



MEMORANDUM

DATE: April 13, 2022

TO: Anthony Vandenberg | Lake Oswego School District

FROM: Lacy Brown, Ph.D., P.E., RSP₁ | DKS Associates
Benjamin Lindell, EI | DKS Associates
Clive Lara, EI | DKS Associates



SUBJECT: River Grove Elementary School Upgrades
Transportation Evaluation

Project #21236-000

This memorandum provides a transportation evaluation for the new River Grove Elementary School, to be constructed on the existing school site at 5850 McEwan Road in Lake Oswego, Oregon. The transportation evaluation will include an estimate of the anticipated increase in vehicle trip generation due to the proposed site upgrades. The evaluation will also include a site assessment to provide suggestions to increase on-site circulation based on Safe Routes to School (SRTS) criteria.

EXISTING USES AND PROPOSED CHANGES

River Grove Elementary School currently provides in-person, classes schedules to grade K-5 students. The school is located on SW McEwan Road and is adjacent to Pilkington Park. The existing on-site building can accommodate up to 575 students.

The proposed upgrades include constructing a new elementary school to replace the existing school building that can accommodate up to 600 students. Other site improvements in this plan will include a modification to the existing north side parking lot/drop off zone and the addition of another parking lot/drop off zone on the east side. The two existing site accesses will be modified to accommodate for new site circulations for the proposed parking lots.

These site upgrades allow for an expansion of the services provided by River Grove Elementary and will result in an increase in enrollment of students. The capacity at the River Grove Elementary site is estimated to increase from approximately 575 students to 600 students.

VEHICLE TRIP GENERATION

Trip generation is the method used to estimate the number of vehicles added to site driveways and the adjacent roadway network by a development during a specified period (such as the PM peak hour). Trip generation for schools are typically driven by student enrollment. The expected net increase in student capacity is approximately 25 students.

To estimate the site’s vehicle trip generation, vehicle trip rates for an Elementary School (Land Use Code 520) from the Institute of Transportation Engineers (ITE) Trip Generation Manual were utilized.¹ See Table 1 below for the estimated increase in vehicle trip generation for the AM and PM peak hours and daily trips for an average weekday.

TABLE 1: ESTIMATED VEHICLE TRIP GENERATION INCREASE

LAND USE (ITE CODE)	SCENARIO	SIZE	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS			DAILY WEEKDAY TRIPS
			IN	OUT	TOTAL	IN	OUT	TOTAL	
ELEMENTARY SCHOOL (520)	Existing	575 on-site students	230	196	425	42	50	92	1305
	Future	600 on-site students	240	204	444	44	52	96	1362
TOTAL INCREASE		+25 on-site students	+10	+8	+18	+2	+2	+4	+57

As shown in the table above, the proposed project will generate an additional 18 a.m. peak hour trips and 4 p.m. peak hour trips during the typical peak hour periods of adjacent street traffic. Based on the City of Lake Oswego Development Code², if a project generates 25 or more p.m. peak hour trips, a full traffic impact study is required. Based on the results of the trip generation for the River Grove Elementary site, a full traffic impact study is not required for this project.

Additionally, the table below shows the peak vehicle traffic generated from the school during the peak hour around school start time (8:10 a.m.) and school release time (2:40 p.m.). As shown, there is an estimated 19 additional vehicle trips during the school start peak hour and 11 additional vehicle trips during the school release peak hour generated by the proposed project.

TABLE 2: ESTIMATED VEHICLE TRIP GENERATION INCREASE DURING SCHOOL START AND RELEASE TIME

LAND USE (ITE CODE)	SCENARIO	SIZE	SCHOOL START PEAK HOUR TRIPS			SCHOOL RELEASE PEAK HOUR TRIPS		
			IN	OUT	TOTAL	IN	OUT	TOTAL
ELEMENTARY SCHOOL (520)	Existing	575 on-site students	233	198	431	119	140	259
	Future	600 on-site students	243	207	450	124	146	270
TOTAL INCREASE		+25 on-site students	+10	+9	+19	+5	+6	+11

¹ Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, 2021.

² LOC 50.07.003.iii (2), City of Lake Oswego Development Code.

SITE EVALUATION

A conceptual site plan showing the proposed site improvements is provided as an attachment. As previously stated, site improvements include a modification to the existing north parking lot and the addition of an east parking lot.

SITE ACCESSES

The two existing site accesses on McEwan Road are proposed to be reconfigured and realigned to allow for two-way traffic at each access. It is expected that 80% of passenger vehicle traffic will use the west most access and 20% of passenger vehicles (faculty) will use the east most access. All buses will use the east most access.

The proposed access configuration will result in 185 feet between access points, which meets City access spacing code of 30 feet between accesses³. Prior to occupancy, sight distance at any existing or proposed access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon. A preliminary sight distance analysis has been conducted and verifies there is sufficient sight distance for vehicles driving along McEwan Road. The sight distance exhibits are attached to this memorandum.

STUDENT LOADING AREA

Student drop-off and pick-up activity will occur in the north parking lot. The site plan shows approximately 520 feet of drop-off and pick-up curb length which is sufficient to accommodate 20 - 25 vehicles. This additional drop-off and pick-up space is expected to improve student safety and on-site circulation over current conditions.

SCHOOL BUS LOADING AREA

School bus loading activity currently occurs in the same north parking lot as the student drop-off and pick-up location. After the project is constructed, school buses will utilize the new proposed east parking lot for loading activity. This additional bus loading area separated from the student drop-off and pick-up area is expected to improve student safety and on-site circulation.

PARKING

Vehicle parking for the site is provided in the north parking lot and the east parking lot. After the proposed site plan updates, a total of 68 stalls will be available on-site.

SAFE ROUTES TO SCHOOL

River Grove Elementary has an existing Safe Routes to School (SRTS) map as part of a School Action Plan conducted in 2018 and is provided as an attachment. The SRTS map provides suggested routes to school based on existing infrastructure and crossing treatments.

³ City of Lake Oswego Municipal Code, Article 50.58.015(1).

The existing SRTS plan includes the following list of recommended improvements could be incorporated into the current site plan to enhance student safety.

- Install lighting on the south side of the school near Pilkington Park
- Improve the existing dirt path running from McEwan Road to the school parking lot in the northeast corner of school grounds
- Install sidewalk on the south side of McEwan Road along the school property frontage
- Restripe crosswalks at Benfield Ave/McEwan Rd and Kristy Way/McEwan Rd.

Including these recommended improvements with the proposed project would enhance safety for students and local residents walking and biking near the school.

SUMMARY

The following list is a summary of the traffic analysis for the River Grove Elementary School Upgrade project, which will increase the student capacity from 575 to 600 students.

