Public Partnerships, Permits, and a Parking Lot:

Underground Detention in Glenview

James Tigue, PE, CFM – Village of Glenview
Matt Moffitt, PE, CFM, CPESC – Baxter & Woodman

BAXTER & WOODMAN Consulting Engineers

Village of Glenview

- Three primary watersheds
- 48 sub-watersheds
- 60% of Village built to old standards
  - No stormwater detention
  - No overland flow paths
  - Limited conveyance
- Clayey soils
- Flat terrain

History of Flooding

2008 Flooding Event

Glenview: Late 1800's

1987 flooding in the Tall Trees area of Glenview.

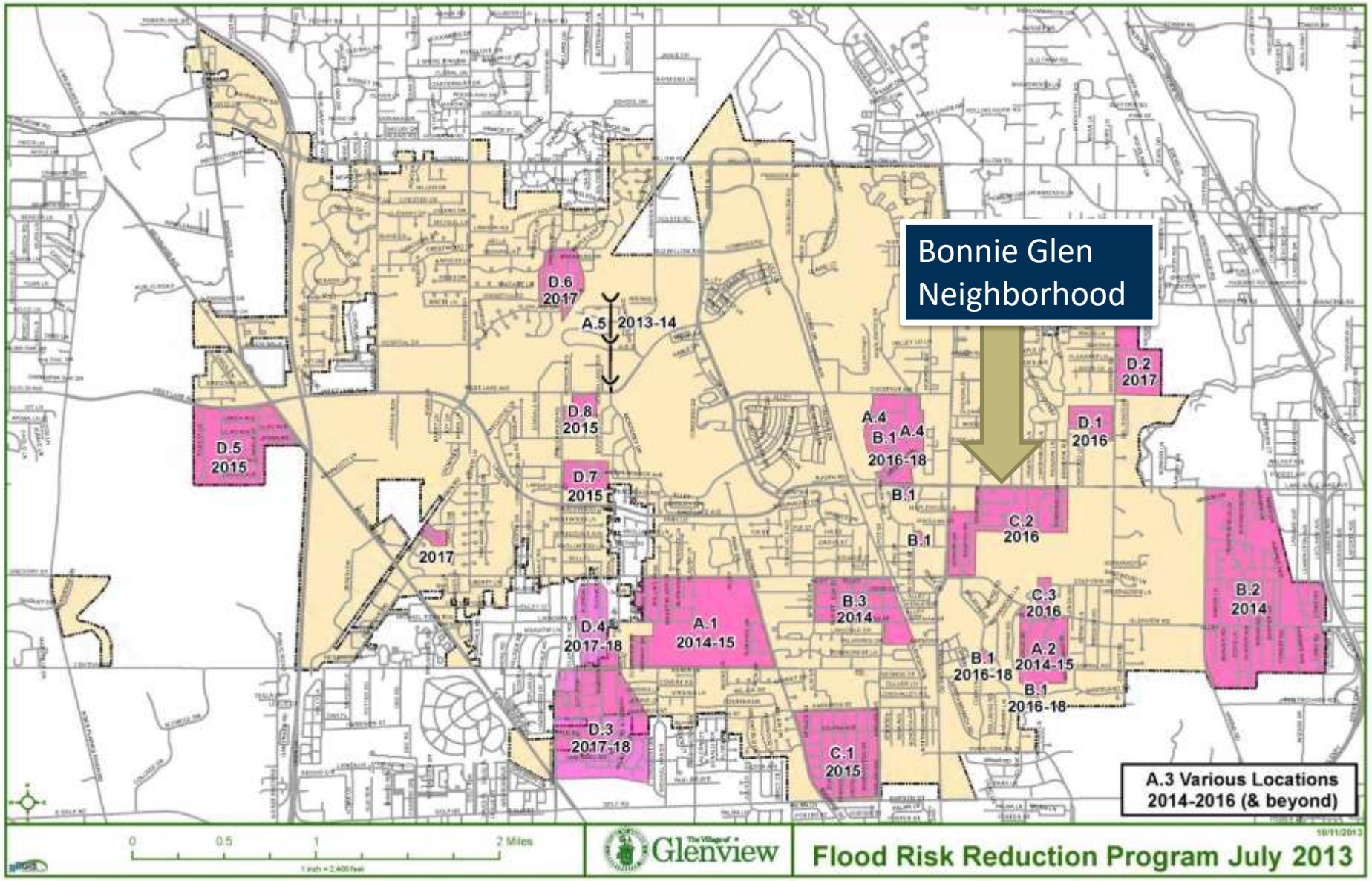
Flooding in 1987. View on right is of the back nine holes of the Valley Lo golf course.

Stormwater Task Force Creation

- 16 area residents
- 14 public meetings
- Very public and active engagement

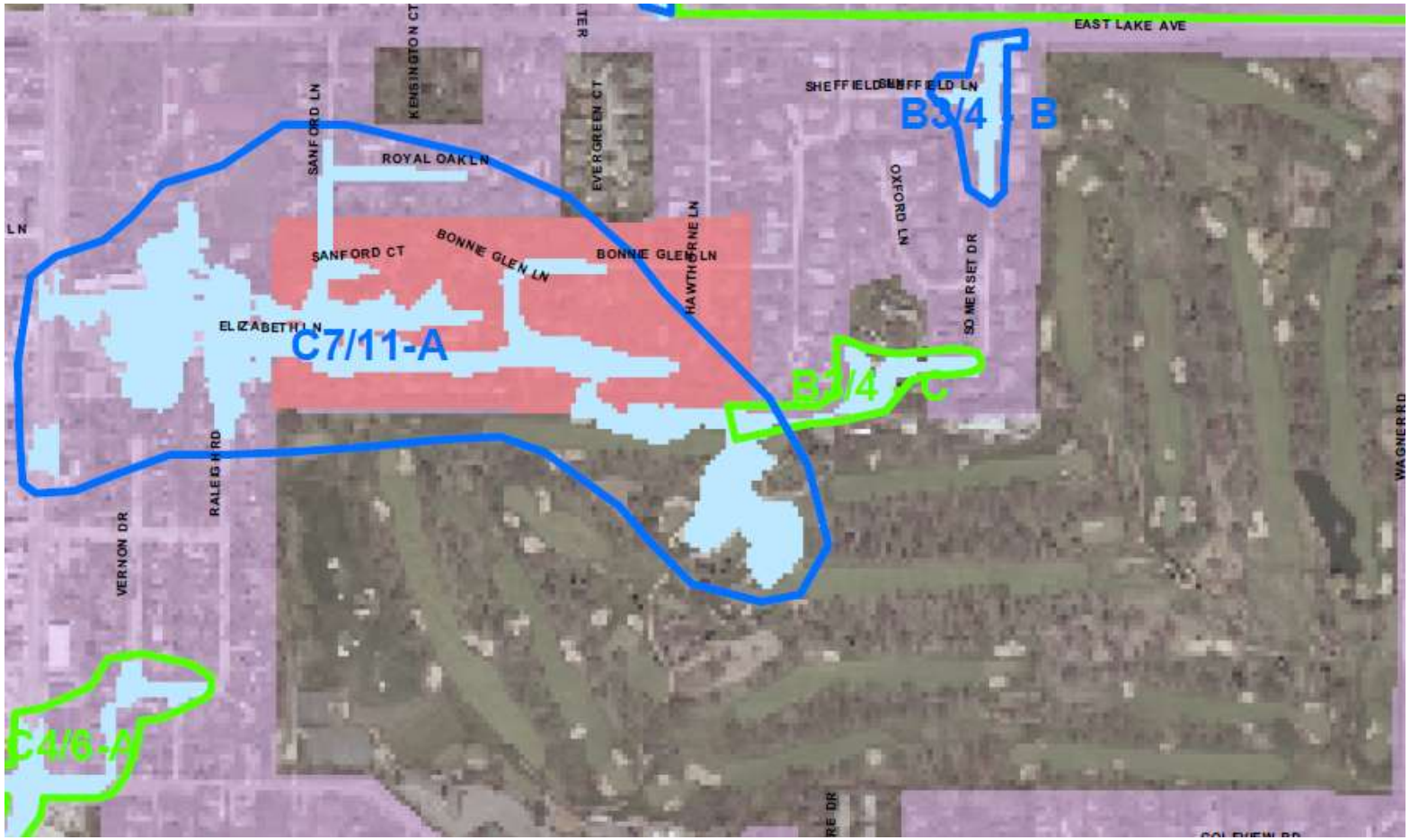
Created the Village's Flood Risk Reduction Program

