

# W. EDWARD BALMER SCHOOL

NORTHBRIDGE, MA  
SCHEMATIC DESIGN

SCHOOL BUILDING  
COMMITTEE MEETING

FEBRUARY 28, 2018



Massachusetts School Building Authority  
*Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities*



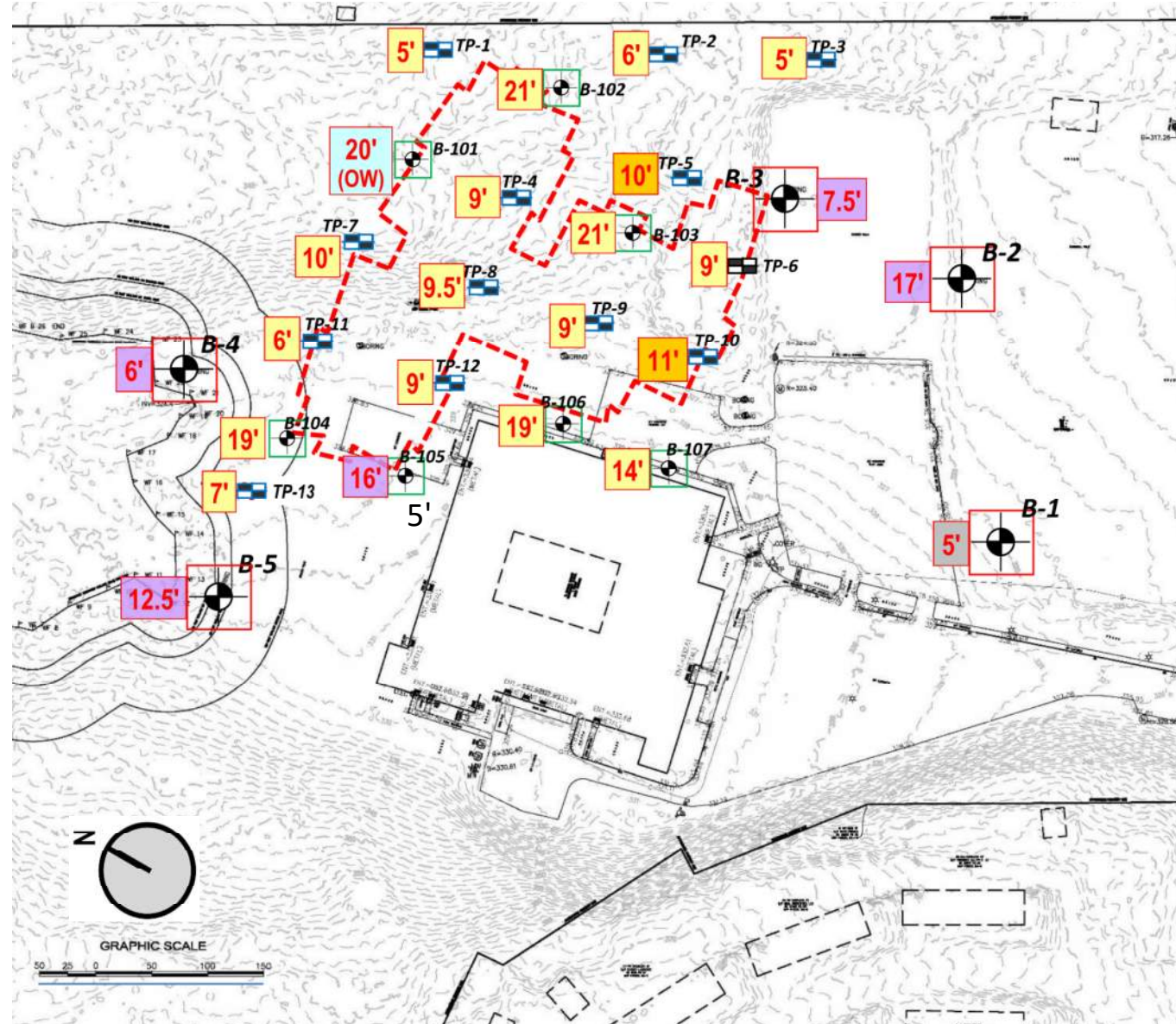
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- 1. SITE PLANNING UPDATE**
  - 2. BUILDING DESIGN UPDATE**
  - 3. MECHANICAL AND ELECTRICAL SYSTEMS**
  - 4. SUSTAINABLE DESIGN FEATURES**
  - 5. QUESTIONS, COMMENTS, FEEDBACK**