- The estimated increase in trip generation for the proposed project is 18 a.m. peak hour trips and 4 p.m. peak hour trips. The increase in trip generation does not trigger the need for a full traffic impact study per City of Lake Oswego code.
- Sight distance evaluations confirmed that sufficient sight distance is provided at the current and proposed site access points.
- The proposed reconfiguration of the on-site student drop-off and pick-up area will provide a total of 520 feet of curb for pick-up and drop-off activities. The improvements are expected to improve student safety and on-site circulation over current conditions.
- School buses will utilize the newly constructed parking lot and loading area to the east of the school with a 175-foot curb for loading activity. The improvements are expected to improve student safety and on-site circulation over current conditions.

Attachment(s)

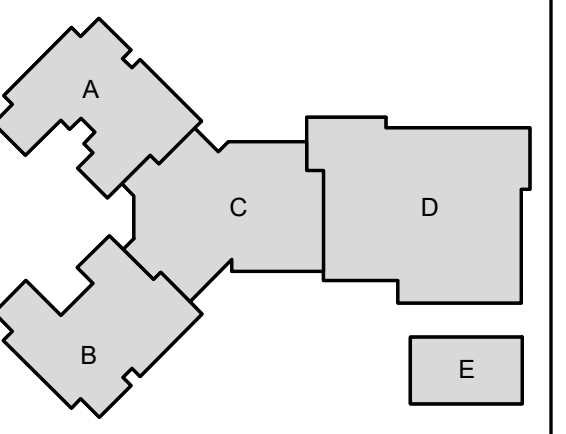
- Site Plan
- River Grove Elementary Safe Routes to School Map

NOT FOR CONSTRUCTION

RIVER GROVE ELEMENTARY SCHOOL REIMAGINED

Lake Oswego School District

5650 SW McEwan Rd, Lake Oswego, OR 97035
t: (503) 534-2000
f: (503) 534-2030



key plan

phase	65% DD
date	11/05/2021
revisions	

project # 134988
PAVING PLAN

C1300

LEGEND

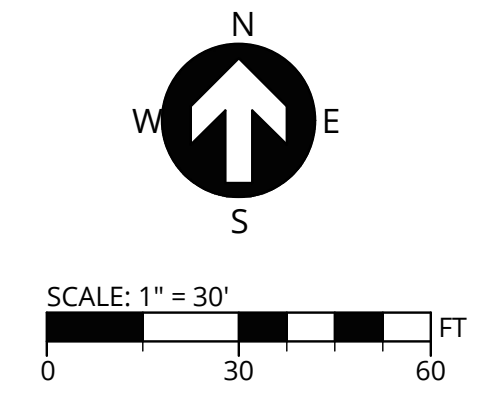
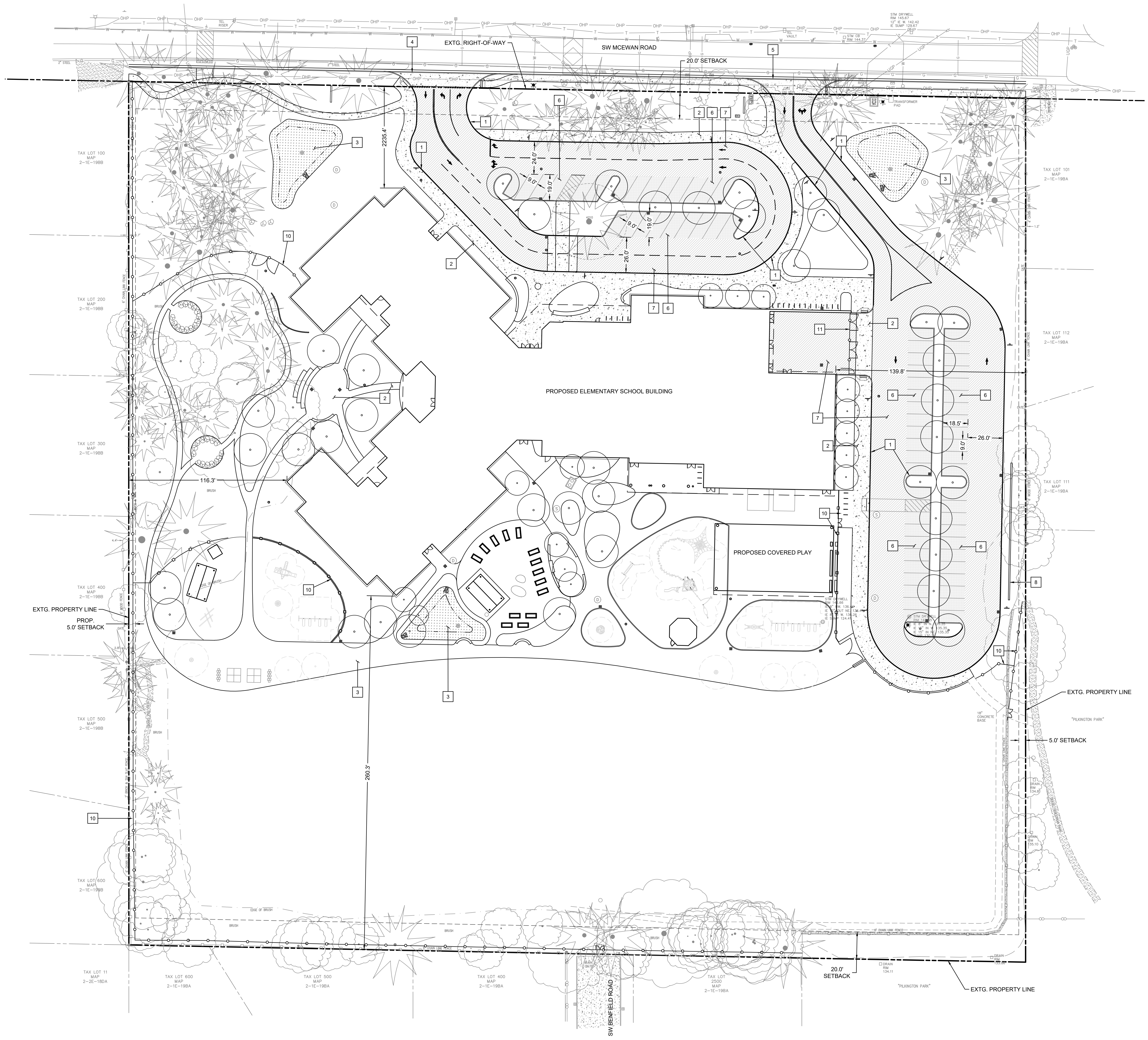
- PROPERTY LINE
- - - SETBACK LINE
- PROPOSED STANDARD CURB
- PROPOSED FENCE
- ▨ PROPOSED CONCRETE
- ▩ PROPOSED INFILTRATION RAIN GARDEN

