

JOE CASALI ENGINEERING, INC.

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300 POST ROAD • WARWICK, RI 02888 • (401) 944-1300 • (401) 944-1313 (FAX) • WWW.JOECASALI.COM

February 14, 2024

RE: Proposed Building Additions – Early Foundation Academy
181 Princess Avenue, Cranston, RI – AP 8, Lot 1552
Drainage Statement

Site Background and Proposed Project

Since 2018 the building has been utilized by two entities, the Early Foundation Academy daycare/pre-school, and the St. Vincent DePaul food pantry. Prior use of the property was an American Legion Post. As a result of the food pantry leaving this location, the daycare/pre-school is proposing to expand its facilities in the vacant area of the building and construct classroom additions. The proposal includes construction of two (2) 1,024 sq. ft. building additions off the western face of the existing building and a 625 sq. ft. front porch addition off its eastern face. To accommodate these small building additions on the west, the northern parking lot off Fountain Avenue will be reduced in size to provide standardized parking dimensions and allow expansion of the outdoor play area required for the child enrollment. A drive aisle that presently connects both existing parking lots on the north and south sides of the building will be converted into a play area extending to the westerly property line. A new sidewalk is proposed to connect the new building addition on the north, to the reconfigured parking lot and provide handicapped accessibility to the building. The existing southern parking area shall be converted and utilized as a parent drop-off zone for the facility.

One of the two building additions to the west will be constructed over the existing paved parking area and will not result in an increase in impervious area. In addition, pavement will be removed as part of the reconfigured parking lot and extension of the outdoor play area. Existing overland stormwater flow patterns will remain unaltered. Overall, the proposed project results in an impervious area loss of 190 sq. ft. The resulting net loss in runoff discharge rates and volume are as shown below.

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Drainage Statement

A stormwater runoff analysis of the pre- and post-construction conditions for the drainage improvements result in the following:

Table 1: Stormwater Runoff Discharge Rates

	Peak Discharge Rate (cfs)			
	1-yr	10-yr	25-yr	100-yr
<i>Design Point 1</i>				
Existing Stormwater Runoff	0.56	1.72	2.41	3.95
Proposed Stormwater Runoff	0.56	1.72	2.41	3.95
ΔQ	0	0	0	0

As shown in Table 1, the peak stormwater runoff rates realized at Design Point 1 have remained the same when comparing existing conditions to proposed conditions for all design storm events.

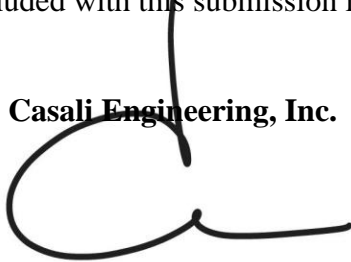
Table 2: Stormwater Total Runoff Volume

	Total Runoff Volume (cf)			
	1-yr	10-yr	25-yr	100-yr
<i>Design Point 1</i>				
Existing Stormwater Runoff	1,853	5,418	7,609	12,630
Proposed Stormwater Runoff	1,853	5,418	7,609	12,630
ΔV	0	0	0	0

As shown in Table 2, the total stormwater runoff volume realized at Design Point 1 has remained the same when comparing existing conditions to proposed conditions for the 1-year, 10-year, 25-year and 100-year design storm events.

Included with this submission is the associated HydroCAD reports.

Joe Casali Engineering, Inc.



Joseph Casali, MBA, P.E. No. 7250
President

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Attachment 1

Existing Watershed Map and HydroCAD Calculations

FOUNDATION AVENUE

PRINCESS AVENUE

EXISTING DAYCARE
"EARLY FOUNDATION ACADEMY"

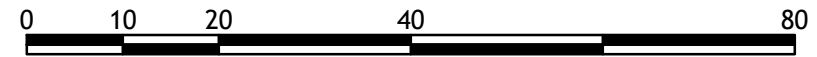
AP 8-3, LOT 1552
25,600 SF

PROPERTY LINE
(TYP.)

