

Cardinal School Stormwater Detention Vault

Watershed Scale Anchor Project

County-APS Partnership

July 28, 2021



ARLINGTON
VIRGINIA

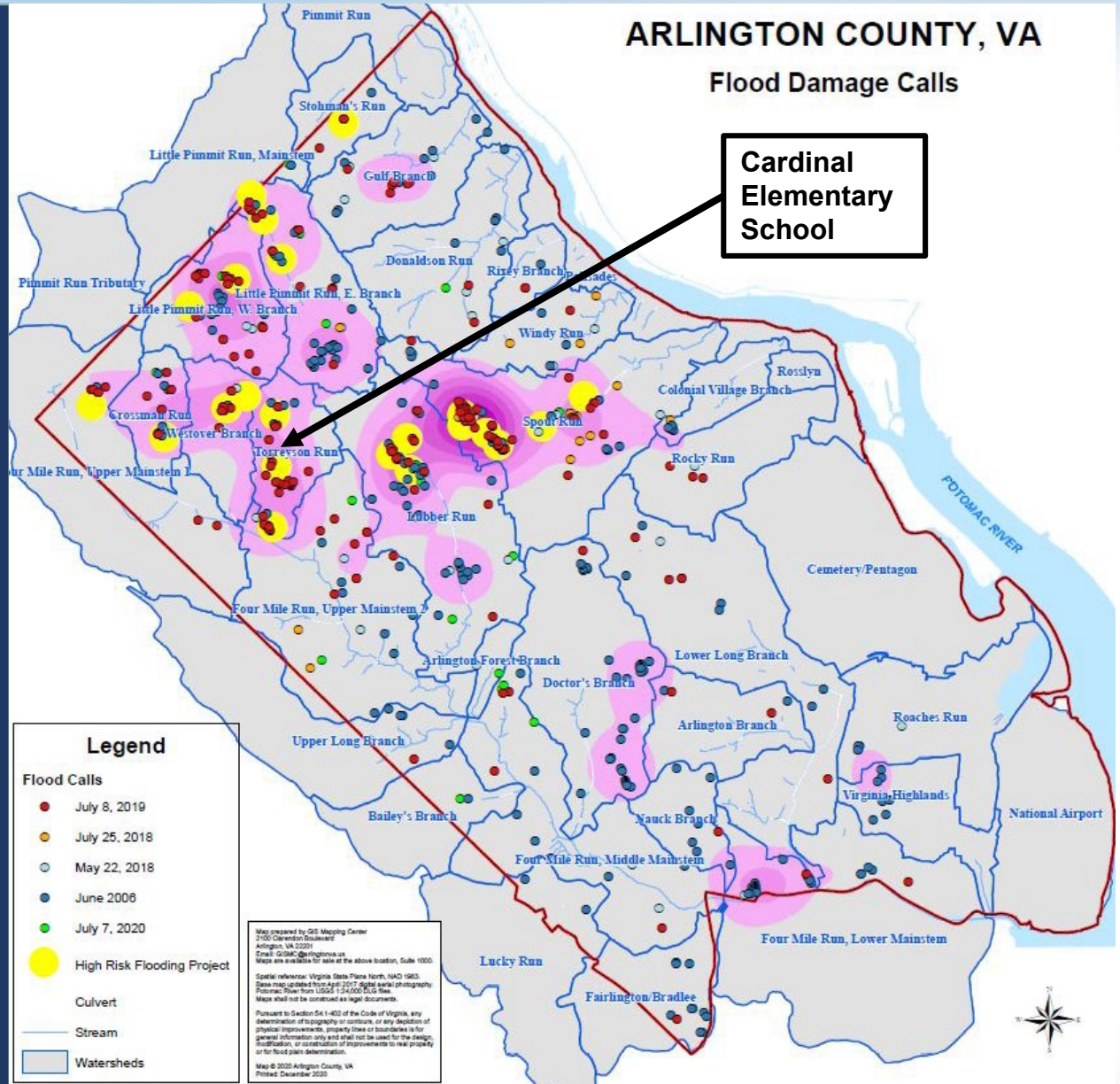
Agenda

- Background
- Engagement to date
- Phase 1 Status
- Phase 2 Design
- Draft maintenance of traffic (MOT) plan
- Transportation Study
- Schedule and next steps

A Call for Action

Map demonstrates flood calls from the following storms in relation to high risk flooding projects identified in Stormwater Master Plan:

- July 7, 2020
- July 8, 2019
- July 25, 2018
- May 22, 2018
- June 2006

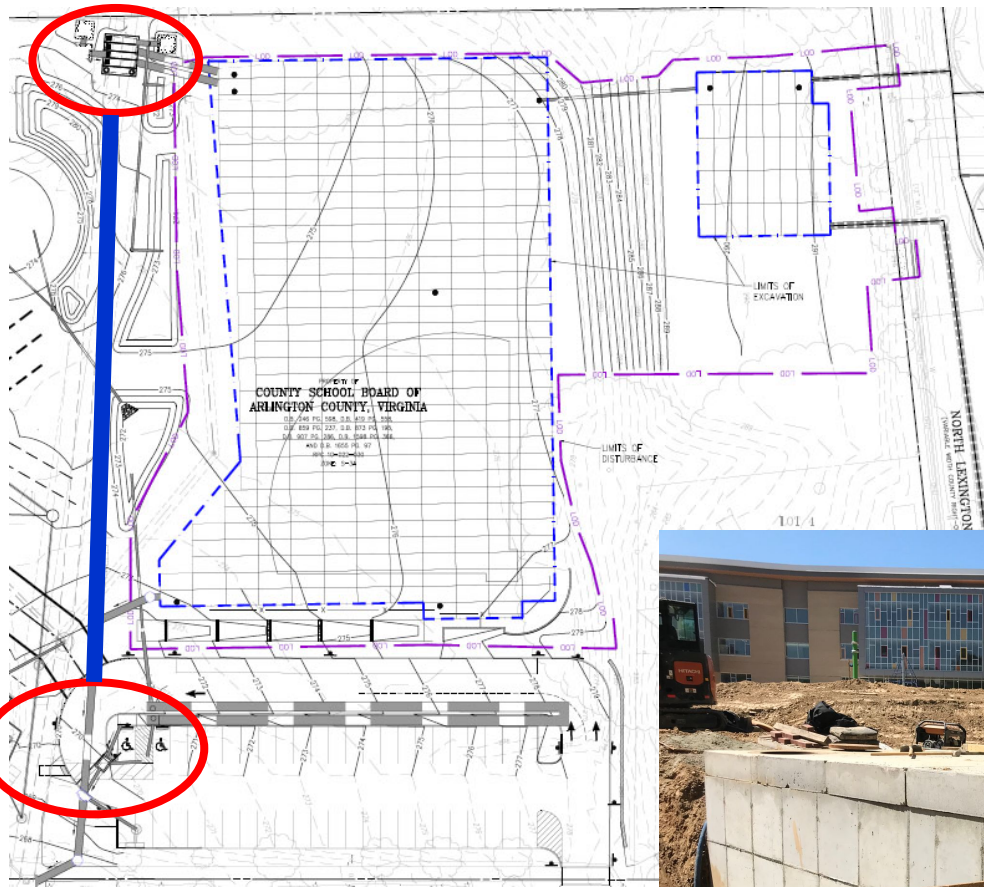


Cardinal School Site



Key Engagement Meetings to Date

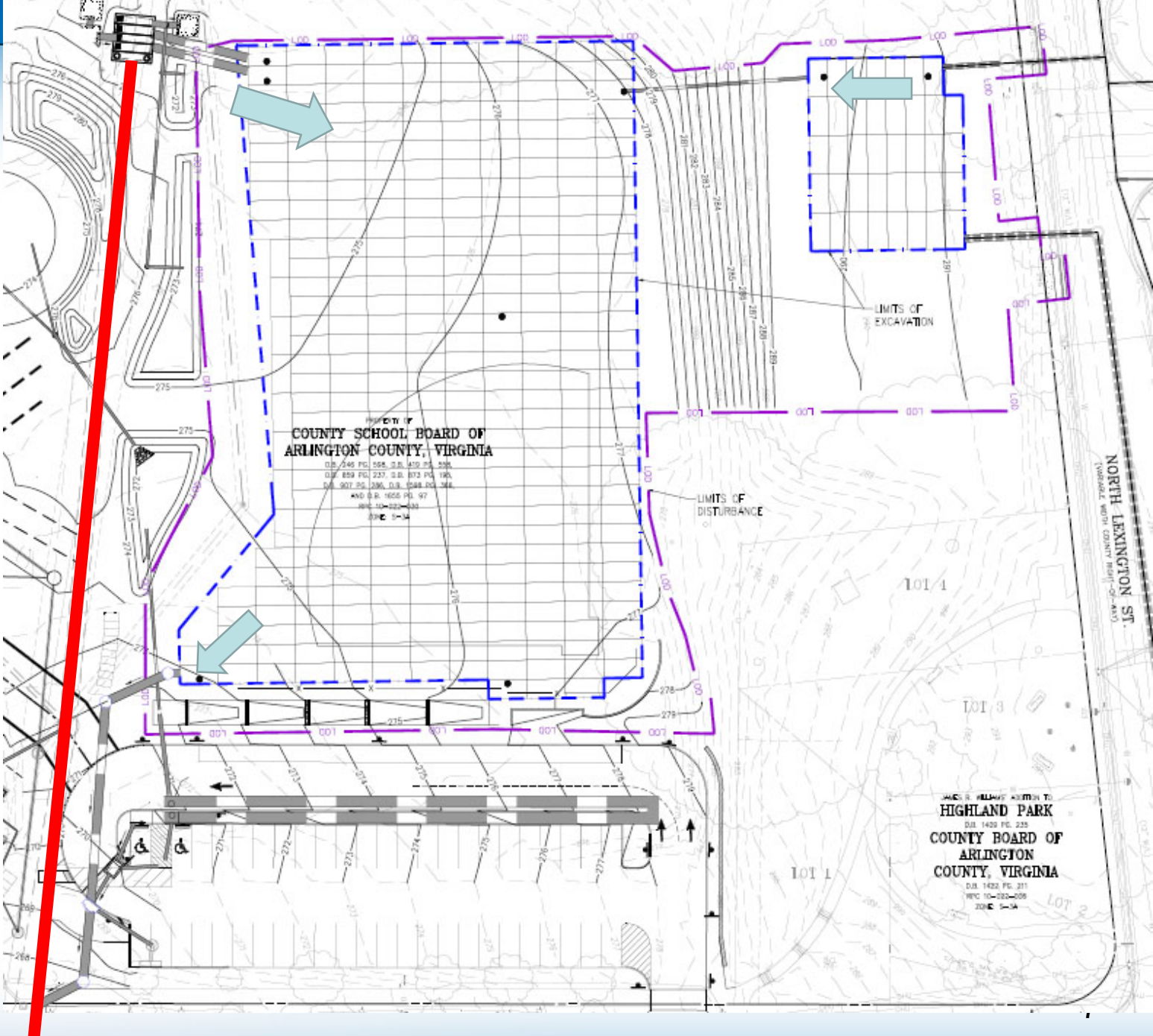
- County/School Board – December, 2020
- Four CAs in January/February with 30% plans
- Civic Federation – February 16
- Sports Commission – February 25
- Use Permit Hearing – March 2
- County/School Board – March, 2021
- C2E2 – May 17
- 65% Design Public meeting – May 26
- Final Design Public meeting – July 28
- Pre-construction meeting – September 22 (tentative)
- Public engagement/outreach will continue through project completion



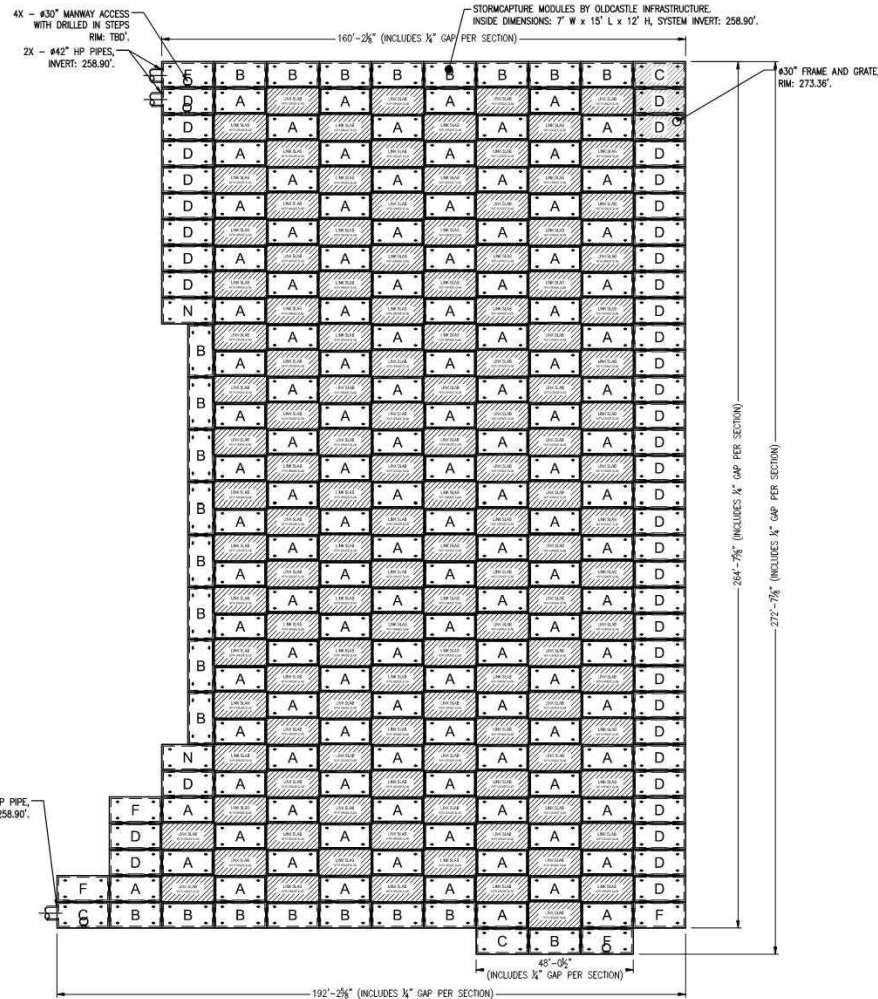
Phase 1 is complete

Phase 2 Design

2 Vault Design reduces excavation near N Lexington St.



Phase 2 Design (Main Vault 1)



MODULE NOTES		
TYPE	QUANTITY	HEIGHT
A	129	12'
B	24	12'
C	3	12'
D	42	12'
F	5	12'
N	2	12'
LINK SLABS	127	
TOTAL	332	
VOLUME	474,462	CUBIC FEET

LEGEND:
 INDICATES 8" BOTTOM SLAB MODULE FOR DEEP COVER

DESIGN NOTES

- LIVE LOADING CRITERIA:
 - AASHTO HS-20-44 DESIGN TRUCK (WITH IMPACT AT 6" MINIMUM COVER)
 - LATERAL LIVE LOAD SURCHARGE: 80 PSF (TO 8'-0" DEPTH)
 - NO LATERAL SURCHARGE(S) FROM ANY ADJACENT BUILDINGS, WALLS, FOUNDATIONS, OR ANY ADDITIONAL SITE ELEMENTS.
- SOIL LOADING CRITERIA:
 - SOIL COVER DEPTH: 1.85' MIN. - 6.52' MAX.
 - SOIL UNIT WEIGHT: 120 PCF
 - ASSUMED WATER TABLE ELEVATION: 6" ABOVE THE BOTTOM OF PRECAST
 - REQUIRED ALLOWABLE BEARING PRESSURE: 3,000 PSF
 - EQUIVALENT LATERAL FLUID PRESSURE, ACTIVE: 45 PCF (DRAINED)
 - EQUIVALENT LATERAL FLUID PRESSURE, AT-REST: 60 PCF (DRAINED)
 - EQUIVALENT LATERAL FLUID PRESSURE, PASSIVE: 150 PCF (DRAINED)
 - COEFFICIENT OF FRICTION: 0.40
 - SEISMIC LATERAL EARTH PRESSURES: NOT APPLICABLE
- STORMCAPTURE MODULE TYPE: DETENTION (WATERTIGHT).
- CONCRETE (NORMALWEIGHT):
 - MIN. 28-DAY COMPRESSIVE STRENGTH: 6,000/ 7000 PSI
 - CEMENT: ASTM C150
- STEEL REINFORCEMENT: ASTM A615 / A706 (GRADE 60), ASTM A1064 (GRADE 80)
- REFERENCE STANDARDS: ASTM C913 & C890, ACI 318-14
- UNLESS NOTED AS "ASSUMED", ALL GEOTECHNICAL CRITERIA IS BASED ON THE PARAMETERS NOTED IN THE GEOTECHNICAL REPORT BY GeoPotential Consulting LLC, DATED 09/20/20.