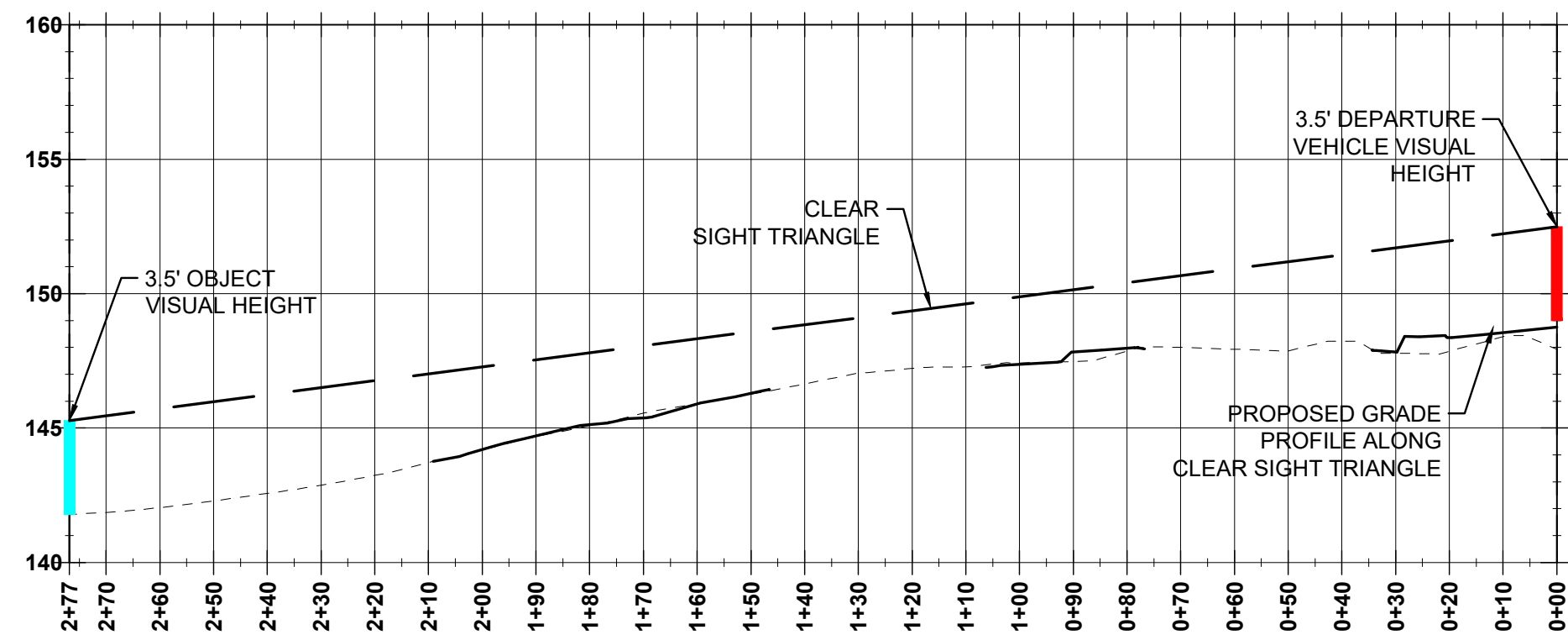
CONSTRUCTION KEY NOTES

- 1 PROPOSED STANDARD CURB
- 2 PROPOSED CONCRETE PAVING
- 3 PROPOSED INFILTRATION RAIN GARDEN
- 4 PROPOSED 36" WIDE DRIVEWAY
- 5 PROPOSED 26" WIDE DRIVEWAY
- 6 PROPOSED LIGHT DUTY ASPHALT PAVING
- 7 PROPOSED HEAVY DUTY ASPHALT PAVING
- 8 PROPOSED RETAINING WALL
- 10 PROPOSED SITE FENCE (FOR DETAILS, SEE LANDSCAPE PLANS)
- 11 PROPOSED SERVICE AREA FENCE (FOR DETAILS, SEE ARCHITECTURE PLANS)

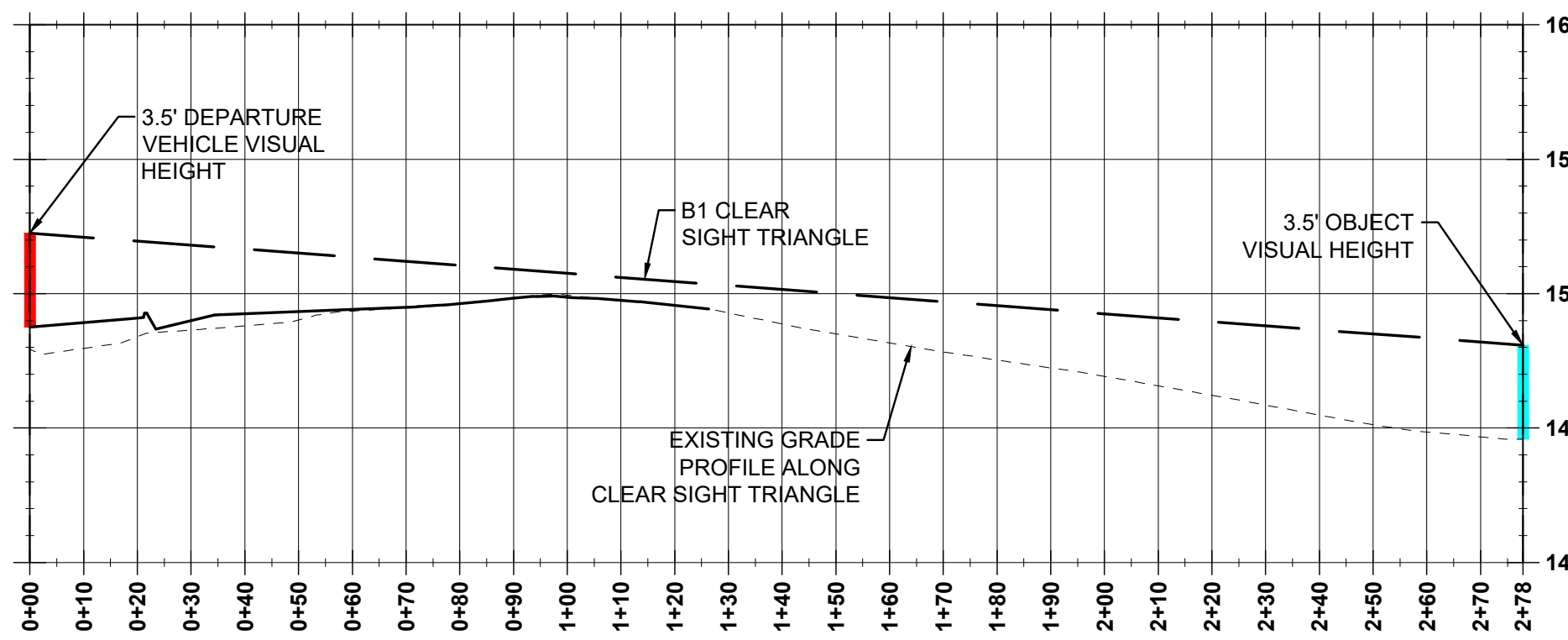
SETBACKS

	SECTION 50.02.003.2
FRONT	20'
SUM OF SIDES	10'
SIDE (WESTERN)	5'
SIDE (EASTERN)	5'
REAR	20'