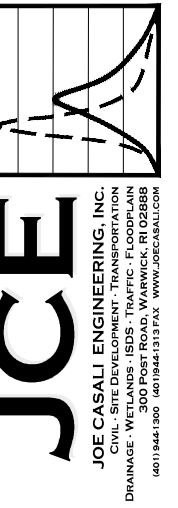
EXISTING IMPERVIOUS
AREA: 16,535 SF±
(64.6% IMPERVIOUS)

MEADOW AVENUE

SCALE (FEET)



1 INCH = 20 FT



EARLY FOUNDATION ACADEMY
181 PRINCESS AVENUE
CRANSTON, RHODE ISLAND
AP 8, LOT 1552

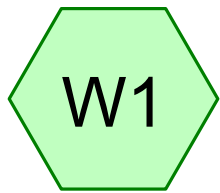
REVISIONS:	
NO.	DATE DESCRIPTION

DESIGNED BY: WMLJR
 DRAWN BY: SEP
 CHECKED BY: JAC
 DATE: FEB. 2024
 PROJECT NO: 23-87

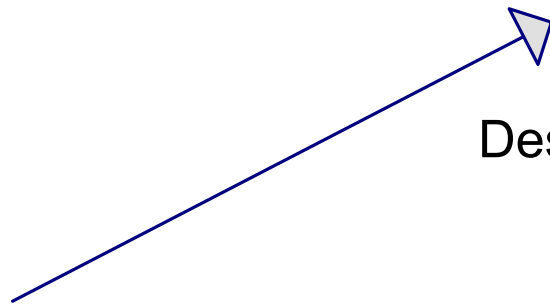
DRAINAGE
SUMMARY

**EXISTING
CONDITIONS**

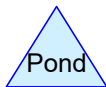
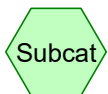
**SHEET
1 OF 1**



Watershed 1



Design Point #1



181 Princess - Existing

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,065	39	>75% Grass cover, Good, HSG A (W1)
16,535	98	Impervious Surface, HSG A (W1)
25,600	77	TOTAL AREA

181 Princess - Existing

Type III 24-hr 1-Year Rainfall=2.70"

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Summary for Subcatchment W1: Watershed 1

Runoff = 0.56 cfs @ 12.10 hrs, Volume= 1,853 cf, Depth= 0.87"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	16,535	98	Impervious Surface, HSG A
	9,065	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,065	39	35.41% Pervious Area
	16,535	98	64.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 64.59% Impervious, Inflow Depth = 0.87" for 1-Year event

Inflow = 0.56 cfs @ 12.10 hrs, Volume= 1,853 cf

Primary = 0.56 cfs @ 12.10 hrs, Volume= 1,853 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

181 Princess - Existing

Type III 24-hr 2-Year Rainfall=3.30"

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Summary for Subcatchment W1: Watershed 1

Runoff = 0.85 cfs @ 12.10 hrs, Volume= 2,739 cf, Depth= 1.28"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
*	16,535	98	Impervious Surface, HSG A
	9,065	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,065	39	35.41% Pervious Area
	16,535	98	64.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 64.59% Impervious, Inflow Depth = 1.28" for 2-Year event

Inflow = 0.85 cfs @ 12.10 hrs, Volume= 2,739 cf

Primary = 0.85 cfs @ 12.10 hrs, Volume= 2,739 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

181 Princess - Existing

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Type III 24-hr 10-Year Rainfall=4.90"

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Summary for Subcatchment W1: Watershed 1

Runoff = 1.72 cfs @ 12.09 hrs, Volume= 5,418 cf, Depth= 2.54"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
*	16,535	98	Impervious Surface, HSG A
	9,065	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,065	39	35.41% Pervious Area
	16,535	98	64.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 64.59% Impervious, Inflow Depth = 2.54" for 10-Year event

Inflow = 1.72 cfs @ 12.09 hrs, Volume= 5,418 cf

Primary = 1.72 cfs @ 12.09 hrs, Volume= 5,418 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

181 Princess - Existing

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Type III 24-hr 25-Year Rainfall=6.10"

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Summary for Subcatchment W1: Watershed 1

Runoff = 2.41 cfs @ 12.09 hrs, Volume= 7,609 cf, Depth= 3.57"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

