement and Sidewalks.
- Accessible Parking Spaces and Loading Spaces Shall Be Sloped at Maximum 2.0% in Any Direction. Maximum Sidewalk Cross Slopes Shall Be 2.0%. Maximum Longitudinal Sidewalk Slope Shall Be 4.9%. Contact Engineer if Conflicts Exist.
- Adjust Frame Elevations of All Structures Located Within The Limits Of The Project To Match Proposed Elevations. Add Or Remove Adjusting Rings As Necessary And Install New Mortar At Rings And Frame. Install New Chimney Seals On Any Sanitary Structures Being Adjusted.

**SURVEY PROVIDED BY:**

Plot of Survey and Topography Provided by R.E. Allen and Associates, Ltd. For Libertyville School District 70 on October 1, 2024.

**PROJECT BENCHMARKS**

Site Benchmark: Survey Control Point Cut Cross on Concrete Sidewalk Elev=731.00 (NAVD88)  
 Source Benchmark: M-257  
 Railroad Spike in South Face of Power Pole First Power Pole West of Wisconsin Central Railroad on the North Side of Dunbar Road Elev=779.18 (NAVD88)

**J.U.L.I.E.**

Note: The exact location of all utilities shall be verified by the contractor prior to construction activities. For utility locations call: J.U.L.I.E. 1 (800) 892-0123

**Butterfield Road School - New Parking Lot and Lighting**

1441 Lake Street  
 Libertyville, Illinois 60048

**Libertyville School District #70**

1381 W Lake Street  
 Libertyville, Illinois 60048



**WOLD ARCHITECTS AND ENGINEERS**

220 N. Smith Street, Suite 310  
 Palatine, Illinois 60067  
 woldae.com | 847.241.6100

Revisions		
Description	Date	Num
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Revisions	12.20.24	

Comm: 243118  
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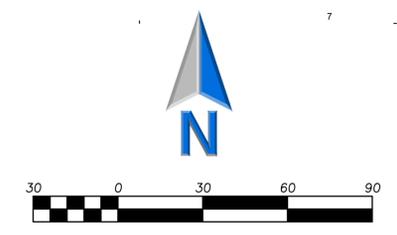
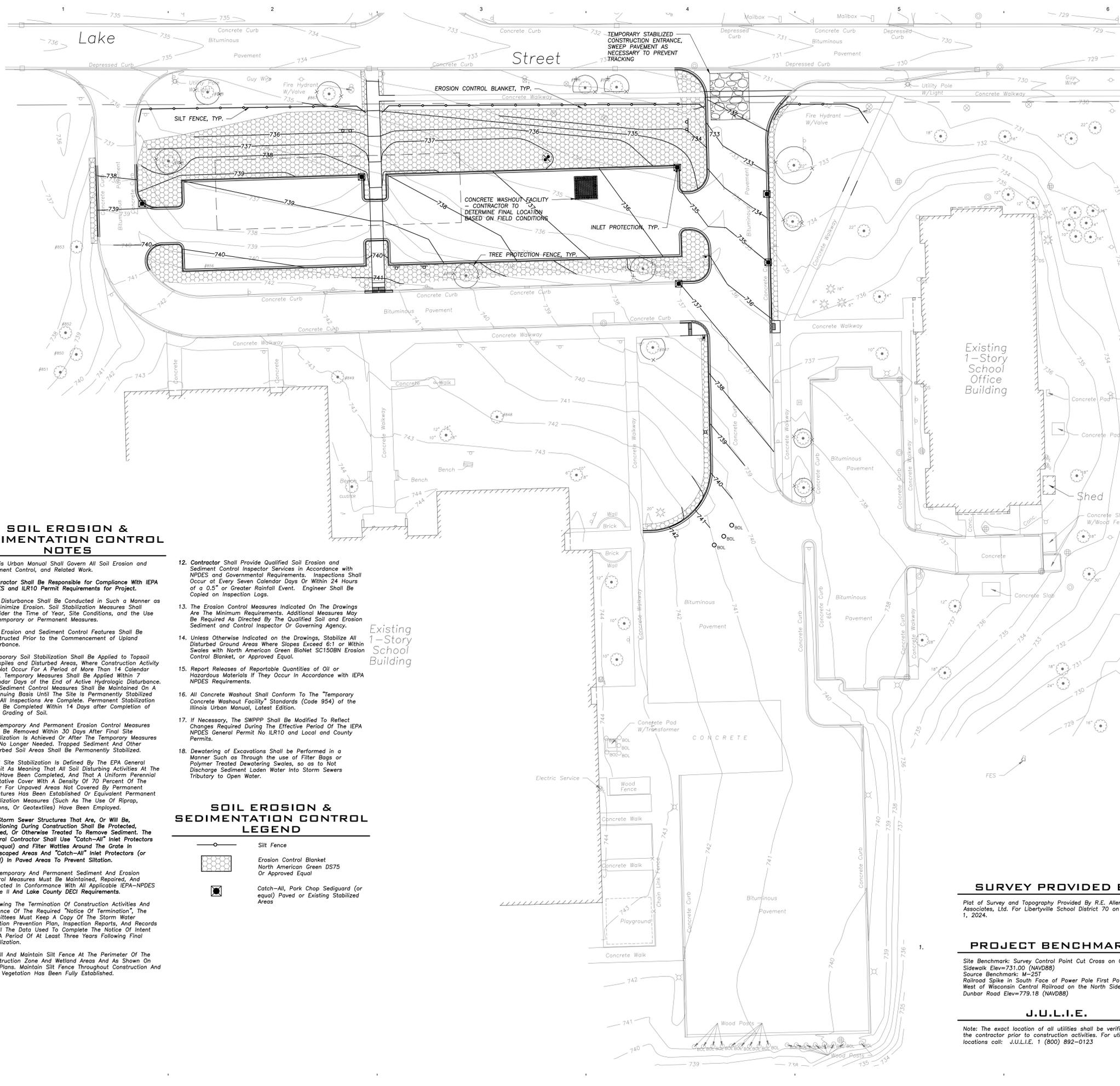
**SITE GRADING AND PAVING PLAN**

Scale:  
**C4.01**

IL

A

E



**LEGEND**

EXISTING	PROPOSED
Manhole	Manhole
Catch Basin	Catch Basin
Inlet	Inlet
Area Drain	Area Drain
Clean Out	Clean Out
Storm Sewer	Storm Sewer
Sanitary Sewer	Sanitary Sewer
Combined Sewer	Combined Sewer
Water Main	Water Main
Gas Line	Gas Line
Overhead Wires	Overhead Wires
Electrical Cable (Buried)	Electrical Cable (Buried)
Telephone Line	Telephone Line
Fire Hydrant	Fire Hydrant
Post Indicator Valve	Post Indicator Valve
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Gas Meter	Gas Meter
Electric Meter	Electric Meter
Electric Manhole	Electric Manhole
Hand Hole	Hand Hole
Light Pole	Light Pole
Utility Pole	Utility Pole
Telephone Pedestal	Telephone Pedestal
Telephone Manhole	Telephone Manhole
Sign	Sign
Fence	Fence
Accessible Parking Stall	Accessible Parking Stall
Curb & Gutter	Curb & Gutter
Depressed Curb	Depressed Curb
Curb Elevation	Curb Elevation
Gutter Elevation	Gutter Elevation
Pavement Elevation	Pavement Elevation
Sidewalk Elevation	Sidewalk Elevation
Ground Elevation	Ground Elevation
Top of Retaining Wall Elevation	Top of Retaining Wall Elevation
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Deciduous Tree	Deciduous Tree
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Brushline	Brushline
Tree Protection Fencing at Drip Line	Tree Protection Fencing at Drip Line

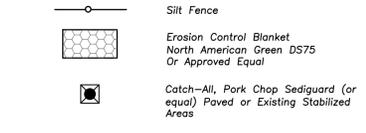
**GENERAL NOTES**

- The location of existing underground utilities, such as water mains, sewers, gas lines, etc., as shown on the plans, has been determined from the best available information and is given for the convenience of the contractor. However, the owner and the engineer do not assume responsibility for the event that during construction, utilities other than those shown may be encountered, and that the actual location of those which are shown may be different from the location as shown on the drawings. Contact engineer immediately if surface and/or subsurface features are different than shown on the drawings.
- Notify the engineer without delay of any discrepancies between the drawings and existing field conditions.
- Contractor shall provide private utility locating services for the project area.
- Notify the owner, engineer and the village of Libertyville a minimum of 48 hours in advance of performing any work.
- All areas, on or off site, disturbed during construction operations and not part of the work as shown hereon shall be restored to original condition to the satisfaction of the owner at no additional cost to the owner. It is incumbent upon contractor to show that damaged areas were not disturbed by construction operations.
- These drawings assume that the contractor will utilize an electronic drawing file (DWG) to stake all site improvements accordingly. Contractor shall re-establish horizontal control. Horizontal control points not provided.
- No person may utilize the information contained within these drawings without written approval from Eriksson Engineering Associates, Ltd.
- The engineer is furnishing these drawings for construction purposes as a convenience to the owner, architect, surveyor, or contractor. Prior to the use of these drawings for construction purposes, the user of this media shall verify all dimensions and locations of buildings with the foundation drawings and architectural site plan, and coordinate all dimensions and locations of all site items. If conflicts exist the user of this information shall contact the engineer immediately.
- Provide an as-built survey prepared by a licensed professional land surveyor in accordance with the authorities having jurisdiction which shall include as a minimum all detention basins and best management practices, include all storm and sanitary sewers, structure locations, sizes, rim and invert elevations, final detention volume calculations for the basin(s), watermain and valve and appurtenance locations. Provide photograph of restrictor plate(s) including ruler across opening for verification of restrictor diameter.
- The Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition, and All Addenda Thereof, shall govern the earthwork and paving work under this contract unless noted otherwise.

**SOIL EROSION & SEDIMENTATION CONTROL NOTES**

- Illinois Urban Manual Shall Govern All Soil Erosion and Sediment Control, and Related Work.
- Contractor Shall Be Responsible for Compliance With IEPA NPDES and ILR10 Permit Requirements for Project.
- Soil Disturbance Shall Be Conducted in Such a Manner as to Minimize Erosion. Soil Stabilization Measures Shall Consider the Time of Year, Site Conditions, and the Use of Temporary or Permanent Measures.
- Soil Erosion and Sediment Control Features Shall Be Constructed Prior to the Commencement of Upland Disturbance.
- Temporary Soil Stabilization Shall Be Applied to Topsoil Stockpiles and Disturbed Areas, Where Construction Activity Will Not Occur For A Period of More Than 14 Calendar Days. Temporary Measures Shall Be Applied Within 7 Calendar Days of the End of Active Hydrologic Disturbance. The Sediment Control Measures Shall Be Maintained On A Continuing Basis Until the Site is Permanently Stabilized And All Inspections Are Complete. Permanent Stabilization Shall Be Completed Within 14 Days after Completion of Final Grading of Soil.
- All Temporary And Permanent Erosion Control Measures Shall Be Removed Within 30 Days After Final Site Stabilization is Achieved Or After The Temporary Measures Are No Longer Needed. Trapped Sediment And Other Disturbed Soil Areas Shall Be Permanently Stabilized.
- Final Site Stabilization is Defined By The EPA General Permit As Meaning That All Soil Disturbing Activities At The Site Have Been Completed, And That A Uniform Perennial Vegetative Cover With A Density Of 70 Percent Of The Cover For Unpaved Areas Not Covered By Permanent Structures Has Been Established Or Equivalent Permanent Stabilization Measures (Such As The Use Of Riprap, Gabions, Or Geotextiles) Have Been Employed.
- All Storm Sewer Structures That Are, Or Will Be, Functioning During Construction Shall Be Protected, Filled, Or Otherwise Treated To Remove Sediment. The General Contractor Shall Use "Catch-All" Inlet Protectors (or equal) and Filter Wattles Around The Grate In Landscaped Areas And "Catch-All" Inlet Protectors (or equal) in Paved Areas To Prevent Siltation.
- All Temporary And Permanent Sediment And Erosion Control Measures Must Be Maintained, Repaired, And Inspected in Conformance With All Applicable IEPA-NPDES Phase II And Lake County DECI Requirements.
- Following The Termination Of Construction Activities And Issuance Of The Required "Notice Of Termination", The Permittees Must Keep A Copy Of The Storm Water Pollution Prevention Plan, Inspection Reports, And Records Of All The Data Used To Complete The Notice Of Intent For A Period Of At Least Three Years Following Final Stabilization.
- Install And Maintain Silt Fence At The Perimeter Of The Construction Zone And Wetland Areas And As Shown On The Plans. Maintain Silt Fence Throughout Construction And Until Vegetation Has Been Fully Established.
- Contractor Shall Provide Qualified Soil Erosion and Sediment Control Inspector Services in Accordance with NPDES and Governmental Requirements. Inspections Shall Occur at Every Seven Calendar Days Or Within 24 Hours of a 0.5" or Greater Rainfall Event. Engineer Shall Be Copied on Inspection Logs.
- The Erosion Control Measures Indicated On The Drawings Are The Minimum Requirements. Additional Measures May Be Required As Directed By The Qualified Soil and Erosion Sediment and Control Inspector Or Governing Agency.
- Unless Otherwise Indicated on the Drawings, Stabilize All Disturbed Ground Areas Where Slopes Exceed 6:1 or Within Swales with North American Green BioNet SC150BN Erosion Control Blanket, or Approved Equal.
- Report Releases of Reportable Quantities of Oil or Hazardous Materials If They Occur in Accordance with IEPA NPDES Requirements.
- All Concrete Washout Shall Conform To The "Temporary Concrete Washout Facility" Standards (Code 954) of the Illinois Urban Manual, Latest Edition.
- If Necessary, The SWPPP Shall Be Modified To Reflect Changes Required During The Effective Period Of The IEPA NPDES General Permit No ILR10 and Local and County Permits.
- Dewatering of Excavations Shall be Performed in a Manner Such as Through the use of Filter Bags or Polymer Treated Dewatering Swales, so as to Not Discharge Sediment Laden Water into Storm Sewers Tributary to Open Water.

**SOIL EROSION & SEDIMENTATION CONTROL LEGEND**



**SURVEY PROVIDED BY:**

Plot of Survey and Topography Provided by R.E. Allen and Associates, Ltd. For Libertyville School District 70 on October 1, 2024.

**PROJECT BENCHMARKS**

Site Benchmark: Survey Control Point Cut Cross on Concrete Sidewalk Elev=731.00 (NAVD88)  
Source Benchmark: M-257  
Railroad Spike in South Face of Power Pole First Power Pole West of Wisconsin Central Railroad on the North Side of Dunbar Road Elev=779.18 (NAVD88)

**J.U.L.I.E.**

Note: The exact location of all utilities shall be verified by the contractor prior to construction activities. For utility locations call: J.U.L.I.E. 1 (800) 892-0123

**Butterfield Road School - New Parking Lot and Lighting**  
1441 Lake Street  
Libertyville, Illinois 60048

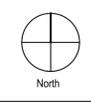
**Libertyville School District #70**  
1381 W Lake Street  
Libertyville, Illinois 60048



**WOLD ARCHITECTS AND ENGINEERS**  
220 N. Smith Street, Suite 310  
Palatine, Illinois 60067  
woldaec.com | 847 241 6100

Description	Revisions	
	Date	Num
Village Submittal	10.25.24	
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Comm: 243118  
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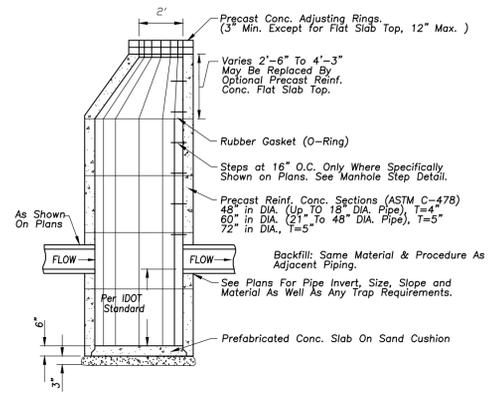


**SOIL EROSION AND SEDIMENT CONTROL PLAN**

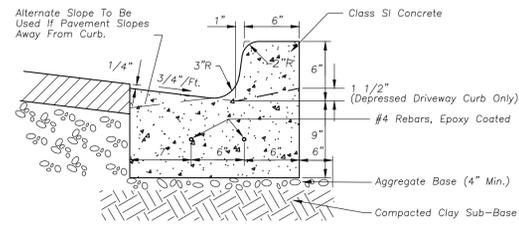
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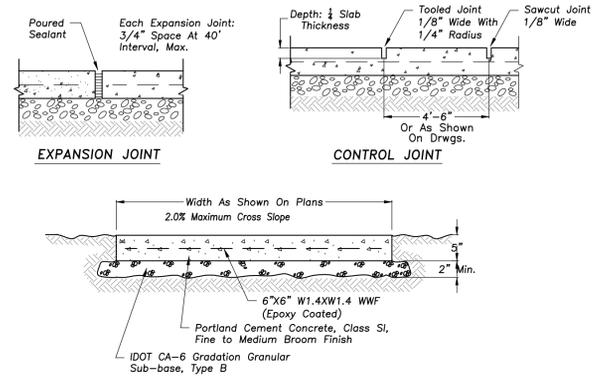


CATCH BASIN

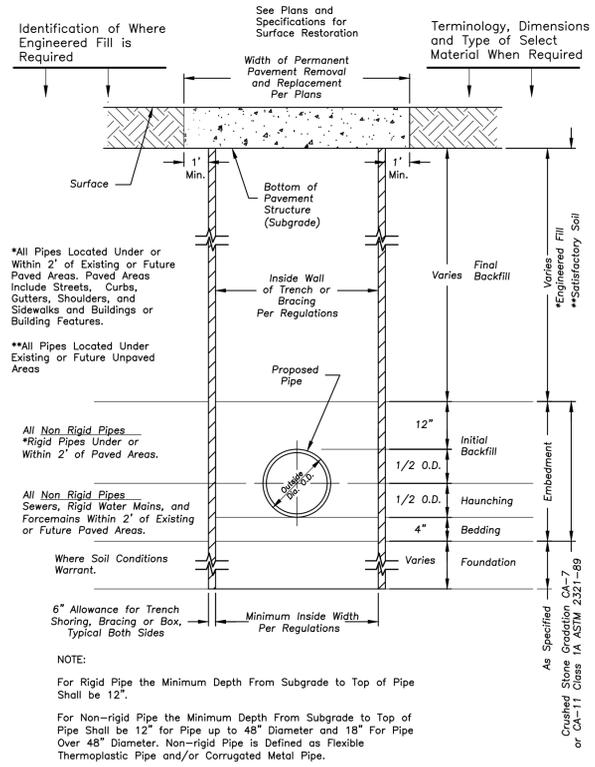


- Notes:
1. A 1" Expansion Joint Shall Be Installed At All Points of Curvature For Short Radius (under 25 ft.) Curves. Maximum Expansion Joint Spacing is 50'. Expansion Joints Shall Be Constructed With 1" Thick Preformed Expansion Joint Filler Conforming To The Curb And Gutter Cross Section And Shall Be Provided With One 1 1/4" Dia. 18" Long, Coated Smooth Dowel Bar. The Dowel Bar Shall Be Fitted With A Cap With A Fringed Stop Which Provides A Minimum Of 1" Of Expansion.
  2. Maximum Contraction (Control) Joint Spacing Shall Be 20'.

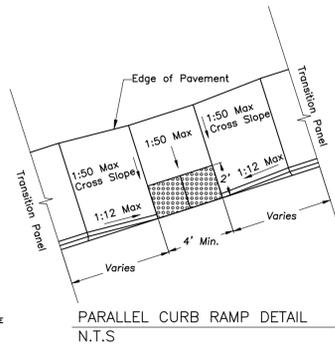
B-6.12 CURB & GUTTER



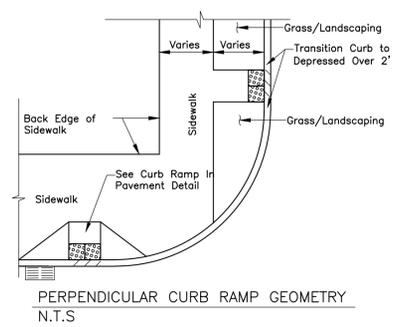
PORTLAND CEMENT CONC. SIDEWALK



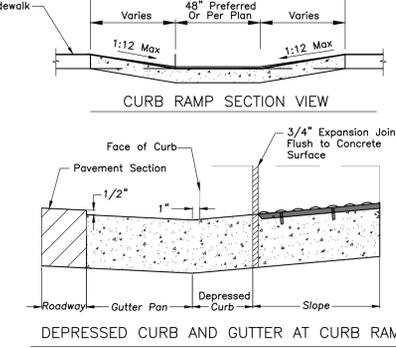
STANDARD SEWER AND WATER TRENCH SECTION



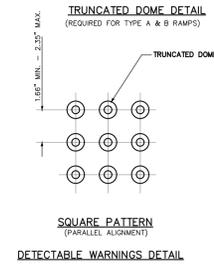
PARALLEL CURB RAMP DETAIL N.T.S.



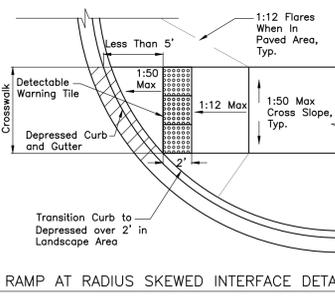
PERPENDICULAR CURB RAMP GEOMETRY N.T.S.



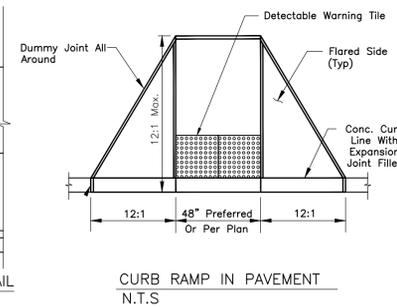
DEPRESSED CURB AND GUTTER AT CURB RAMP



DETECTABLE WARNINGS DETAIL



CURB RAMP AT RADIUS SKEWED INTERFACE DETAIL N.T.S.



CURB RAMP IN PAVEMENT N.T.S.

ACCESSIBLE RAMPS FOR SIDEWALKS

**GENERAL NOTES**

**Description:**  
This work shall consist of constructing sidewalk curb ramps with detectable warnings in compliance with the Americans with Disabilities Act, Accessibility Guidelines (ADAAG). The detectable warnings shall consist of an area of truncated domes that provide both visual and tactile cues to pedestrians who are about to enter into traffic.

**Construction Requirements:**

1. Ramps Shall Be Located As Shown On Plans In Alignment With Normal Sidewalk And/or Crosswalk And Shall Have Sufficient Curb Length At Corner Radius To Prevent Vehicular Encroachment.
2. Curb Ramps At Marked Crossings Shall Be Wholly Contained Within The Markings Excluding Flared Sides.
3. In No Case Shall Expansion Joints That Are Constructed In Curbs And Gutters At Or Near Corner Radiuses Be Located Within The Accessible Ramp Areas.
4. Where Preformed Joint Filler (p-j-f) Is Installed Against A Curved Surface, The Contractor Shall Use A Flexible Filler In Accordance With The Illinois Department Of Transportation (IDOT) Standard Specifications.

**Equipment:** Equipment for the detectable warning area of the curb ramps shall meet the requirements of the Authorities having Jurisdiction.

**DETECTABLE WARNING SURFACE TILES**

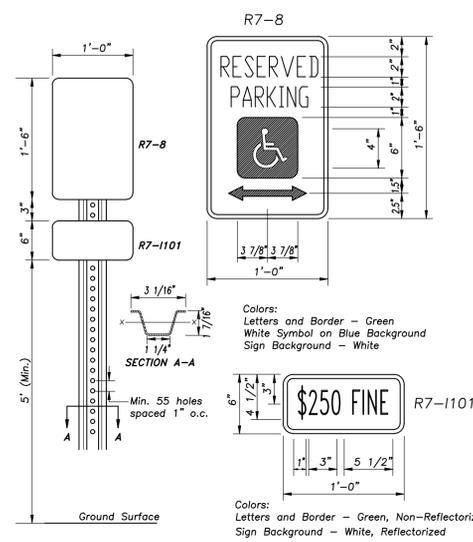
**Provide Surface Applied Detectable/Tactile Warning Surface Tiles which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title III Regulations, 28 CFR Part 36 ADA STANDARDS FOR ACCESSIBLE DESIGN, Appendix A, Section 4.29.2**

**Dimensions:** Cast In Place Detectable/Tactile Warning Surface Tiles shall be held within the following dimensions and tolerances:  
Length and Width in One of the Following as Necessary for the Dimensions of the Surface in Which the Detectable Warning is Proposed: 12x12 24x24 24x36 24x48 24x60 36x48 36x60 nominal. No Cutting of Tiles is Allowed.

**Installation of Detectable/Tactile Warning Surface Tiles Per Manufacturer's Instructions.**

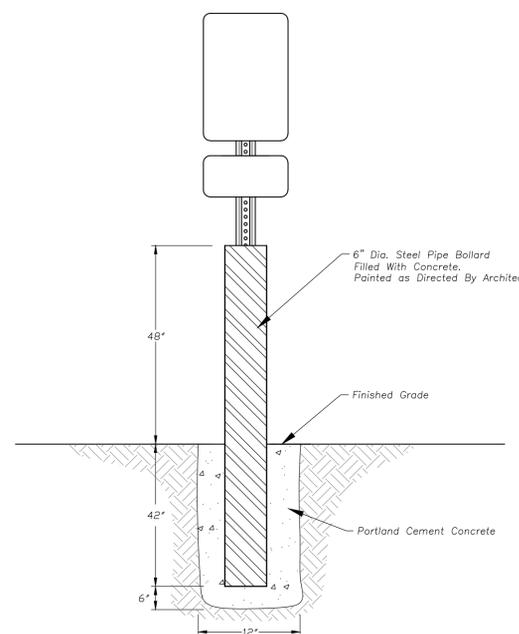
**Verify With The Local Authorities Having Jurisdiction that Detectable/Tactile Warning Surface Tiles are an Accepted Method of Providing for the Detectable Warning Surface.**

**Verify With The Local Authorities Having Jurisdiction that the Manufacturer's Products are Acceptable for the Detectable Warning Surface.**



Notes: Dimensions shown for cross sections are minimum.  
All holes are 3/8" dia. Minimum section modulus about the x-x axis of the post shall be 0.223 in.  
For posts in which holes are punched or drilled for more than half their length, the section modulus shall be computed for the net section.  
3'-6" Post Bury Depth.  
Post shall weigh 2.00 lb/ft length.  
One in 8 Accessible Parking Spaces Must be Van Accessible, Minimum of One, Van Accessible Spaces Have the Same Requirement Except They Must Also Have 96" of Clear Vertical Space.

ACCESSIBLE PARKING SIGN IN BOLLARD



**Butterfield Road School - New Parking Lot and Lighting**  
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Libertyville, Illinois 60048

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SITE DETAILS

Scale:  
**C6.01**





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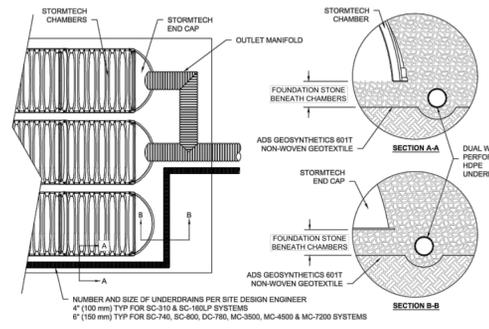


**SC-800 STORMTECH CHAMBER SPECIFICATIONS**

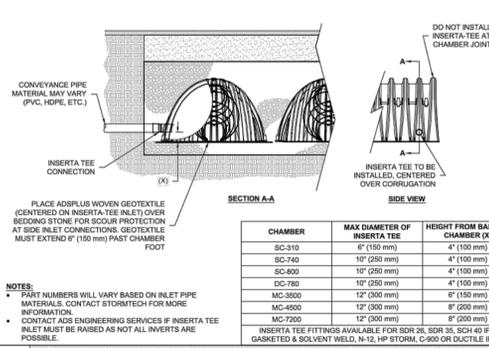
- CHAMBERS SHALL BE STORMTECH SC-800.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE CORROUGATED WALL STORMWATER COLLECTION CHAMBERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPED FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE ASHITO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE ASHITO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (15 MIN) ASHITO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) ASHITO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STAKING LEGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 850 LB/FT<sup>2</sup>. THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418, AND 3) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.66 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE ASHITO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

**IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-800 SYSTEM**

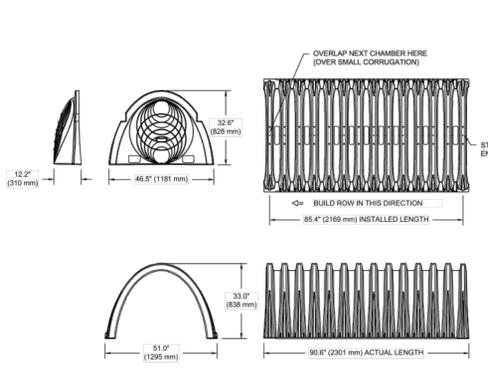
- STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
  - STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/SC-780 CONSTRUCTION GUIDE".
  - CHAMBERS ARE NOT TO BE BACKFILLED WITH AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
    - STONE/SHOTTER LOCATED OFF THE CHAMBER BED.
    - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
    - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
  - THE FOUNDATION STONE SHALL BE LEVELLED AND COMPACTED PRIOR TO PLACING CHAMBERS.
  - JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
  - MAINTAIN MINIMUM 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
  - EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" (20-50 mm).
  - THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
  - ADS RECOMMENDS THE USE OF "FLXSTARCH CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.
- NOTES FOR CONSTRUCTION EQUIPMENT**
- STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/SC-780 CONSTRUCTION GUIDE".
  - THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
    - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
    - NO RUBBER TREDDED TRACKS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNLESS PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/SC-780 CONSTRUCTION GUIDE".
    - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/SC-780 CONSTRUCTION GUIDE".
  - FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.
- USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.**
- CONTACT STORMTECH AT 1-888-852-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



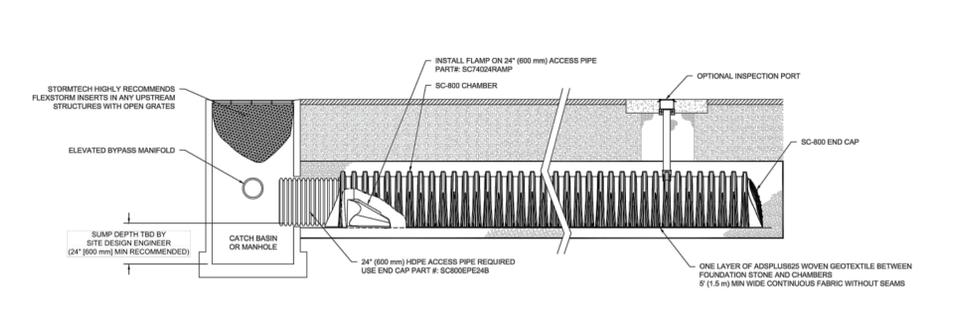
**5 UNDERDRAIN DETAIL**



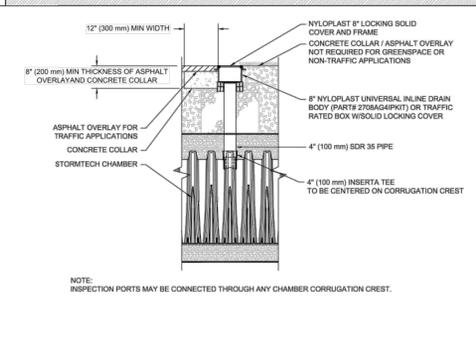
**6 INSERTA-TEE SIDE INLET DETAIL**



**2 SC-800 TECHNICAL SPECIFICATIONS**



**3 SC-800 ISOLATOR ROW PLUS DETAIL**



**4 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)**

**INSPECTION & MAINTENANCE**

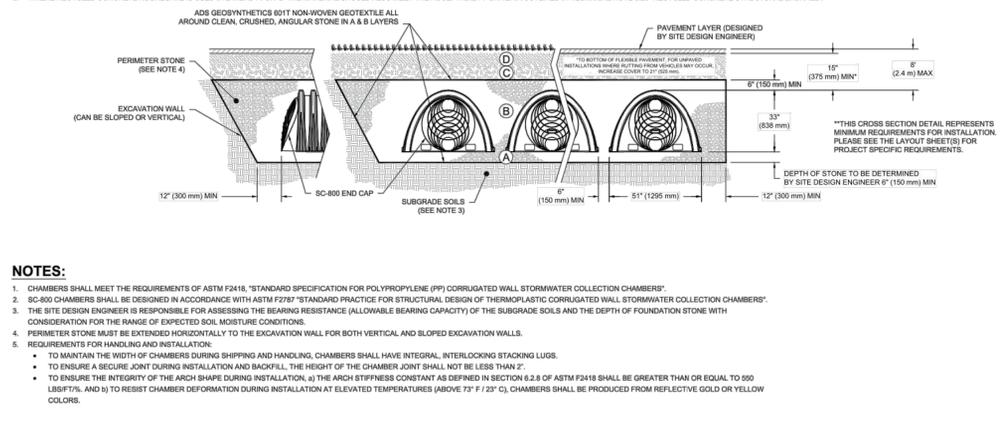
- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT**
- INSPECTION PORTS (IF PRESENT)
  - REMOVE/OPEN LID ON NYLONLAST INLINE DRAIN
  - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - USING A FLASHLIGHT AND STADIUM ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROW PLUS**
- REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - MEMBERS OR POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 3. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS**
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 40" (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.**
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.**
- NOTES:**
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
  - CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

**ACCEPTABLE FILL MATERIALS: STORMTECH SC-800 CHAMBER SYSTEMS**

MATERIAL LOCATION	DESCRIPTION	ASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 12" (300 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'C' LAYER.	ASHTO M45 <sup>1</sup> A-1, A-2-A, A-3 OR ASHTO M47 <sup>2</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 76, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 90% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lb (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lb (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	ASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	ASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>1,2</sup>

**PLEASE NOTE:**

- THE LISTED ASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE "CLEAN, CRUSHED, ANGULAR NO. 4 (ASHTO M43) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'C' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERSAGES WITH A VIBRATORY COMPACTOR.
- WHERE INITIAL TYPICAL SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDING DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOLID MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOLS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
- WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



**1 SC-800 CROSS SECTION DETAIL**

DRAWN: JLM  
REVIEWED: JLM  
REV:  
DATE: 01/10/24  
PROJECT NO:  
NOT TO SCALE

SC-800  
STANDARD DETAILS

StormTech  
Chambers  
4640 TRUENMAN BLVD  
HILLIARD, OH 43026

4640 TRUENMAN BLVD  
HILLIARD, OH 43026



SHEET  
1

ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS DETAIL BASED ON REFERENCED STANDARDS. ADS HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT. FOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED, THE INSTALLATION DETAILS PROVIDED HEREIN ARE GENERAL RECOMMENDATIONS AND ARE NOT SPECIFIC FOR THIS PROJECT. UNLESS THE PLANS ARE SIGNED AND SEALED BY THE SITE DESIGN ENGINEER, THE SITE DESIGN ENGINEER SHALL VERIFY THESE DETAILS PRIOR TO CONSTRUCTION AND SEALING THE DOCUMENT. IT IS THE SITE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THE DETAILS PROVIDED HEREIN MEET OR EXCEEDS THE APPLICABLE NATIONAL, STATE, OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.