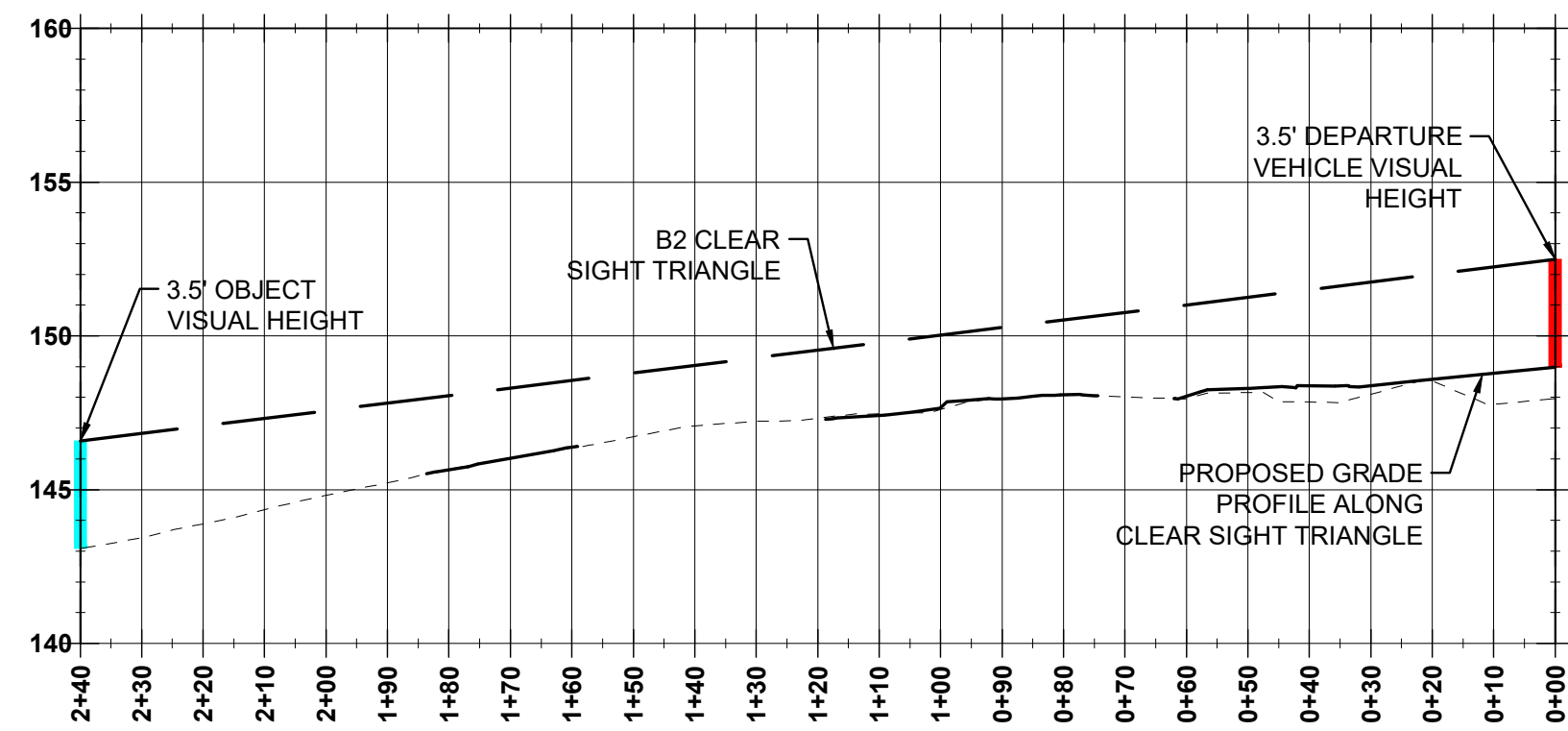




DWY1-SIGHT TRIANGLE-CAR-LEFT TURN LANE PROFILE
 (STA: 0+00 - STA: 2+77)
 SCALE: 1" = 30' H; 1" = 6' V



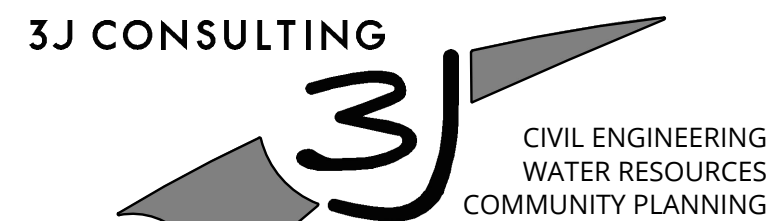
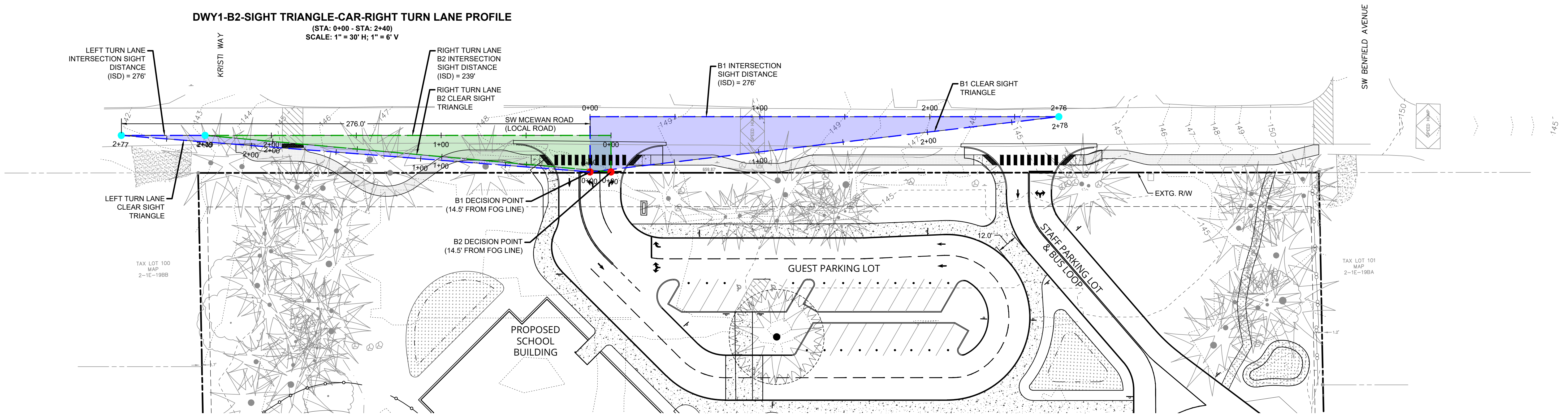
DWY1-B1-SIGHT TRIANGLE-CAR PROFILE
 (STA: 0+00 - STA: 2+78)
 SCALE: 1" = 30' H; 1" = 6' V