# 1.1

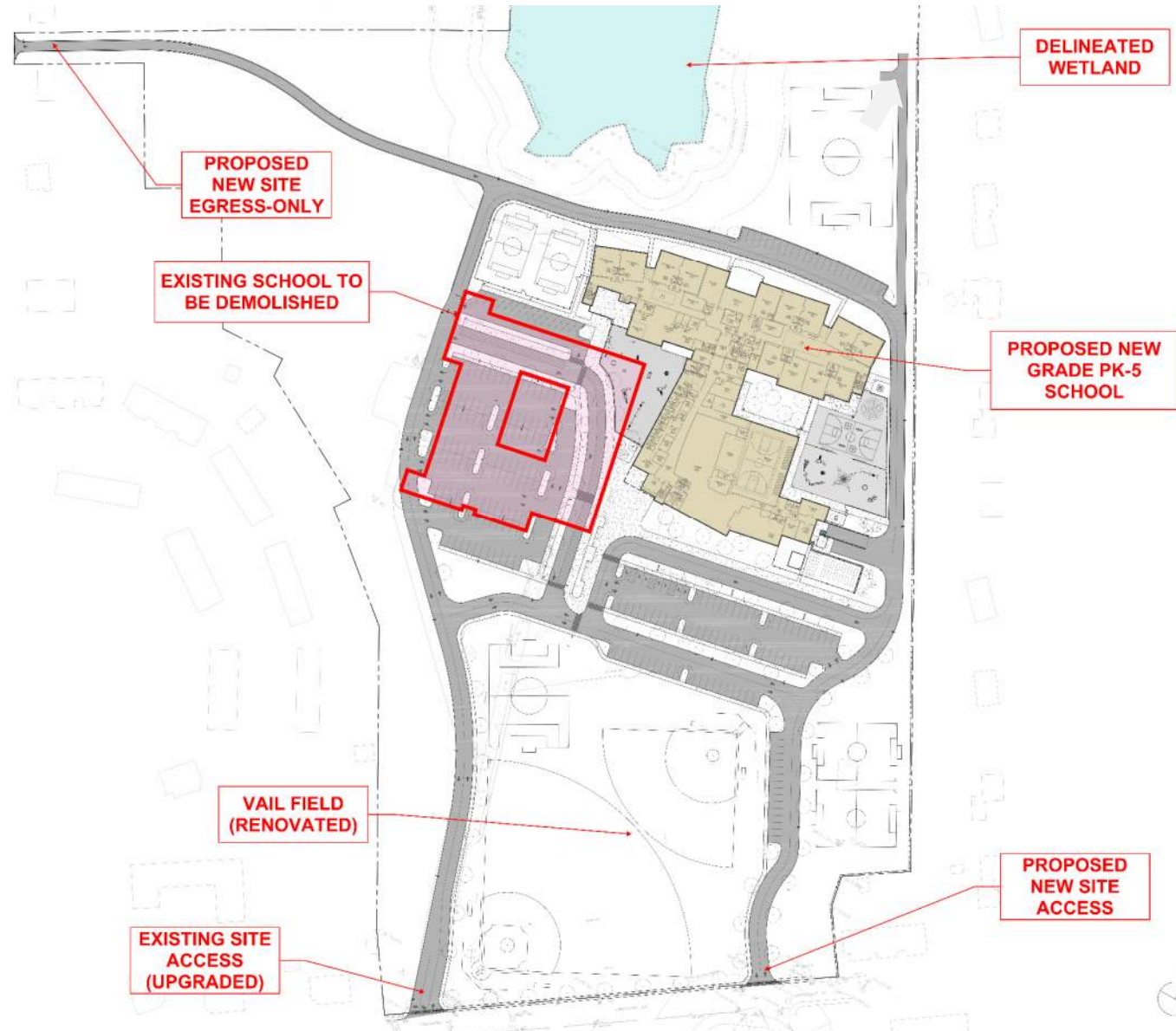
**SITE PLANNING  
UPDATE**

# MAP OF BORINGS AND TEST PITS

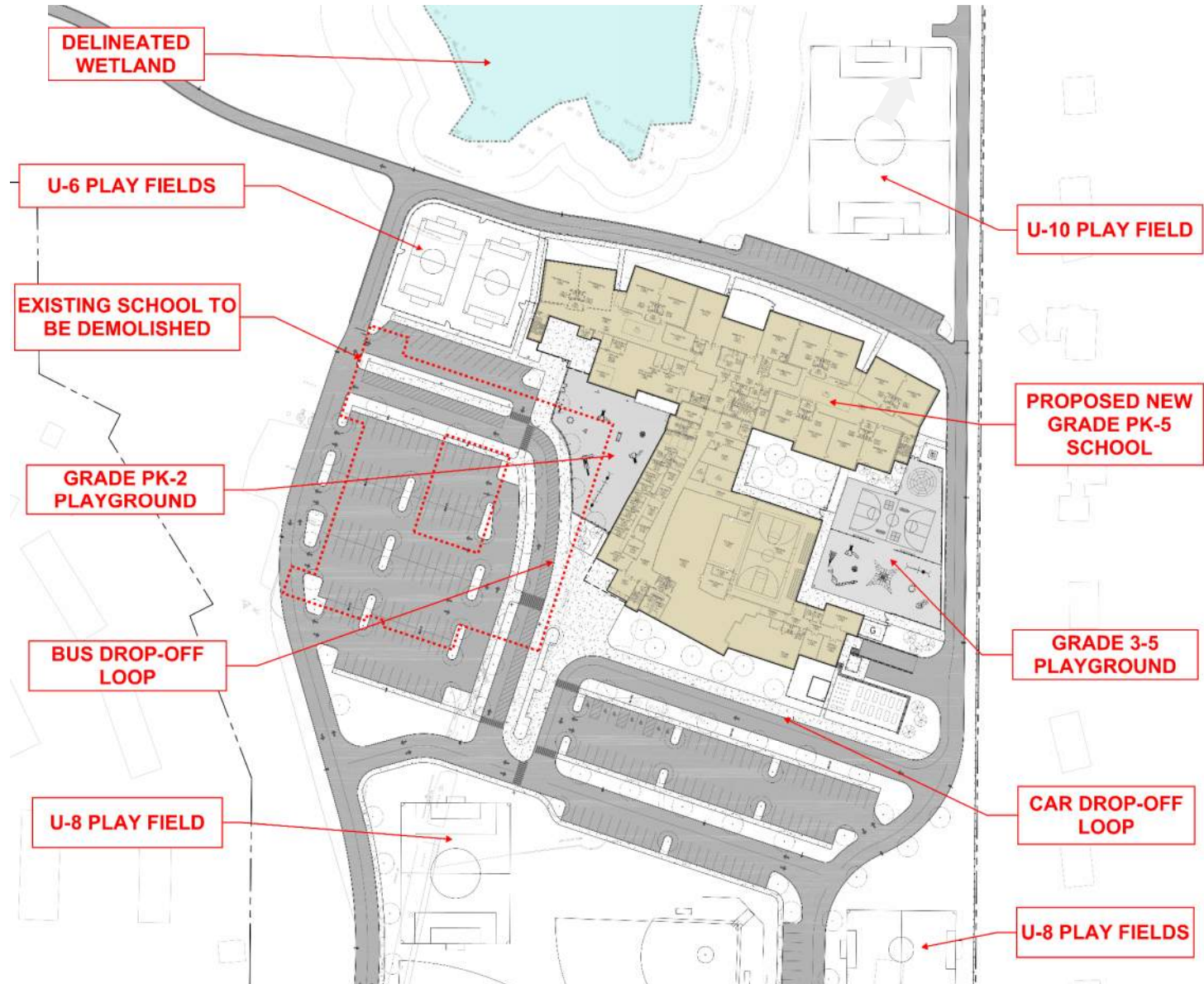
- X' TO LEDGE
- X' TO BOULDER
- X' TO SAND
- X' WITH FILL
- X' OBSERV. WELL







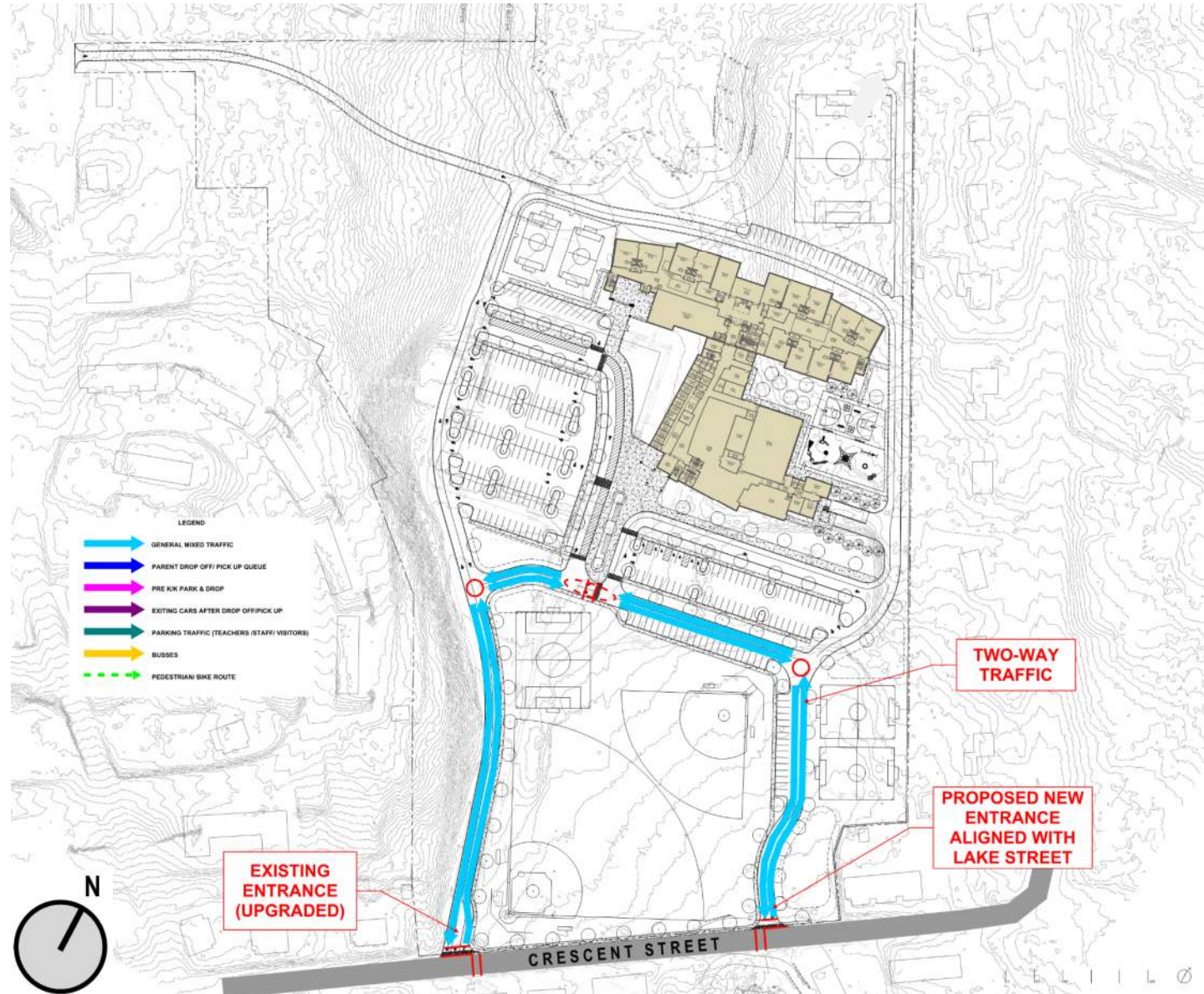
# MAJOR SITE FEATURES





# VAIL FIELD CIRCULATION

- Upgraded existing entrance
- Added new entrances
- Two-way traffic around fields
- All-way-stop intersections