- Approved August 2010
- Identified $125M of local infrastructure projects
- Updated in 2013


Bonnie Glen Neighborhood
D.6 2017
A.5 2013-14
D.8 2015
D.5 2015
D.7 2015
2017
D.4 2017-18
A.1 2014-15
D.3 2017-18
C.1 2015
A.4 B.1 A.4 2016-18
B.1
B.1
C.2 2016
D.2 2017
D.1 2016
B.3 2014
C.3 2016
B.2 2014
A.2 2014-15
B.1 2016-18
B.1 2016-18
A.3 Various Locations 2014-2016 (& beyond)
0 0.5 1 2 Miles
1 inch = 2,400 feet
The Village of Glenview
10/11/2013
Flood Risk Reduction Program July 2013

Bonnie Glen Subdivision

Bonnie Glen Subdivision



Existing Conditions

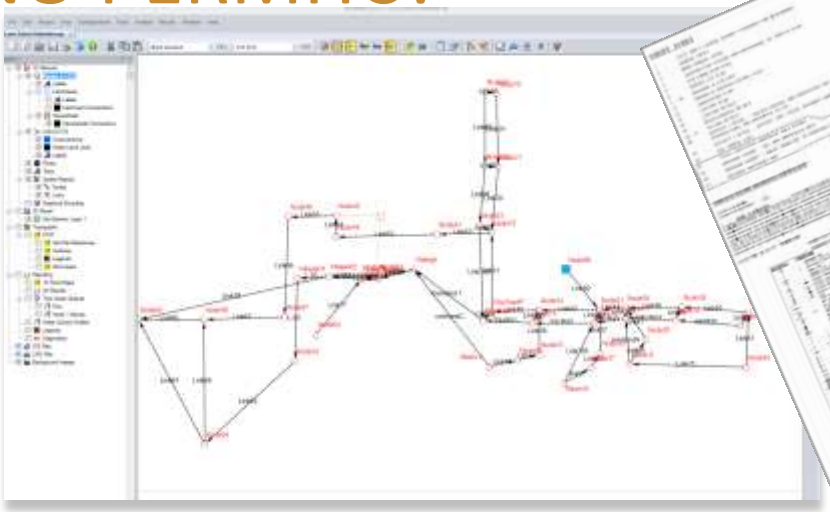
Proposed Conditions

Getting Ready for the Project

- ✓ Drainage Study
- ✓ Conceptual Project
- ✓ School Board buy in
- ✓ Board Approval
- ✓ Funding Allocated
- ✓ Design Team given go ahead in late 2016 for construction summer 2017

STANDARD PROJECT AT START

- Detailed XPSWMM Model
- Preliminary Design of Sewer and Basin
- Utility/Private Property Coordination
- Overland Flow Routes
- NO PERMITS!

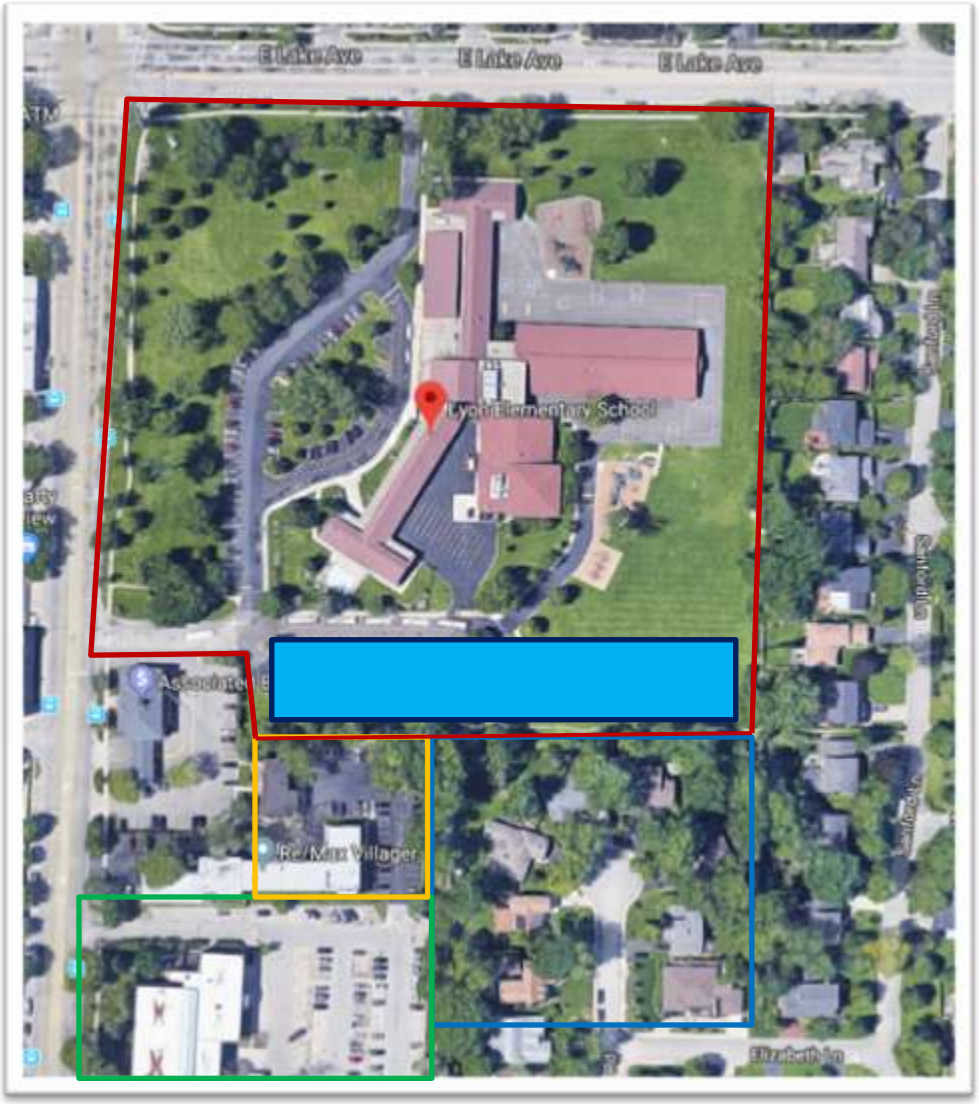


Detention Analysis

Flood Conditions and Alternatives	Lyons School Detention - Flood Elevations for Various Flood Events								
	2 Year			5 Year			10 Year		
	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall
Street/Rim Elevation	634.6	633.0	633.4	634.6	633.0	633.4	634.6	633.0	633.4
Existing Conditions	634.9	634.7	631.9	635.3	635.3	634.2	635.5	635.5	634.8
Lyons School Detention - 5 ac-ft	634.9	631.9	630.1	635.0	632.6	630.9	635.1	633.9	632.1
Change from Existing to Proposed	0	2.8	1.8	0.3	2.7	3.3	0.4	1.6	2.7
Lyons School Detention - 4 ac-ft	634.9	631.9	630.2	635.0	632.7	631.2	635.1	634.0	632.7
Change from Existing to Proposed	0	2.8	1.7	0.3	2.6	3	0.4	1.5	2.1
Lyons School Detention - 3 ac-ft	634.9	631.9	630.3	635.0	632.7	631.8	635.1	634.5	633.1
Change from Existing to Proposed	0	2.8	1.6	0.3	2.6	2.4	0.4	1.0	1.7

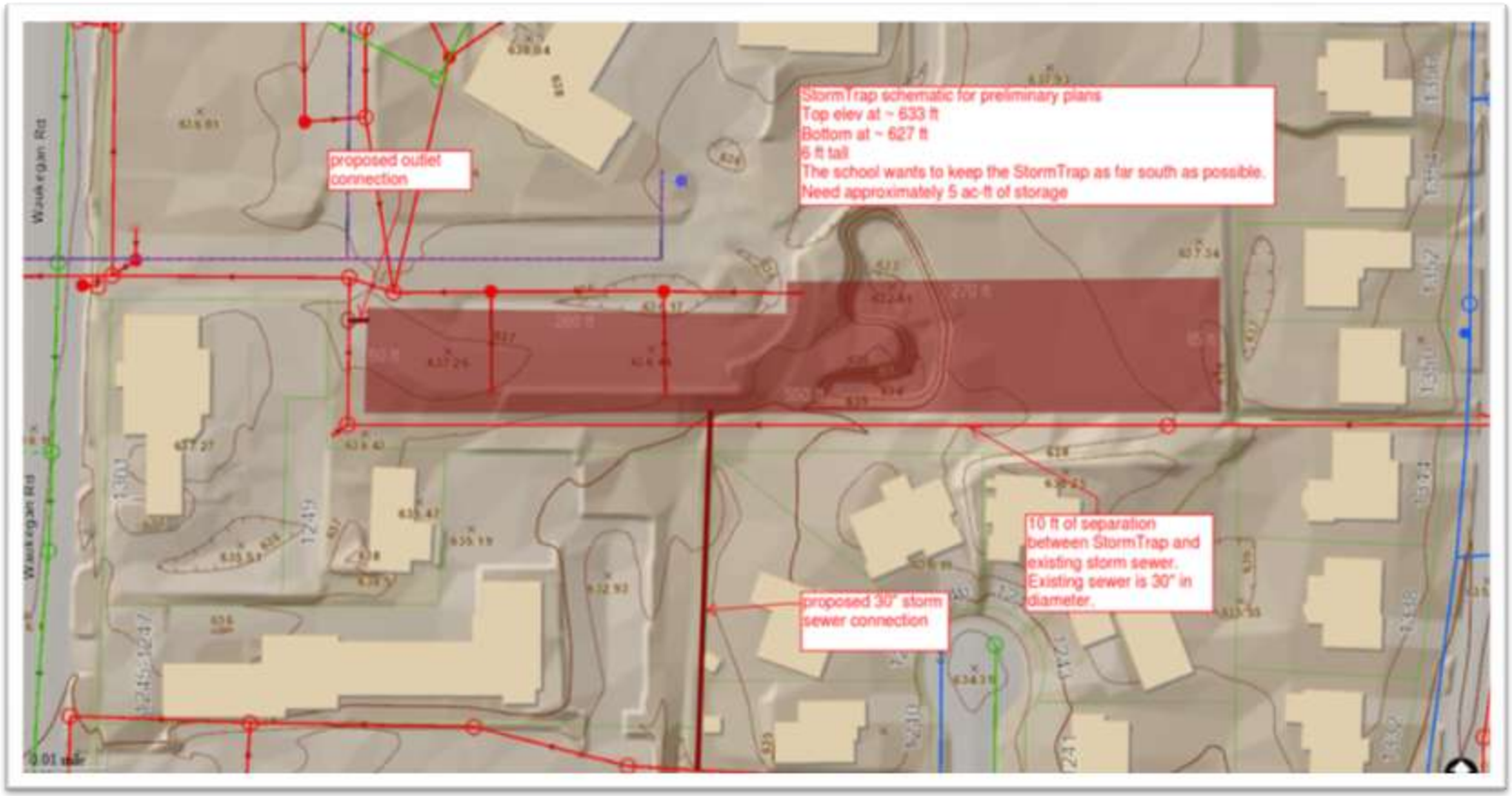
Flood Conditions and Alternatives	Lyons School Detention - Flood Elevations for Various Flood Events								
	25 Year			50 Year			100 Year		
	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall	Elizabeth & Sanford Ln	Raleigh Cul de Sac	Village Hall
Street/Rim Elevation	634.6	633.0	633.4	634.6	633.0	633.4	634.6	633.0	633.4
Existing Conditions	635.8	635.8	635.0	635.9	635.9	635.1	636.1	636.1	635.2
Lyons School Detention - 5 ac-ft	635.2	635.2	634.3	635.6	635.6	634.8	635.8	635.8	635.0
Change from Existing to Proposed	0.6	0.6	0.7	0.3	0.3	0.3	0.3	0.3	0.2
Lyons School Detention - 4 ac-ft	635.3	635.3	634.6	635.6	635.6	634.9	635.9	635.9	635.1
Change from Existing to Proposed	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1
Lyons School Detention - 3 ac-ft	635.4	635.4	634.7	635.7	635.7	634.9	635.9	635.9	635.1
Change from Existing to Proposed	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1

Stakeholder Negotiations



- Raleigh Road Residents
- Old Village Hall Site
- Condo property
- Lyon Elementary School

Stakeholder Negotiations



School Negotiations

Fix Front Ponding

Fix Sidewalk Ponding

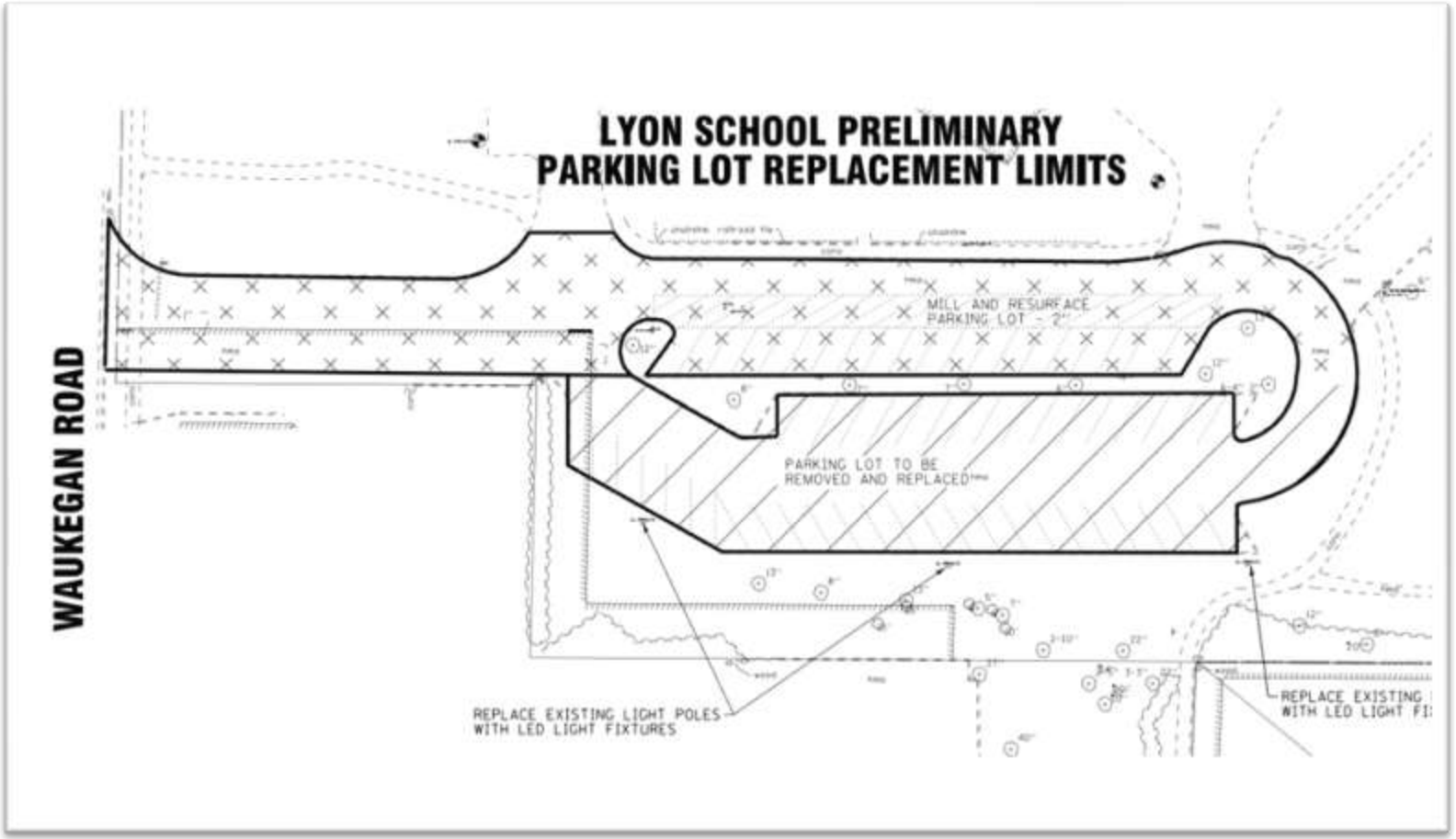
Brand New Parking Lots

Parking Lot Reconstruction

While we're at it, maybe just a few changes….

- LED Lights
- Remove Islands
- Improve Bus Lanes
- Add Pick up/ Drop off Lanes
- Include Green Infrastructure
- Increase Stall Count
- Option for Overflow Parking

Original Parking Lot Plan

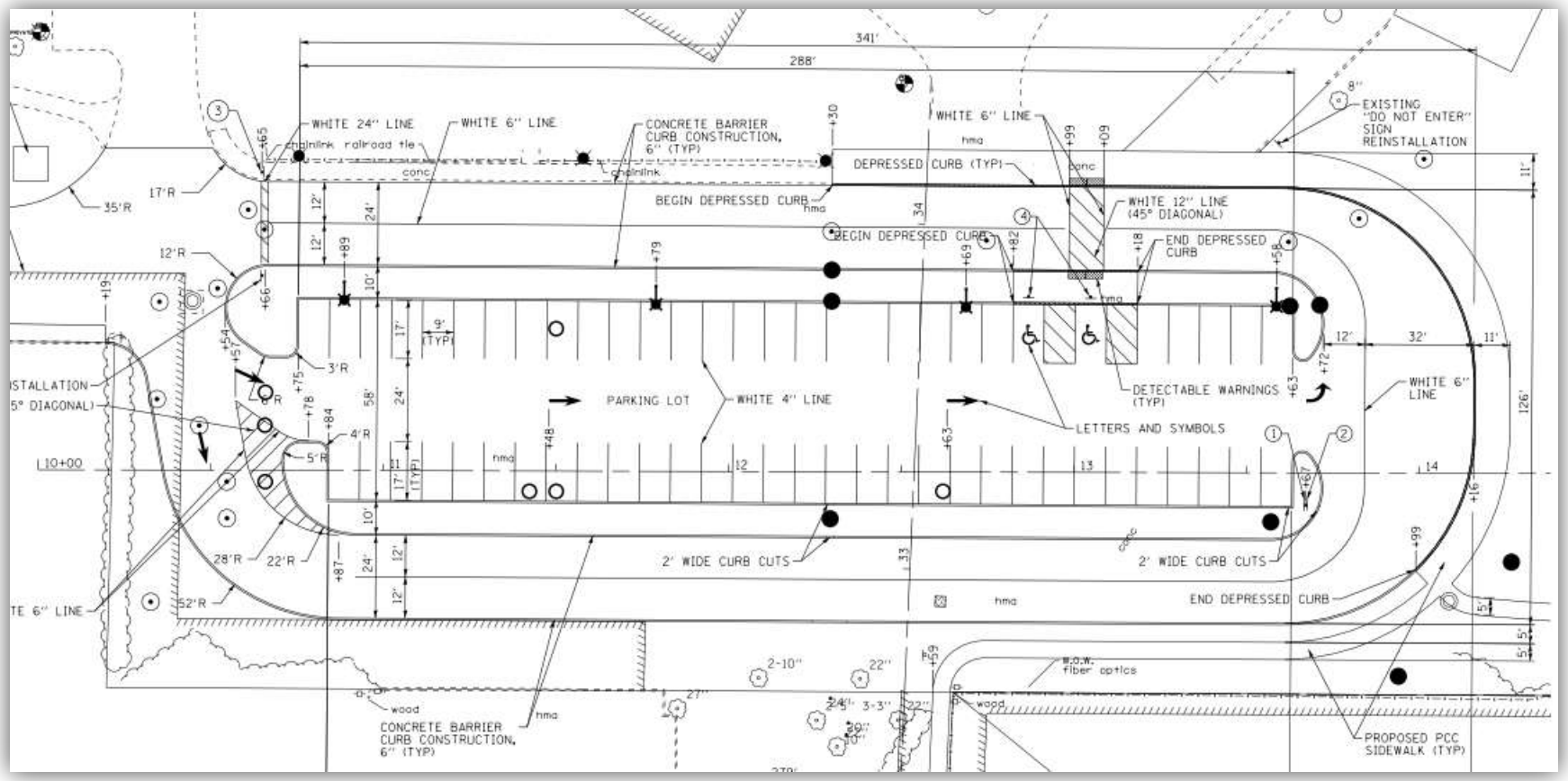


Parking Lot Reconstruction

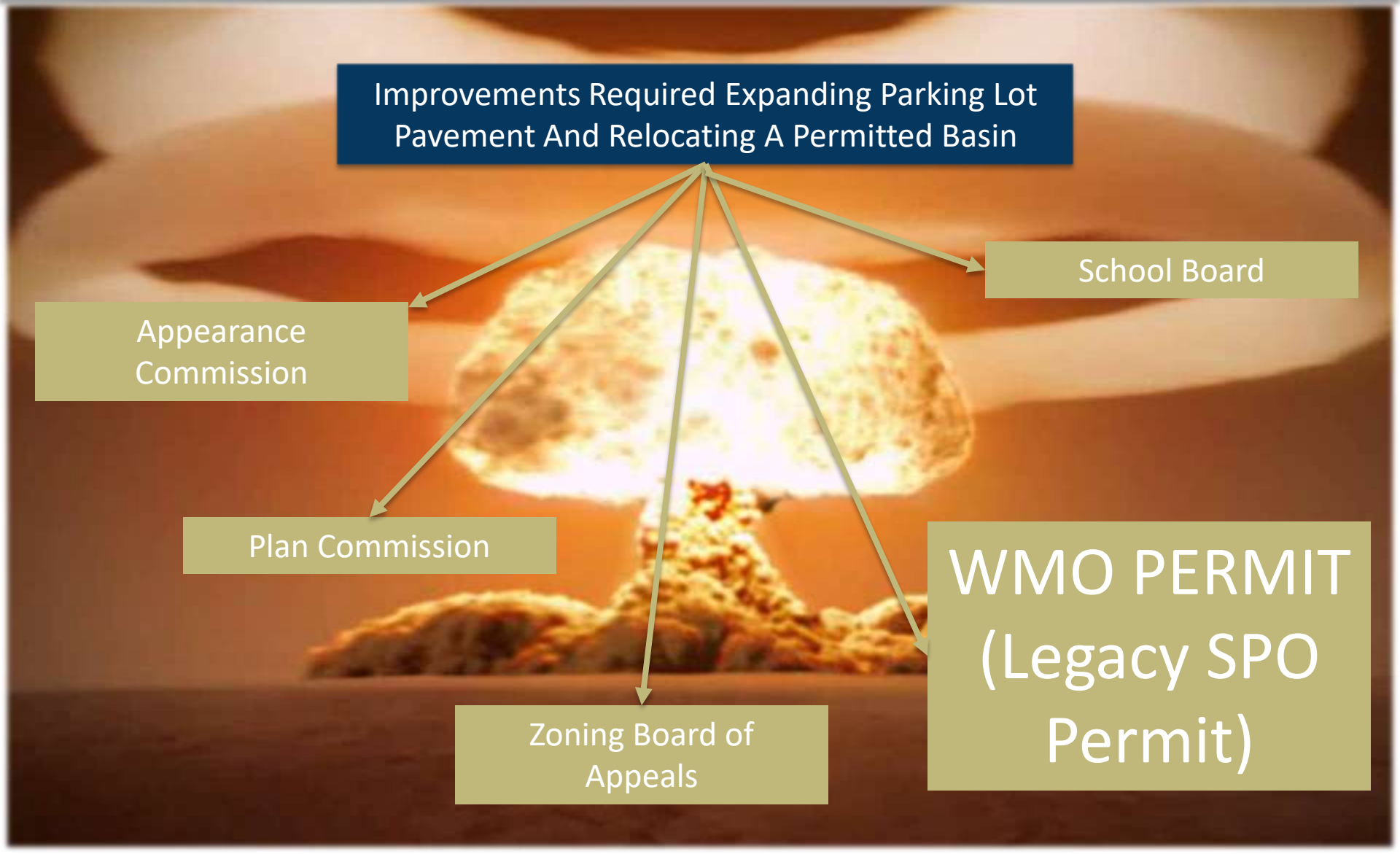
- LED Lights
- Remove Islands
- Improve Buss Lanes
- Add Pick up/ Drop off Lanes
- Include Green Infrastructure
- Increase Stall Count
- Option for Overflow Parking

The Village and the School District Entered into an IGA for a 50/50 Cost Share

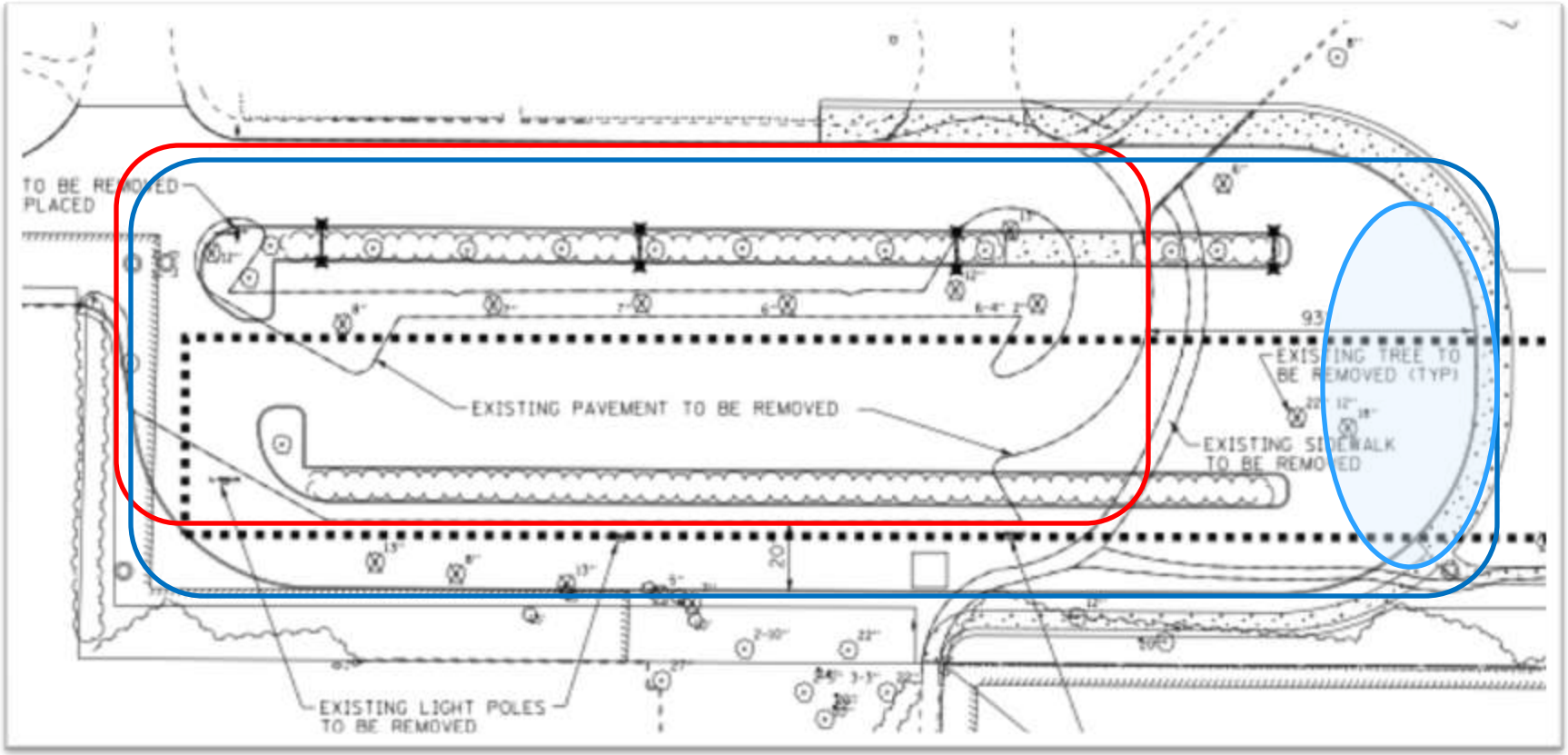
New and Improved Parking Lot



New and Improved Parking Lot



New and Improved Parking Lot



1999 SEWERAGE SYSTEM PERMIT

SCHEDULE A
BASIC INFORMATION

MWRDGC Permit No. 99-444

1. NAME OF PROJECT LYON SCHOOL
(as shown on plans)

2. APPURTENANCES (check all applicable items)
☐ Siphon ☐ Drop Manholes
☐ Stream Crossing ☐ Direct Connections to MWRDGC

3. RECEIVING SANITARY SEWER SYSTEM
A. System that project will connect to is:
☒ Existing ☐ Proposed/Under Construction —> MWRDGC Permit #
B. List owners of all sewers from project to MWRDGC interceptor VILLAGE OF GLENVIEW

4. EXISTING LIFT STATION
☒ No ☐ Yes —> Receiving system includes existing lift station
If Yes, indicate location

5. FLOOD PLAIN
Is any part of the project area in a flood plain?
☒ No ☐ Yes —> Percentage of area in flood plain %
Flood crest elevation Ft.
Identify any manholes in flood plain

6. SIZE OF PROJECT
A. What is the size of this project? 3.39 acres
B. Total contiguous ownership, including project 11.17 acres
C. Existing impervious area within project 0.52 acres
D. New impervious area created within project 1.07 acres

7. DETENTION
A. Is detention provided under this permit?
☐ No ☒ Yes —> Detention required by: ☒ MWRDGC ☐ Other
B. Is project in the service area of existing detention reservoir?
☒ No ☐ Yes —> MWRDGC Permit No.

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NO WATERSHED EXHIBITS

SCHEDULE D -
DETENTION (continued)

MWRDGC Permit No. 99-444

D. DEVELOPED SITE-DETERMINATION OF RESERVOIR SIZE
(Submit calculations for 3 and 4)

1. Impervious drainage area 1.72 acres
2. Pervious drainage area 0.52 acres
3. Composite runoff coefficient(s) 0.77
4. Required detention capacity .22 0.53 acre-feet
5. Actual detention capacity provided acre-feet

E. REQUIRED BYPASS RATE THROUGH DEVELOPMENT SITE FROM UPSTREAM AREA
NOTE: Design frequency shall be determined by local ordinance. If no local requirement is established use 5 year storm frequency.

1. N/A acres
2. N/A acres
3. N/A acres
4. Composite runoff coefficient (minimum of 0.35) N/A
5. Design storm frequency for the upstream area N/A year
6. Time of concentration for upstream area at point of entry; upstream area to be considered as developed N/A minutes
7. Rainfall intensity for time of concentration N/A inches/hr
8. Permissible bypass rate (line 1*line 4*line 7) N/A cfs

Name GARY A. WISS
Title PRESIDENT
Signature [signature] Date 12/22/99
Engineering Firm GARY A. WISS, INC.

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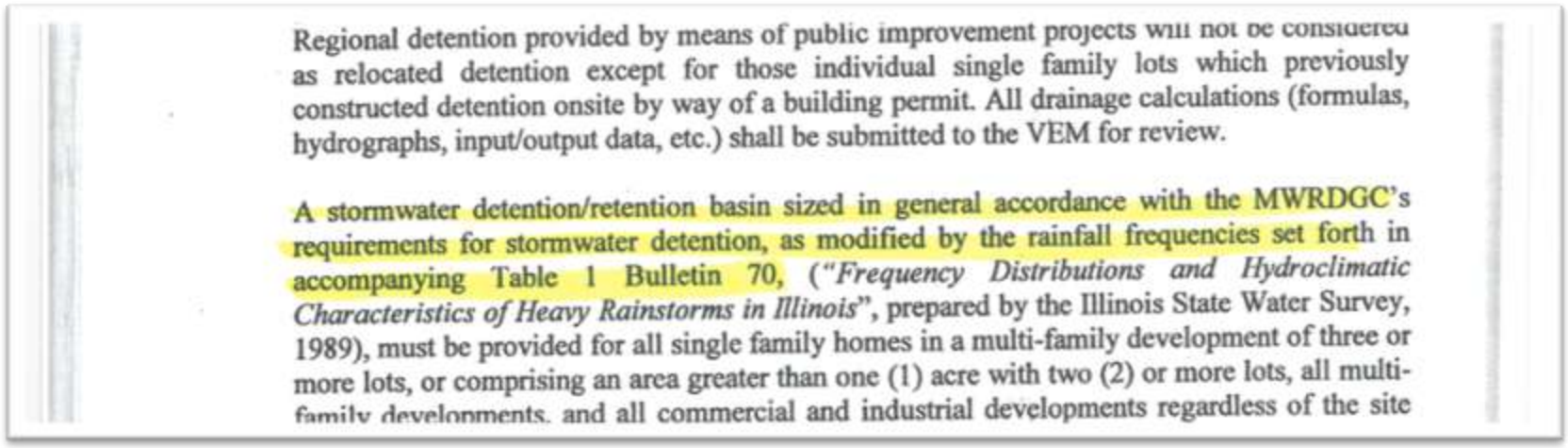
Glenview Engineering Standards Manual



Regional detention provided by means of public improvement projects will not be considered as relocated detention except for those individual single family lots which previously constructed detention onsite by way of a building permit. All drainage calculations (formulas, hydrographs, input/output data, etc.) shall be submitted to the VEM for review.

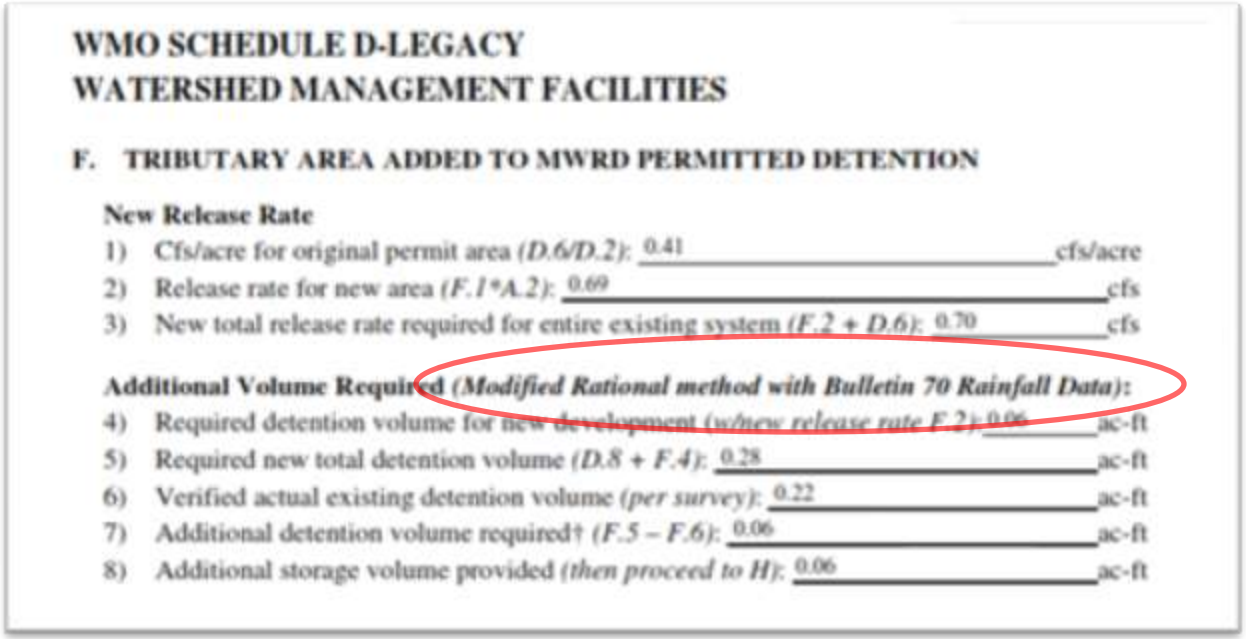
A stormwater detention/retention basin sized in general accordance with the MWRDGC's requirements for stormwater detention, as modified by the rainfall frequencies set forth in accompanying Table 1 Bulletin 70, ("*Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois*", prepared by the Illinois State Water Survey, 1989), must be provided for all single family homes in a multi-family development of three or more lots, or comprising an area greater than one (1) acre with two (2) or more lots, all multi-family developments, and all commercial and industrial developments regardless of the site

Utilize MWRDGC's requirements (SPO) as modified by the rainfall frequencies set forth in Bulletin 70

WMO Schedule D-Legacy

Amended SPO calculations for Site Runoff Requirements and Release Rate

New WMO calculations for Site Volume Control (VC) Requirements



WMO SCHEDULE D-LEGACY
WATERSHED MANAGEMENT FACILITIES

F. TRIBUTARY AREA ADDED TO MWRD PERMITTED DETENTION

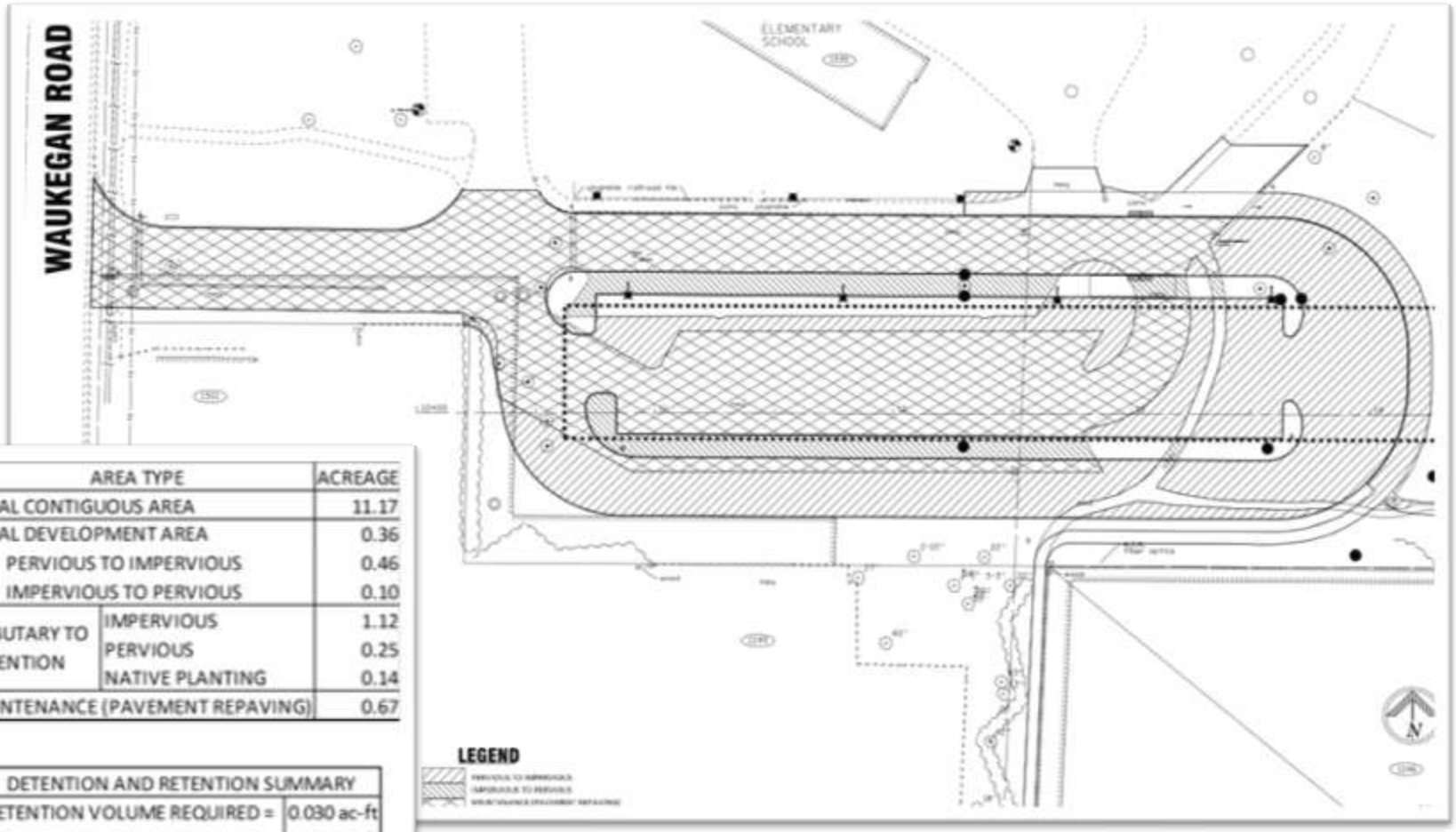
New Release Rate

1) Cfs/acre for original permit area *(D.6/D.2)*: 0.41 cfs/acre
2) Release rate for new area *(F.1*A.2)*: 0.69 cfs
3) New total release rate required for entire existing system *(F.2 + D.6)*: 0.70 cfs

Additional Volume Required *(Modified Rational method with Bulletin 70 Rainfall Data)*:

4) Required detention volume for new development *(w/new release rate F.2)*: 0.06 ac-ft
5) Required new total detention volume *(D.8 + F.4)*: 0.28 ac-ft
6) Verified actual existing detention volume *(per survey)*: 0.22 ac-ft
7) Additional detention volume required† *(F.5 – F.6)*: 0.06 ac-ft
8) Additional storage volume provided *(then proceed to H)*: 0.06 ac-ft

Pavement Development

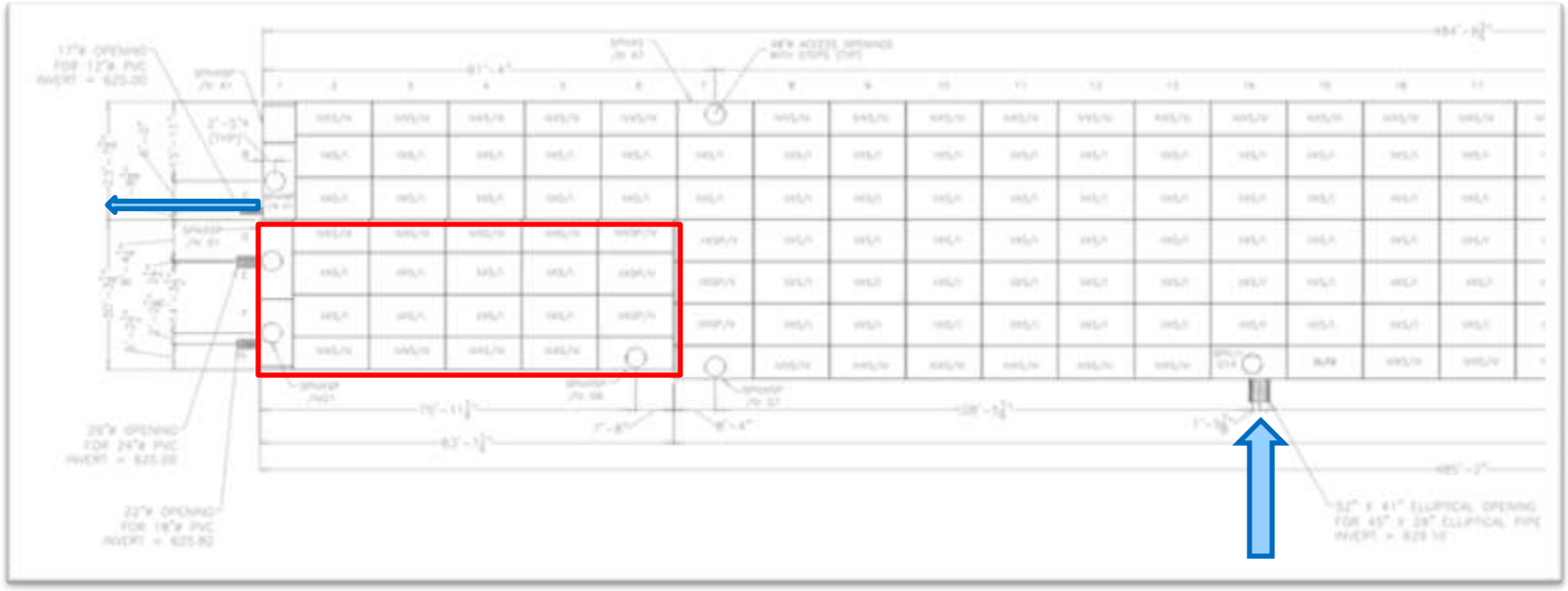


AREA TYPE		ACREAGE
TOTAL CONTIGUOUS AREA		11.17
TOTAL DEVELOPMENT AREA		0.36
PERVIOUS TO IMPERVIOUS		0.46
IMPERVIOUS TO PERVIOUS		0.10
TRIBUTARY TO DETENTION	IMPERVIOUS	1.12
	PERVIOUS	0.25
	NATIVE PLANTING	0.14
MAINTENANCE (PAVEMENT REPAVING)		0.67

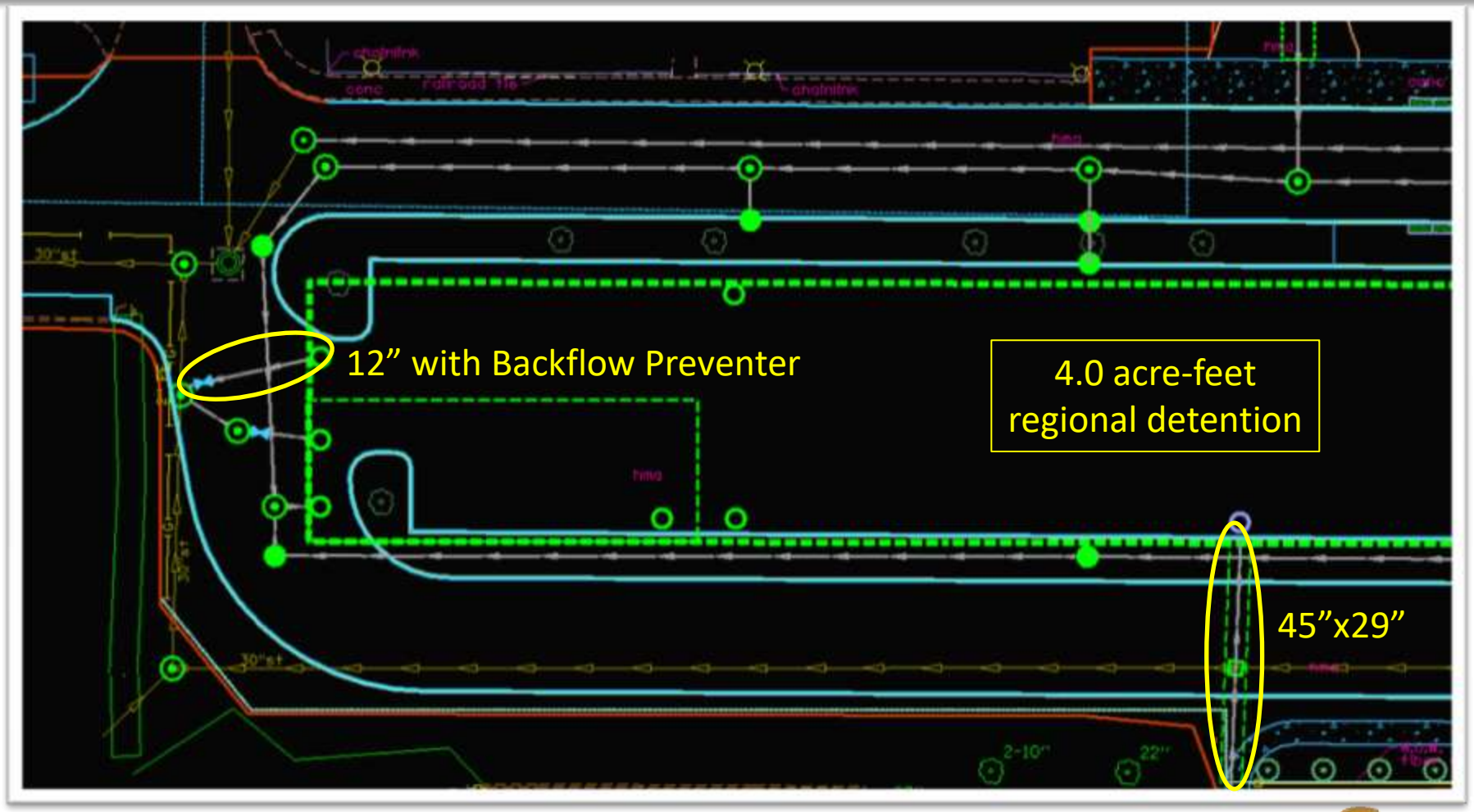
DETENTION AND RETENTION SUMMARY	
RETENTION VOLUME REQUIRED =	0.030 ac-ft
RETENTION VOLUME PROVIDED =	0.031 ac-ft
DETENTION VOLUME REQUIRED =	0.414 ac-ft
LESS PROVIDED RETENTION =	0.383 ac-ft
DETENTION VOLUME PROVIDED =	

Regional Watershed Map

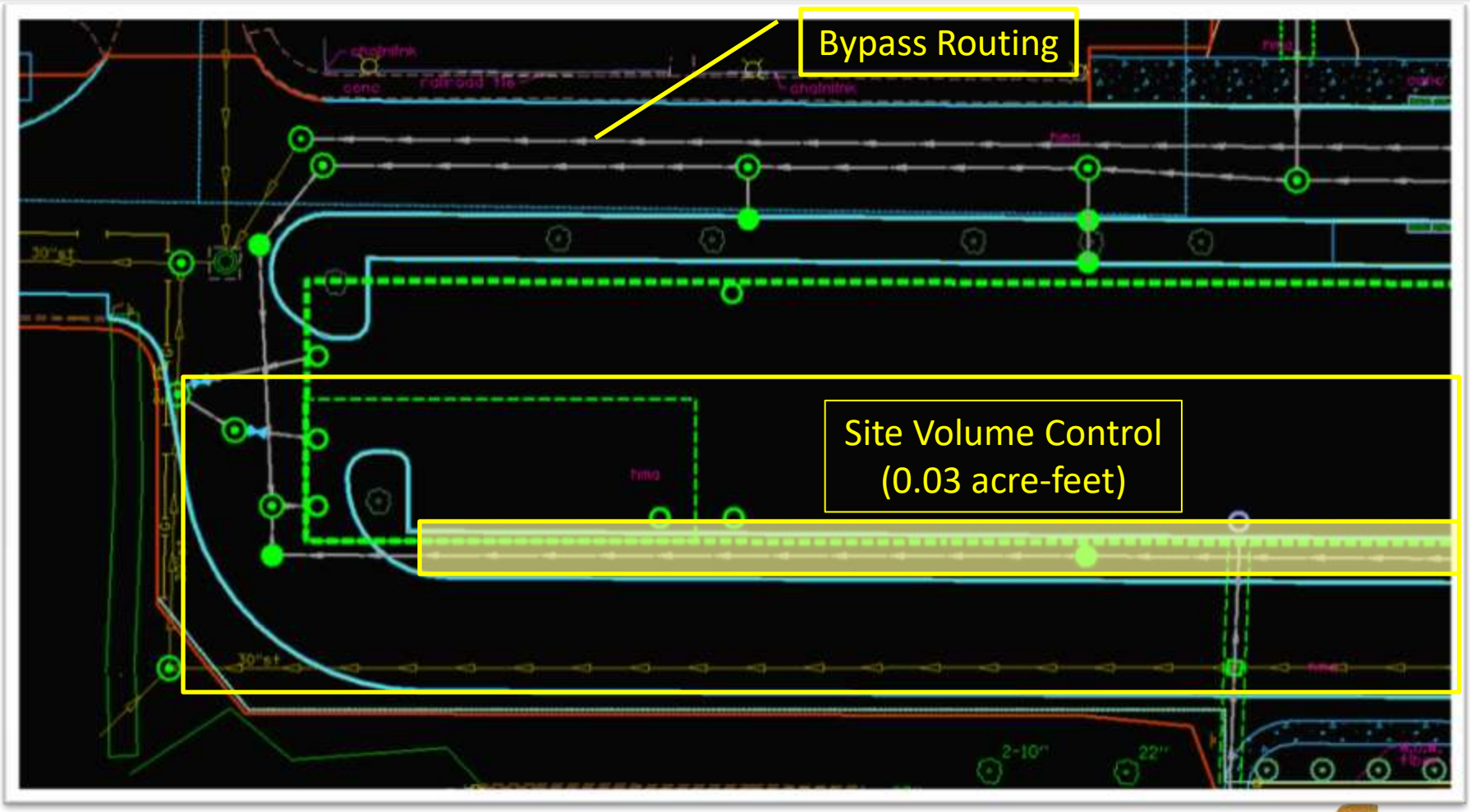
Segmented Vault



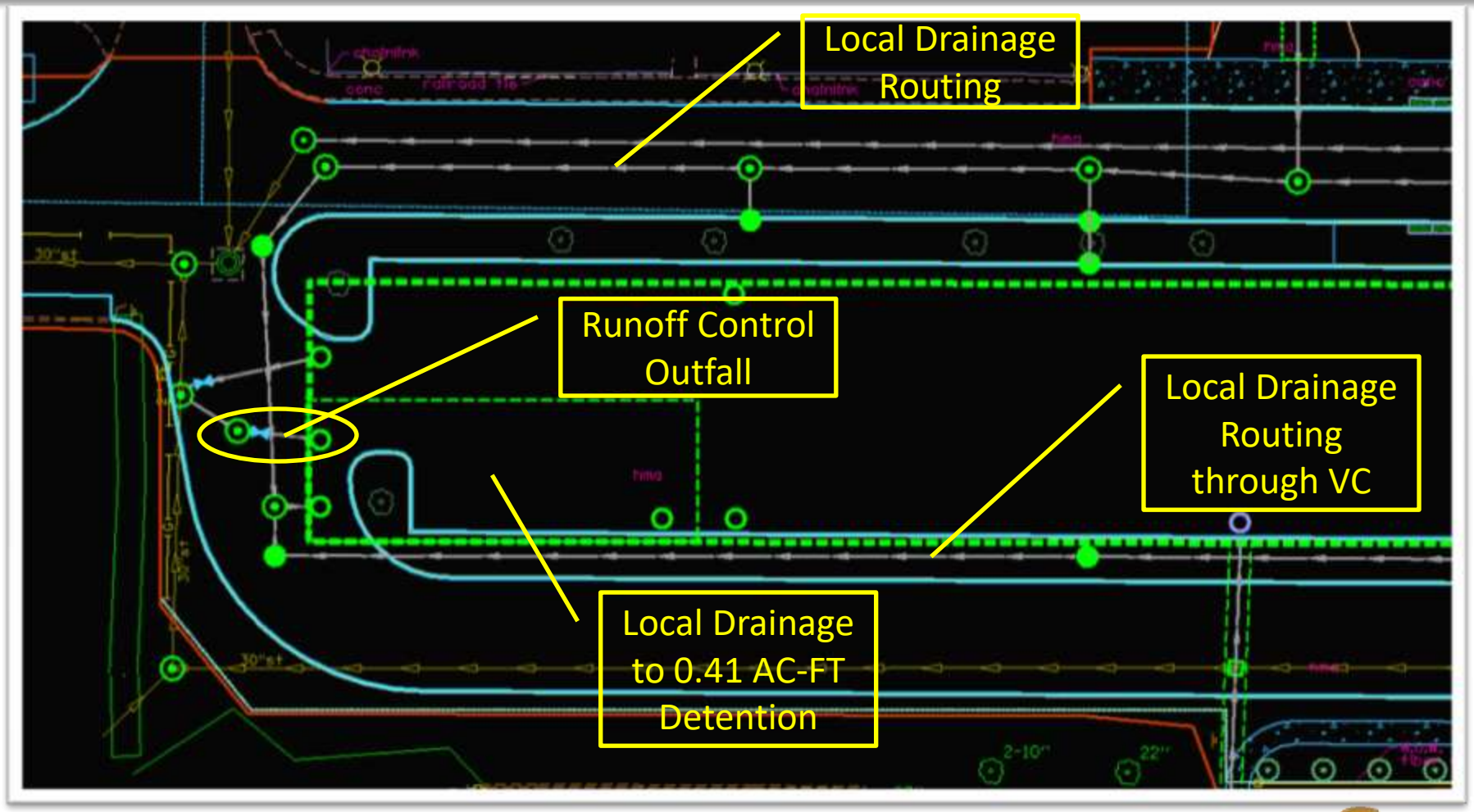
Regional Flood Control



Local Detention



Local Detention - Local Runoff Control



Final Stats

- 4.41 AC-FT Stormwater Detention
- 0.03 AC-FT Stormwater Retention
- New and Improved Parking Lot
- EOPC $3.155M ($598k for parking lot reconstruction)
- Pirtano Construction $3.061M

Lessons Learned

- Meet with Partners (School District, MWRD) early and often
- Document Everything
- You must paint the whole picture – backed with documentation
- Walk the reviewer through the whole process
- Don’t assume consistent reviewing staff

Final Parking Lot

Public Partnerships, Permits, and a Parking Lot:

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