DWY1-B2-SIGHT TRIANGLE-CAR-RIGHT TURN LANE PROFILE
 (STA: 0+00 - STA: 2+40)
 SCALE: 1" = 30' H; 1" = 6' V

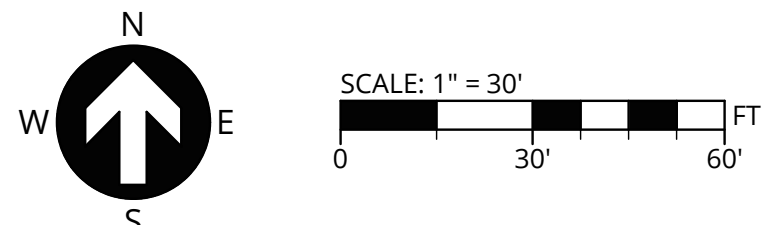
INTERSECTION SIGHT DISTANCE ANALYSIS, DRIVEWAY 1	
CASE B1, LEFT TURN FROM STOP - LEFT TURN LANE	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	7.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	276 feet
CASE B2, RIGHT TURN FROM STOP - RIGHT TURN LANE	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	6.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	239 feet

NOTES:
 1. SEE SECTION 9.5 FROM AASHTO STANDARDS ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS.
 2. DESIGN SPEED OF SIGHT DISTANCE ANALYSIS IS BASED ON POSTED SPEED OF 25 M.P.H. FOR SW MCEWAN ROAD.
 3. TIME GAP VALUE USED FOR B2 ASSUMES MAXIMUM OF 5% MINOR-ROAD APPROACH GRADIENT. STANDARD OF 7.5s ASSUMES 3% MAX. MINOR-ROAD APPROACH GRADIENT. ADDITIONAL 0.1s ADDED FOR EACH PERCENT OF GRADE OVER 0%.
 4. INTERSECTION SIGHT DISTANCE (ISD) = 1.47*(DESIGN SPEED OF MAJOR ROAD)*(TIME GAP)



9600 SW NIMBUS AVE., SUITE 100; BEAVERTON, OR 97008

DRAWING BY: 3J CONSULTING
 PLAN ISSUE DATE: 01/08/2022
 PLAN ISSUE PURPOSE: ANALYSIS



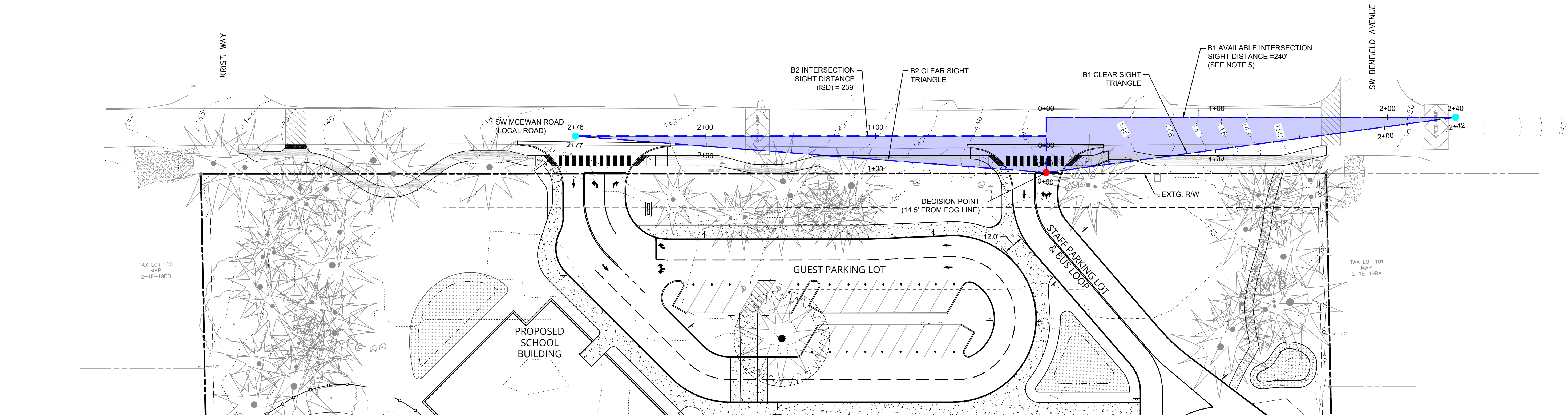
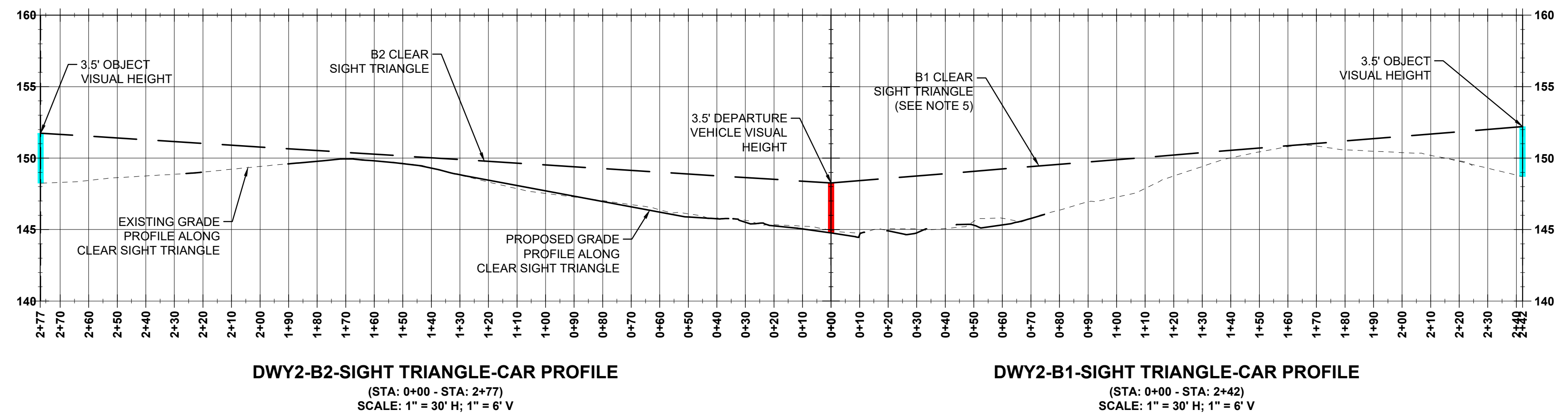
RIVER GROVE ELEMENTARY SCHOOL
LAKE OSWEGO SCHOOL DISTRICT

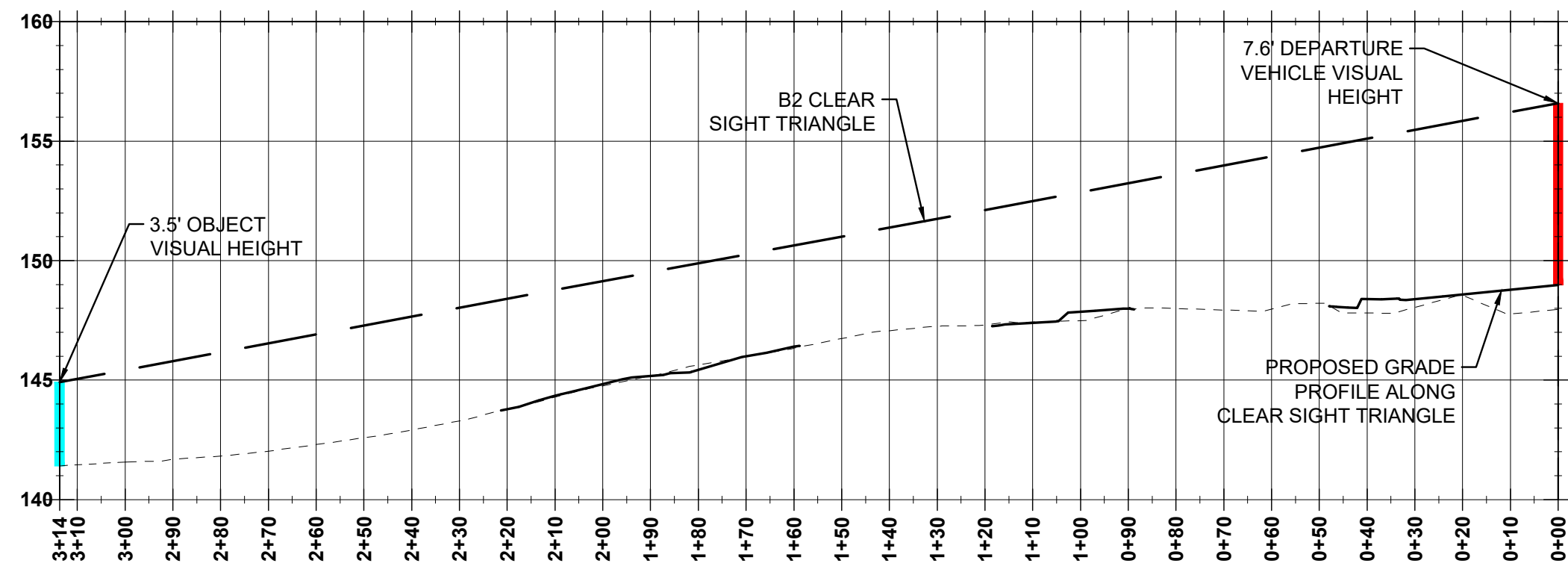
SW MCEWAN RD
INTERSECTION SIGHT
DISTANCE DWY 1 - CAR

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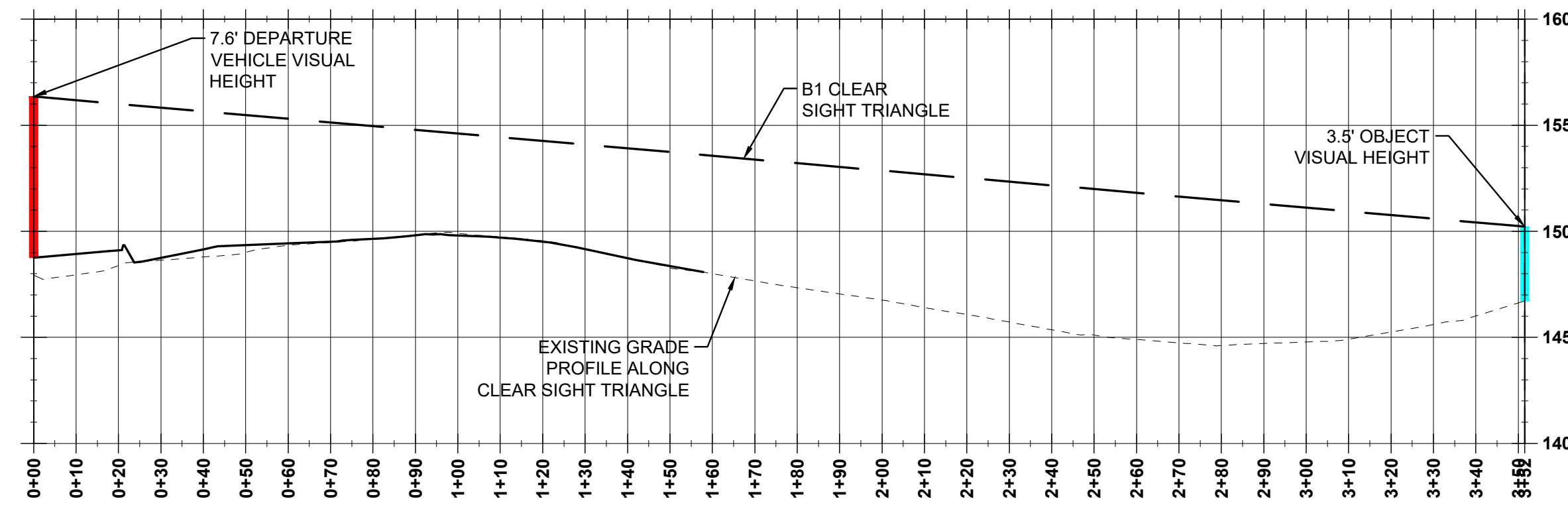
INTERSECTION SIGHT DISTANCE ANALYSIS, DRIVEWAY 2	
CASE B1, LEFT TURN FROM STOP	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	7.5 seconds
DESIGN SPEED	25 m.p.h
INTERSECTION SIGHT DISTANCE (ISD)	276 feet
AVAILABLE INTERSECTION SIGHT DISTANCE	240 feet
STOPPING SIGHT DISTANCE (SSD)	158 feet
CASE B2, RIGHT TURN FROM STOP	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	6.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	239 feet (276 feet governs)

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4. INTERSECTION SIGHT DISTANCE (ISD) = 1.47*(DESIGN SPEED OF MAJOR ROAD)*(TIME GAP)
5. THE B1 (LEFT TURN) CONDITION FROM DRIVEWAY 2 SHOWS THE AVAILABLE INTERSECTION SIGHT DISTANCE (ISD) OF 240 FT. AVAILABLE ISD IS DEEMED APPROPRIATE BECAUSE COMPLETE ISD OF 276 FT CANNOT BE ACHIEVED, AVAILABLE ISD IS GREATER THAN REQUIRED STOPPING SIGHT DISTANCE (SSD) OF 158 FT, AND DUE TO MCEWAN BEING A LOCAL ROAD IN COMBINATION WITH THERE BEING AN EXISTING TRAFFIC CALMING DEVICE (SPEED HUMP) AT THE INTERSECTION OF SW MCEWAN RD AND SW BENFIELD AVE.





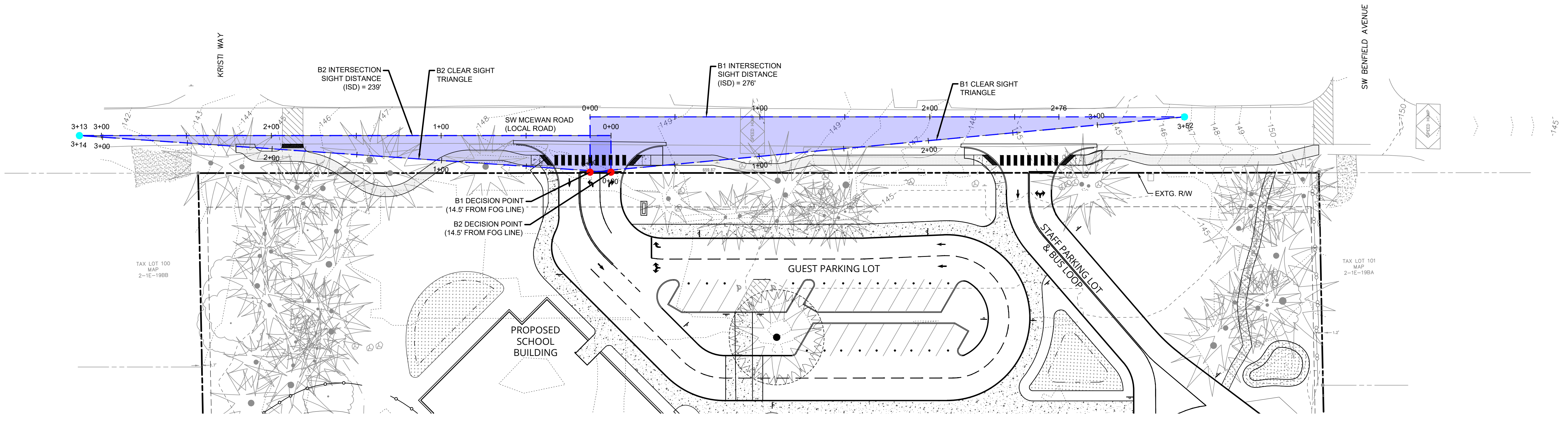
DWY1-B2-SIGHT TRIANGLE-TRUCK PROFILE
 (STA: 0+00 - STA: 3+14)
 SCALE: 1" = 30' H; 1" = 6' V



DWY1-B1-SIGHT TRIANGLE-TRUCK PROFILE
 (STA: 0+00 - STA: 3+52)
 SCALE: 1" = 30' H; 1" = 6' V

INTERSECTION SIGHT DISTANCE ANALYSIS, DRIVEWAY 1	
CASE B1. LEFT TURN FROM STOP	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	9.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	350 feet
CASE B2. RIGHT TURN FROM STOP	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	8.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	313 feet

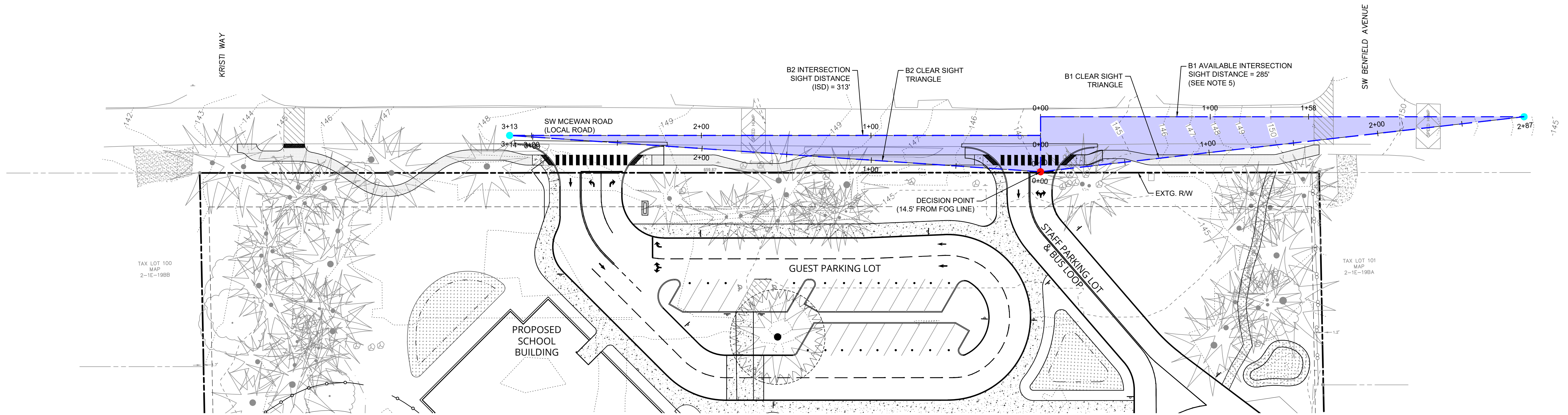
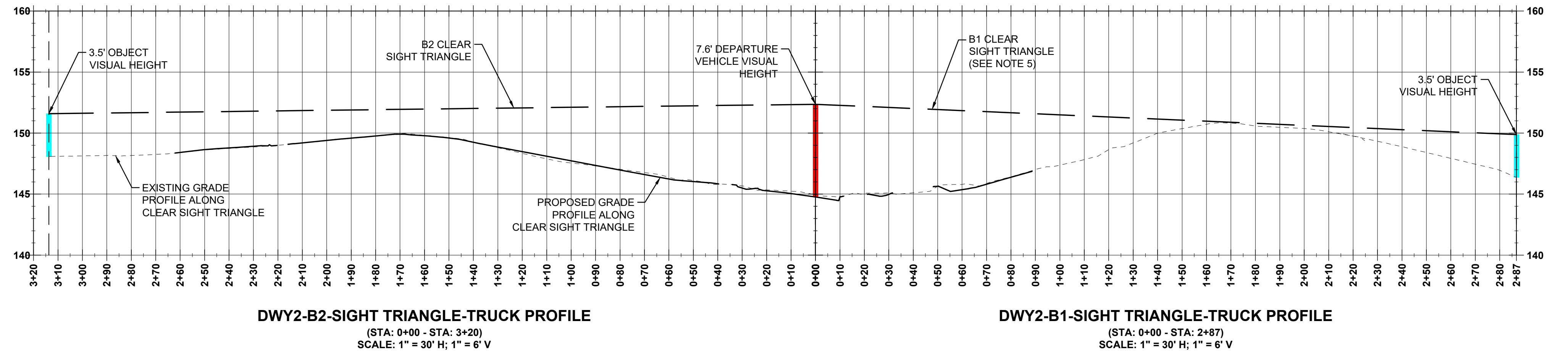
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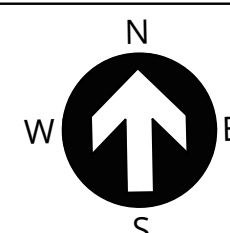
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INTERSECTION SIGHT DISTANCE ANALYSIS, DRIVEWAY 2	
CASE B1, LEFT TURN FROM STOP	
DESIGN VEHICLE	SINGLE UNIT TRUCK
TIME GAP	9.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	350 feet
AVAILABLE INTERSECTION SIGHT DISTANCE	285 feet
STOPPING SIGHT DISTANCE (ISD)	158 feet
CASE B2, RIGHT TURN FROM STOP	
DESIGN VEHICLE	PASSENGER CAR
TIME GAP	8.5 seconds
DESIGN SPEED	25 m.p.h.
INTERSECTION SIGHT DISTANCE (ISD)	313 feet