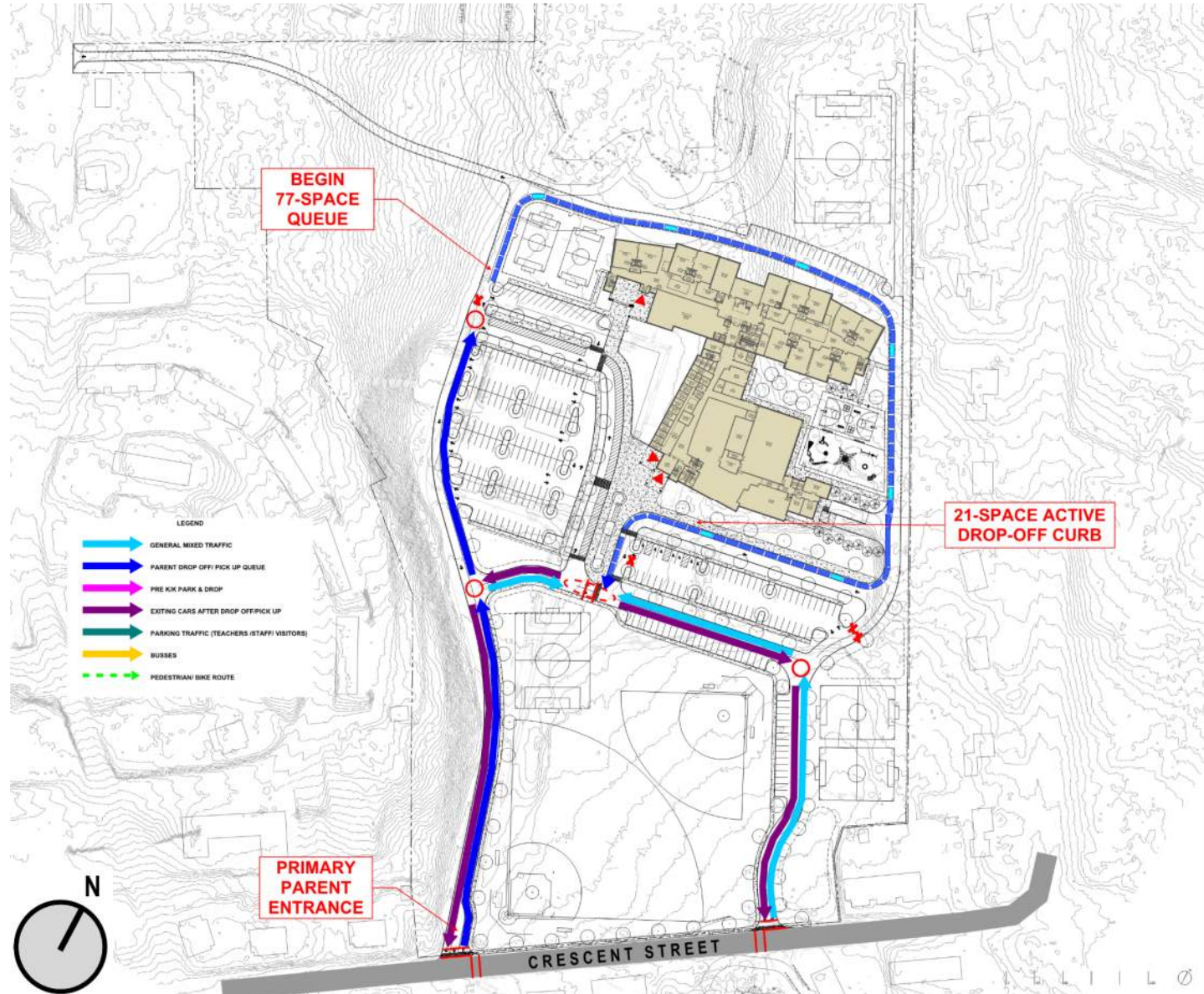


SITE CIRCULATION



# PARENT DROP-OFF CIRCULATION

- Primarily use existing (west) entrance
- Circulate/queue around back of school
- Drop-off at curb, passenger side
- Exit via either entrance



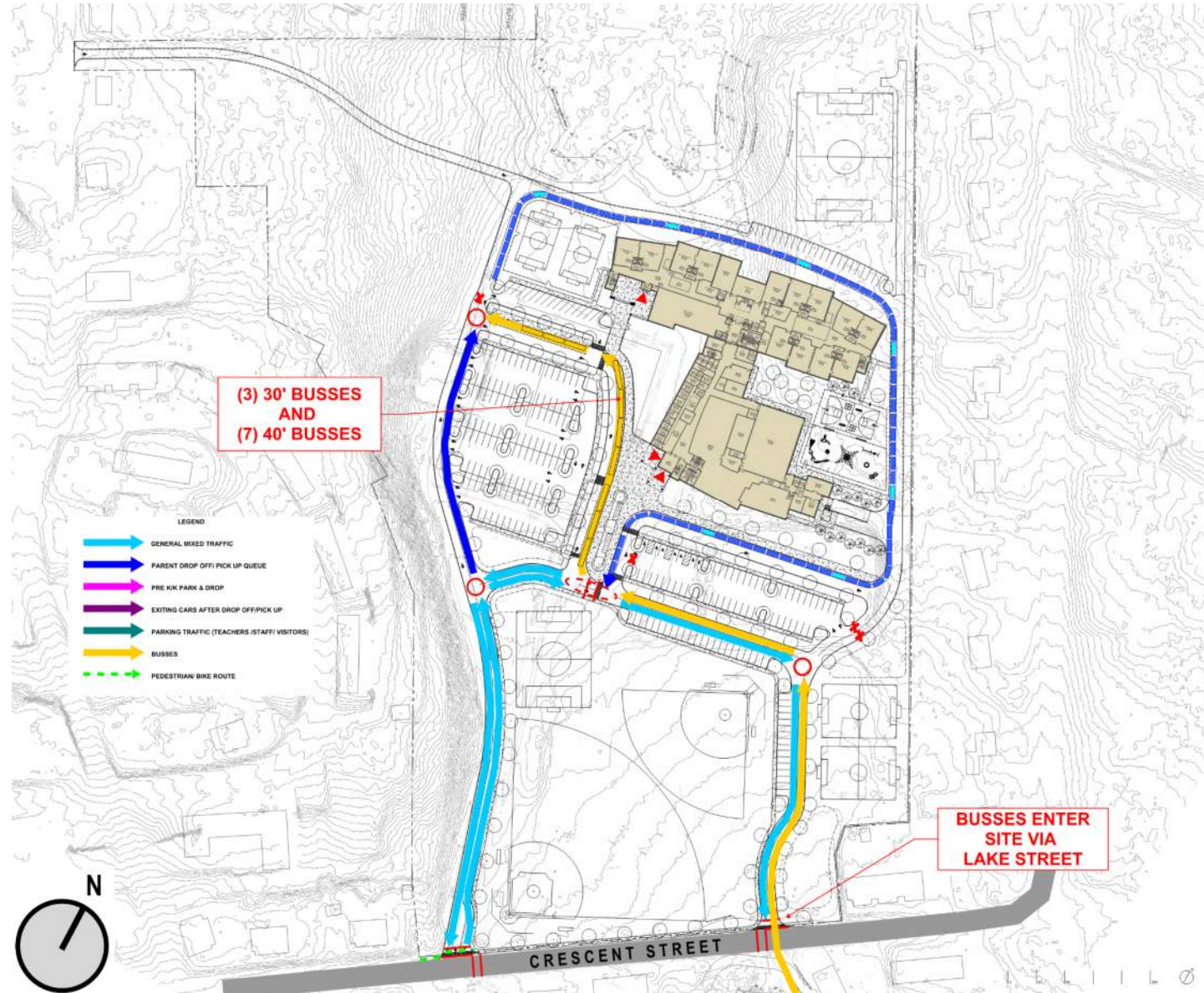
SITE CIRCULATION





# BUS CIRCULATION

- Primarily use new east entrance (could use both)
- Drop-off at curb
- Exit via existing (west) entrance

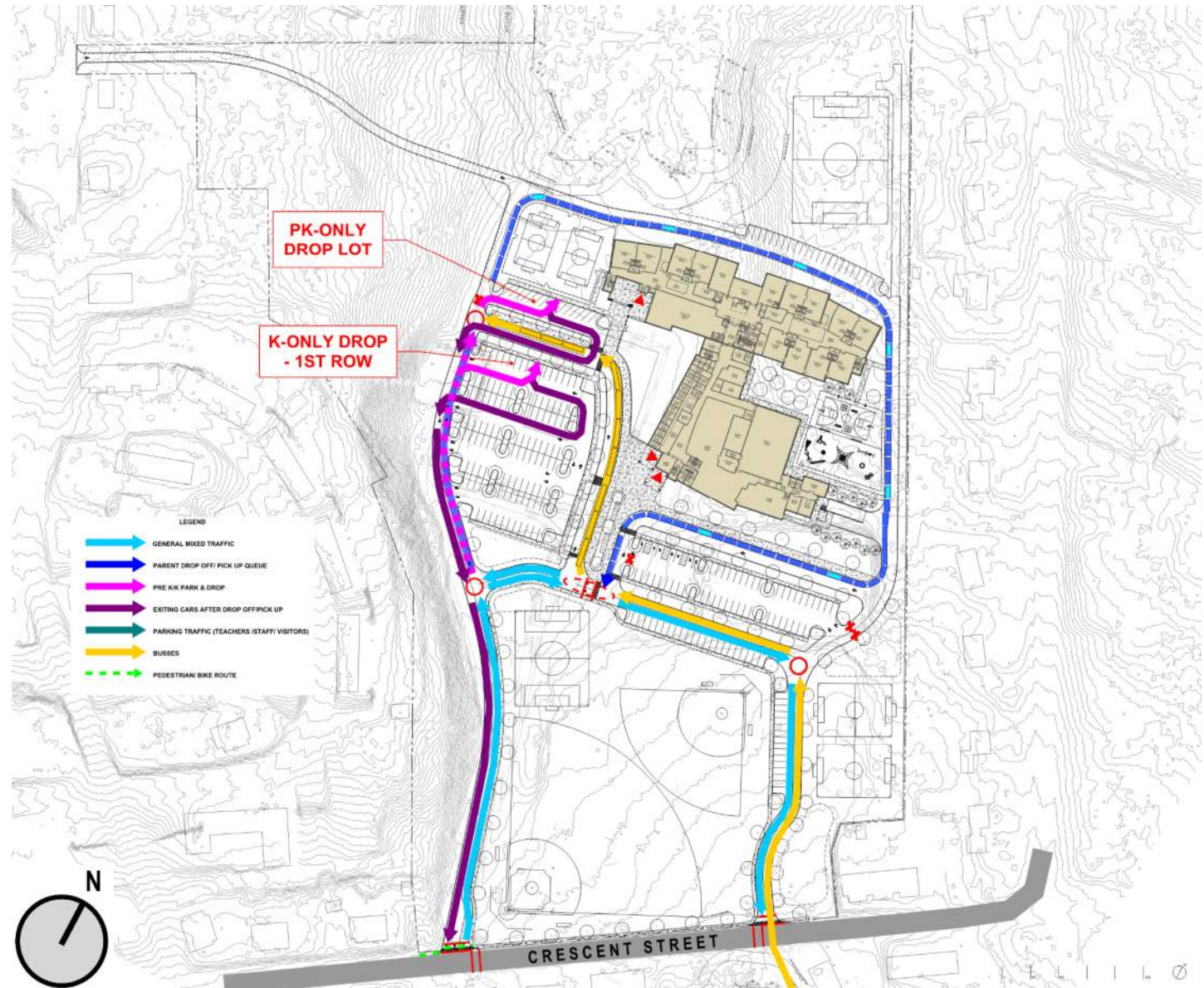


SITE CIRCULATION



# PRE-K/ K PARK & DROP CIRCULATION

- Primarily use existing (west) entrance
- Park and escort child to building
- Exit via existing (west) entrance



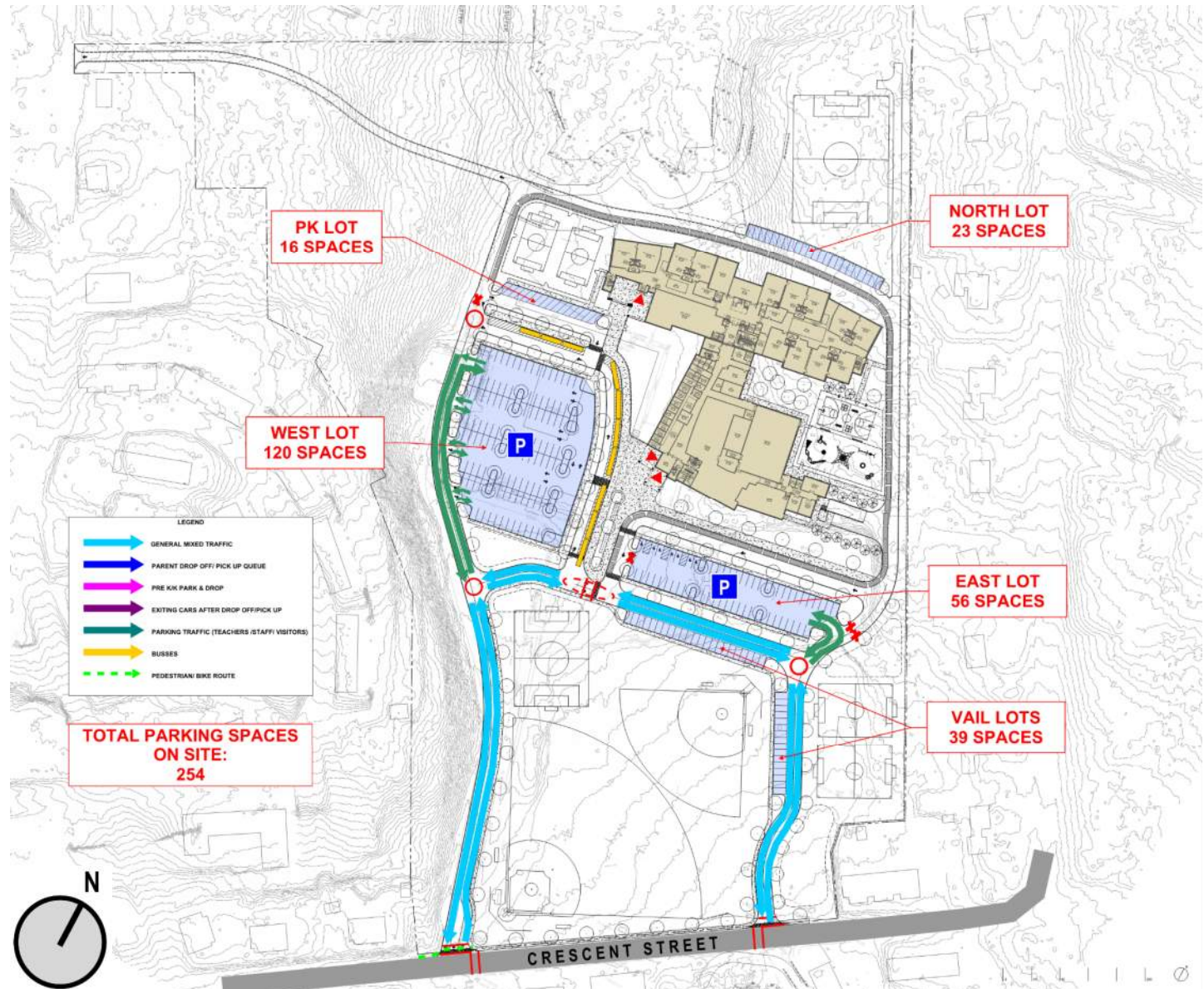
SITE CIRCULATION





# PARKING LOT ACCESS CIRCULATION

- Access via either entrance
- Access lots as shown
- Strategic barriers to prevent “cheating” the queue
- Exit either direction



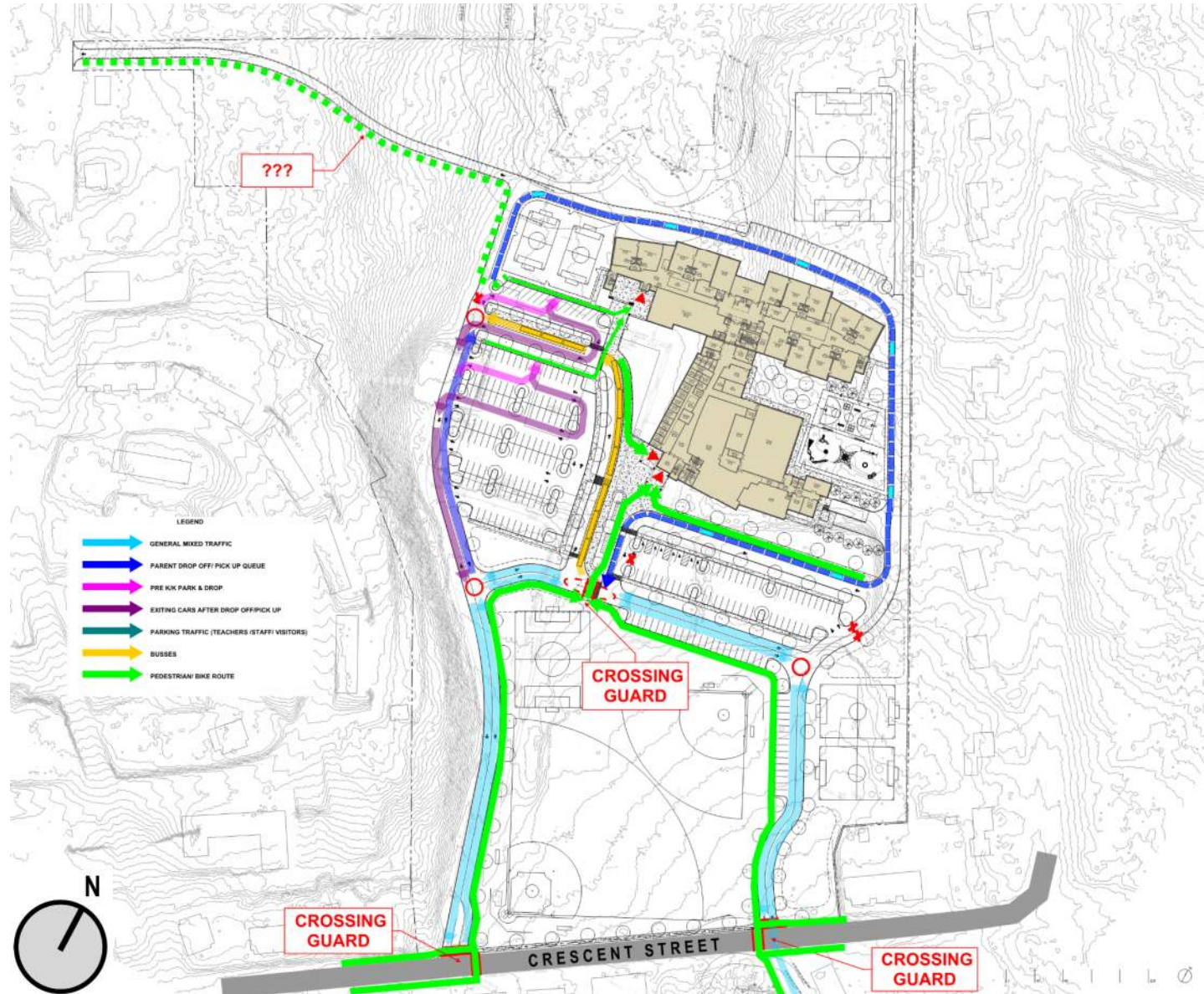
SITE CIRCULATION





# BIKE- PEDESTRIAN CIRCULATION

- Access via street sidewalks
- Move to central crossing point
- Move from vehicular drop curbs
- Bike parking in front of school