2	LDH	5/14/21
1	LDH	3/17/21
REV	BY	DATE



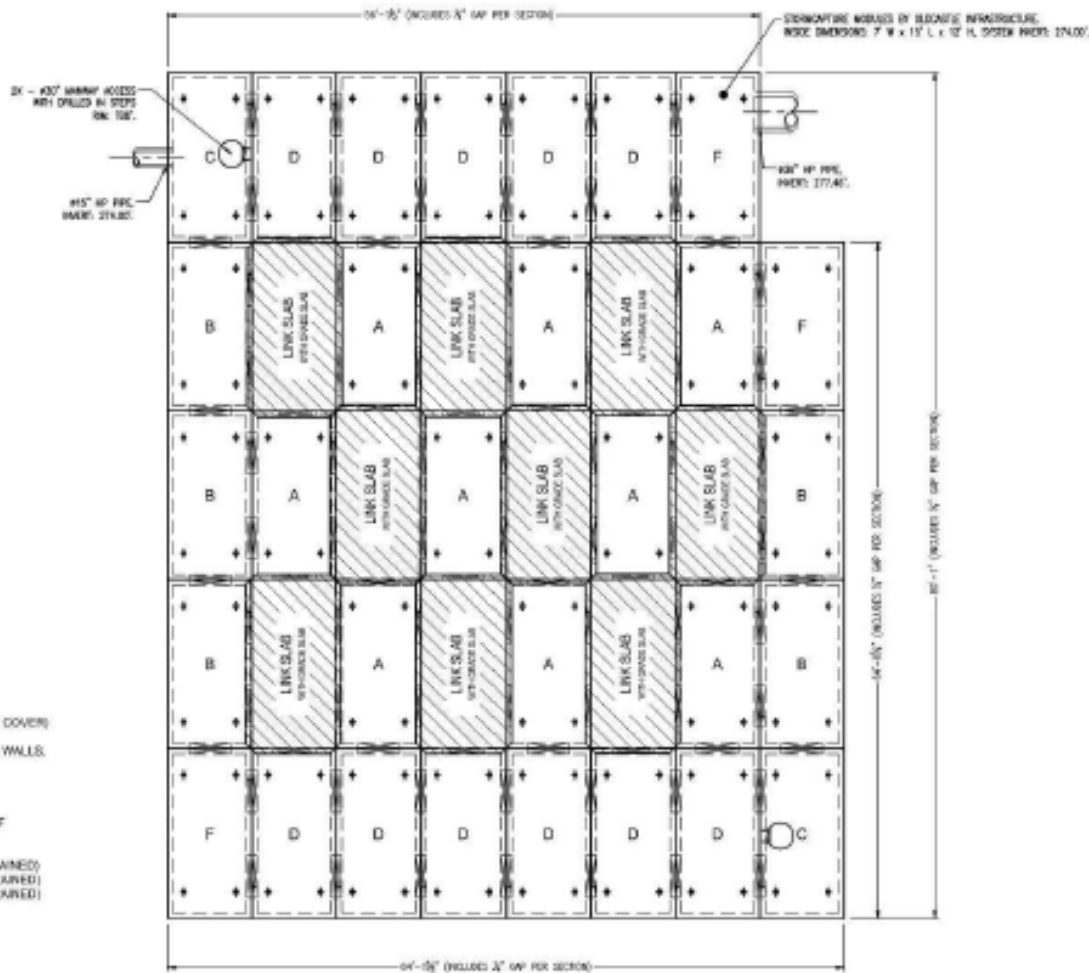
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STORMCAPTURE®		SYSTEM ID	PLAN
DETENTION SYSTEM		Vault 1	
CUSTOMER Bowman Consulting			
JOB NAME Walter Reed Elementary School - Arlington, VA			
DATE 02/04/21	DRAWN CRA	ENGINEER LDH	CHECKED LDH
SCDD-2129-2-SC1_DT		SHEET 1 OF 3	



Phase 2 Design (Small Vault 2)

MODULE NOTES		
TYPE	QUANTITY	HEIGHT
A	8	12"
B	8	12"
C	2	12"
D	12	12"
F	2	12"
LINK SLAB	1	12"
EQCL	10	
VOLUME	SLAB	SUBTOTAL



- DESIGN NOTES**
- LIVE LOADING CRITERIA:**
 - AASHTO HS-20-44 DESIGN TRUCK (WITH IMPACT AT 8' MINIMUM COVER)
 - LATERAL LIVE LOAD SURCHARGE: 66 PSF (TO 8'-0" DEPTH)
 - NO LATERAL SURCHARGE(S) FROM ANY ADJACENT BUILDINGS, WALLS, FOUNDATIONS, OR ANY ADDITIONAL SITE ELEMENTS.
 - SOIL LOADING CRITERIA:**
 - SOIL COVER DEPTH: 2.75' MIN. - 4.42' MAX.
 - SOIL UNIT WEIGHT: 126 PCF
 - ASSUMED WATER TABLE ELEVATION: 8' ABOVE THE BOTTOM OF PRECAST
 - REQUIRED ALLOWABLE BEARING PRESSURE: 3,000 PSF
 - EQUIVALENT LATERAL FLUID PRESSURE, ACTIVE: 45 PCF (DRAINED)
 - EQUIVALENT LATERAL FLUID PRESSURE, AT REST: 80 PCF (DRAINED)
 - EQUIVALENT LATERAL FLUID PRESSURE, PASSIVE: 150 PCF (DRAINED)
 - COEFFICIENT OF FRICTION: 0.40
 - SEISMIC LATERAL EARTH PRESSURES: NOT APPLICABLE
 - STORMCAPTURE MODULE TYPE: DETENTION (WATERTIGHT).**
 - CONCRETE (NORMALWEIGHT):**
 - MIN. 28 DAY COMPRESSIVE STRENGTH: 8,000 PSI
 - CEMENT: ASTM C150
 - STEEL REINFORCEMENT: ASTM A615 (A706) (GRADE 60), ASTM A1064 (GRADE 80).**
 - REFERENCE STANDARDS: ASTM C913 & C880, ACI 318-14**
 - UNLESS NOTED AS "AS-BUILT", ALL GEOTECHNICAL CRITERIA IS BASED ON THE PARAMETERS NOTED IN THE GEOTECHNICAL REPORT BY Geotechnical Consulting LLC, DATED 08/30/20.**

PLAN VIEW
SCALE: 3/32" = 1'

OR APPROVED EQUAL

1	120	28' x 32'
80	80	120' x 8'