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DRAWING BY: 3J CONSULTING
PLAN ISSUE DATE: 01/18/2022
PLAN ISSUE PURPOSE: ANALYSIS



RIVER GROVE ELEMENTARY SCHOOL
LAKE OSWEGO SCHOOL DISTRICT

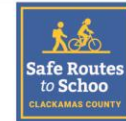
SW MCEWAN RD
INTERSECTION SIGHT
DISTANCE DWY 2 - TRUCK

RIVER GROVE ELEMENTARY SCHOOL REPORT



River Grove Elementary School

Improvement Recommendations



1 School Parking Lot and Grounds

- Replace old bike racks and reposition to eliminate sidewalk obstruction when bikes are parked.
- Install lighting in Pilkington Park from the school to Benfield Ave and to Pilkington Rd.
- Upgrade existing dirt path at northeast corner of school grounds from SE McEwan Road to school parking lot.

2 SW McEwan Road

- Install sidewalks on the south side of McEwan Rd from the school driveway (west of Kristi Way) to Longfellow Ave.
- Install sidewalks on the south side of McEwan Rd from Longfellow Ave to SW 65th Ave.
- Install sidewalks on the north side of McEwan Road from SW 65th Avenue to SW Benfield Avenue.
- Restripe crosswalks at Benfield Ave and at Kristi Way.
- Post "Do Not Block Driveway" sign at school driveway egress.
- Install a three-way stop at Kristi Way with advance stop bars.

3

Pilkington Road

- Construct a sidewalk from Korean Methodist Church to crosswalk at SW McEwan Road consider parking lot as additional drop-off/loading zone.
- Post radar speed signs between SW Dawn Street and Red Leaf Street, and between SW Fernbrook Way and Red Leaf Street.
- Install Rectangular Rapid Flashing Beacon (RRFB) across Pilkington Road at McEwan Road.
- Install sidewalks on east side of Pilkington Road from Jean Road to SW Childs Road.
- Stripe crosswalk at Kenny Street with advance pedestrian warning signs.
- Install a Rectangular Rapid Flashing Beacon (RRFB) across Pilkington Road across at SW Dawn St.
- Pave path through Pilkington Park
- Construct pedestrian pathway on west side of Pilkington Road from SW Childs Rd. to Dawn St.

4

SW Childs Road

- Trim vegetation to improve stop sign visibility at 65th Ave.
- Stripe crosswalk on SW Childs Rd. at Indian Creek Ave.
- Install a Rectangular Rapid Flashing Beacon (RRFB) at Megly Ct. and Woodcrest Lane.
- Formalize existing pedway (current wide shoulder with no parking signs) from SW 65th Ave. to SW Terry Ave into a raised sidewalk with curb and gutter or a separated pedestrian path.
- Reconstruct existing pedway from SW Terry Ave. to Pilkington Rd into a raised sidewalk with curb and gutter.
- Consider installing a Rectangular Rapid Flashing Beacon (RRFB) across SW Childs Road at SW Benfield Ave.

5

SW 65th Avenue

- Relocate stop signs at SW McEwan Rd to improve to improve visibility and straighten intersection.
- Stripe crosswalks across all lanes and adjust stop bars to tighten turning radius.

Legend

	Crossing Guard		Proposed Radar Speed Sign		Proposed Reduced Curb Radius		Proposed Lighting
	Existing Bike Parking		Proposed Sidewalk		Proposed "Do Not Block" Sign		
	School Bus Loading		Proposed Crosswalk / Restriping				
	Student Loading		Proposed Flashing Beacon				
	Proposed Pedestrian Pathway		Proposed Paved Path				

Figure 3. River Grove Elementary School Improvements Map



HOW TO USE THIS MAP: This suggested route to school map is intended to encourage adults and students to consider walking or bicycling to school. Adults are responsible for choosing the most appropriate option based on their knowledge of the different routes.

River Grove Elementary

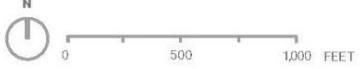
5850 McEwan Road
Lake Oswego, OR 97035

- MAP LEGEND**
- Enrollment area
 - Park or natural area
 - School campus
 - Suggested route
 - Missing or partial sidewalk
 - Crosswalk
 - Stop Sign
 - Crossing Guard



Clackamas County Safe Routes to School (SRTS)

Visit our website to learn more about how you can support SRTS at your school,
www.clackamas.us/engineering/srts.html



Created April 2018

Figure 2. River Grove Elementary School Suggested Route Map