SITE CIRCULATION



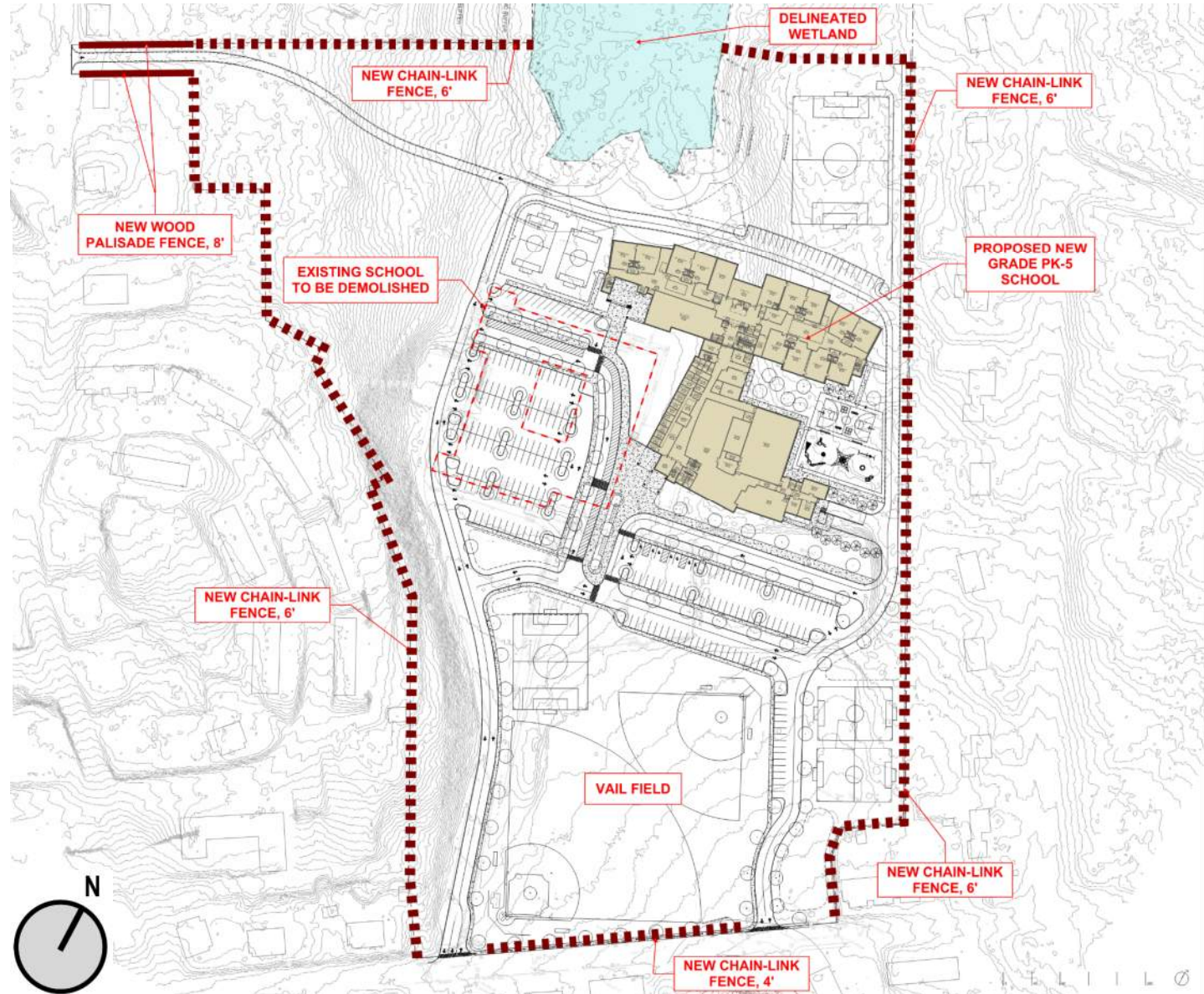
# 1.2

**SITE SAFETY &  
SECURITY**



# SITE FENCES

- Chain-link fence around entire site?
- Channels site access
- Integral part of claiming territory



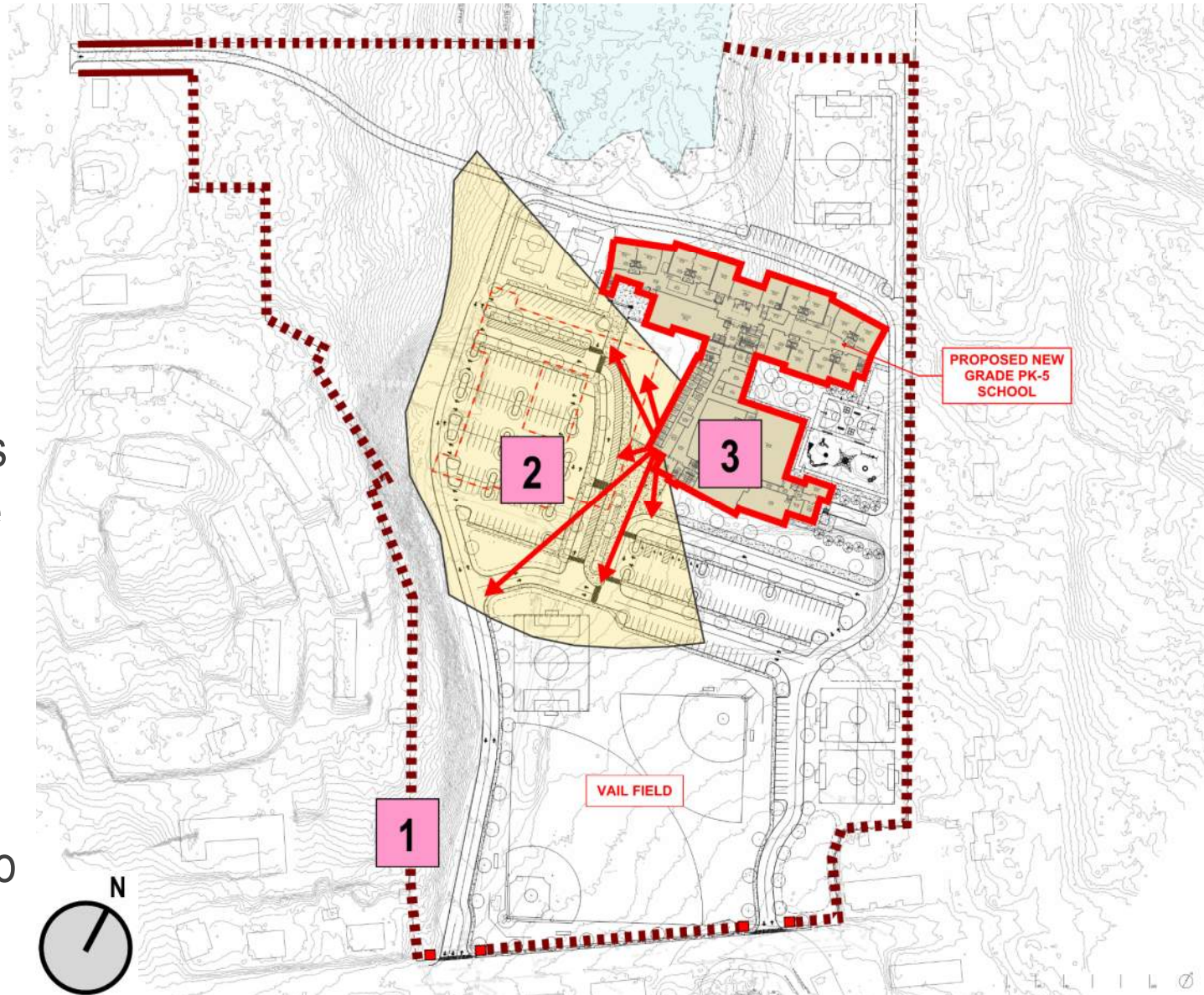
SAFETY & SECURITY





# SECURITY PERIMETERS

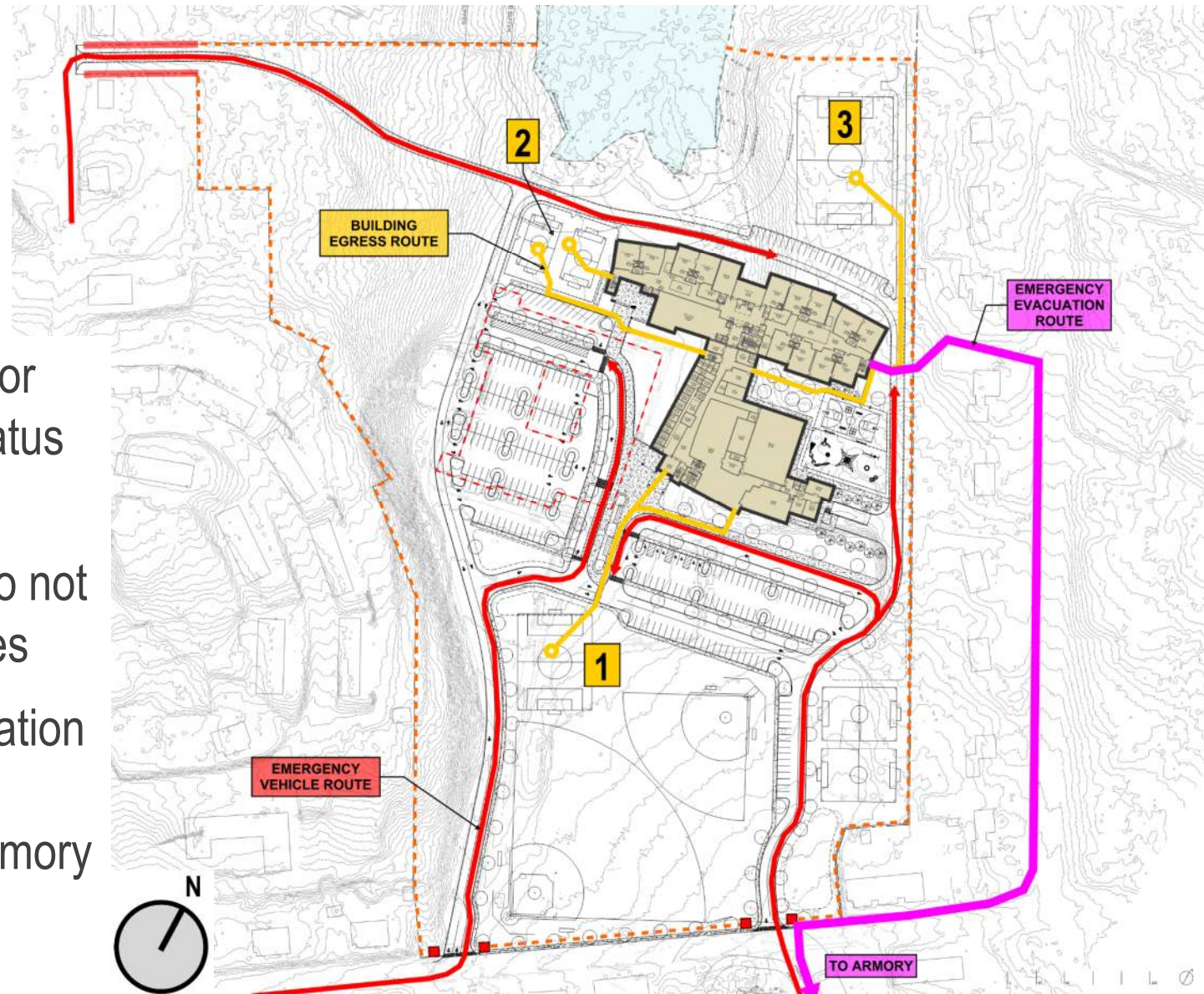
- Rings or layers of security
- Claim territory
- Signage, gateways announce “you are being watched”
- Potentially provide precious seconds of early warning
- Limit entry points to building





# EMERGENCY EGRESS ROUTES

- Four approaches for emergency apparatus
- Egress routes to assembly points do not cross vehicle routes
- Emergency evacuation route essentially unchanged – to Armory



# 2.1

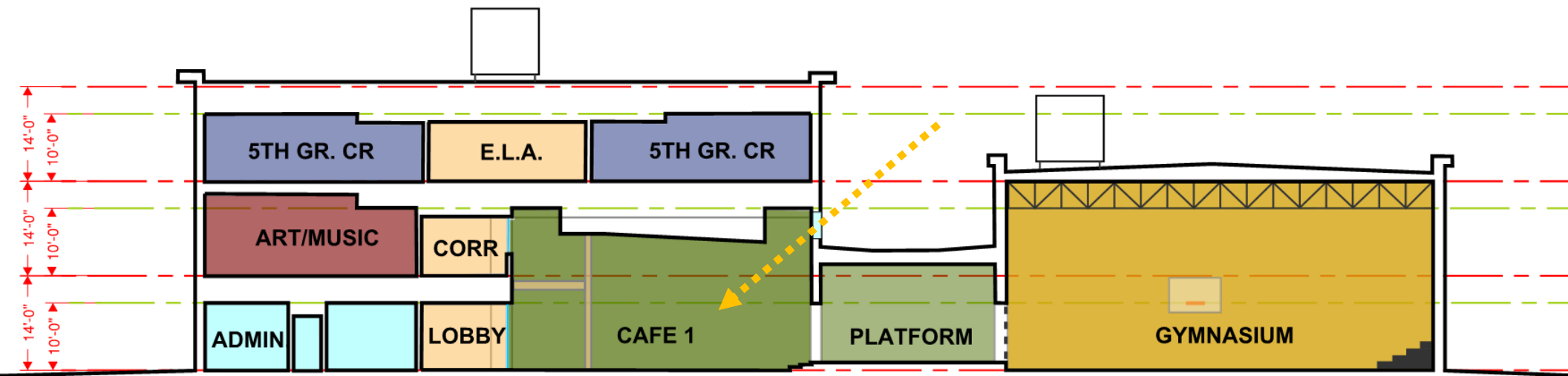
**BUILDING DESIGN:  
PLANS & SECTIONS**





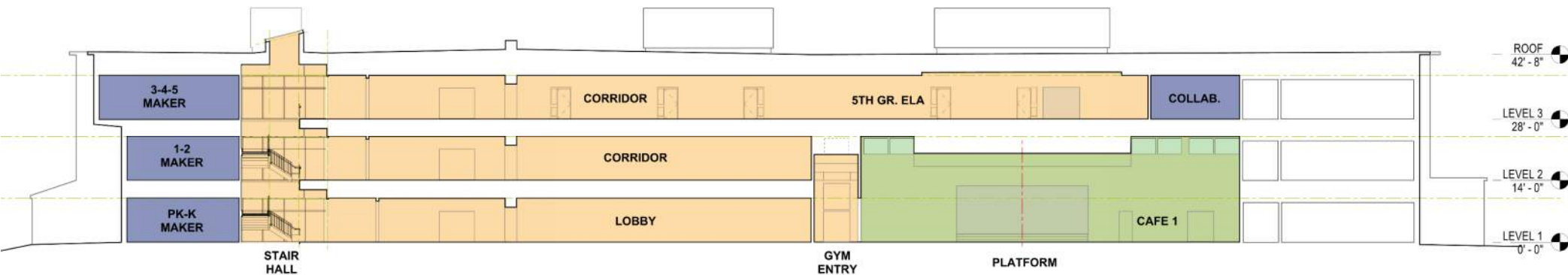
- Classroom pairs split to let in light; creates reading nook
- Cafeteria separated into two areas
- Stage between Café 1 and Gym
- Café 1 is a two-story space
- Boiler and Electrical in center of building

- Floors related through vertical spaces
- Dual utility of platform – Café/Gym
- Natural light & views into Café



BUILDING SECTION E-W THRU “PUBLIC” WING

- Skylight over stair creates luminous central hall
- Floors related through vertical stair
- View from Café 1 to Platform



BUILDING SECTION THRU N-S AXIS







N  
3

## THIRD FLOOR PLAN

- Further simplified geometry
- Main “open” stair at crossing with skylight above
- Light well provides connection from stair hall to library
- “Well” stair central to principals’ offices



# 2.2

**BUILDING DESIGN:  
EXTERIOR IMAGERY**



VIEW FROM SOUTHWEST SITE ENTRANCE 1





AERIAL VIEW FROM SOUTHWEST **2**



ENTRY VIEW FROM SOUTHWEST 3



VIEW FROM ENTRY PLAZA 4





VIEW FROM ENTRY PLAZA 5



VIEW OF WEST FACADE FROM PARKING LOT 6



VIEW OF MEDIA CENTER AND SOUTH FACADE 7





VIEW OF EARLY EDUCATION ENTRY AND MEDIA CENTER 8



VIEW OF WEST FACADES **9**



VIEW OF NORTHWEST CORNER OF ACADEMIC WING **10**





AERIAL VIEW: NORTH FACADE OF ACADEMIC WING **11**



VIEW OF NORTH FACADE OF ACADEMIC WING **12**



VIEW OF SOUTH-EAST CORNER OF ACADEMIC WING **13**





VIEW OF SOUTH FACADE OF KITCHEN/GYM WING **14**



AERIAL VIEW FROM SOUTHEAST **15**

3

**MECHANICAL/  
ELECTRICAL  
SYSTEMS UPDATE**



# LIFE CYCLE COST ANALYSIS – THREE SYSTEMS

## 1

### Variable

### Refrigerant Flow (VRF)



- Refrigerant (the cooling and heating medium) is conditioned by outdoor condensing unit(s), and circulated within the building to multiple fan-coil units
- Conditioned air is delivered from the ceiling; returned to grilles in the ceiling
- Highly efficient, flexible, high degree of control
- Heavy environmental footprint due to refrigerant ODP
- Medium first cost, higher operating cost



# LIFE CYCLE COST ANALYSIS – THREE SYSTEMS

## 2

### Full Air Conditioning System

- Dehumidified, chilled outdoor air is supplied at medium velocity from ceiling diffusers, and returned thru ceiling grilles.
- Air supplied by HVAC roof-top units (RTUs) with A/C, economizer, and energy recovery; heat supplied by gas-fired reheat within RTU
- Somewhat efficient, flexible, high degree of control
- Medium first cost, more expensive to operate



# LIFE CYCLE COST ANALYSIS – THREE SYSTEMS

## 3

### Displacement Ventilation



- Dehumidified outdoor air is supplied at low velocity near floor level and extracted above the occupied zone, usually at ceiling height.
- Air supplied by rooftop air handling units (AHUs) with economizer and energy recovery; heat supplied by radiant panels in ceiling at exterior walls
- Highly efficient, flexible, medium degree of control
- Relatively low first cost, lowest operating cost of three

***“A/C-Light”***

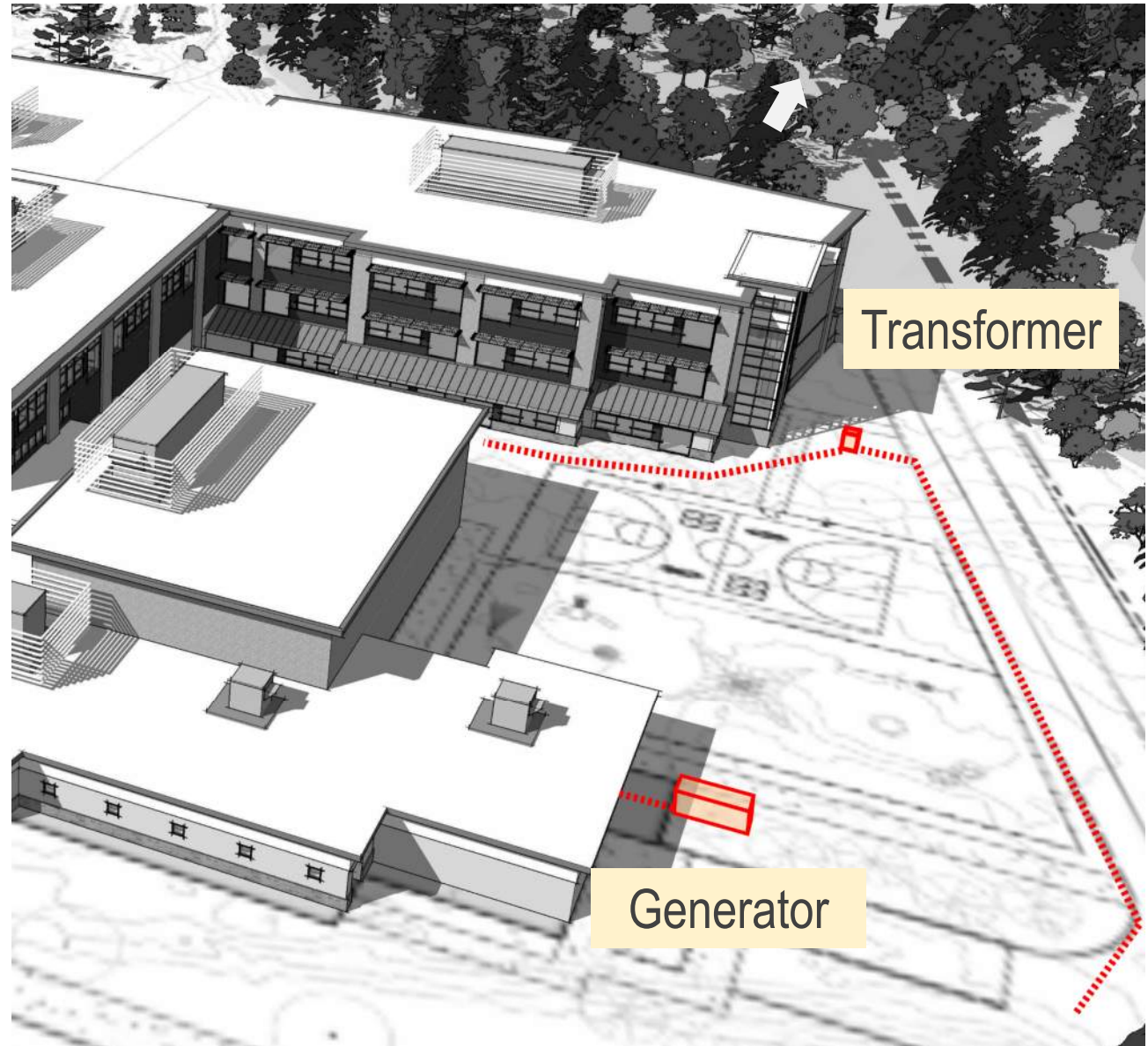
MECHANICAL SYSTEMS





# PLACEMENT OF MAJOR EQUIPMENT

- Primary power
- Transformer
- Secondary power
- Standby Generator
- Confirmed that main and secondary electrical rooms are correct size and location, with egress



**4**

**SUSTAINABLE DESIGN  
UPDATE**

# CURRENT LEED STATUS

Yes	No
45	31
	34

Project Totals (Certification Estimates) 110

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points

<b>Project Goal(s)</b>	LEED v4 BD+C NC Silver minimum
<b>Activity Over the 2 Last Months</b>	Reviewed MSBA Preferred Schematic Report. Participated in SD Phase Consultants Kickoff Meeting on January 17, 2018. Updated LEED-S v4 Scorecard based on additional project data and after meeting.
<b>Planned Activity Over the Next Month</b>	Work with team to identify LEED credit documentation responsibilities. Facilitate team to complete LEED Integrative Process and Site Assessment worksheets and OPR document.



# SELECTED SUSTAINABLE DESIGN ASSUMPTIONS



- No general landscape irrigation (play fields may be irrigated)
- No renewable energy generation as part of project, but building roof and electrical room will be Solar-Ready
- To reach MSBA 2% “bonus” reimbursement energy efficiency goal, the envelope (roof, walls, windows & doors, and slab) must be:
  - Very tight (low air leakage rate)
  - Highly efficient (High R-value - better insulation, Low-E glazing with best coatings)
  - Detailed using best practices – no thermal short circuits



# SELECTED SUSTAINABLE DESIGN ASSUMPTIONS



- After-hours use of building by public
- Stepped-up recycling requirements (five waste streams)
- Daylight harvesting/ automatic dimming controls
- Building as a Teacher
  - Signage: materials Q&A, building usage, story of construction
  - Demonstration features: wetlands, rain gardens, controls dashboard, interior materials and features, etc.



# LEED NEXT STEPS

- Owner's Project Requirements (OPR) document
- Basis of Design (BOD) document
- Confirm that project specifications conform to OPR and BOD
- Capture costs in SD cost estimate







***Thank you  
for your  
attention!***

***Questions?  
Comments?***