	Area (sf)	CN	Description
*	16,535	98	Impervious Surface, HSG A
	9,065	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,065	39	35.41% Pervious Area
	16,535	98	64.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 64.59% Impervious, Inflow Depth = 3.57" for 25-Year event

Inflow = 2.41 cfs @ 12.09 hrs, Volume= 7,609 cf

Primary = 2.41 cfs @ 12.09 hrs, Volume= 7,609 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

181 Princess - Existing

Type III 24-hr 100-Year Rainfall=8.70"

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Summary for Subcatchment W1: Watershed 1

Runoff = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf, Depth= 5.92"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	16,535	98	Impervious Surface, HSG A
	9,065	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,065	39	35.41% Pervious Area
	16,535	98	64.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 64.59% Impervious, Inflow Depth = 5.92" for 100-Year event

Inflow = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf

Primary = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

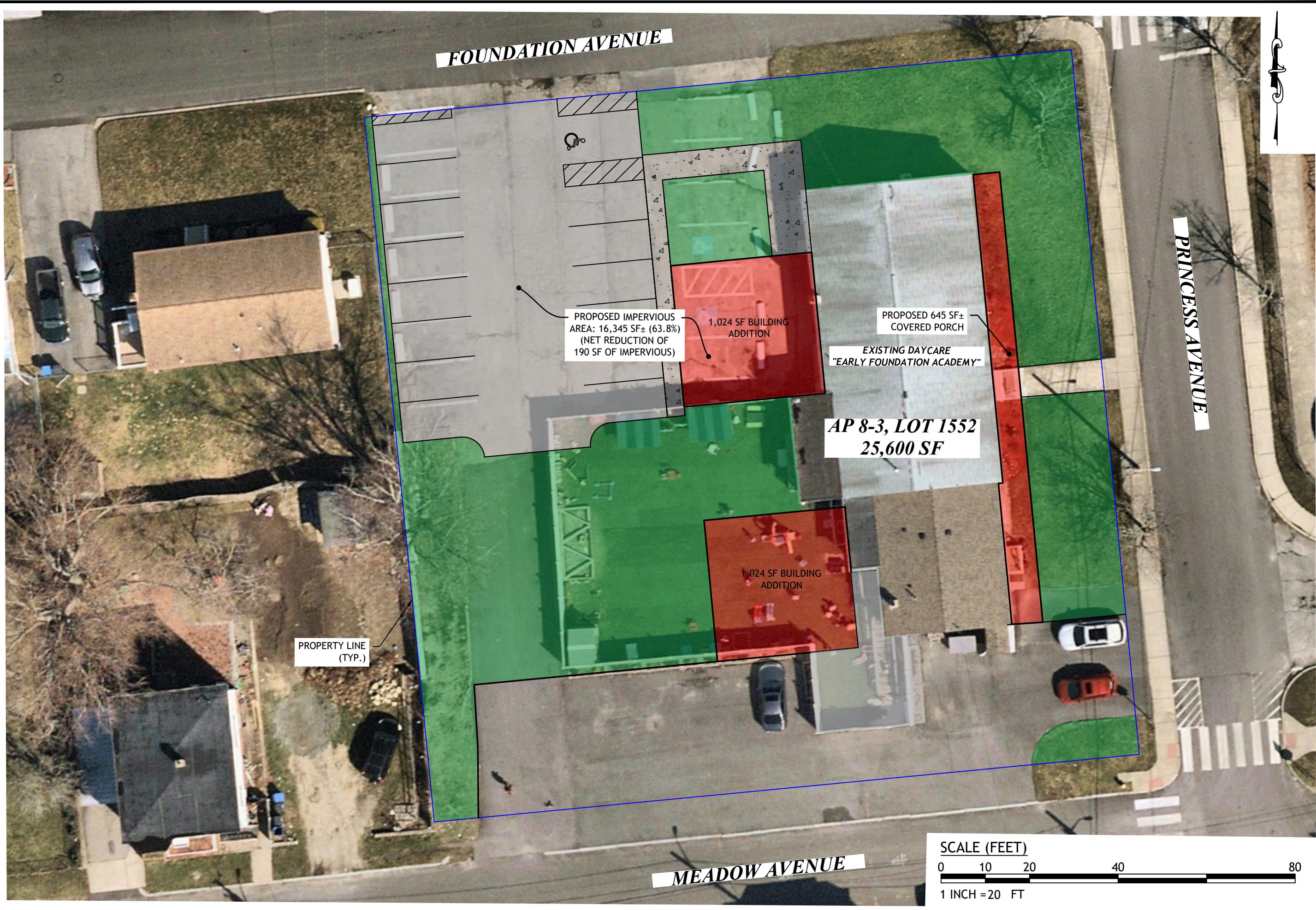
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Attachment 2