Oldcastle Infrastructure
A WATCO COMPANY

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PROJECT: STORMCAPTURE & DETENTION SYSTEM
DATE: 10/20/2020
DRAWING: Val.B.2
SCALE: 3/32" = 1'

DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 10/20/2020

PROJECT LOCATION: Water Reed Elementary School - Arlington, VA

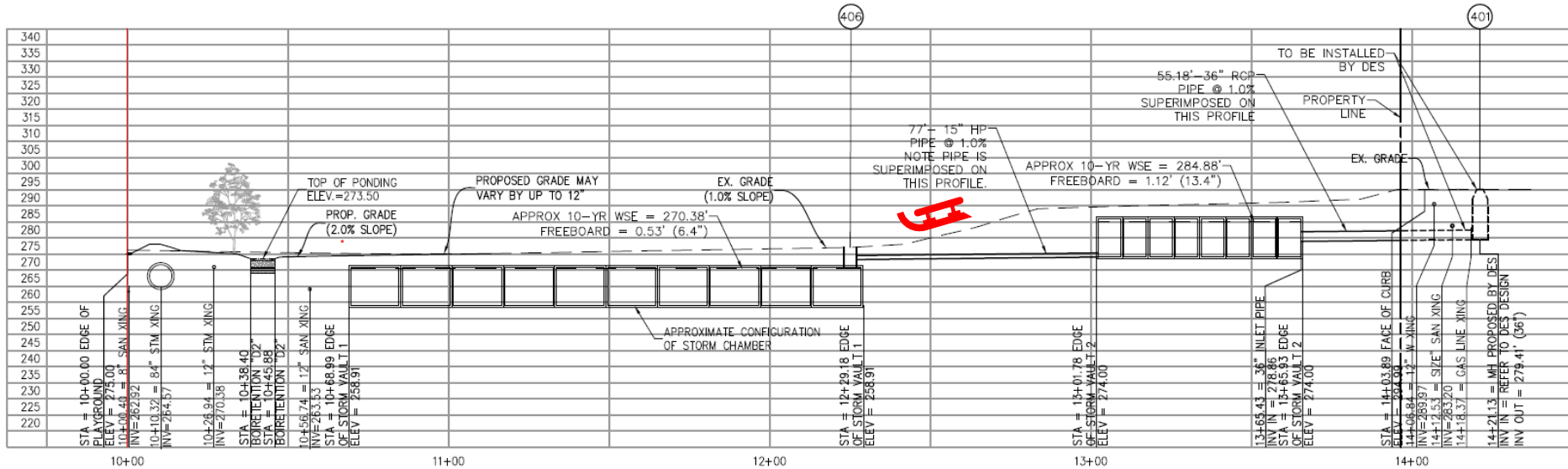
DATE: 10/20/2020
DRAWING: 104
SCALE: 3/32" = 1'
SHEET: 1 OF 2

PROJECT NUMBER: SCDD-21821-SCL_DT



Profile – side view

Showing the Two Vaults
Sledding Hill Remains



SECTION B-B PROFILE VIEW

Phase 2

Details of one option for the modules (out of three that were considered)

INTRODUCTION

StormCapture (shown in **Figure 1**) is a total stormwater management system. The highly-configurable module has many solutions for detention, retention, infiltration, treatment and harvesting. Multiple modules can be arranged into endless formations to meet the needs of even the most challenging sites. The rectangular design facilitates rapid and easy installation, plus stress-free maintenance. The precast concrete provides long-term reliability and low lifecycle costs.

The engineer of record is responsible for reviewing and approving the system design, storage volume, required depth of cover, vehicular loading, water table elevation, backfill material and soil bearing capacity. Any variations found during construction to those stated on the plans must be reported to the engineer and Oldcastle Infrastructure.

This manual is not intended to be all-inclusive and is a reference guide only.

FIGURE 1



FIGURE 2

StormCapture System During Installation Process



Time lapse video of detention vault construction

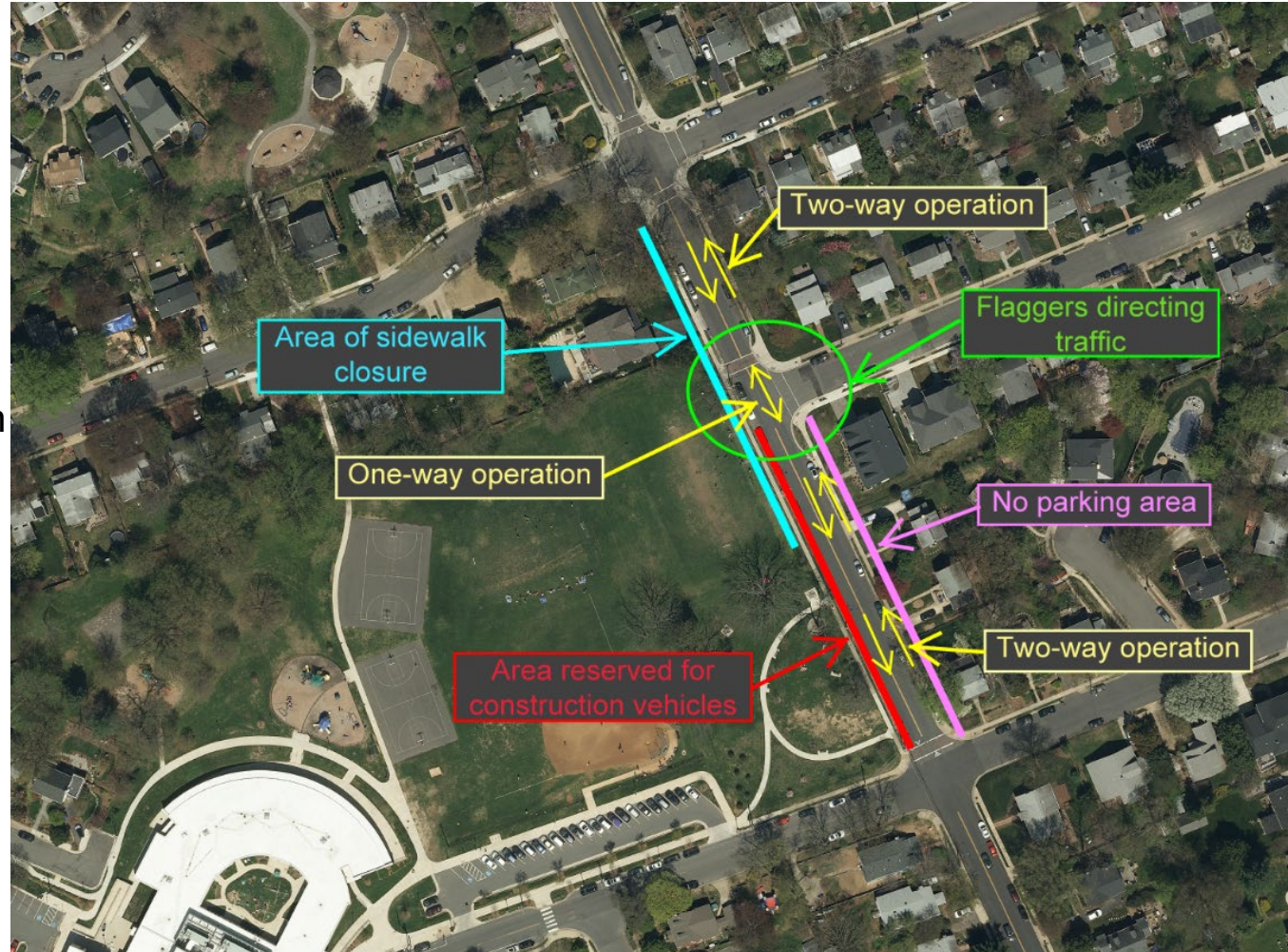
- <https://www.youtube.com/watch?v=O5tobzjoDdA>

Draft MOT Plan

During Working Hours

Highlights:

- Left side of Lexington below 18th road will be reserved for construction
- 2-way traffic on Lexington (except by 18th road)
- Flaggers on Lexington near 18th Road
- No parking on Lexington between 18th St and 18th Road
- Upper part of Lexington sidewalk closed (part by park open)
- ROW hours are 9-4



PARKING OF CONSTRUCTION AND STAFF VEHICLES IS PROHIBITED WITHIN THE PROPOSED EMERGENCY VEHICLE ZONE.

Concerns about lane closure in MOT

- We have heard concerns from Lexington St. residents
- We will schedule on-site meeting with them to discuss
- Contractor will not need lane closure for full year (likely ~ 8 months)
- Maintaining grid network is important for public safety on all surrounding roads

which afford access to within fifty (50) feet of all booths, tents, rides, and any other equipment, buildings, or structures used as part of, or in conjunction with, the special event.

Draft MOT Plan

During Non-Working Hours

Highlights:

- 2-way traffic along entire length of Lexington
- Left side of Lexington below 18th road will be reserved for construction
- Upper part of Lexington sidewalk closed (part by park open)

PARKING OF CONSTRUCTION AND STAFF VEHICLES IS PROHIBITED WITHIN THE PROPOSED EMERGENCY VEHICLE ZONE.

SAFETY FENCE TO BE MOVED BACK, AFTER CONSTRUCTION HOURS, TO ALLOW FOR 2-WAY TRAFFIC (10' MIN LANE WIDTH) AT THE INTERSECTION OF NORTH LEXINGTON STREET AND 18TH ROAD NORTH. FENCE TO BE RESET, AS SHOWN ON SHEET C-14.00, AT THE BEGINNING OF THE DAY AND INTERSECTION TRAFFIC TO BE GUIDED BY FLAGGERS AT ALL TIMES DURING CONSTRUCTION HOURS.



Site Access Plan

ARLINGTON COUNTY RIGHT-OF-WAY WORK HOURS:

- MON –FRI: 9:00 AM TO 4:00 PM
- SAT–SUN AND HOLIDAYS: 10:00 AM TO 6:00 PM

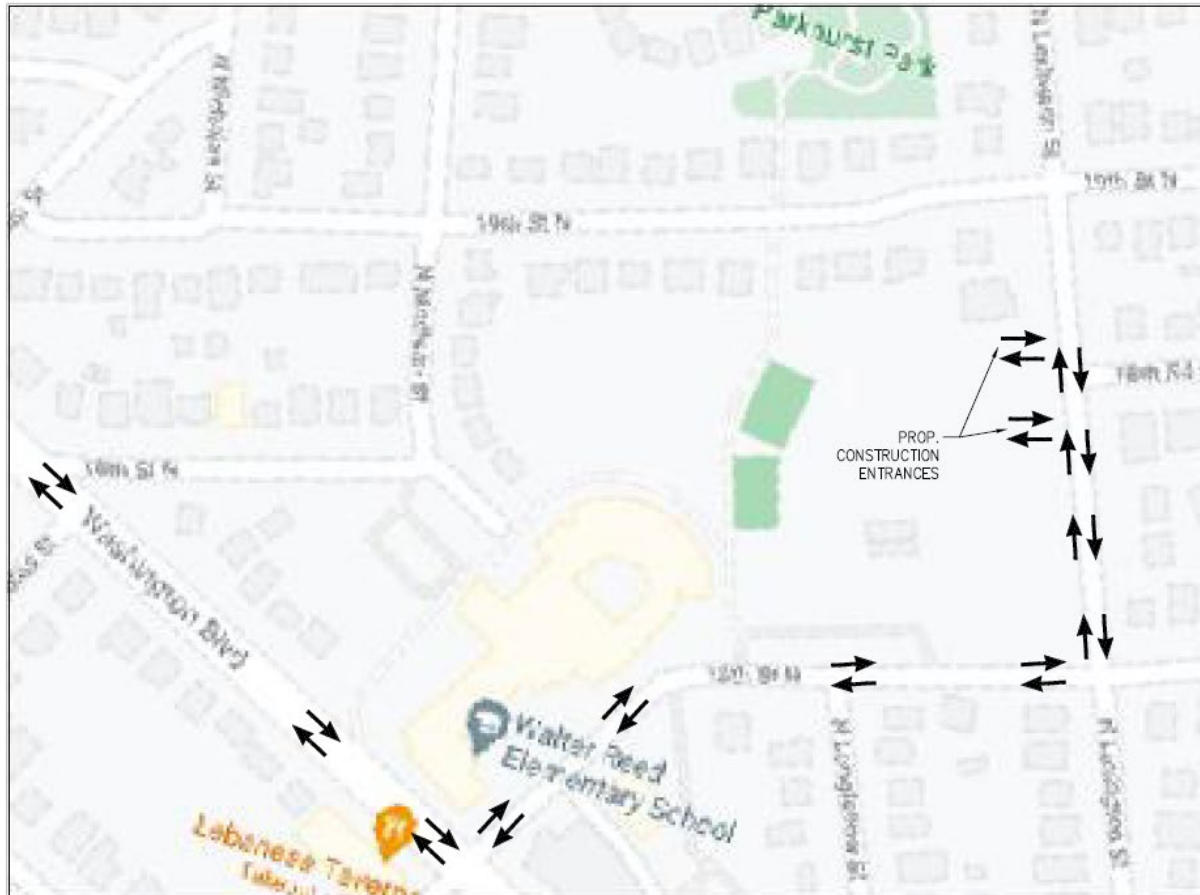
WORK OUTSIDE THESE HOURS WILL REQUIRE SPECIAL PERMISSION BY THE ARLINGTON COUNTY ZONING ADMINISTRATOR.

PROJECT DURATION: APPROX. 10 TO 12 MONTHS

NORTH LEXINGTON STREET: APPROX. 7 TO 10 MONTHS

SITE ACCESS PLAN FOR CONSTRUCTION VEHICLES

N.T.S



Truck route

HAUL ROUTE PLAN

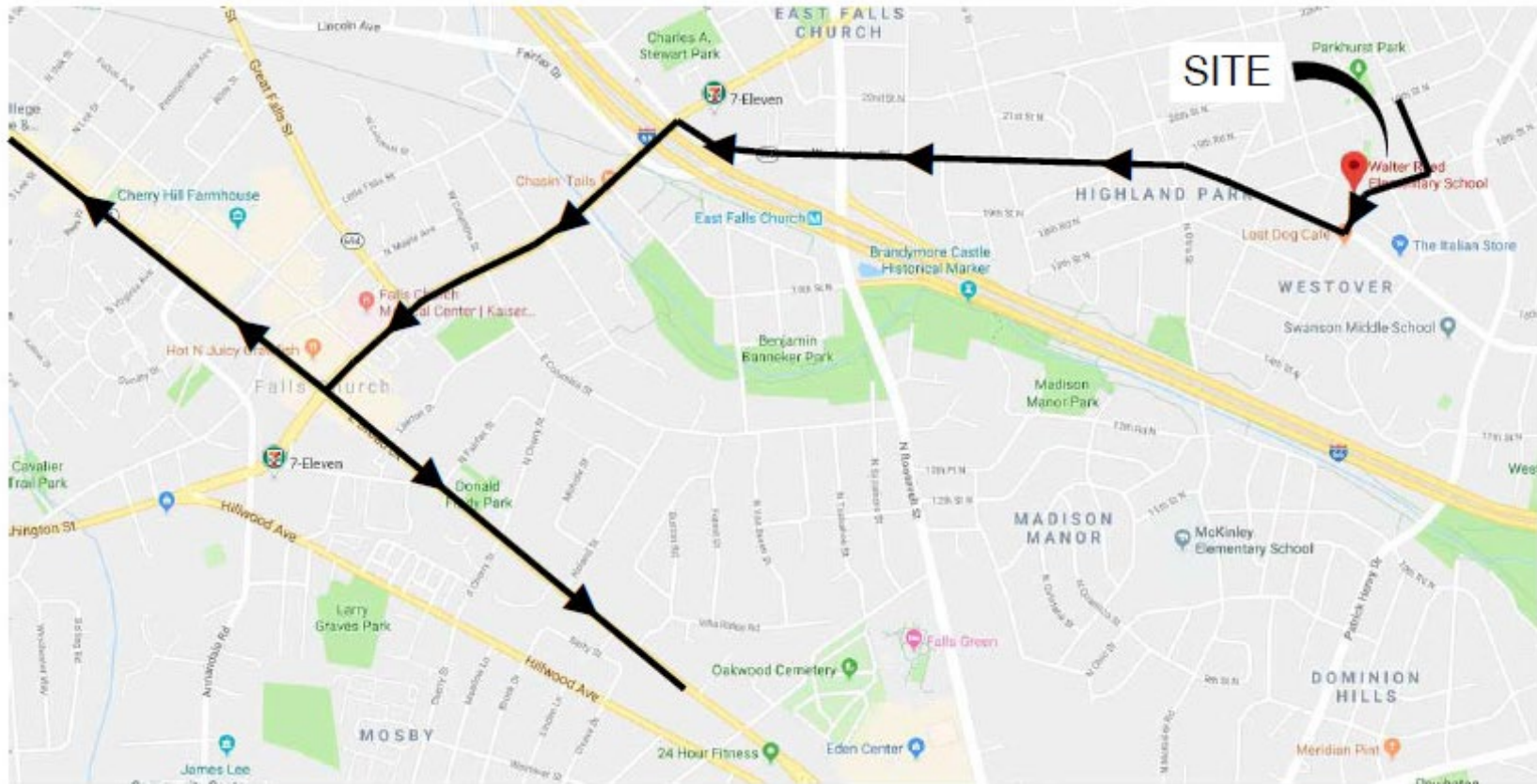
N.T.S

ARLINGTON COUNTY RIGHT-OF-WAY WORK HOURS:

- MON –FRI: 9:00 AM TO 4:00 PM
- SAT–SUN AND HOLIDAYS: 10:00 AM TO 6:00 PM

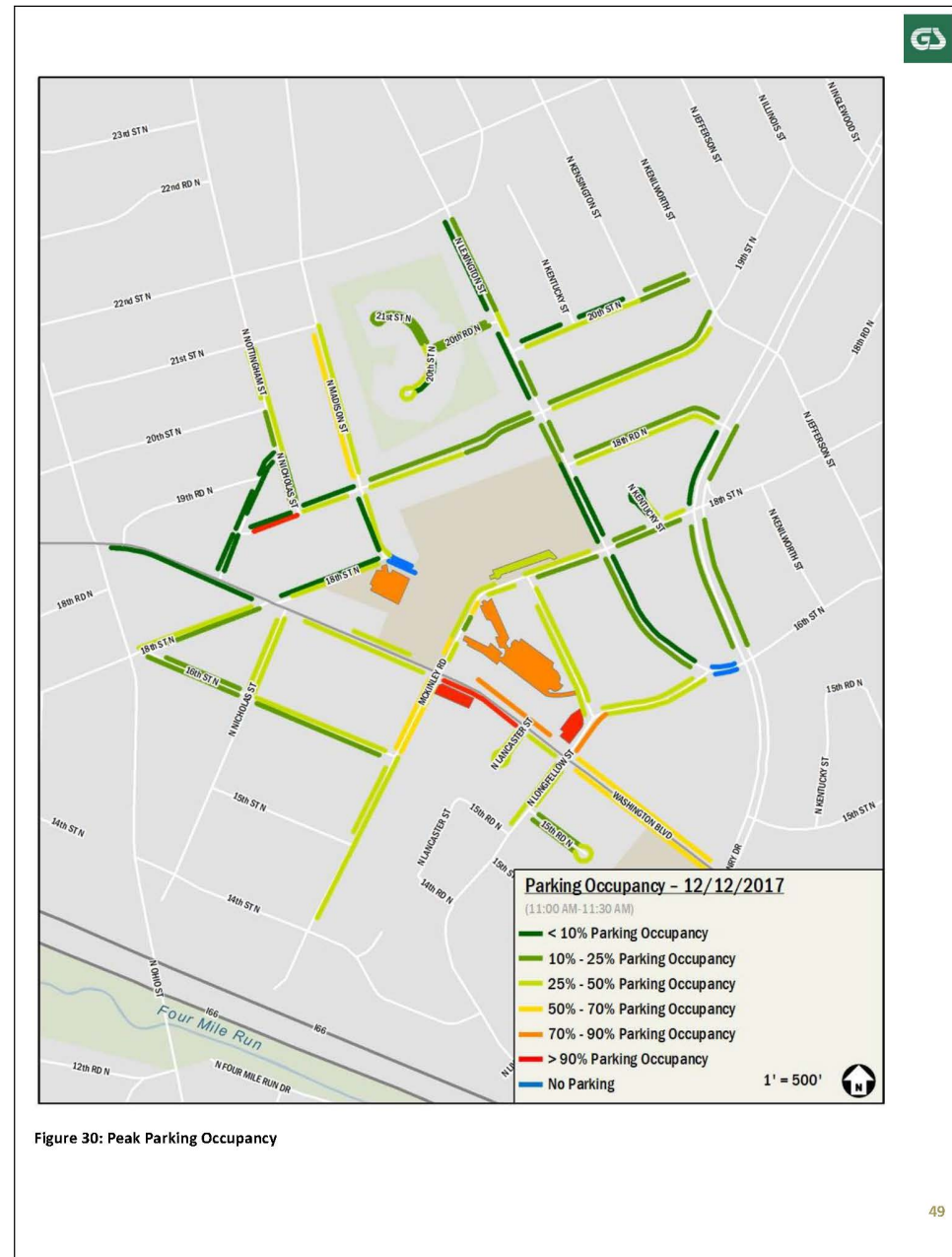
WORK OUTSIDE THESE HOURS WILL REQUIRE SPECIAL PERMISSION BY THE ARLINGTON COUNTY ZONING ADMINISTRATOR.

PROJECT DURATION: APPROX. 10 TO 12 MONTHS
NORTH LEXINGTON STREET: APPROX. 7 TO 10 MONTHS



Transportation Study

- Good capacity on the road for driving and parking around site (60-70%)
- Pickup and dropoff on dedicated facility on school site
- Buses will be on the street
- Working on circulation/walking exhibits



Starting Phase 2

Even though it may look quiet at the site, there will be plenty of work being completed!

- Pipe connection to Vault 2 from North Lexington St.
- Pre-Construction Community Meeting in September
- Administrative tasks for beginning of construction:
 - Finalize sub-contracts
 - Submittal Review
 - Shop Drawings Review
 - Adjustment to New School Traffic Patterns for Student Drop-off and Pick-Up
 - New Pedestrian Access Routes

Schedule and Next Steps

- LOD has been set up around the construction area
- Cost estimating
- Present to County/School Board in September (no August meetings)
- Pre-construction public meeting (September 22)
- Major construction start October
- May work on nearby storm infrastructure under other contracts this summer

Other Issues

- Noise – Phase 2 will have on-site power, so no need for generator for dewatering. Noise mitigation for pumps.
- Coordinating with Police for additional patrols to avoid early AM noise issues.
- Dust – project will use water on site and street sweeping on Lexington to control dust.
- Reporting issues at construction site – go through APS project manager.
- Trees – we are working with arborist to protect and save large trees near the site, but with any construction project there is some risk

Questions?

Project Team

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Project Manager

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Project Websites

<https://projects.arlingtonva.us/projects/reed-school-stormwater-vault/>

<https://www.apsva.us/design-and-construction/cardinal-elementary/>