Revisions		
Description	Date	Num
Village Submittal	10.25.24	
Revisions	12.20.24	

Comm: 243118  
Date: 12/20/24  
Drawn: MO  
Check: KC



**STORMTECH  
STANDARD  
DETAILS**

# Butterfield Road School - New Parking Lot and Lighting

1441 Lake Street  
Libertyville, Illinois 60048

Libertyville School District #70  
1381 W Lake Street  
Libertyville, Illinois 60048

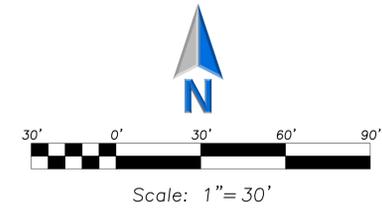


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www.ERIKSON-LLC.COM  
(847) 222-4884  
Professional Engineer No. 021-000152  
Expiring 04/30/2025



### LANDSCAPE NOTES:

- PLANT QUANTITIES SHOWN IN THE PLANT SCHEDULE ARE FOR CONVENIENCE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIALS SHOWN ON THE PLAN AND SHOULD NOT RELY ON THE PLANT SCHEDULE FOR DETERMINING QUANTITIES.
- ALL PLANT MATERIALS SHALL BE NURSERY GROWN STOCK AND SHALL BE FREE FROM ANY DEFORMITIES, DISEASES OR INSECT DAMAGE. ANY MATERIALS WITH DAMAGED OR CROOKED/DISFIGURED LEADERS, BARK ABRASION, SUNSCALD, INSECT DAMAGE, ETC. ARE NOT ACCEPTABLE AND WILL BE REJECTED. TREES WITH MULTIPLE LEADERS WILL BE REJECTED UNLESS CALLED OUT IN THE PLANT SCHEDULE AS MULTI-STEM. NO PRUNING TO BE DONE AT THE TIME OF INSTALLATION EXCEPT FOR DEAD OR BROKEN LIMBS.
- ALL LANDSCAPE IMPROVEMENTS SHALL MEET MUNICIPALITY REQUIREMENTS AND GUIDELINES, WHICH SHALL BE VERIFIED BY MUNICIPAL AUTHORITIES.
- ALL PLANTING OPERATIONS SHALL BE COMPLETED IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICES. THIS MAY INCLUDE, BUT NOT BE LIMITED TO, PROPER PLANTING BED AND TREE PIT PREPARATION, PLANTING MIX, PRUNING, STAKING AND GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE OF MATERIALS DURING CONSTRUCTION ACTIVITIES.
- ALL PLANT MATERIALS SHALL BE INSPECTED AND APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. ANY MATERIALS INSTALLED WITHOUT APPROVAL MAY BE REJECTED.
- THE CONTRACTOR SHALL GUARANTEE PLANT MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER. THE CONTRACTOR SHALL OUTLINE PROPER MAINTENANCE PROCEDURES TO THE OWNER AT THE TIME OF ACCEPTANCE. DURING THE GUARANTEE PERIOD, DEAD OR DISEASED MATERIALS SHALL BE REPLACED AT NO COST TO THE OWNER. AT THE END OF THE GUARANTEE PERIOD THE CONTRACTOR SHALL OBTAIN FINAL ACCEPTANCE FROM THE OWNER.
- ANY EXISTING TREES TO BE RETAINED SHALL BE PROTECTED FROM SOIL COMPACTION AND OTHER DAMAGES THAT MAY OCCUR DURING CONSTRUCTION ACTIVITIES BY ERECTING FENCING AROUND SUCH MATERIALS THE DRIP LINE OF THE TREE TO BE PROTECTED UNLESS SPECIFIED OTHERWISE.
- ALL GRASS, CLUMPS, OTHER VEGETATION, DEBRIS, STONES, ETC. SHALL BE RAKED OR OTHERWISE REMOVED FROM PLANTING AND LAWN AREAS PRIOR TO INITIATION OF INSTALLATION PROCEDURES.
- THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INITIATING PLANTING OPERATIONS. THE CONTRACTOR SHALL REPAIR/ REPLACE AND UTILITY, PAVING, CURBING, ETC. WHICH IS DAMAGED DURING PLANTING OPERATIONS.
- REFER TO PLAT OF SURVEY FOR LEGAL DESCRIPTION, BOUNDARY DIMENSIONS AND EXISTING CONDITIONS.
- ALL PLANT MATERIAL ON THIS PLANTING PLAN REPRESENTS THE INTENTION AND INTENSITY OF THE PROPOSED LANDSCAPE MATERIAL. THE EXACT SPECIES AND LOCATIONS MAY VARY IN THE FIELD DO TO MODIFICATIONS IN THE SITE IMPROVEMENTS AND THE AVAILABILITY OF PLANT MATERIAL AT THE TIME OF INSTALLATION. ANY SUCH CHANGES MUST FIRST BE APPROVED BY THE CITY IN WRITING.
- ALL PLANT MATERIAL SHALL BE PLANTED WITH A MINIMUM OF SIX INCHES OF ORGANIC SOIL AND MULCHED WITH A SHREDDED BARK MATERIAL TO A MINIMUM 3" DEPTH.
- ALL BEDS SHALL BE EDGED, HAVE WEED PREMERGENTS APPLIED AT THE RECOMMENDED RATE.
- ALL PARKWAYS SHALL HAVE LAWN ESTABLISHED WITH SEED A GROUNDCOVER, UNLESS OTHERWISE NOTED.
- ALL LAWN AREAS ON THIS PLAN SHALL BE GRADED SMOOTH AND TOPPED WITH AT LEAST 8" OF TOPSOIL. ALL LAWN AREAS TO BE ESTABLISHED USING SOD. ALL TURF GRASS AREAS ADJACENT TO PAVEMENT OR CURB SHALL BE GRADED FLUSH WITH THAT PAVEMENT AND ALLOW POSITIVE DRAINAGE. ANY SETTLEMENT OF THE TURF GRASS AREAS SHALL BE CORRECTED BY THE LANDSCAPE CONTRACTOR AT THE CONTRACTOR'S EXPENSE PRIOR TO FINAL ACCEPTANCE BY OWNER.
- THIS LANDSCAPE PLAN ASSUMES THE SITE WILL BE PREPARED WITH TOP SOIL SUITABLE FOR THE ESTABLISHMENT OF THE LANDSCAPE MATERIAL PRESENTED ON THIS PLAN. IF ADDITIONAL TOP SOIL IS REQUIRED IT IS UP TO THE LANDSCAPE CONTRACTOR ON THE PROJECT TO PROVIDE, SPREAD AND PREPARE THE SITE AS NEEDED FOR THE IMPLEMENTATION OF THIS LANDSCAPE PLAN.
- CONTRACTORS MUST VERIFY ALL QUANTITIES AND OBTAIN ALL PROPER PERMITS AND LICENSES FROM THE PROPER AUTHORITIES.
- ALL MATERIAL MUST MEET INDUSTRY STANDARDS AND THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REFUSE ANY POOR MATERIAL OR WORKMANSHIP.
- LANDSCAPE ARCHITECT IS NOT RESPONSIBLE FOR UNSEEN SITE CONDITIONS.
- ALL PLANTINGS SHALL BE SPACED EQUAL DISTANT, BACK FILLED WITH AMENDED SOIL IN A HOLE TWICE THE ROOTBALL DIAMETER, WATERED, FERTILIZED, PRUNED, AND HAVE ALL TAGS AND ROPES REMOVED.
- LAWN AND BED AREAS SHALL BE ROTOTILLED, RAKED OF CLUMPS AND DEBRIS.
- REMOVE ALL DEAD AND DISEASED PLANT MATERIAL FROM SITE AND DISPOSE OF PROPERLY.
- PLANTS TO BE PLANTED SO THAT ROOT FLARE IS AT THE GRADE OF THE AREA WHERE PLANTED. NO PRUNING TO BE DONE AT THE TIME OF INSTALLATION EXCEPT TO REMOVE DEAD OR BROKEN LIMBS.

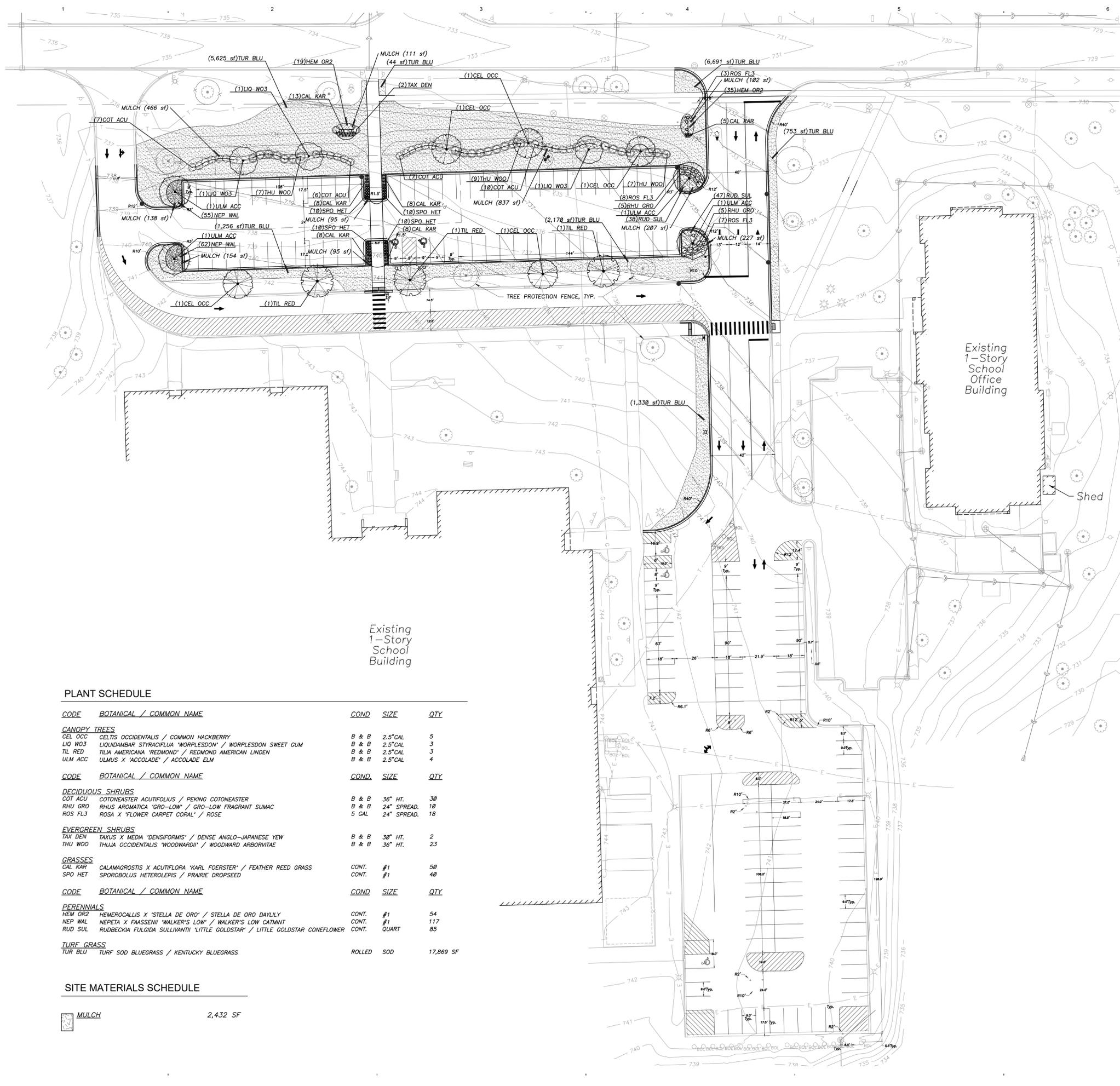
Revisions		
Description	Date	Num
Village Submittal	10.25.2024	
Revisions	12.20.2024	

Comm: 243118  
Date: 10.25.24  
Drawn: SSG  
Check: KC



## LANDSCAPE PLAN

Scale:  
**L1.0**



### PLANT SCHEDULE

CODE	BOTANICAL / COMMON NAME	COND.	SIZE	QTY
<b>CANOPY TREES</b>				
CEL OCC	CELTIS OCCIDENTALIS / COMMON HACKBERRY	B & B	2.5" CAL	5
LIO W03	LIQUIDAMBAR STRYACIFLUA "WORPLESDON" / WORPLESDON SWEET GUM	B & B	2.5" CAL	3
TIL RED	TILIA AMERICANA "REDMOND" / REDMOND AMERICAN LINDEN	B & B	2.5" CAL	3
ULM ACC	ULMUS X "ACCOLADE" / ACCOLADE ELM	B & B	2.5" CAL	4
<b>DECIDUOUS SHRUBS</b>				
COT ACU	COTONEASTER ACUTIFOLIUS / PEKING COTONEASTER	B & B	36" HT.	30
RHU GRO	RHUS AROMATICA "GRO-LOW" / GRO-LOW FRAGRANT SUMAC	B & B	24" SPREAD	10
ROS FL3	ROSA X "FLOWER CARPET CORAL" / ROSE	5 GAL	24" SPREAD	18
<b>EVERGREEN SHRUBS</b>				
TAX DEN	TAXUS X MEDIA "DENSIFORMIS" / DENSE ANGLO-JAPANESE YEW	B & B	30" HT.	2
THU WOO	THUJA OCCIDENTALIS "WOODWARDII" / WOODWARD ARBORVITAE	B & B	36" HT.	23
<b>GRASSES</b>				
CAL KAR	CALAMAGROSTIS X ACUTIFLORA "KARL FOERSTER" / FEATHER REED GRASS	CONT.	#1	50
SPO HET	SPOROBOLUS HETEROLEPIS / PRAIRIE DROPSPEED	CONT.	#1	40
<b>PERENNIALS</b>				
HEM OR2	HEMEROCALLIS X "STELLA DE ORO" / STELLA DE ORO DAYLILY	CONT.	#1	54
NEP WAL	NEPETA X FAASSENII "WALKER'S LOW" / WALKER'S LOW CATMINT	CONT.	#1	117
RUD SUL	RUDBECKIA FULGIDA SULLIVANTII "LITTLE GOLDSTAR" / LITTLE GOLDSTAR CONEFLOWER	CONT.	QUART	85
<b>TURF GRASS</b>				
TUR BLU	TURF SOD BLUEGRASS / KENTUCKY BLUEGRASS	ROLLED SOD		17,869 SF

### SITE MATERIALS SCHEDULE

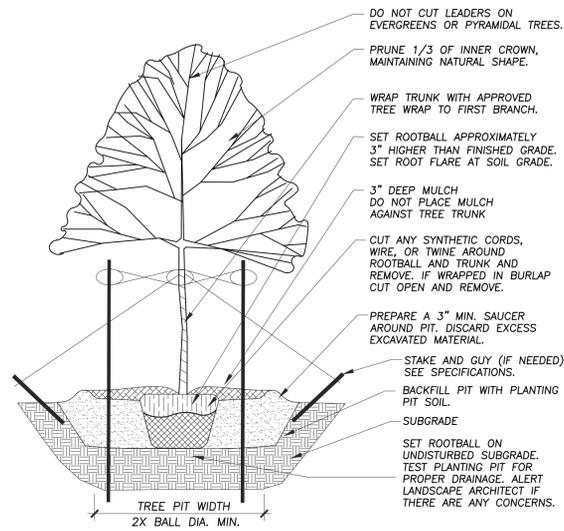
MULCH	2,432 SF
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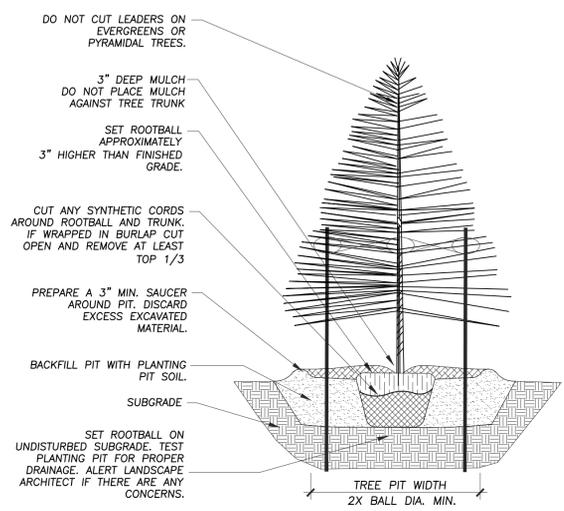
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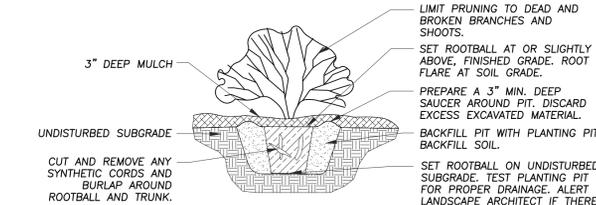
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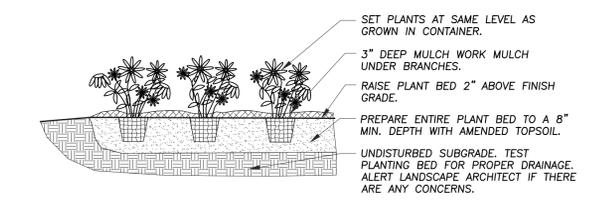
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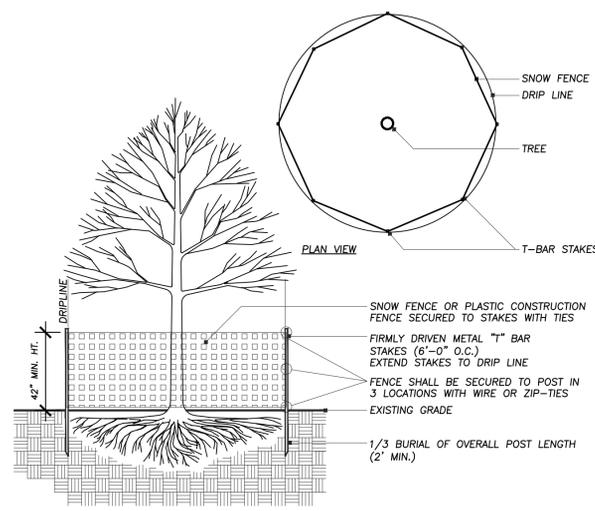
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**3** SHRUB PLANTING DETAIL  
 Not To Scale 329333-01



**4** ANNUAL, PERENNIAL, & GROUNDCOVER DETAIL  
 Not To Scale 329301-03



**5** TREE PROTECTION DETAIL  
 Not To Scale 329383-01

**Butterfield Road School - New Parking Lot and Lighting**  
 1441 Lake Street  
 Libertyville, Illinois 60048

**Libertyville School District #70**  
 1381 W Lake Street  
 Libertyville, Illinois 60048



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Revisions		
Description	Date	Num
Village Submittal	10.25.2024	
Revisions	12.20.2024	

Comm: **243118**  
 Date: **10.25.24**  
 Drawn: **SSG**  
 Check: **KC**



**LANDSCAPE DETAILS**

Scale:  
**L2.0**

Butterfield School - Landscape Plan  
 12/19/2024 4:10:29 PM

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# Butterfield School Traffic and Parking Study Libertyville, Illinois



## Prepared For:

Libertyville School District 70

and

Wold Architects & Engineers

## Prepared by:

Eriksson Engineering Associates, Ltd.

December 20, 2024



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## INTRODUCTION

Eriksson Engineering Associates, Ltd. (EEA) was retained by Libertyville School District 70 and Wold Architects & Engineers to conduct a traffic and parking study at Butterfield School in Libertyville, Illinois. The purpose of the study was to observe the existing traffic patterns around the school, to determine the traffic characteristics of the school, to review its parking needs, and to develop roadway and parking recommendations.

## EXISTING CONDITIONS

### Site Location and Area Land-Uses

Butterfield School is located at 1441 Lake Street in Libertyville, Illinois. The site is bounded by Lake Street to the north, Butterfield Road to the south and west, and powerlines to the east. It is located within a single-family residential neighborhood on the north and east with a golf course to the west. **Figure 1** illustrates the site location and the surrounding land-uses and roads. All figures are at the end of the report.

### Bicycle and Pedestrian Routes

Springhaven Drive is a bike route. Lake Street east of Springhaven Drive is also a bike route to Butler Lake. Sidewalks are provided on the south side of Lake Street east of Springhaven Drive. A crosswalk over Lake Street is located west of Springhaven Drive.

### Roadway Characteristics

A description of the area roadways accessing the school is provided on **Figure 2** and below:

**Lake Street** is an east-west major collector roadway with one travel lane in each direction. At the two-way stop-controlled intersection with Butterfield Road, Lake Street has two westbound lanes (one left and one shared thru/right). On-street parking is not permitted. The road has a 25-mph speed limit with a 20-mph school speed zone by the school and is under the authority of the Village of Libertyville.

**Butterfield Road** is a north-south minor arterial four-lane roadway. At the intersection with Lake Street, Butterfield Road has three lanes in each direction, one left-turn, one thru, and one shared thru/right-turn lane. On-street parking is not permitted. The road has a 40-mph speed limit and is under the authority of Lake County Division of transportation.

**Springhaven Drive** is a north-south local residential roadway with one travel lane in each direction. On-street parking is not permitted south of Windhaven Road but is available to the north. The road has a speed limit of 25-mph and is under the authority of the Village of Libertyville.

### Existing Traffic Volumes

Weekday morning arrival (7:30-9:00 AM) and afternoon dismissal (1:30-4:30 PM) traffic counts were conducted within the study area. Peak-hours of school traffic occurred from 7:45 to 8:45 AM and 2:45 to 3:45 PM on a school weekday which coincides with the school's 8:37 AM start and 3:15 PM dismissal. The existing traffic volumes are shown on **Figure 3A** and included in the **Appendix**. EEA separated the school traffic from the background traffic in **Figures 3B and 3C**. **Figure 4** summarizes the existing pedestrian and bicycle volumes observed. Traffic during the midday early childhood dismissal and arrival periods have minimal traffic with significantly less school traffic during off-peak traffic times.

### Student Loading Procedures

Butterfield School procedures are for school buses to enter the west entrance, load their students on the north side of the school, and exit via the east entrance. Parents and staff enter through the east driveway and proceed south to the drop-off/pick-up lanes next to the school or to the parking areas. Both exit via the east entrance.

**School Observations**

Butterfield School’s arrival and dismissal times for the Kindergarten thru 5<sup>th</sup> Grades are from 8:45 AM to 2:45 PM. Early Child has two half-day sections from 8:15-10:45 AM and from 12:05 to 2:45 PM. During the morning arrival, traffic conditions were good on the road system. The eastbound and westbound left-turns from Lake Street to Butterfield Road had longer delays waiting for gaps in mainline traffic. On the school grounds, the school bus loading worked well. Student drop-off internally was congested and backed up to but not on Lake Street. School staff indicated that school traffic regularly backs up into Lake Street. This congestion is due in part to staff and parent traffic circulation patterns overlapping. The afternoon dismissal worked well.

**SITE TRAFFIC CHARACTERISTICS**

The school currently serves 492 children, including 46 early childhood, with 106 staff. The overall student population is stable and not expected to grow or decrease over the next five years. The district administrative offices have 25 staff members and can host up to 40 additional staff for training.

The proposed site plan creates a new parking lot within the bus loading area with 67 spaces including two accessible spaces. These spaces will be reserved for staff parking during the school day since staff arrive before and leave after the school buses. The east parking lot will be partially restriped to help traffic flow in the lot and will lose six parking spaces. The new parking plan will provide 188 total spaces including 7 accessible.

**School Trip Generation and Distribution**

The site traffic generated by the school was obtained from the existing traffic counts with the results shown in **Table 1**. No growth in the student population is expected over the next few years. There are 13 buses serving the school with 394 students (80%) riding the bus.

**Table 1  
Existing School Traffic Volumes**

Scenario	Morning Arrival			Afternoon Dismissal		
	In	Out	Total	In	Out	Total
Existing 492 Students	220	135	355	99	120	219

The directional distribution for school traffic is based on the existing school traffic counts and is shown in **Table 2** and on **Figure 5**. More than half of the school traffic (55%) approaches the site on Butterfield Road and 40% are from the east on Lake Street. The remaining vehicles use Springhaven Drive (5%).

**Table 2  
Existing Directional Distribution**

Direction	Percentage
East on Lake Street	40%
South on Butterfield Road	15%
North on Butterfield Road	40%
North on Springhaven Drive	5%
<b>Total</b>	<b>100%</b>

**Trip Assignment**

The existing school trips were redistributed to the area roadways based on the proposed site plan and the directional distribution analysis. The primary change in the traffic pattern is that some staff will now enter at the bus entrance to access the north parking lot instead of the east drive to the east lot. **Figure 6** illustrates the rerouted site traffic generated by the school on the road system.

The total traffic volumes are estimated for a period of five years after the projected opening which is the Year 2030. Data provided by the Chicago Metropolitan Agency for Planning shows a regional growth rate of 0.7% per year on Butterfield Road and 0.6% a year on Lake Street. A copy of the CMAP letter is included in the **Appendix**. The existing traffic volumes adjusted for regional growth (**Figure 7**) were then combined with the site traffic volumes to generate the Year 2030 total traffic volumes which are shown on **Figure 8**.

**ANALYSES**

**Intersection Capacity Analyses**

An intersection’s ability to accommodate traffic flow is based on the average control delay experienced by vehicles passing through the intersection. The intersection and individual traffic movements are assigned a level of service (LOS), ranging from A to F based on the control delay created by a traffic signal or stop sign. Control delay consists of the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS A has the best traffic flow and least delay. LOS E represents saturated or at capacity conditions. LOS F experiences oversaturated conditions and extensive delays. The Highway Capacity Manual definitions for levels of service and the corresponding control delay for both signalized and unsignalized intersections are shown in **Table 3**.

**Table 3  
Level of Service Criteria for Intersections**

Level of Service	Description	Control Delay (seconds/vehicle)	
		Signals	Stop Signs
A	Minimal delay and few stops	<10	<10
B	Low delay with more stops	>10-20	>10-15
C	Light congestion	>20-35	>15-25
D	Congestion is more noticeable with longer delays	>35-55	>25-35
E	High delays and number of stops	>55-80	>35-50
F	Unacceptable delays and over capacity	>80	>50

Source: Highway Capacity Manual

Capacity analyses were conducted for each intersection using the micro-simulation computer program SYNCHRO to determine the existing future operating conditions of the access system. These analyses were performed for the school’s peak arrival and dismissal periods. **Table 4** shows the existing and future level of service results for each intersection. Copies of the capacity analysis summaries are included in the **Appendix**.

**Butterfield Road at Lake Street**

Butterfield Road is an arterial roadway carrying large volumes of traffic. At Lake Street and the golf course, there are stop signs controlling vehicles turning onto or crossing Butterfield Road, During peak hours, delays are high for left-turning traffic onto Butterfield Road resulting in LOS F for those movements. This is not an unusual condition. As a result, most westbound Lake Street traffic is turning right onto Butterfield Road (80 to 88%). The volume of left-turns is low and there is minimal queueing. No improvements are warranted at this intersection.

**Table 4  
Intersection Level of Service and Delay**

Intersection	Movement	AM Arrival		PM Dismissal	
		2023	2029	2023	2029
Lake Street at Butterfield Road (Two-Way-Stop)	NB Left	B-12.9	B-13.4	A-9.5	A-9.6
	SB Left	B-11.1	B-11.5	B-11.8	B-12.12
	EB Thru/Right	B-14.8	C-15.4	B-11.1	B-11.3
	EB Left	F-100+	F-100+	F-97.6	F-100+
	WB Thru/Right	D-27.0	D-31.8	C-17.2	C-18.2
	WB Left	F-100+	F-100+	F-100+	F-100+
Lake Street at Springhaven Drive	SB Approach	B-12.5	B-11.6	B-11.5	B-10.5
	EB Left	A-7.7	A-7.5	A-7.9	A-7.7
Lake Street at West School Drive	WB Left	A-7.9	A-7.9	A-7.4	A-7.5
Lake Street at East School Drive (Two-Way Stop)	WB Left	A-8.3	A-8.3	A-7.6	A-7.6
	NB Left/Right	B-14.7	B-14.9	B-11.2	B-11.4

**Lake Street at West Bus Entrance Drive**

The west school drive in an entrance only drive that serves school buses today and will accommodate staff and school buses in the future. The additional staff traffic volumes are low, and they typically arrive before or after the school buses. The westbound left turn lane is low and operates at a level of service A. No additional improvements are proposed.

**Lake Street at Springhaven Drive**

Springhaven Drive is a stop-controlled roadway serving the residential area to the north. During the school arrival and dismissal periods, a crossing guard is present to help students cross Spirnghaven Drive and Lake Street. The overall level of service of the intersection is good (LOS A or B). Please note the crossing guard creates some delays when they stop traffic to allow students to cross safely. No additional improvements are recommended.

**Lake Street at East School Entrance**

The intersection of Lake Street and the East School entrance should operate well based on the level of service calculations. However, observations by EEA and staff indicate that the inbound movements internally cause congestion that can back up on to Lake Street. This is due to one inbound lane serving the student loading area on the east side of the school building and is the only entry to the school/administrative parking lot. Staff parking in the lot get caught in the vehicular queue resulting in more queuing.

To reduce this congestion, the following improvements are proposed:

1. Widen the east entrance to two inbound lanes to allow parents to stack in the western lane leaving the eastern lane open for access to the parking lot.
2. Change the parking circulation to a southbound only lane by the east side of the school for morning drop-off and afternoon pick-ups. The other north-south parking aisle is currently one-way outbound forcing loading and parking traffic to mix. Restripe the parking aisle from one-way with angled parking to two-way with perpendicular parking. Staff arriving to park can access the parking by avoiding the loading area.

3. Relocate a portion of the staff parking to the new north lot which reduces the amount of inbound traffic at the east entrance.
4. Move the existing loading area further south in the parking lot to extend the available stacking by another 120 feet.

The above improvements will minimize the on-site congestion and minimize any stacking onto Lake Street.

### **On-site Traffic Circulation**

**Exhibits 1 thru 6** were prepared showing the traffic circulation routes within the school site for the school buses, school and district staff, and parents dropping off or picking up their students.

### **Vehicle Queuing**

The existing loading area for students is located at the northern half of the east building face. From Lake Street, this provides 420 feet of stacking space which can accommodate 21 vehicles. Because of the single inbound lane, some of the queued vehicles are school/administrative staff. In the future, the loading zone will be moved further south in the lot for 540 feet or 27 vehicles of stacking capacity. This additional storage along with providing a separate travel path for staff will minimize any vehicles backing up on Lake Street.

### **Parking Supply**

The existing school provides 123 standard parking stalls and 4 accessible parking stalls (127 total) that are shared between Butterfield School and the School District 70 administrative office building on the east side of the site.

The proposed site plan creates a new parking lot within the bus loading area with 67 spaces including two accessible spaces. These spaces will be reserved for staff parking during the school day since staff arrive before and leave after the school buses. Signs by the entrance should be posted limiting access to staff and buses only from 7:30 AM to 3:30 PM.

The east parking lot will be partially restriped to help traffic flow in the lot and will lose six parking spaces. The new parking plan will provide 188 total spaces including 7 accessible spaces for an increase of 61 spaces.

### **Parking Demand**

The Village of Libertyville requires a minimum of one parking space per classroom (36 spaces) and 1 space per 250 square feet of administrative space (62 spaces) for a total of 98 spaces which are exceeded by the existing and proposed parking demand.

Discussions with school staff noted that parking is inadequate for after-school and evening events, on larger staff training days for the school district office, and when daytime events are held at the school.

Daytime school events create additional parking demand. For example, during the recent 5th grade gingerbread houses in-school event, 20 cars parked on the street in the neighborhood plus 15 illegally parked in the school lot (35 total).

### **Event Parking**

Butterfield School has approximately 12 large events in the evening during the school year. The events and their typical attendance are:

1. Parent / Teacher Conferences (twice a year) = 250 families each night
2. Curriculum Night = 500 families
3. 5th Grade Showcase = 100 families (sometimes grandparents)
4. Kinder Orientation = 100 families
5. EC Open House= 50 families
6. K Showcase = 100 families
7. 1st / 2nd Grade Showcase = 200 families
8. 3rd / Grade 4th Showcase = 200 families

- 9. BFA Winterfest = 300 families
- 10. BFA Trakathon (during the day) = 50 families
- 11. Field Day (during the day) = 50 families

During the day, the school has a number of small events, like the gingerbread house event, which would fill any excess spaces resulting in illegal and neighborhood parking.

**Table 5** provides a summary of the parking supply and daytime/nighttime needs at the school. The proposed 188 space parking supply will meet the needs of the staff and training. When typical training and daytime activities are scheduled simultaneously, there would be some overflow parking in the neighborhood.

**Table 5  
Parking Summary**

Supply	Daytime Demand	Evening Demand
North Lot – 67 sp	School Staff – 101 per	<b>50 – 500 families Up to 50 staff</b>
East Lot – 121 sp	District Staff – 25 per	
<b>Total – 188 sp</b>	Training – 20 to 40 per	
	Visitors/Traveling Staff – 21 per	
	<b>Total – 167 to 187 per</b>	
	Daytime Event - 35 per	
	<b>Total Daytime – 222 per</b>	

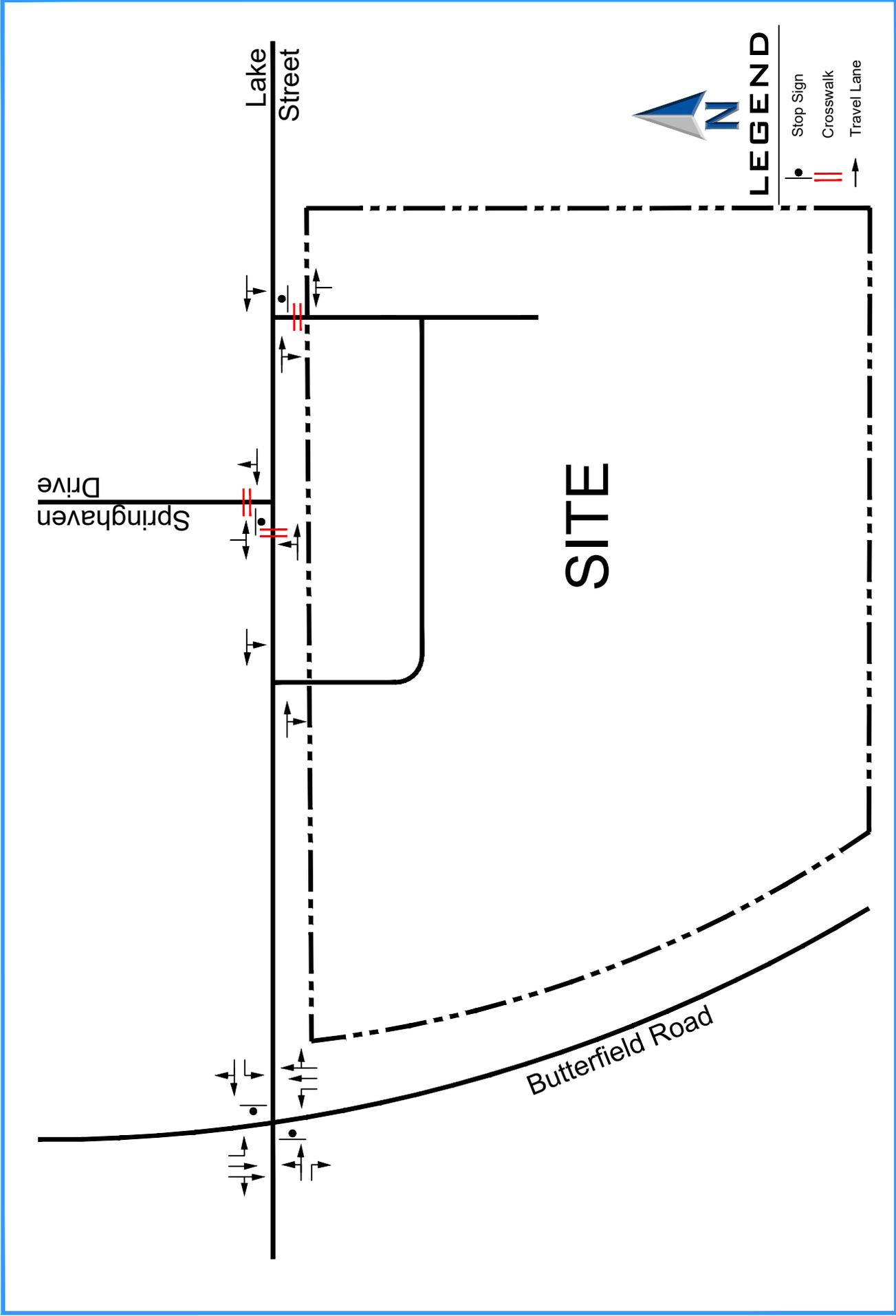
Note: Also See Exhibit A-1 from WOLD

## SUMMARY

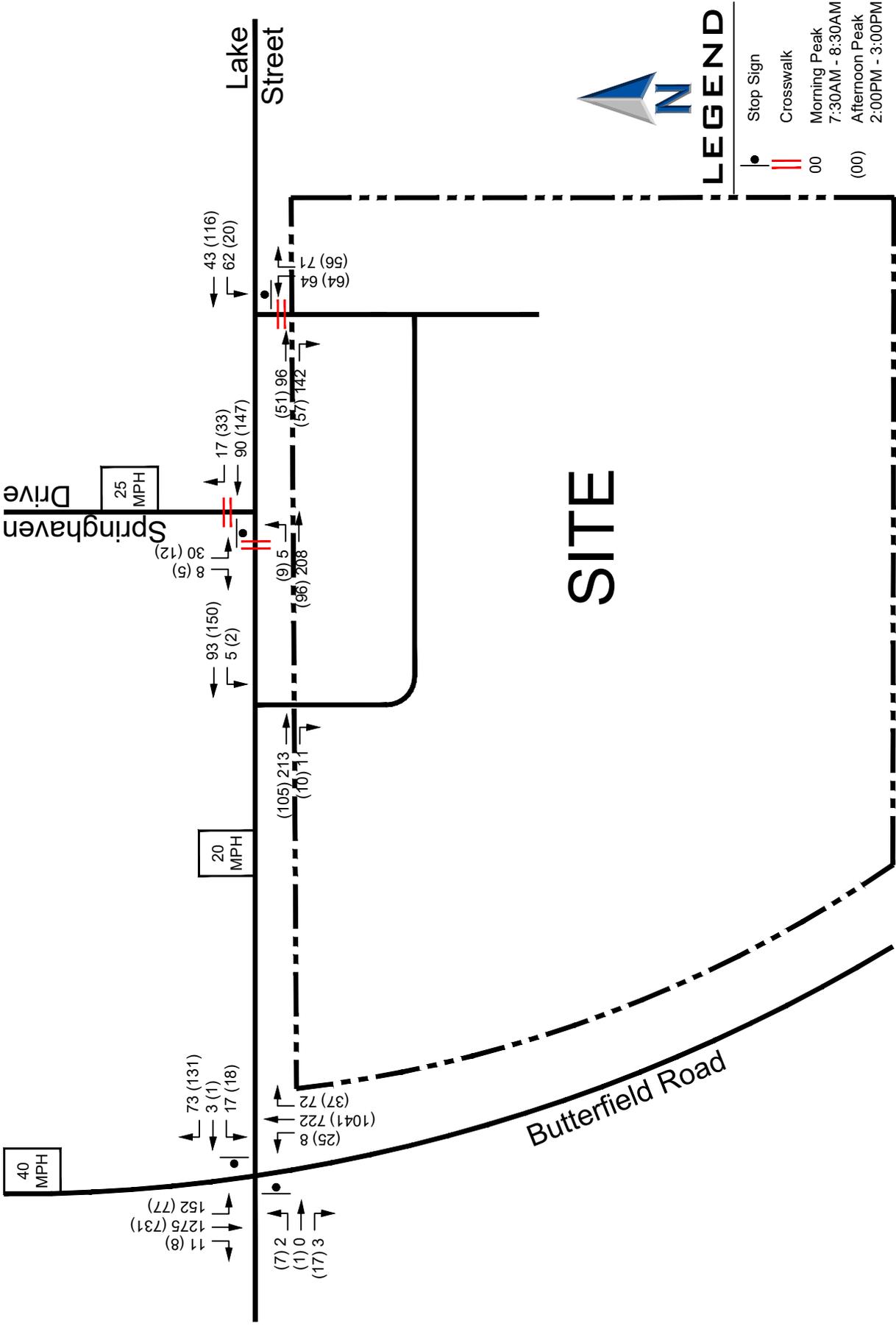
This report summarizes the results of the traffic and parking study for the expansion of Butterfield School in Libertyville, Illinois. The following recommendations were developed:

1. Butterfield School is not expected to increase student population or vehicular volumes during the peak school hours and will not adversely change the level-of-service of study area intersections.
2. A 67-space parking lot on the north side of the site will serve staff during the school day and be available for event parking at other times. Signs by the entrance should be changed to staff and buses only from 7:30 AM to 3:30 PM.
3. The east parking lot will be restriped to move the student loading area further south to increase the on-site vehicle storage. It will also create a two-way parking aisle to allow staff/trainees to access parking without going thru the drop-off area. The number of parking spaces will be reduced from 127 to 121 spaces.
4. The east driveway will be widened to two inbound lanes to accommodate vehicular queuing for the student loading in one lane and a bypass lane to the school's parking lot. This should decrease queuing when staff can avoid the student loading area.
5. The new parking plan will provide 188 total spaces including 7 accessible spaces for an increase of 61 spaces.



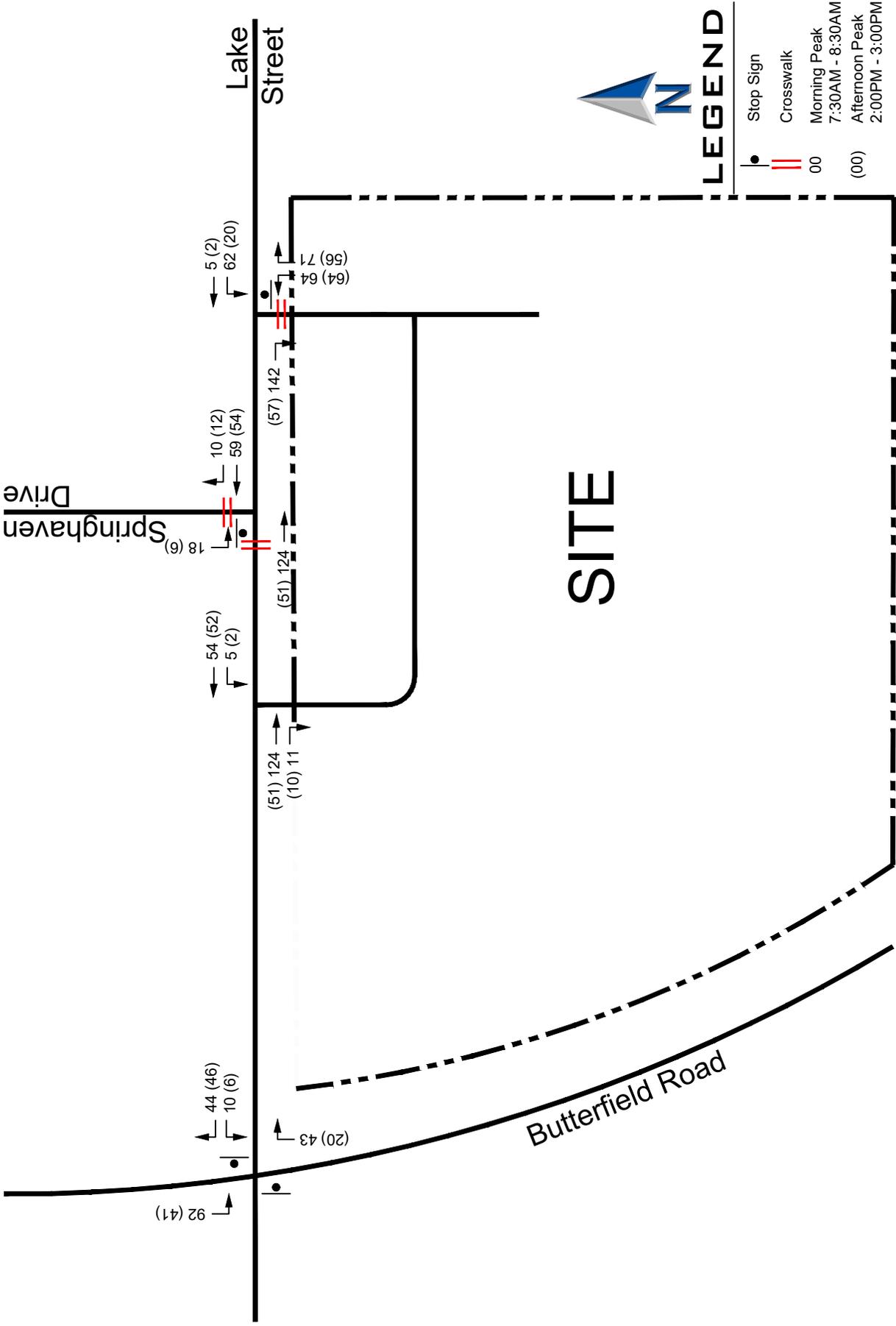


**Existing Roadways Geometrics**  
**Figure 2**



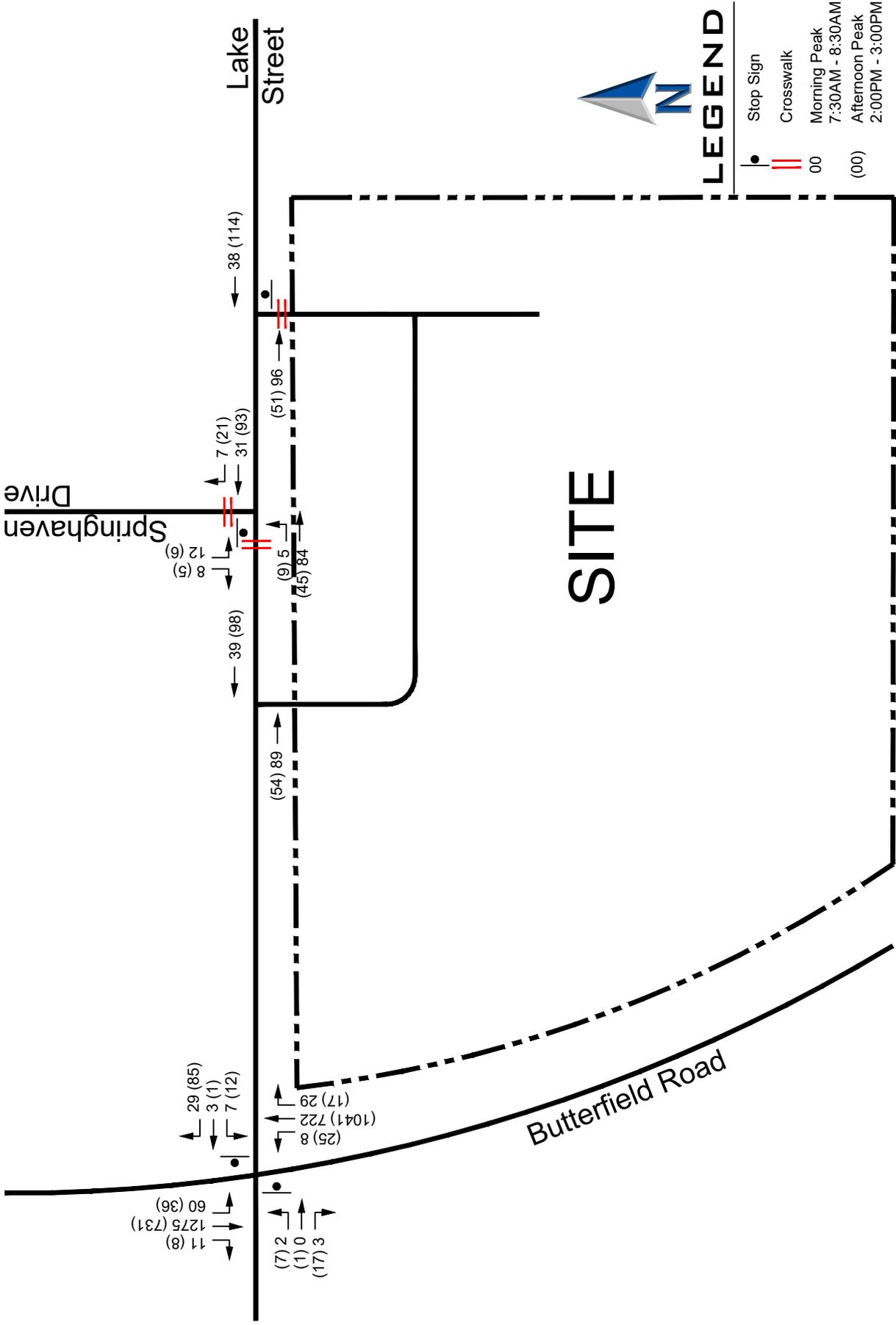
**Existing Traffic Volumes**

**Figure 3A**

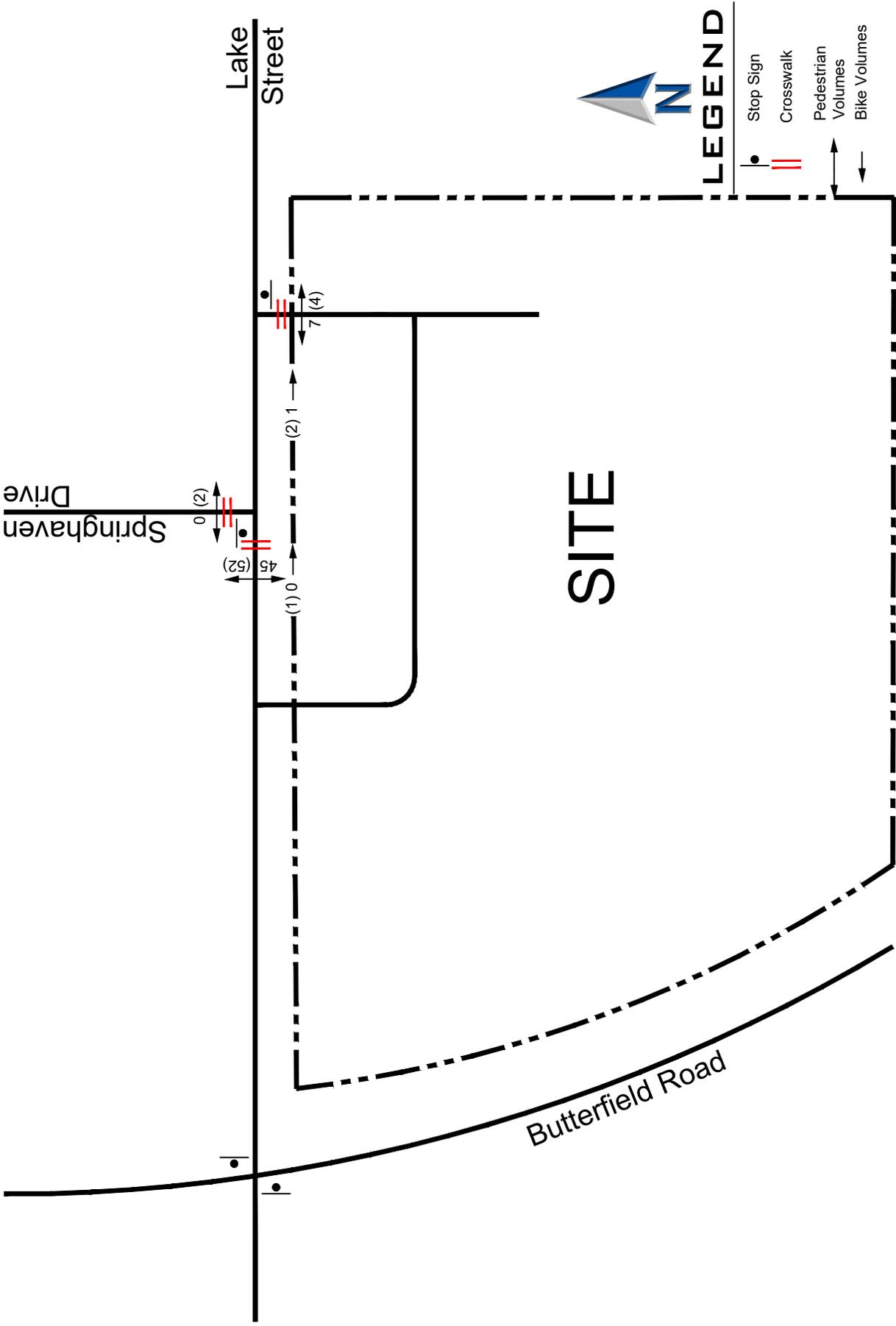


**Existing School Traffic Volumes**

**Figure 3B**

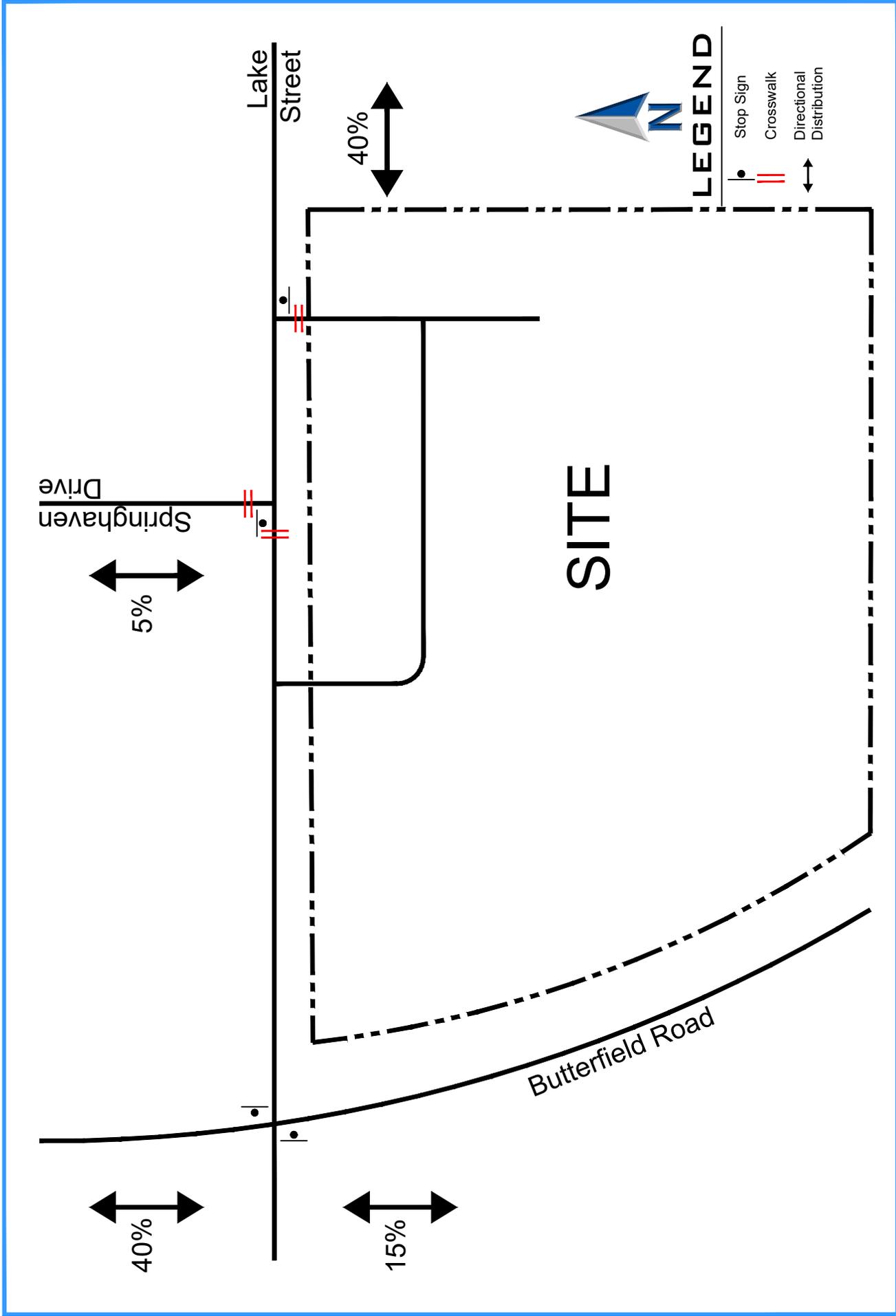


**Existing Non-School Traffic Volumes**  
**Figure 3C**



**Year 2023 Pedestrian and Bike Volumes**

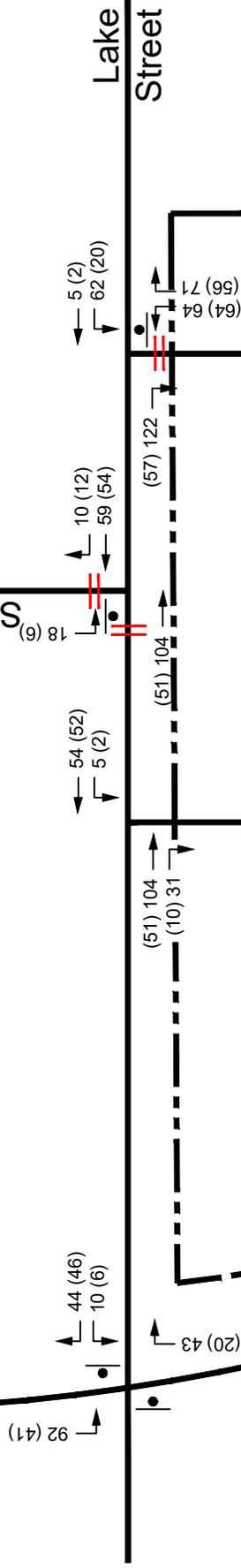
**Figure 4**



**Directional Distribution**

**Figure 5**

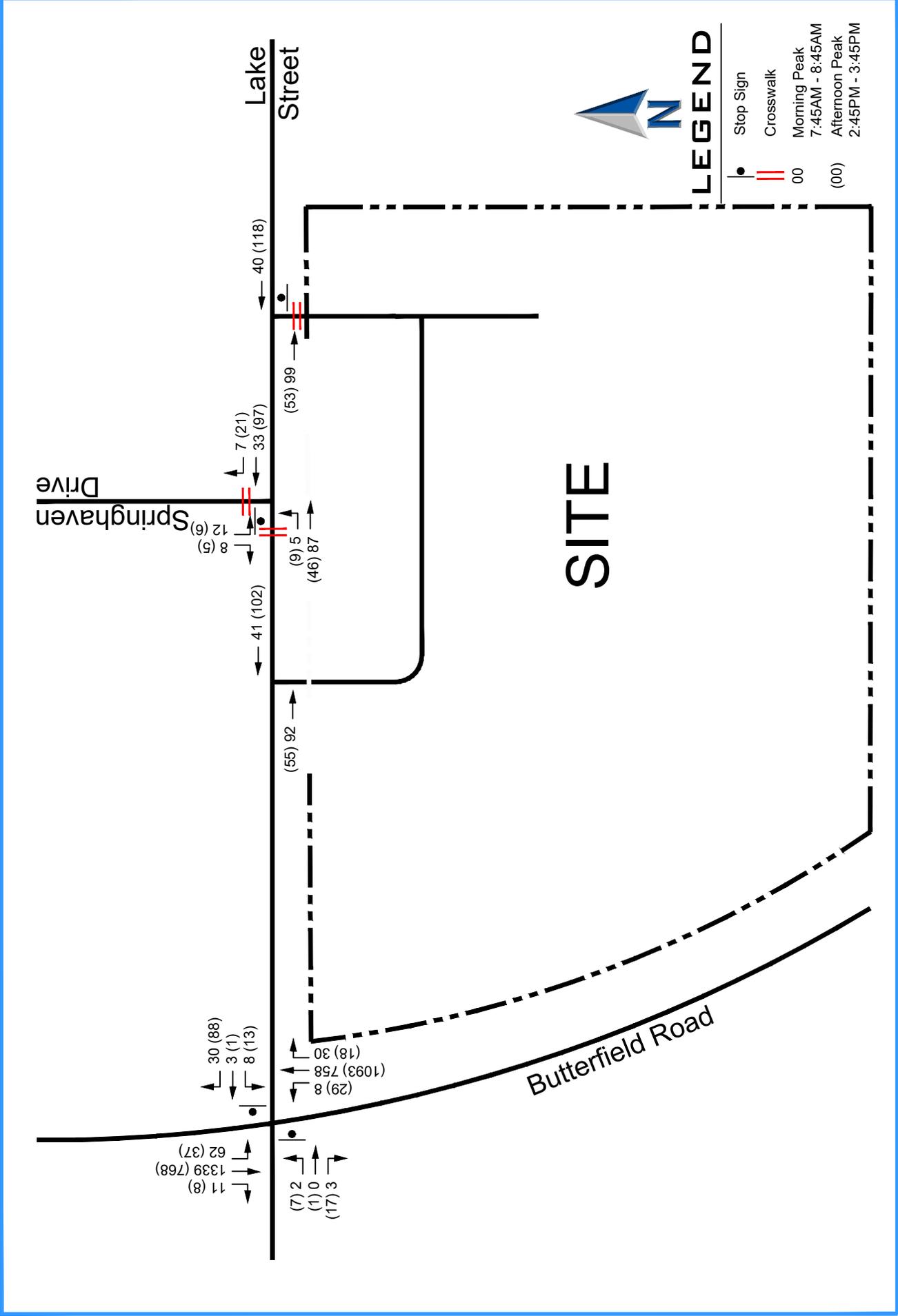
Springhaven Drive

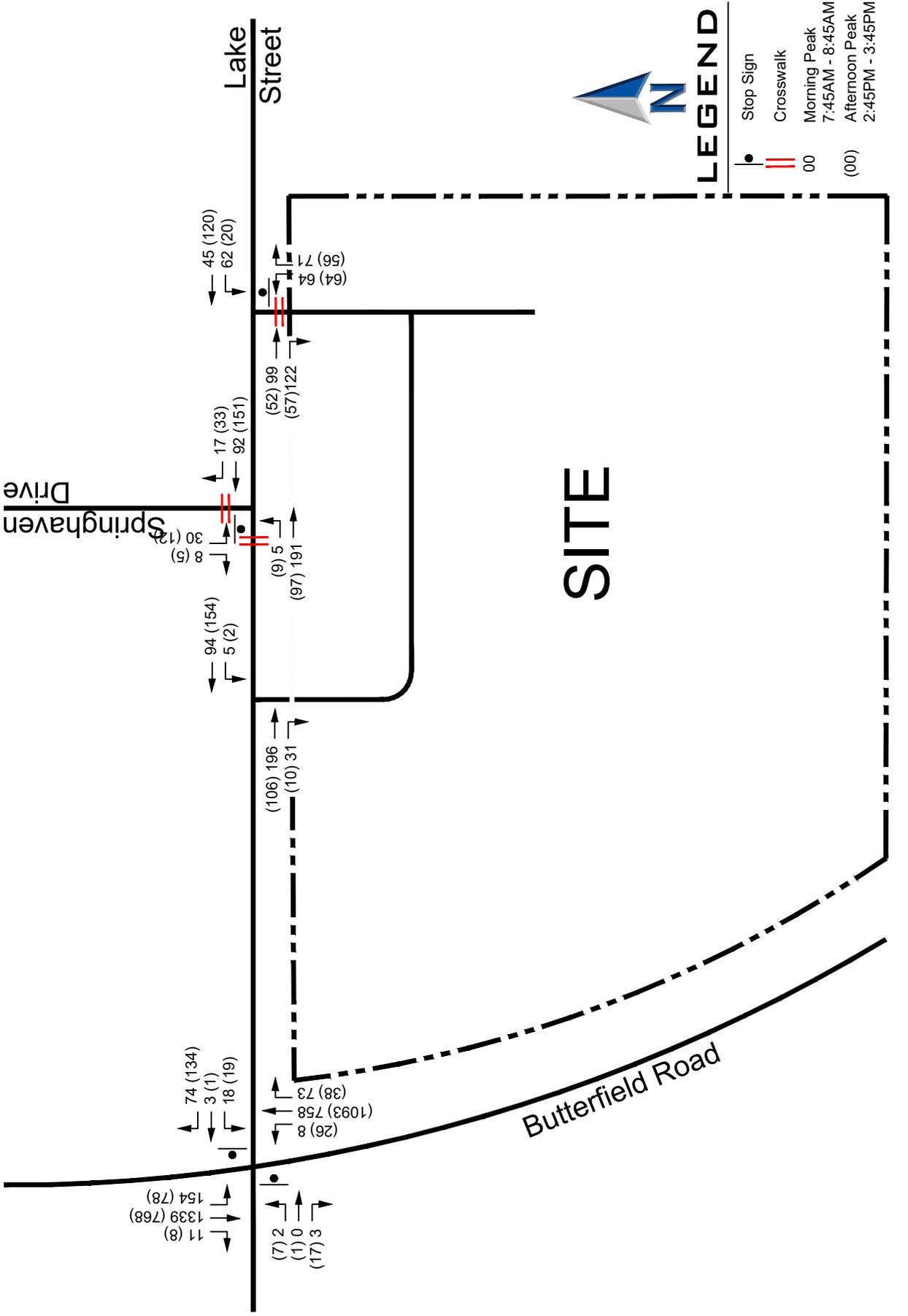


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**Rerouted School Traffic Volumes**  
**Figure 6**

**Year 2030 Base Traffic Volumes**  
**Figure 7**

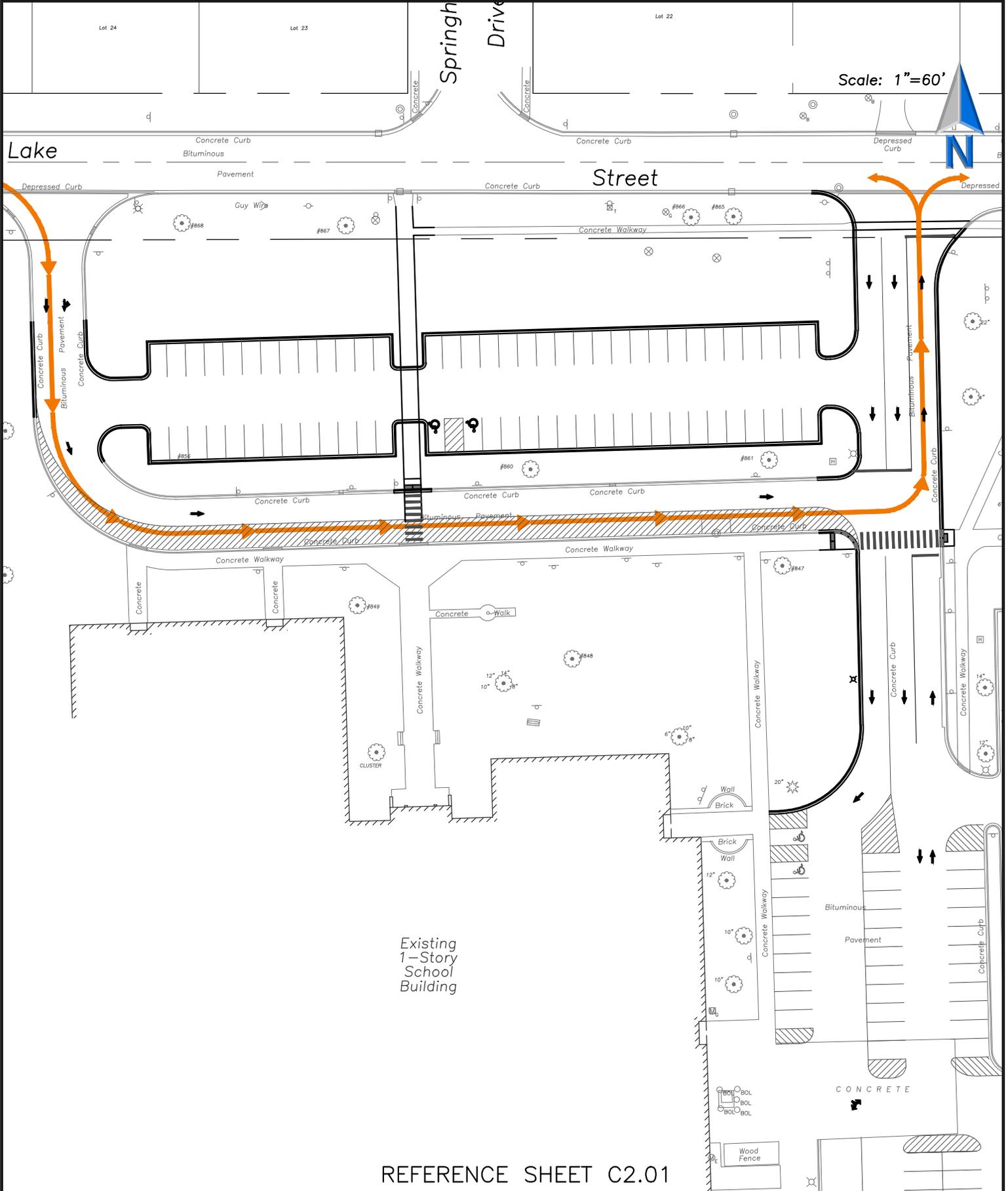




**Year 2030 Projected Total Traffic Volumes**

**Figure 8**

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MRO	SC	12/16/24
Sheet No:		
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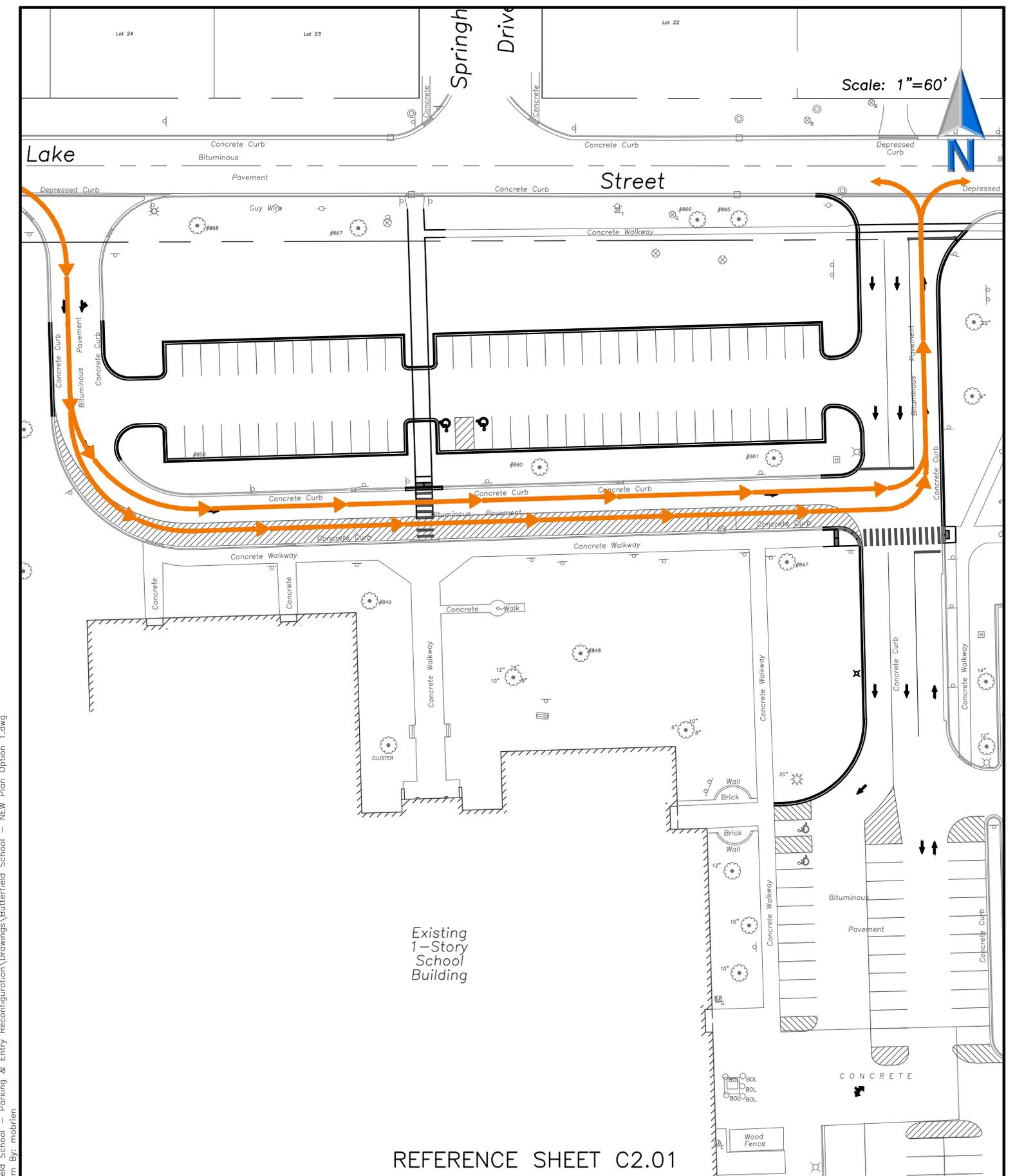
# BUTTERFIELD SCHOOL

## PARKING LOT IMPROVEMENTS

1441 LAKE ST, LIBERTYVILLE, ILLINOIS

**ERIKSSON ENGINEERING ASSOCIATES, LTD.**

145 COMMERCE DRIVE, SUITE A  
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 PROFESSIONAL DESIGN FIRM  
 LICENSE NO. 184-003220  
 EXPIRES: 04/30/2025



REFERENCE SHEET C2.01

Sheet Title:  
**AFTERNOON  
 DISMISSAL -  
 SCHOOL  
 BUS**

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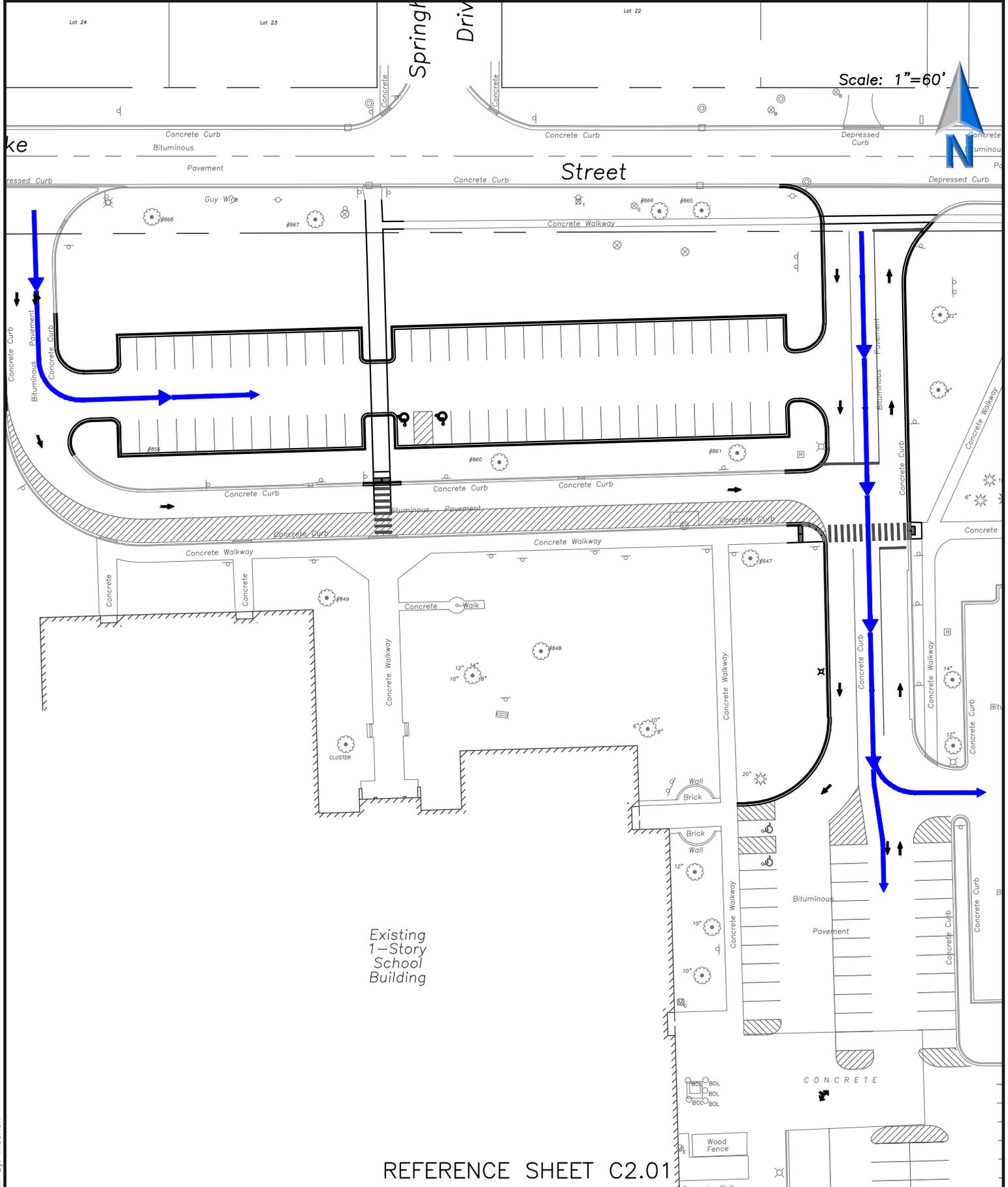
**BUTTERFIELD SCHOOL**  
 PARKING LOT IMPROVEMENTS  
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Existing  
1-Story  
School  
Building

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**BUTTERFIELD SCHOOL**  
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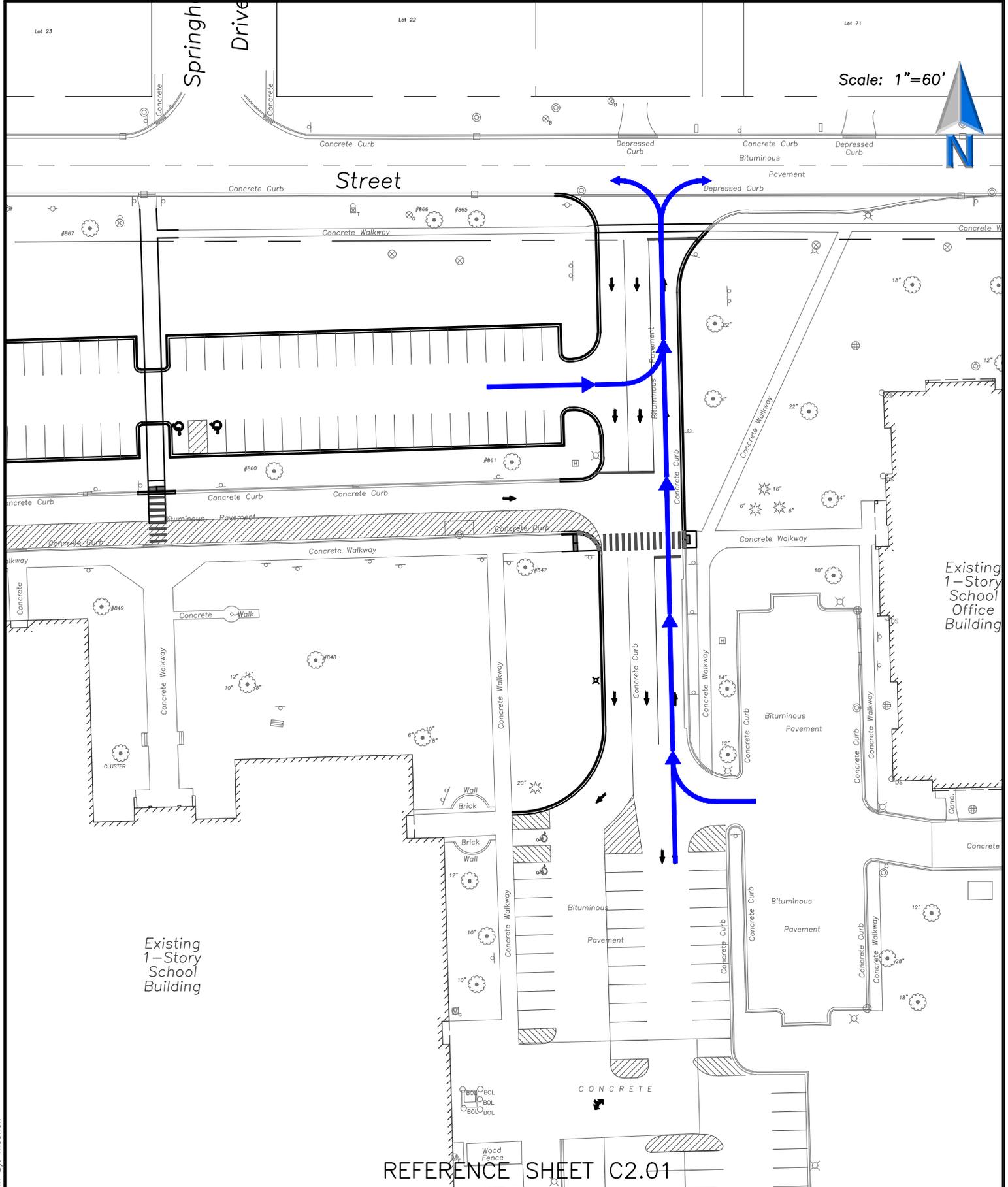
Lot 23 Lot 22 Lot 71

Spring Drive

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Street



Existing 1-Story School Office Building

Existing 1-Story School Building

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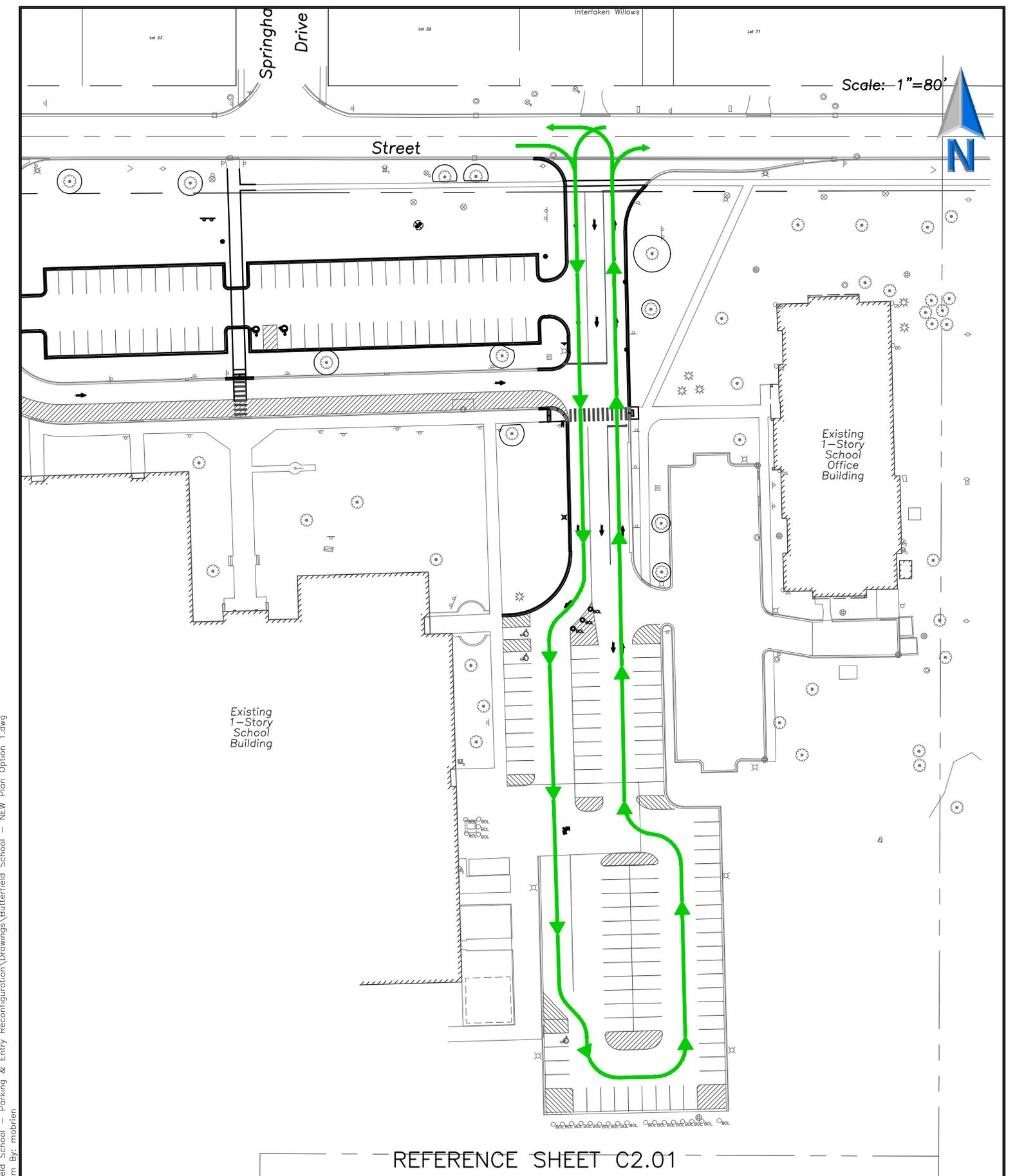
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STAFF**

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I hereby certify that I am the designer of the plans shown on this drawing and that I am a duly Licensed Professional Engineer in the State of Illinois.  
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**EX-04**

**BUTTERFIELD SCHOOL**  
PARKING LOT IMPROVEMENTS  
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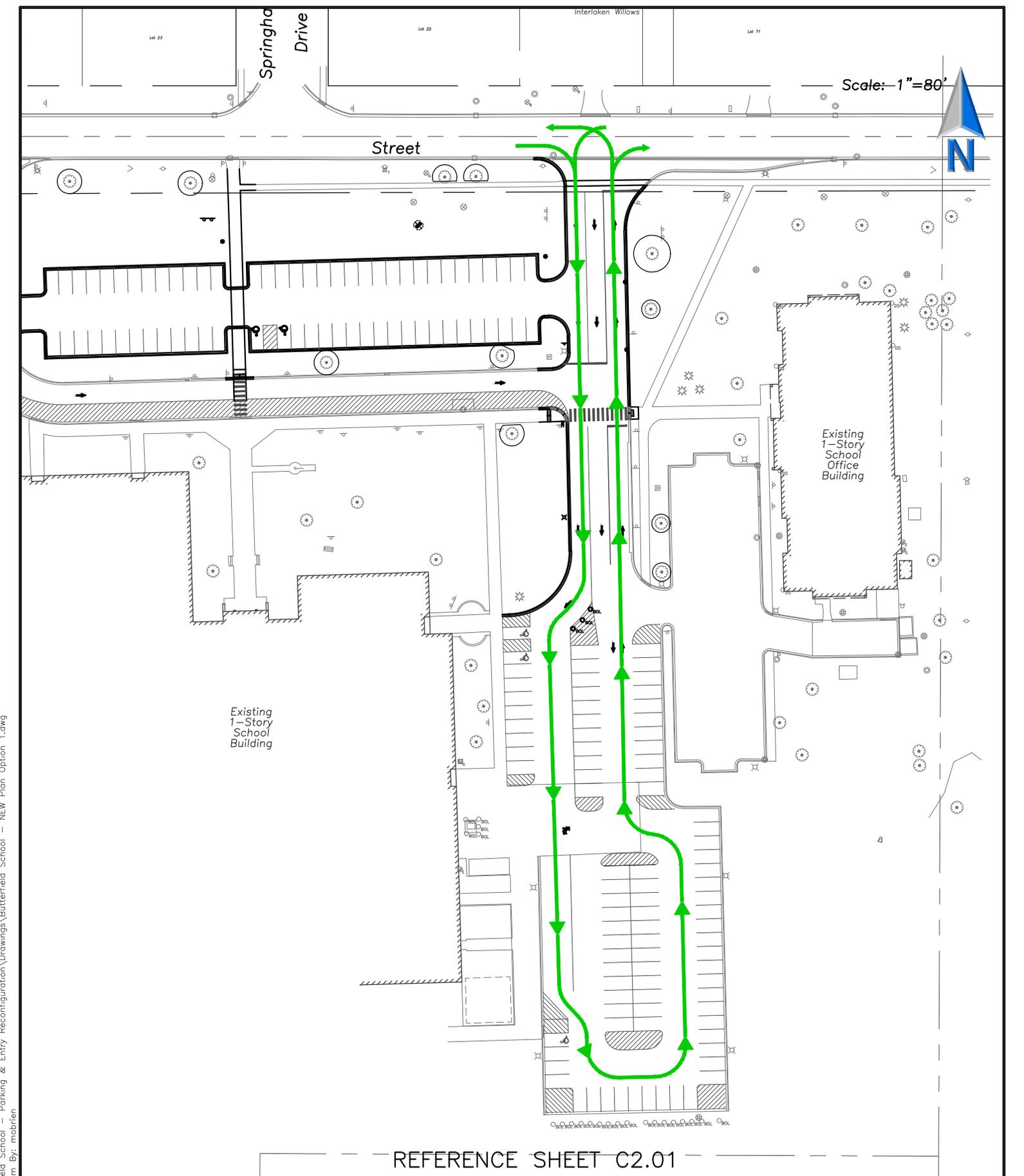
Sheet Title:  
**MORNING  
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Sheet No: <b>EX-05</b>		

**BUTTERFIELD SCHOOL**  
**PARKING LOT IMPROVEMENTS**  
 1441 LAKE ST, LIBERTYVILLE, ILLINOIS

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Scale: 1"=80'



REFERENCE SHEET C2.01

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 DISMISSAL -  
 PARENTS**

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**EX-06**

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**PARKING LOT IMPROVEMENTS**  
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## **Appendix**

- **Existing 2023 Traffic Counts**
- **CMAP Projection Letter**
- **Intersection Capacity Analyses**
  - **2023 Existing Conditions**
  - **2030 Total Traffic Volumes**



## Butterfield Road at Lake Street

Libertyville, Illinois																		
Begin Time	Butterfield Road Southbound				Lake Street Westbound				Butterfield Road Northbound				Lake Street Eastbound		15 Minute Totals	60 Minute Totals	Peak Hour Factor	
	Right Turn	Through	Left Turn		Right Turn	Through	Left Turn		Right Turn	Through	Left Turn		Right Turn	Through				Left Turn
<b>Monday May 22, 2023</b>																		
7:00 AM	10	184	20		8	0	0		4	137	15		0	1	0	379	2149	0.82
7:15 AM	12	287	28		8	0	0		6	146	14		0	0	0	501	2302	0.88
7:30 AM	7	393	34		10	0	0		15	191	7		0	0	0	657	<b>2338</b>	<b>0.89</b>
7:45 AM	1	328	43		25	0	4		22	187	1		0	0	1	612		
8:00 AM	3	258	49		23	1	9		25	164	0		0	0	0	532		
8:15 AM	0	296	26		15	2	4		10	180	0		3	0	1	537		
Total	33	1746	200		89	3	17		82	1005	37		3	1	2			
<b>7:30-8:30 AM</b>	<b>11</b>	<b>1275</b>	<b>152</b>		<b>73</b>	<b>3</b>	<b>17</b>		<b>72</b>	<b>722</b>	<b>8</b>		<b>3</b>	<b>0</b>	<b>2</b>	<b>2338</b>		
1:45 PM	2	192	13		11	1	2		3	170	4		8	0	4	410	1984	0.90
2:00 PM	2	193	21		33	0	3		8	286	3		3	0	1	553	<b>2093</b>	<b>0.95</b>
2:15 PM	1	184	21		31	0	1		13	237	7		4	1	1	501	2082	0.96
2:30 PM	4	166	23		19	0	4		13	273	8		7	0	3	520		
2:45 PM	1	188	11		48	1	10		3	245	7		3	0	2	519		
3:00 PM	6	217	10		23	1	7		6	266	2		1	0	3	542		
Total	16	1140	99		165	3	27		46	1477	31		26	1	14			
<b>2:00-3:00 PM</b>	<b>8</b>	<b>731</b>	<b>76</b>		<b>131</b>	<b>1</b>	<b>18</b>		<b>37</b>	<b>1041</b>	<b>25</b>		<b>17</b>	<b>1</b>	<b>7</b>	<b>2093</b>		



## Lake Street at West School Entrance

Libertyville, Illinois									
Begin Time	Lake Street Westbound		East Drive Northbound		Lake Street Eastbound		15 Minute Totals	60 Minute Totals	Peak Hour Factor
	Through	Left Turn	Inbound Only		Right Turn	Through			
Monday, May 22, 2023									
7:00 AM	8	1			0	25	34	229	0.60
7:15 AM	8	0			0	33	41	303	0.70
7:30 AM	10	0			1	48	59	<b>320</b>	<b>0.74</b>
7:45 AM	28	3			8	56	95		
8:00 AM	31	2			2	73	108		
8:15 AM	22	0			0	36	58		
Total	107	6			11	271			
<b>7:30-8:30 AM</b>	<b>91</b>	<b>5</b>			<b>11</b>	<b>213</b>	<b>320</b>		
1:45 PM	14	0			2	14	30	230	0.86
2:00 PM	37	1			4	25	67	<b>266</b>	<b>0.99</b>
2:15 PM	32	1			4	30	67	249	0.93
2:30 PM	29	0			2	35	66		
2:45 PM	52	0			0	14	66		
3:00 PM	34	0			2	14	50		
Total	198	2			14	132			
<b>2:00-3:00 PM</b>	<b>150</b>	<b>2</b>			<b>10</b>	<b>104</b>	<b>266</b>		



## Lake Street at East School Entrance

Libertyville, Illinois											
Begin Time	Lake Street Westbound			West Drive Northbound			Lake Street Eastbound			Peak Hour Factor	
	Through	Left Turn	Right Turn	Right Turn	Left Turn	Right Turn	Right Turn	Through	15 Minute Totals		60 Minute Totals
Monday May 22, 2023											
7:00 AM	10	0	3	3	2	8	22	45	305	0.57	
7:15 AM	10	0	3	3	0	15	21	49	448	0.60	
7:30 AM	9	9	0	0	5	29	25	77	476	0.63	
7:45 AM	13	25	17	17	17	49	13	134			
8:00 AM	10	25	41	41	28	53	31	188			
8:15 AM	9	3	13	13	14	11	27	77			
Total	61	62	77	77	66	165	139	476			
<b>7:30-8:30 AM</b>	<b>41</b>	<b>62</b>	<b>71</b>	<b>71</b>	<b>64</b>	<b>142</b>	<b>96</b>	<b>476</b>			
1:45 PM	13	3	2	2	4	4	16	42	275	0.83	
2:00 PM	38	2	2	2	4	7	15	68	362	0.70	
2:15 PM	31	6	6	6	6	18	15	82	352	0.68	
2:30 PM	20	7	13	13	14	19	10	83			
2:45 PM	25	5	35	35	40	13	11	129			
3:00 PM	20	0	10	10	14	1	13	58			
Total	147	23	68	68	82	62	80	362			
<b>2:00-3:00 PM</b>	<b>114</b>	<b>20</b>	<b>56</b>	<b>56</b>	<b>64</b>	<b>57</b>	<b>51</b>	<b>362</b>			



## Lake Street at Springhaven Drive

Libertyville, IL

Begin Time	Springhaven Drive Southbound				Lake Street Westbound			Lake Street Eastbound			15 Minute Totals	60 Minute Totals	Peak Hour Factor
	Right Turn	Left Turn	Through	Right Turn	Through	Left Turn	Through	Left Turn	Through				
										Turn			
<b>Monday May 22, 2023</b>													
7:00 AM	0	5	9	2	9	0	25	0	41	253	0.66		
7:15 AM	0	3	8	2	8	0	33	0	46	337	0.67		
7:30 AM	0	9	10	3	10	1	47	1	70	<b>354</b>	<b>0.71</b>		
7:45 AM	4	9	27	4	27	2	50	2	96				
8:00 AM	3	8	30	8	30	0	76	0	125				
8:15 AM	1	4	21	2	21	2	33	2	63				
Total	8	38	105	21	88	5	264	10	<b>354</b>				
<b>7:30-8:30 AM</b>	<b>8</b>	<b>30</b>	<b>88</b>	<b>17</b>	<b>88</b>	<b>9</b>	<b>206</b>	<b>5</b>					
<b>Monday May 22, 2023</b>													
1:45 PM	0	3	13	3	13	0	15	0	34	249	0.86		
2:00 PM	2	2	36	7	36	4	21	4	72	<b>301</b>	<b>0.88</b>		
2:15 PM	0	3	33	5	33	2	28	2	71	280	0.81		
2:30 PM	1	4	29	5	29	1	32	1	72				
2:45 PM	2	3	49	16	49	2	14	2	86				
3:00 PM	2	3	32	2	32	1	11	1	51				
Total	7	18	192	38	147	10	121	10	<b>301</b>				
<b>2:00-3:00 PM</b>	<b>5</b>	<b>12</b>	<b>147</b>	<b>33</b>	<b>147</b>	<b>9</b>	<b>95</b>	<b>9</b>					



Chicago Metropolitan Agency for Planning

433 West Van Buren Street  
Suite 450  
Chicago, IL 60607  
312-454-0400  
cmap.illinois.gov

May 17, 2023

Stephen B. Corcoran, PE PTOE  
Director of Traffic Engineering  
Eriksson Engineering Associates, Ltd.  
145 Commerce Drive  
Suite A  
Grayslake, IL 60030

**Subject: Butterfield and Highland Schools (SD 70)**  
SD 70

Dear Mr. Corcoran:

In response to a request made on your behalf and dated May 16, 2023, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2050 ADT	
Butterfield Rd, @ Lake St	23,100	28,300	4.4%/ 6 yrs
Lake St east of Butterfield Rd	3,150	3,700	3.4%/ 6 yrs
Garfield Ave north of Rockland Rd	3,600	4,220	3.3%/6 yrs
Rockland Rd from Garfield Ave to Stewart Ave	3,100	3,640	3.4%/6 yrs

Traffic projections are developed using existing ADT data provided in the request letter and the results from the October 2022 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2050 socioeconomic projections and assumes the implementation of the ON TO 2050 Comprehensive Regional Plan for the Northeastern Illinois area.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP  
Senior Planner, Research & Analysis

cc: SD 70; Rios (IDOT)  
2023\_TrafficForecasts\Libertyville\la-20-23\la-20-23.docx

## **TRAFFIC FORECAST RECORD**

**Record Number:** la-20-23

**Type of Report:** Projection

**Year Sought:** 2050

**Analyst:** JAR

**Organization requesting forecast:** Eriksson Engineering Associates

**Contact:** Stephen B. Corcoran, P.E., PTOE

**Email or Phone:** scorcoran@eea-ltd.com

**Sponsor:** SD 70

**Date request was received:** May 16, 2023

**Date that response was emailed:** May 17, 2023

**Facility Location:** Butterfield and Highland Schools (SD 70)

**Municipality:** Libertyville

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘		↖	↗		↖	↗	
Traffic Vol, veh/h	2	0	3	17	3	73	8	722	72	152	1275	11
Future Vol, veh/h	2	0	3	17	3	73	8	722	72	152	1275	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	0	160	-	-	155	-	-	255	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	3	19	3	82	9	811	81	171	1433	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2206	2691	723	1929	2657	446	1445	0	0	892	0	0
Stage 1	1781	1781	-	870	870	-	-	-	-	-	-	-
Stage 2	425	910	-	1059	1787	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	25	21	369	40	22	560	465	-	-	756	-	-
Stage 1	85	133	-	313	367	-	-	-	-	-	-	-
Stage 2	578	352	-	240	132	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	15	16	369	32	17	560	465	-	-	756	-	-
Mov Cap-2 Maneuver	15	16	-	32	17	-	-	-	-	-	-	-
Stage 1	83	103	-	307	360	-	-	-	-	-	-	-
Stage 2	479	345	-	184	102	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	122.2		62.8		0.1		1.2	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	465	-	-	15	369	32	248	756	-	-
HCM Lane V/C Ratio	0.019	-	-	0.15	0.009	0.597	0.344	0.226	-	-
HCM Control Delay (s)	12.9	-	-	283.4	14.8	222.9	27	11.1	-	-
HCM Lane LOS	B	-	-	F	B	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	2	1.5	0.9	-	-

HCM 6th TWSC  
 3: West School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	213	11	5	93	0	1
Future Vol, veh/h	213	11	5	93	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	288	15	7	126	0	1

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	303	0	- 296
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	- 6.22
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	- 3.318
Pot Cap-1 Maneuver	-	-	1258	-	0 743
Stage 1	-	-	-	-	0 -
Stage 2	-	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1258	-	- 743
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	743	-	-	1258	-
HCM Lane V/C Ratio	0.002	-	-	0.005	-
HCM Control Delay (s)	9.9	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th TWSC  
5: East School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	5.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	96	142	62	43	64	71
Future Vol, veh/h	96	142	62	43	64	71
Conflicting Peds, #/hr	0	2	2	0	5	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	152	225	98	68	102	113

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	379	0	536
Stage 1	-	-	-	-	267
Stage 2	-	-	-	-	269
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1179	-	505
Stage 1	-	-	-	-	778
Stage 2	-	-	-	-	776
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1177	-	458
Mov Cap-2 Maneuver	-	-	-	-	458
Stage 1	-	-	-	-	776
Stage 2	-	-	-	-	705

Approach	EB	WB	NB
HCM Control Delay, s	0	4.9	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	582	-	-	1177	-
HCM Lane V/C Ratio	0.368	-	-	0.084	-
HCM Control Delay (s)	14.7	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.3	-

HCM 6th TWSC  
 9: Lake Street & Springhaven Drive

03/25/2024

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	208	90	17	30	8
Future Vol, veh/h	5	208	90	17	30	8
Conflicting Peds, #/hr	45	0	0	45	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	293	127	24	42	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	196	0	-	0	491 184
Stage 1	-	-	-	-	184 -
Stage 2	-	-	-	-	307 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1377	-	-	-	537 858
Stage 1	-	-	-	-	848 -
Stage 2	-	-	-	-	746 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1318	-	-	-	489 821
Mov Cap-2 Maneuver	-	-	-	-	489 -
Stage 1	-	-	-	-	806 -
Stage 2	-	-	-	-	714 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1318	-	-	-	535
HCM Lane V/C Ratio	0.005	-	-	-	0.1
HCM Control Delay (s)	7.7	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘		↖	↗		↖	↗	
Traffic Vol, veh/h	7	1	17	18	1	131	25	1041	37	77	731	8
Future Vol, veh/h	7	1	17	18	1	131	25	1041	37	77	731	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	0	160	-	-	155	-	-	255	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	18	19	1	138	26	1096	39	81	769	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1536	2122	389	1715	2107	568	777	0	0	1135	0	0
Stage 1	935	935	-	1168	1168	-	-	-	-	-	-	-
Stage 2	601	1187	-	547	939	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	79	50	610	58	51	466	835	-	-	611	-	-
Stage 1	285	342	-	206	266	-	-	-	-	-	-	-
Stage 2	454	260	-	489	341	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	48	42	610	48	43	466	835	-	-	611	-	-
Mov Cap-2 Maneuver	48	42	-	48	43	-	-	-	-	-	-	-
Stage 1	276	297	-	200	258	-	-	-	-	-	-	-
Stage 2	308	252	-	410	296	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.8		29.8		0.2		1.1	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	835	-	-	47	610	48	434	611	-	-
HCM Lane V/C Ratio	0.032	-	-	0.179	0.029	0.395	0.32	0.133	-	-
HCM Control Delay (s)	9.5	-	-	97.6	11.1	122.3	17.2	11.8	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	1.4	1.4	0.5	-	-

HCM 6th TWSC  
3: West School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	105	10	2	150	0	0
Future Vol, veh/h	105	10	2	150	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	106	10	2	152	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	116	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-
Pot Cap-1 Maneuver	-	-	1473	-	0
Stage 1	-	-	-	-	0
Stage 2	-	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1473	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1473	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 6th TWSC  
5: East School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	51	57	20	116	64	56
Future Vol, veh/h	51	57	20	116	64	56
Conflicting Peds, #/hr	0	1	1	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	81	29	166	91	80

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	155	0	342
Stage 1	-	-	-	-	115
Stage 2	-	-	-	-	227
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1425	-	654
Stage 1	-	-	-	-	910
Stage 2	-	-	-	-	811
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1424	-	637
Mov Cap-2 Maneuver	-	-	-	-	637
Stage 1	-	-	-	-	909
Stage 2	-	-	-	-	791

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	749	-	-	1424	-
HCM Lane V/C Ratio	0.229	-	-	0.02	-
HCM Control Delay (s)	11.2	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

HCM 6th TWSC  
 9: Lake Street & Springhaven Drive

03/25/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	9	96	147	33	12	5
Future Vol, veh/h	9	96	147	33	12	5
Conflicting Peds, #/hr	52	0	0	52	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	109	167	38	14	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	257	0	-	0	369 238
Stage 1	-	-	-	-	238 -
Stage 2	-	-	-	-	131 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1308	-	-	-	631 801
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	895 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1243	-	-	-	564 761
Mov Cap-2 Maneuver	-	-	-	-	564 -
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	850 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1243	-	-	-	610
HCM Lane V/C Ratio	0.008	-	-	-	0.032
HCM Control Delay (s)	7.9	0	-	-	11.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘		↖	↗		↖	↗	
Traffic Vol, veh/h	2	0	3	18	3	74	8	758	73	154	1339	11
Future Vol, veh/h	2	0	3	18	3	74	8	758	73	154	1339	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	0	160	-	-	155	-	-	255	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	3	20	3	83	9	852	82	173	1504	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	2302	2808	758	2009	2773	467	1516	0	0	934	0	0
Stage 1	1856	1856	-	911	911	-	-	-	-	-	-	-
Stage 2	446	952	-	1098	1862	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	21	18	350	35	19	542	437	-	-	729	-	-
Stage 1	76	122	-	295	351	-	-	-	-	-	-	-
Stage 2	561	336	-	227	121	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	12	13	350	28	14	542	437	-	-	729	-	-
Mov Cap-2 Maneuver	12	13	-	28	14	-	-	-	-	-	-	-
Stage 1	74	93	-	289	344	-	-	-	-	-	-	-
Stage 2	461	329	-	171	92	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	155	79.8	0.1	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	437	-	-	12	350	28	219	729	-	-
HCM Lane V/C Ratio	0.021	-	-	0.187	0.01	0.722	0.395	0.237	-	-
HCM Control Delay (s)	13.4	-	-	\$ 364.5	15.4	284.9	31.8	11.5	-	-
HCM Lane LOS	B	-	-	F	C	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0	2.3	1.8	0.9	-	-

HCM 6th TWSC  
 3: West School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	196	31	5	95	0	0
Future Vol, veh/h	196	31	5	95	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	265	42	7	128	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	307	0	- 286
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	- 6.22
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	- 3.318
Pot Cap-1 Maneuver	-	-	1254	-	0 753
Stage 1	-	-	-	-	0 -
Stage 2	-	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1254	-	- 753
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1254	-
HCM Lane V/C Ratio	-	-	-	0.005	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 6th TWSC  
5: East School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	5.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	99	122	62	45	64	71
Future Vol, veh/h	99	122	62	45	64	71
Conflicting Peds, #/hr	0	7	7	0	7	7
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	157	194	98	71	102	113

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	358	0	535 268
Stage 1	-	-	-	-	261 -
Stage 2	-	-	-	-	274 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1201	-	506 771
Stage 1	-	-	-	-	783 -
Stage 2	-	-	-	-	772 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1193	-	456 761
Mov Cap-2 Maneuver	-	-	-	-	456 -
Stage 1	-	-	-	-	778 -
Stage 2	-	-	-	-	701 -

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	578	-	-	1193	-
HCM Lane V/C Ratio	0.371	-	-	0.082	-
HCM Control Delay (s)	14.9	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.3	-

HCM 6th TWSC  
 9: Lake Street & Springhaven Drive

03/25/2024

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	5	191	92	17	30	8
Future Vol, veh/h	5	191	92	17	30	8
Conflicting Peds, #/hr	0	0	0	0	45	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	269	130	24	42	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	154	0	-	0	470 142
Stage 1	-	-	-	-	142 -
Stage 2	-	-	-	-	328 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1426	-	-	-	552 906
Stage 1	-	-	-	-	885 -
Stage 2	-	-	-	-	730 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1426	-	-	-	549 906
Mov Cap-2 Maneuver	-	-	-	-	549 -
Stage 1	-	-	-	-	880 -
Stage 2	-	-	-	-	730 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1426	-	-	-	599
HCM Lane V/C Ratio	0.005	-	-	-	0.089
HCM Control Delay (s)	7.5	0	-	-	11.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘		↖	↗		↖	↗	
Traffic Vol, veh/h	7	1	17	19	1	134	26	1093	38	78	768	8
Future Vol, veh/h	7	1	17	19	1	134	26	1093	38	78	768	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	0	160	-	-	155	-	-	255	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	18	20	1	141	27	1151	40	82	808	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1606	2221	408	1794	2205	596	816	0	0	1191	0	0
Stage 1	976	976	-	1225	1225	-	-	-	-	-	-	-
Stage 2	630	1245	-	569	980	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	70	43	593	51	44	447	807	-	-	582	-	-
Stage 1	270	327	-	190	249	-	-	-	-	-	-	-
Stage 2	436	244	-	474	326	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	41	36	593	42	37	447	807	-	-	582	-	-
Mov Cap-2 Maneuver	41	36	-	42	37	-	-	-	-	-	-	-
Stage 1	261	281	-	184	241	-	-	-	-	-	-	-
Stage 2	287	236	-	393	280	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	45.3		34.8		0.2		1.1	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	807	-	-	40	593	42	413	582	-	-
HCM Lane V/C Ratio	0.034	-	-	0.211	0.03	0.476	0.344	0.141	-	-
HCM Control Delay (s)	9.6	-	-	117.6	11.3	152.5	18.2	12.2	-	-
HCM Lane LOS	A	-	-	F	B	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.1	1.7	1.5	0.5	-	-

HCM 6th TWSC  
 3: West School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	106	10	2	154	0	0
Future Vol, veh/h	106	10	2	154	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	10	2	156	0	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	117	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-
Pot Cap-1 Maneuver	-	-	1471	-	0
Stage 1	-	-	-	-	0
Stage 2	-	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1471	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1471	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 6th TWSC  
5: East School Site Drive & Lake Street

03/25/2024

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	52	57	20	120	64	56
Future Vol, veh/h	52	57	20	120	64	56
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	81	29	171	91	80

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	159	0	352
Stage 1	-	-	-	-	119
Stage 2	-	-	-	-	233
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1420	-	646
Stage 1	-	-	-	-	906
Stage 2	-	-	-	-	806
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1415	-	626
Mov Cap-2 Maneuver	-	-	-	-	626
Stage 1	-	-	-	-	902
Stage 2	-	-	-	-	784

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	736	-	-	1415	-
HCM Lane V/C Ratio	0.233	-	-	0.02	-
HCM Control Delay (s)	11.4	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

HCM 6th TWSC  
 9: Lake Street & Springhaven Drive

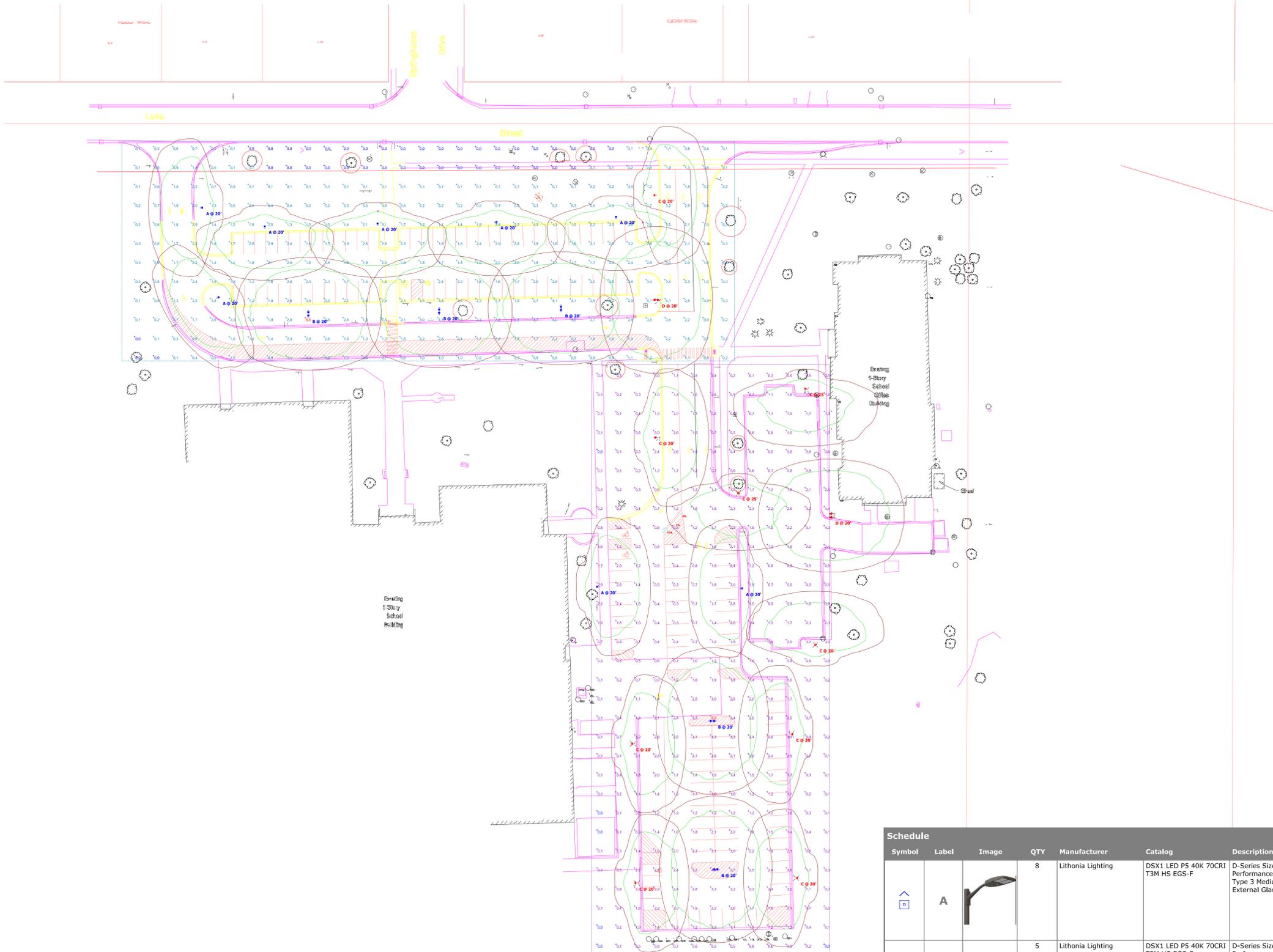
03/25/2024

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	9	97	151	33	12	5
Future Vol, veh/h	9	97	151	33	12	5
Conflicting Peds, #/hr	2	0	0	2	52	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	110	172	38	14	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	212	0	-	0	375 193
Stage 1	-	-	-	-	193 -
Stage 2	-	-	-	-	182 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1358	-	-	-	626 849
Stage 1	-	-	-	-	840 -
Stage 2	-	-	-	-	849 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1355	-	-	-	618 847
Mov Cap-2 Maneuver	-	-	-	-	618 -
Stage 1	-	-	-	-	832 -
Stage 2	-	-	-	-	847 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1355	-	-	-	671
HCM Lane V/C Ratio	0.008	-	-	-	0.029
HCM Control Delay (s)	7.7	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
South Lot	+	1.3 fc	6.0 fc	0.0 fc	N/A	N/A
North Parking Lot	+	1.4 fc	5.5 fc	0.0 fc	N/A	N/A

Schedule											
Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power	Polar Plot
	A		8	Lithonia Lighting	DSX1 LED P5 40K 70CRI T3M HS EGS-F	D-Series Size 1 Area Luminaire P5 Performance Package 4000K CCT 70 CRI Type 3 Medium Houseside Shield Forward External Glare Shield	1	9630	0.85	138.16	 Max: 6414cd
	B		5	Lithonia Lighting	DSX1 LED P5 40K 70CRI T3M HS EGS-F	D-Series Size 1 Area Luminaire P5 Performance Package 4000K CCT 70 CRI Type 3 Medium Houseside Shield Forward External Glare Shield	1	9630	0.85	276.32	 Max: 6414cd
	C		9	Lithonia Lighting	DSX1 LED P5 40K 70CRI T3M HS EGS-F	D-Series Size 1 Area Luminaire P5 Performance Package 4000K CCT 70 CRI Type 3 Medium Houseside Shield Forward External Glare Shield	1	9630	0.85	138.16	 Max: 6414cd
	D		2	Lithonia Lighting	DSX1 LED P5 40K 70CRI T3M HS EGS-F	D-Series Size 1 Area Luminaire P5 Performance Package 4000K CCT 70 CRI Type 3 Medium Houseside Shield Forward External Glare Shield	1	9630	0.85	276.32	 Max: 6414cd

Designer  
 D.SALAZAR  
 Date  
 12/20/2024  
 Scale  
 Not to Scale  
 Drawing No.  
 Summary  
 BUTTERFIELD PARK  
 1 of 1