Proposed Watershed Map and HydroCAD Calculations

Q:\23-87 Martha Lima\ACAD\Early Foundation Academy Addition.dwg, Feb. 15, 2024 10:35am



FOUNDATION AVENUE

PRINCESS AVENUE

MEADOW AVENUE

PROPOSED IMPERVIOUS AREA: 16,345 SF± (63.8%)
(NET REDUCTION OF 190 SF OF IMPERVIOUS)

1,024 SF BUILDING ADDITION

PROPOSED 645 SF± COVERED PORCH

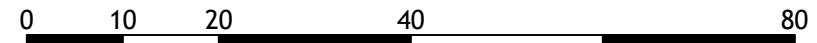
EXISTING DAYCARE "EARLY FOUNDATION ACADEMY"

AP 8-3, LOT 1552
25,600 SF

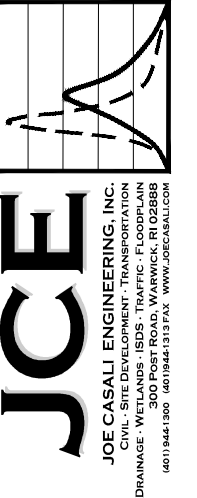
1,024 SF BUILDING ADDITION

PROPERTY LINE (TYP.)

SCALE (FEET)



1 INCH = 20 FT



EARLY FOUNDATION ACADEMY
 181 PRINCESS AVENUE
 CRANSTON, RHODE ISLAND
 AP 8, LOT 1552

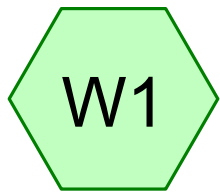
REVISIONS:	
NO.	DATE DESCRIPTION

DESIGNED BY: WMLJR
 DRAWN BY: SEP
 CHECKED BY: JAC
 DATE: FEB. 2024
 PROJECT NO: 23-87

DRAINAGE SUMMARY

PROPOSED CONDITIONS

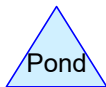
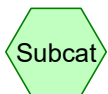
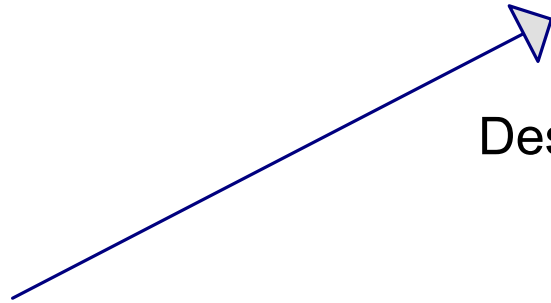
SHEET 1 OF 1



Watershed 1



Design Point #1



181 Princess - Proposed

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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,255	39	>75% Grass cover, Good, HSG A (W1)
16,345	98	Impervious Surface, HSG A (W1)

181 Princess - Proposed

Type III 24-hr 100-Year Rainfall=8.70"

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Page 3

Summary for Subcatchment W1: Watershed 1

Runoff = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf, Depth= 5.92"

Routed to Link DP-1 : Design Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	16,345	98	Impervious Surface, HSG A
	9,255	39	>75% Grass cover, Good, HSG A
	25,600	77	Weighted Average
	9,255	39	36.15% Pervious Area
	16,345	98	63.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Link DP-1: Design Point #1

Inflow Area = 25,600 sf, 63.85% Impervious, Inflow Depth = 5.92" for 100-Year event

Inflow = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf

Primary = 3.95 cfs @ 12.09 hrs, Volume= 12,630 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs