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# Beecher Road School

## Board of Selectmen Presentation

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December 1, 2011

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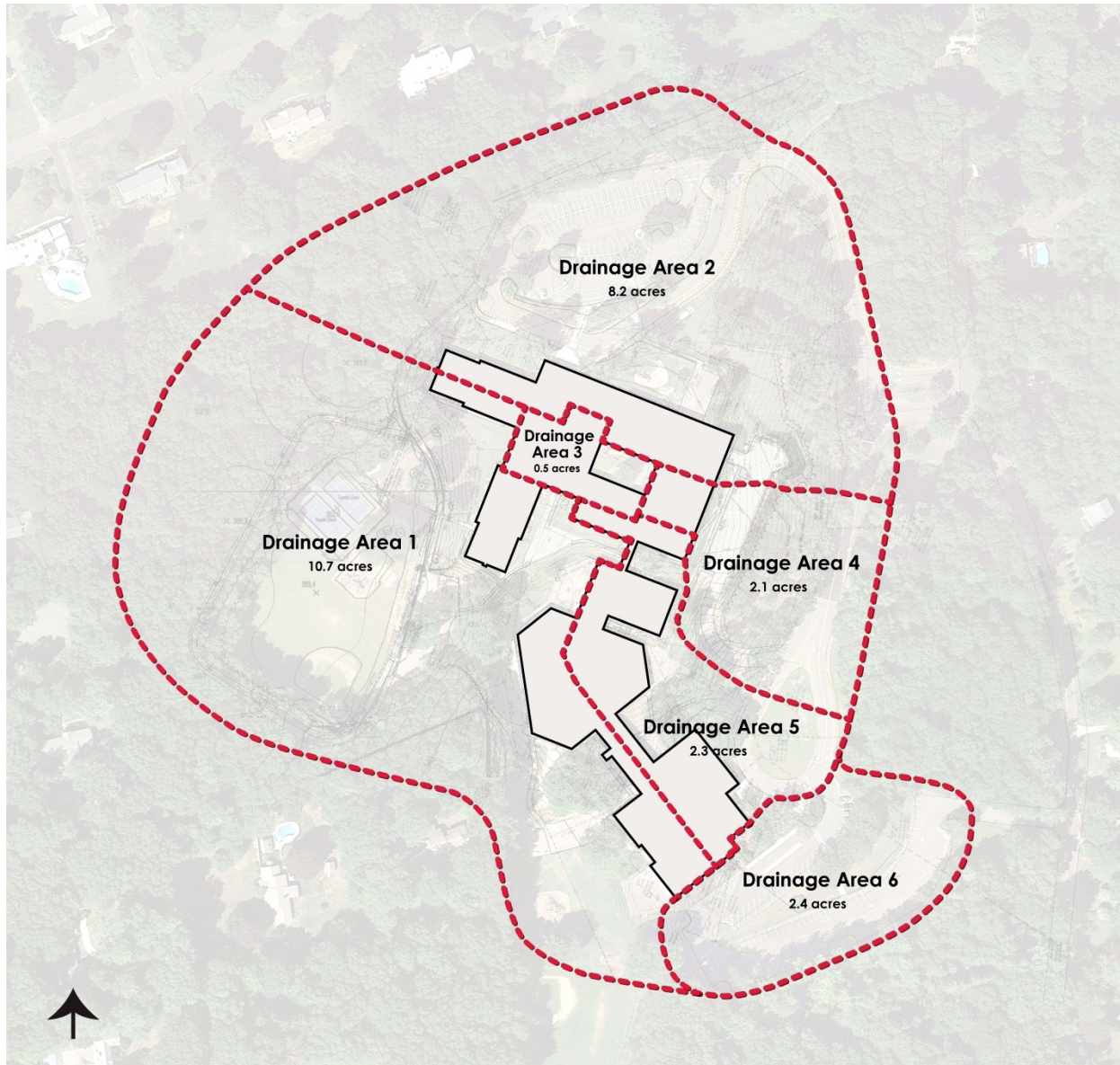
# Analysis & Site Mapping

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Beecher Road School

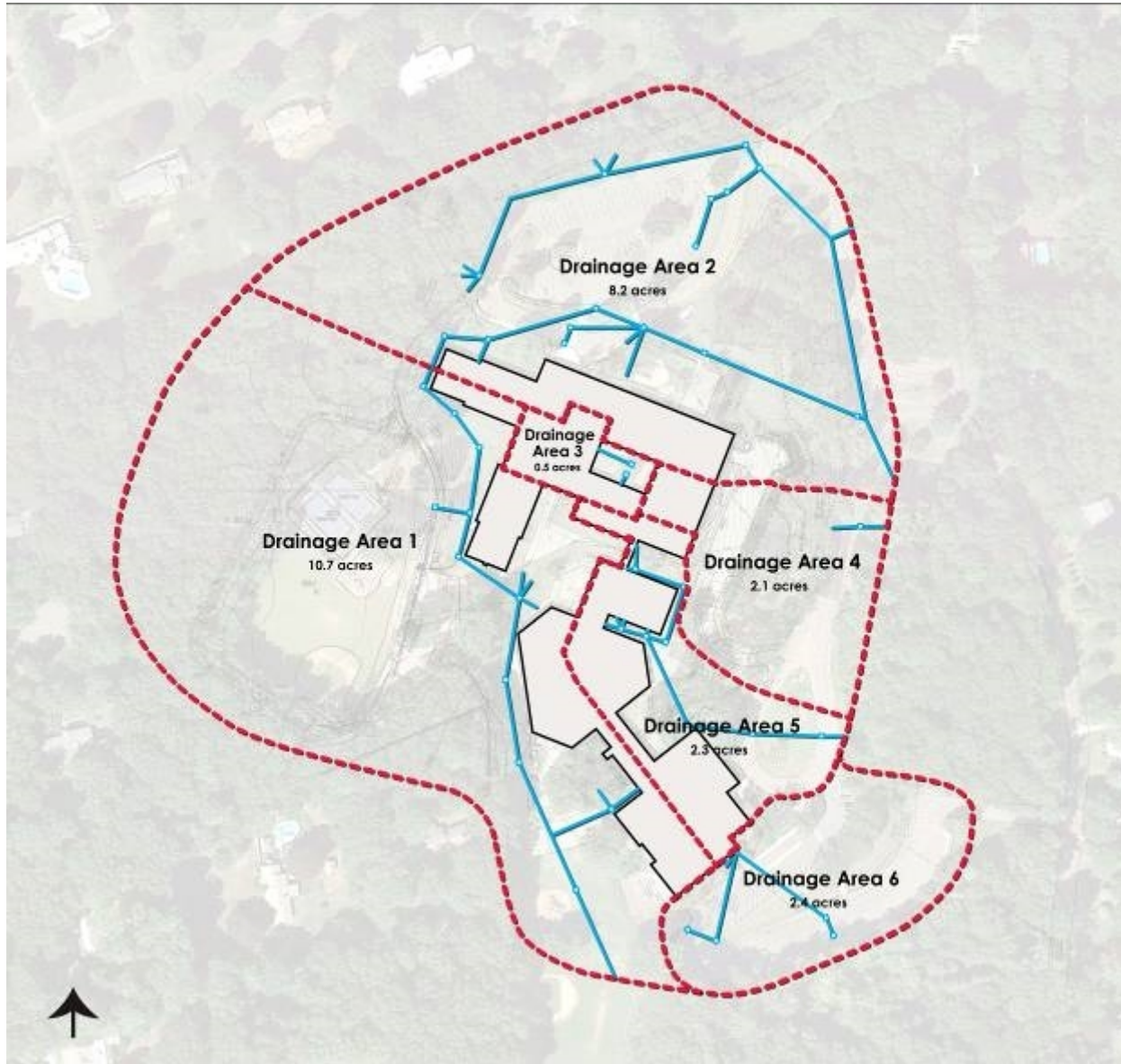


## Base Map

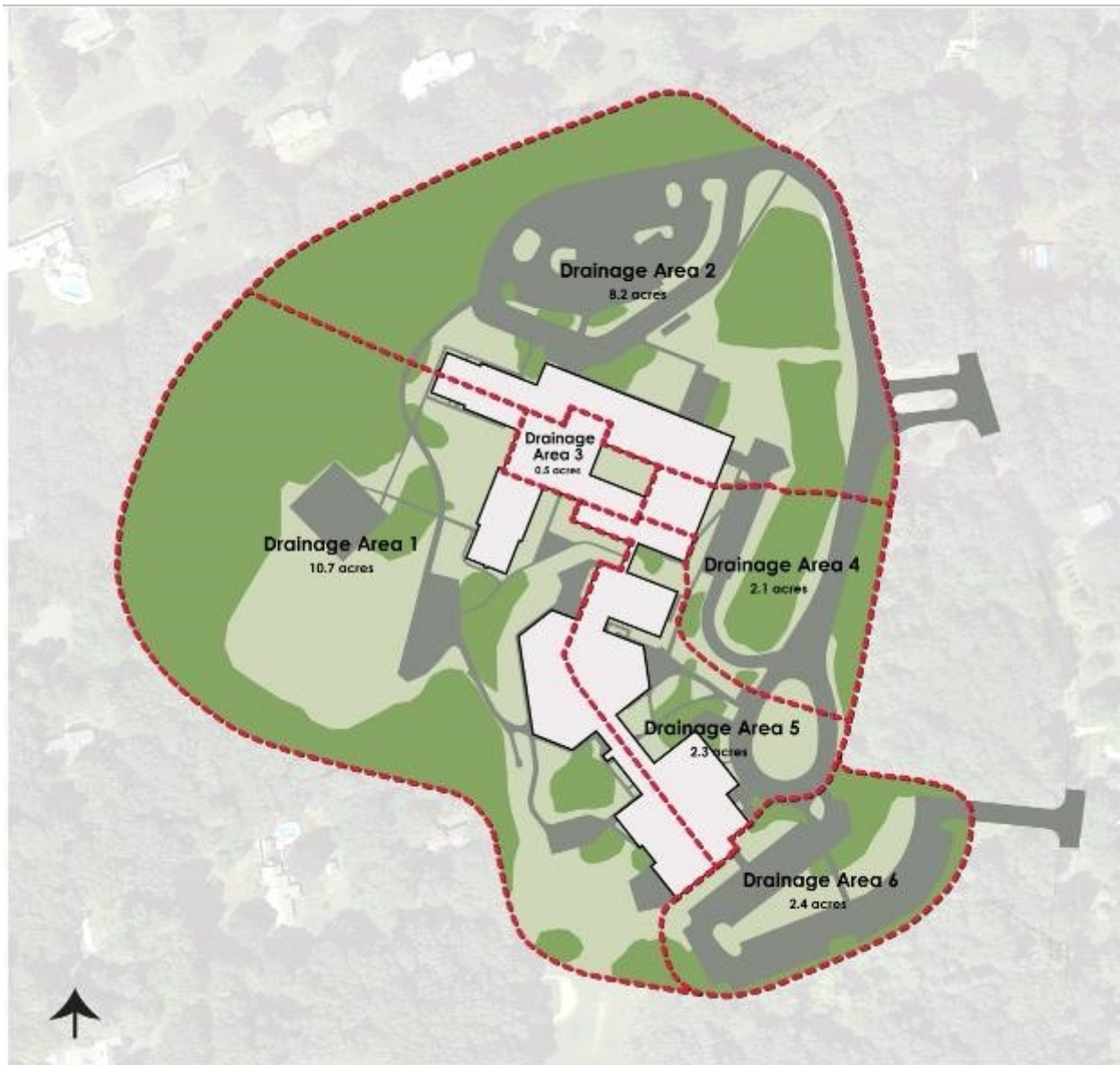


# Drainage Areas

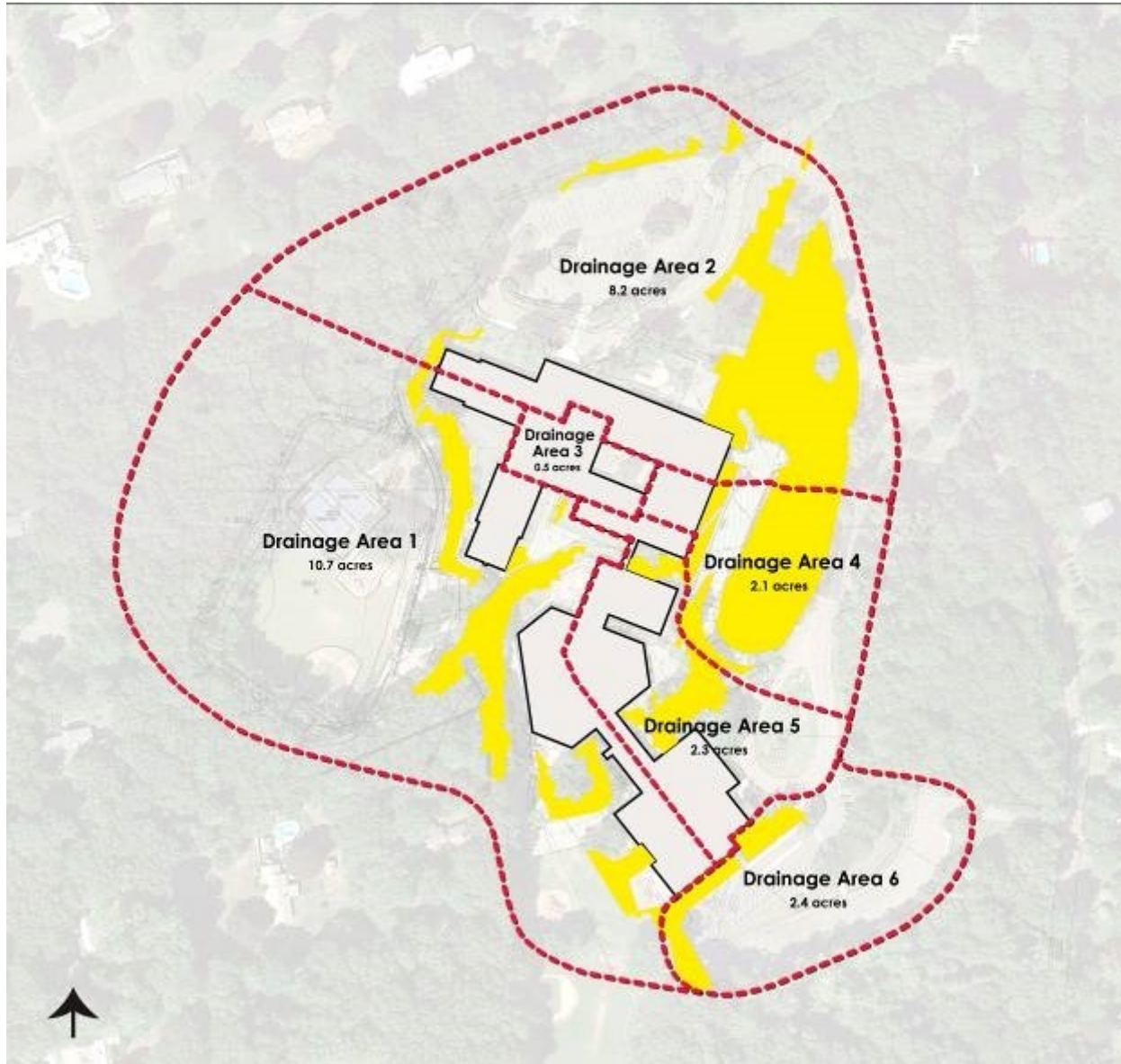




# Storm Drainage

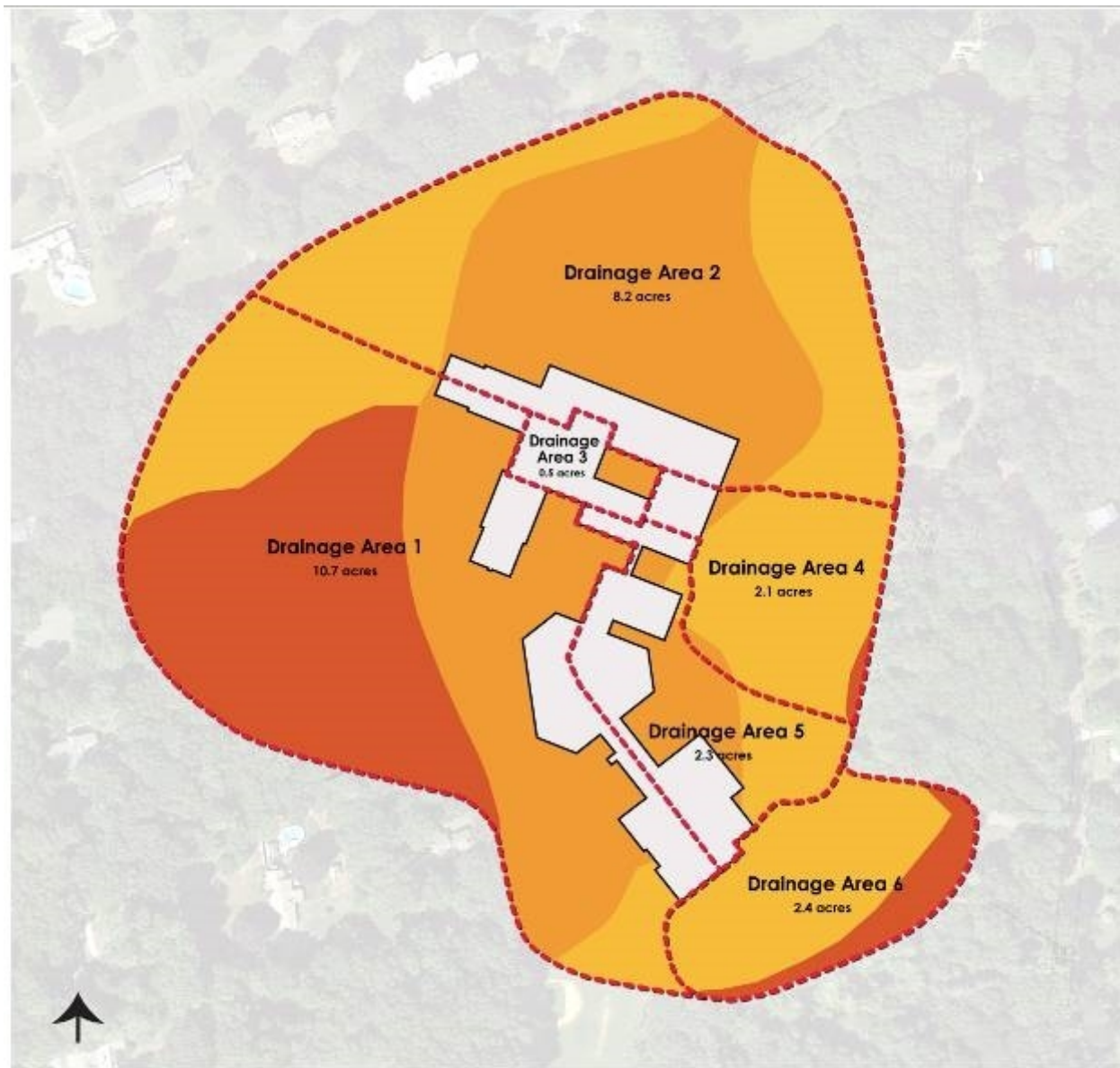


## Surface Type



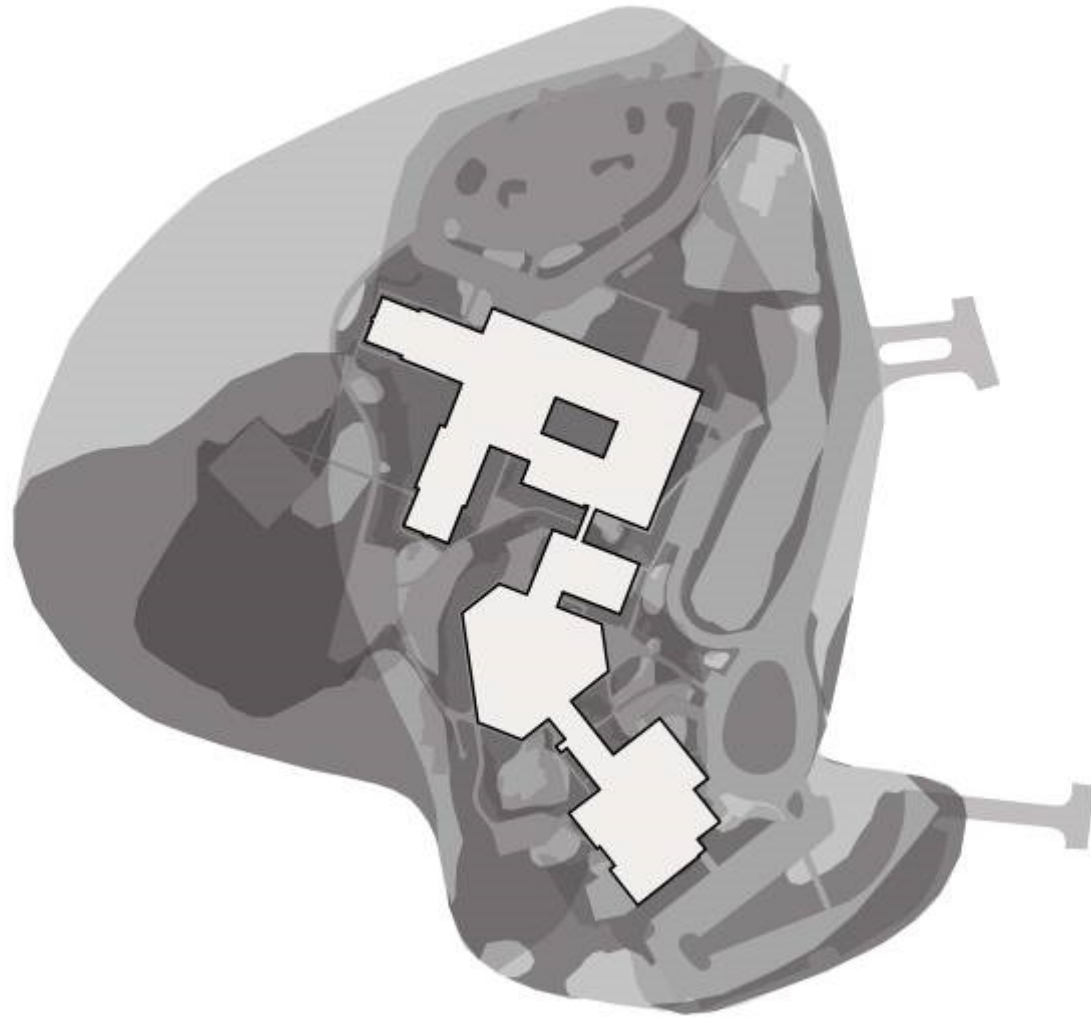
Slopes >10%





## Soils – Erosion Hazard





**Composite Erosion Prone**

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# Areas of Concern & Opportunity

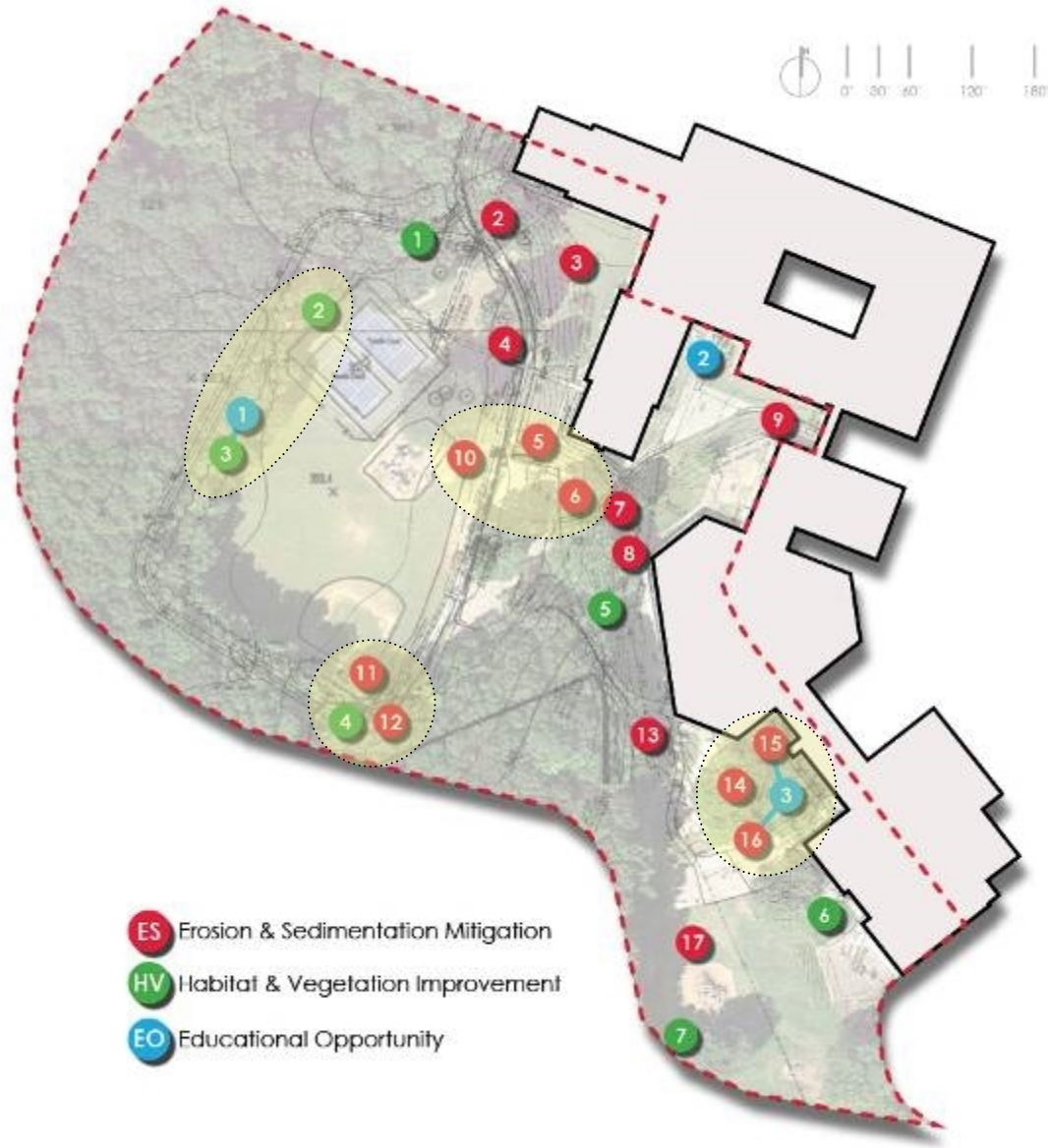
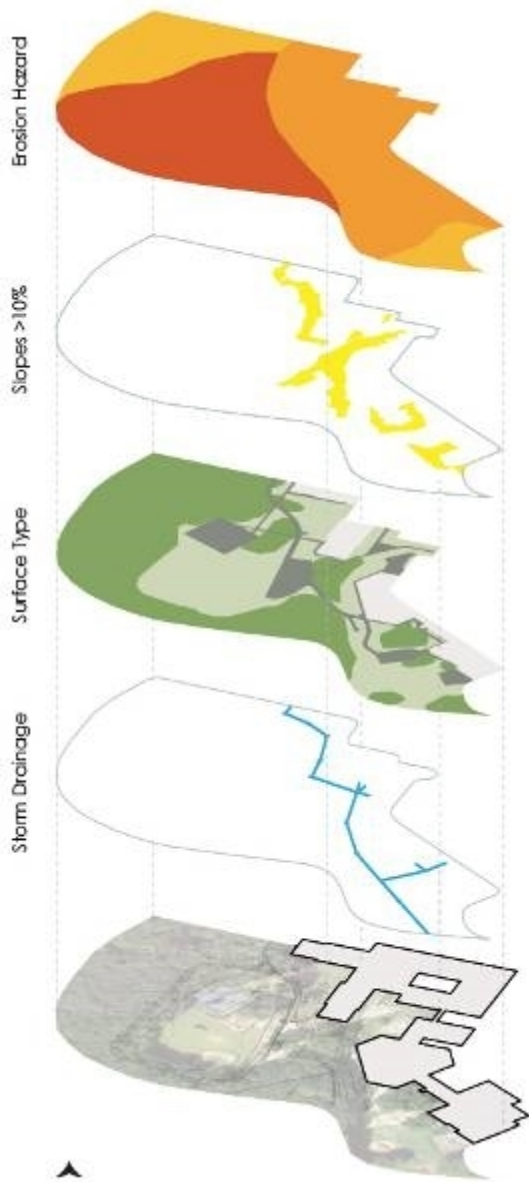
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Beecher Road School



## Catch Basins

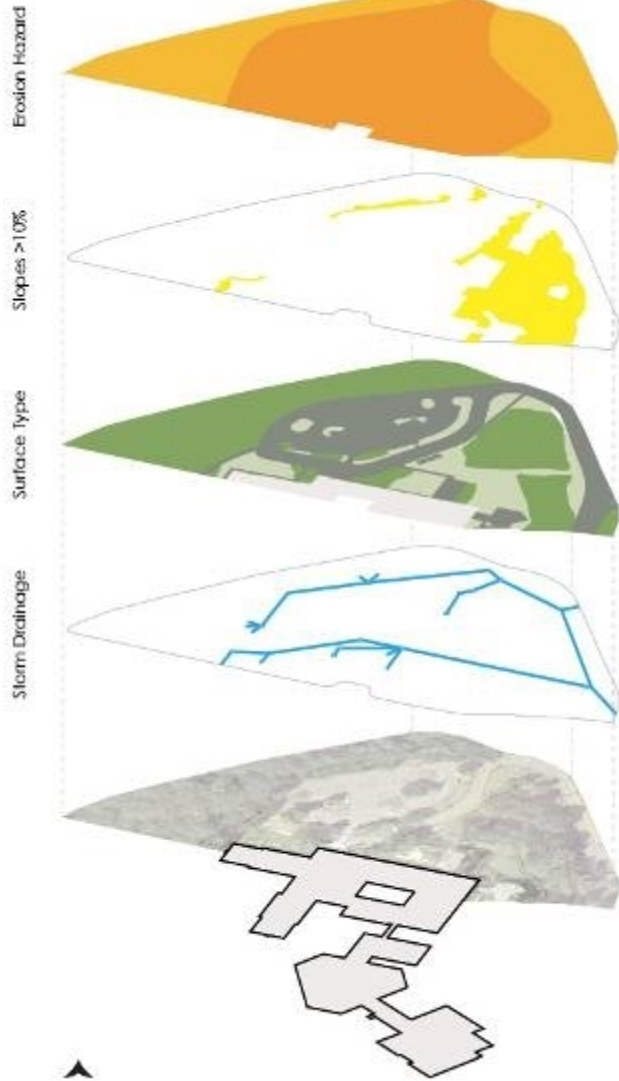




- ES Erosion & Sedimentation Mitigation
- HV Habitat & Vegetation Improvement
- EO Educational Opportunity

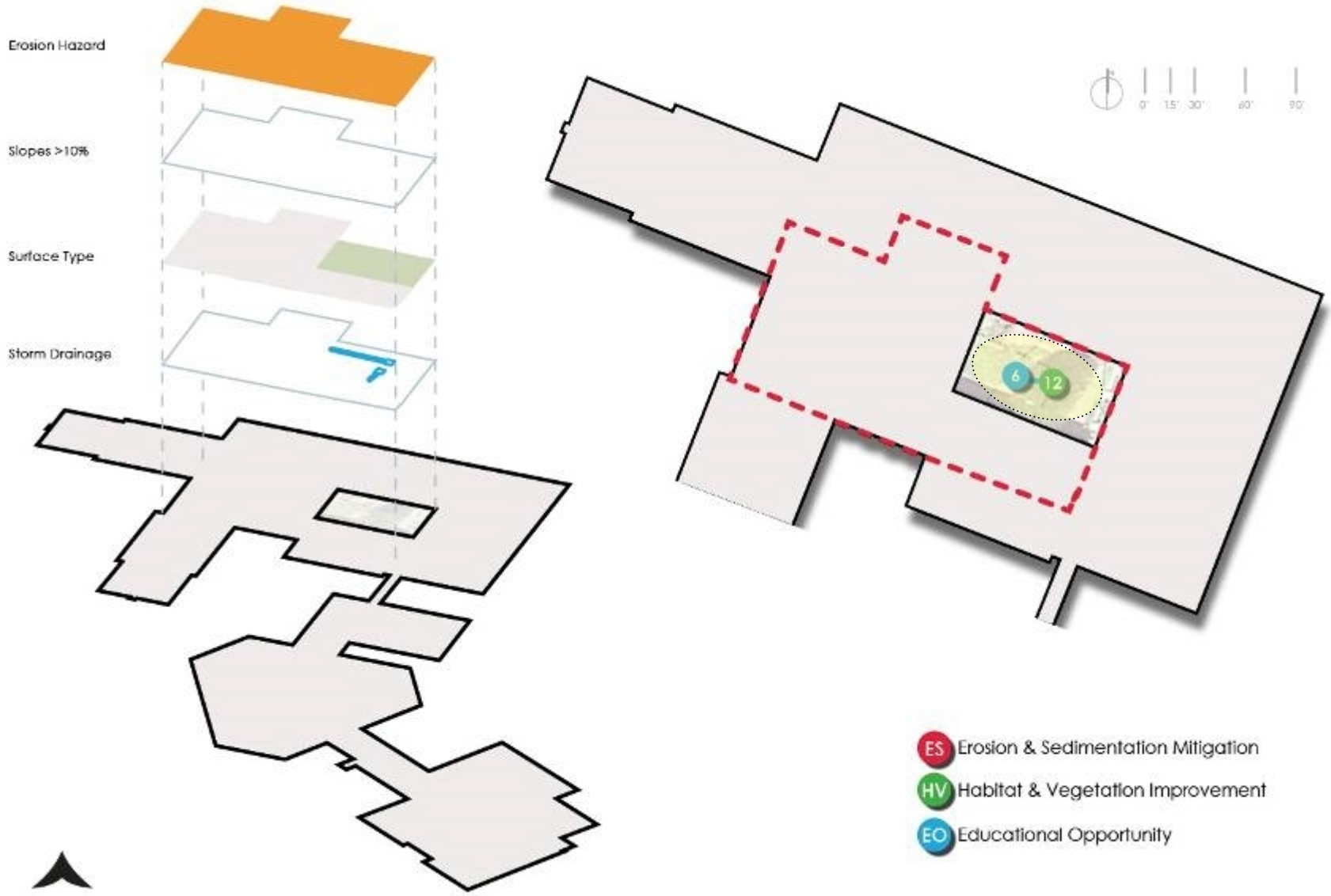
# Drainage Area 1



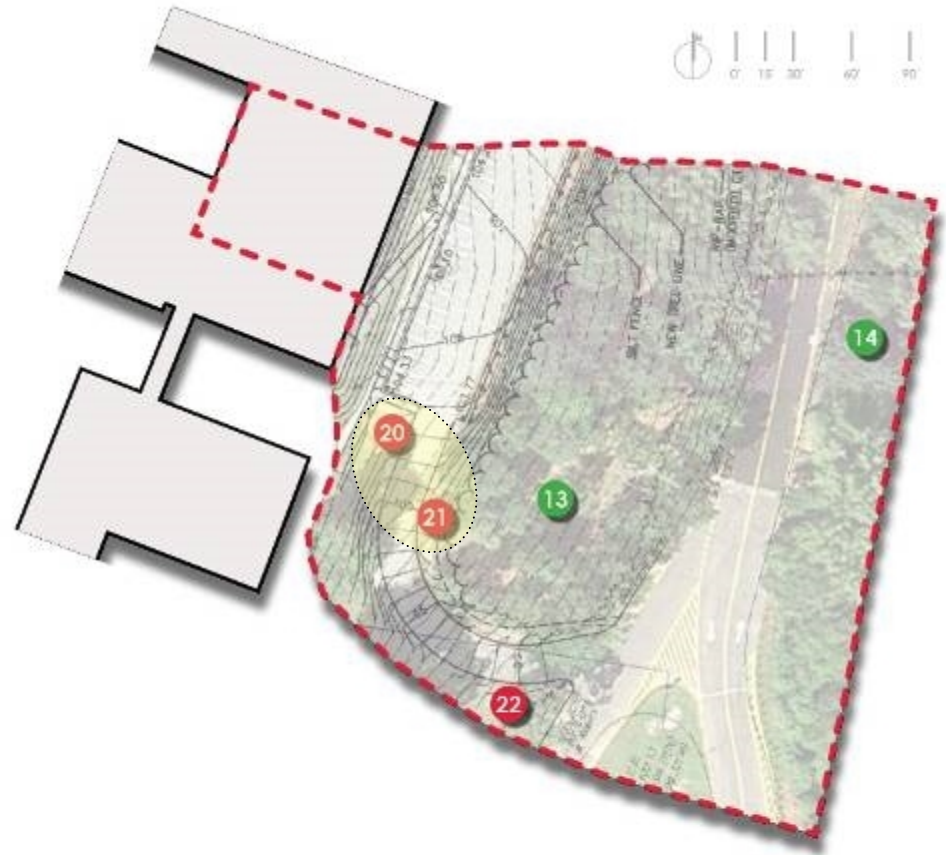
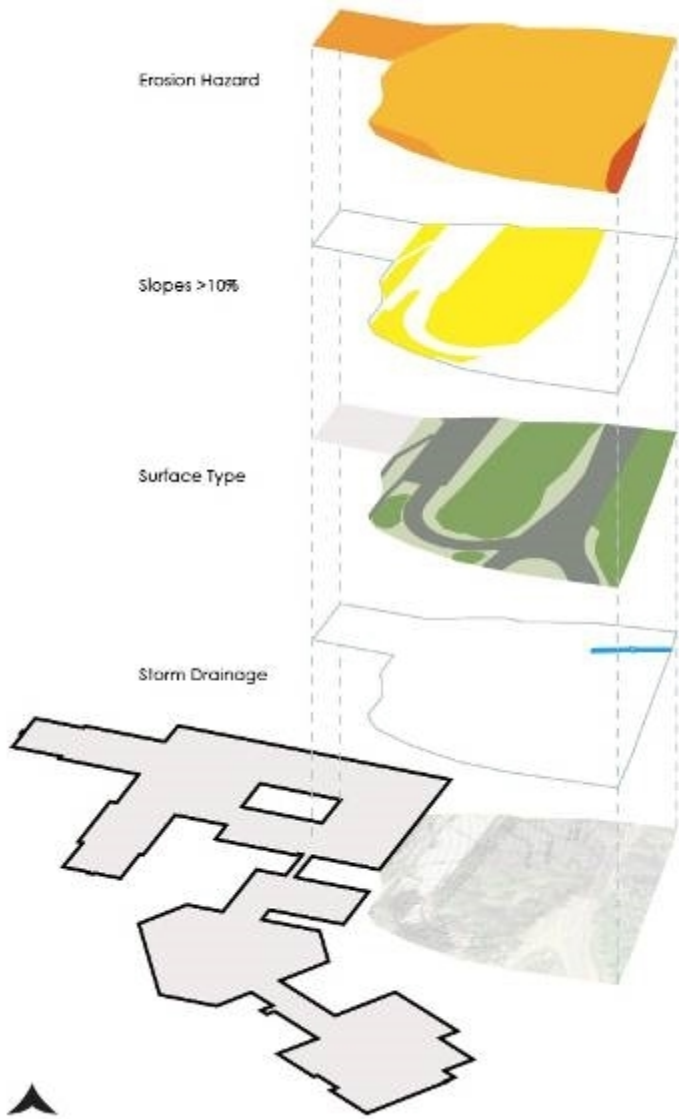


- ES Erosion & Sedimentation Mitigation
- HV Habitat & Vegetation Improvement
- EO Educational Opportunity

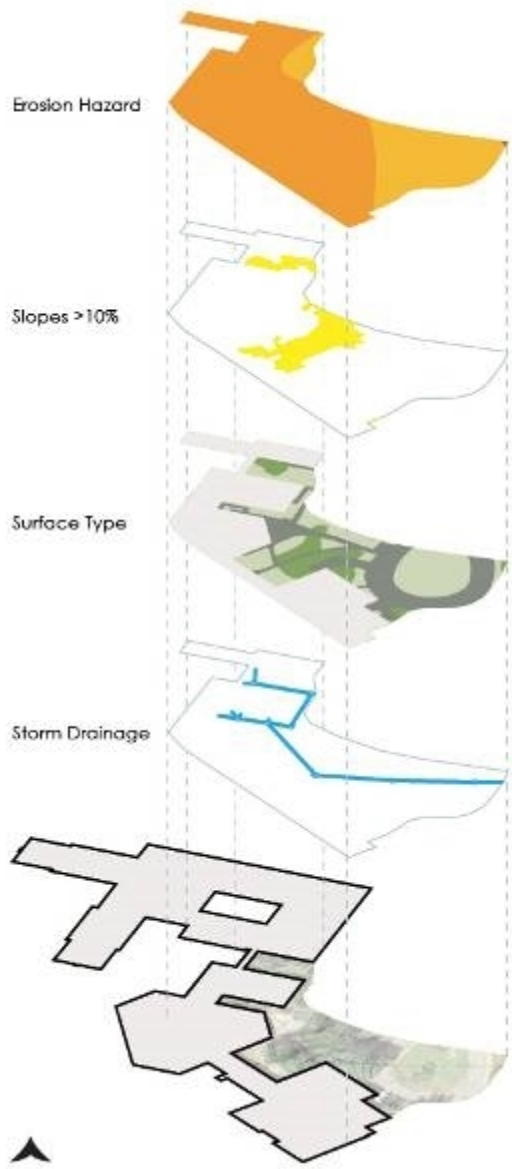
## Drainage Area 2



# Drainage Area 3



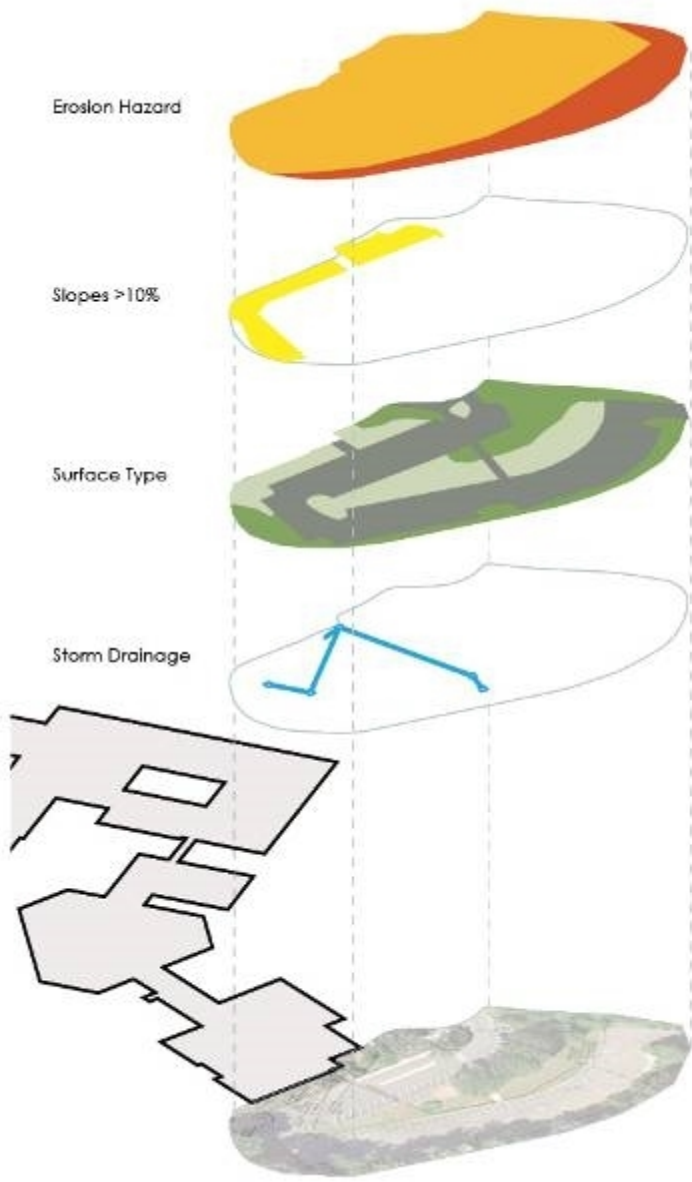
# Drainage Area 4



- ES Erosion & Sedimentation Mitigation
- HV Habitat & Vegetation Improvement
- EO Educational Opportunity

# Drainage Area 5





- ES Erosion & Sedimentation Mitigation
- HV Habitat & Vegetation Improvement
- EO Educational Opportunity

# Drainage Area 6

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# Master Plan & Recommended Improvements

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Beecher Road School

# EROSION & SEDIMENTATION MITIGATION

©2011 FUS  
 18100  
 18100  
 18100



**1 Catch Basin Cleaning**  
**Energy Disposer Outfall**  
 Drainage Area 1  
 Priority: High  
 Cost: \$0

Remove sediment build up within annual catch basins. Provide slope energy dissipator at outfalls.



**2 Biofiltration Swales**  
 Drainage Area 1  
 Priority: Med/High  
 Cost: \$

Create biofiltration swales along outer side of existing parking decks. Receive with slope designed.



**3 Rain Garden / Retention Basin**  
 Drainage Area 1  
 Priority: Low/Med  
 Cost: \$0

Convert lawn areas adjacent to wing to rain garden. Install grade retention structure near building. Make inlet of catch basin and convert to down flow structure. Use mulch in retention.



**4 Biofiltration Swales**  
 Drainage Area 1  
 Priority: Med/High  
 Cost: \$

Create biofiltration swales along inner edge of parking deck. Provide with slope designed.



**5 Biofiltration Swales**  
 Drainage Area 1  
 Priority: High  
 Cost: \$

Create biofiltration swales in wooded area for lateral flow to catch basins.



**6 Formalize Walk**  
**Revegetate Slope**  
 Drainage Area 1  
 Priority: High  
 Cost: \$0

Provide new concrete walk from "U" deck. Wing plan to be installed soon. Vegetate wooded area with non-invasive plants to gain better hold. Prevent erosion along foot path. A.K.A. tree hold kit.



**7 Revegetate Slope**  
 Drainage Area 1  
 Priority: High  
 Cost: \$0

Revegetate heavily eroded slope and install habitat with erosion control measures and hardy understory plants.



**8 Rain Garden**  
 Drainage Area 1  
 Priority: Med/Low  
 Cost: \$0

Convert lawn at foot of slope to rain garden. Make inlet of catch basin and convert to down flow structure to remove for fully. A.K.A. Retain.



**9 Rain Garden**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$

Convert open area north of "U" wing. Install biofiltration swales. Make inlet of catch basin and convert to down flow structure. Use mulch in retention.



**10 Formalize Walk**  
**Revegetate Slope**  
**Biofiltration Swales**  
 Drainage Area 1  
 Priority: Med/High  
 Cost: \$0

Provide concrete walk from wing to catch basin. Provide with slope designed. Provide with slope designed. Provide with slope designed. Provide with slope designed.



**11 Establish Gravel Edge**  
**Biofiltration Swale**  
 Drainage Area 1  
 Priority: High  
 Cost: \$

Install gravel parking barrier edge to retention structure and outflow. Form and grade structure at biofiltration swale.



**12 Energy Disposer**  
**Revegetate Slopes**  
 Drainage Area 1  
 Priority: High  
 Cost: \$

Provide 30" x 30" in rip rap energy dissipator at catch basin. Vegetate surrounding slopes with erosion control measures and hardy understory shrubs for habitat and erosion prevention.



**13 Remove Pavement**  
**Biofiltration Swale**  
 Drainage Area 1  
 Priority: Med/Low  
 Cost: \$0

Remove pavement and convert to biofiltration swale.



**14 Establish Gravel Gathering Area**  
**Revegetate Slopes**  
 Drainage Area 1  
 Priority: High  
 Cost: \$0

Install gravel gravel gathering / vehicle exit area of top level catch basin. Form slope with erosion prevention measures. Provide shrubs for erosion control, habitat and understory plants.



**15 Remove Pavement**  
**New Pavement**  
 Drainage Area 1  
 Priority: Med/Low  
 Cost: \$0

Remove existing concrete to pavement outside of structural elements. Replace with porous pavement.



**16 Rain Garden**  
 Drainage Area 1  
 Priority: High  
 Cost: \$0

Convert lawn area at foot of slope to rain garden. Make inlet of catch basin and convert to down flow structure to remove for fully. A.K.A. Retain.



**17 Biofiltration Swale**  
 Drainage Area 1  
 Priority: Low  
 Cost: \$

Convert existing wet lawn to biofiltration swale near edge of road.



**18 Rain Garden**  
 Drainage Area 2 & 2  
 Priority: High  
 Cost: \$0

Convert lawn area of "U" wing to rain garden. Install grade retention structure near building. Make inlet of catch basin and convert to down flow structure to remove for fully. A.K.A. Retain.



**19 Remove Pavement**  
**New Porous Pavement**  
 Drainage Area 2  
 Priority: Low  
 Cost: \$0

Convert asphalt road to porous pavement.



**20 Revegetate Slope**  
 Drainage Area 4  
 Priority: Med/High  
 Cost: \$

Revegetate slope with erosion prevention measures and habitat plants to gain better hold. Provide shrubs for erosion control, habitat and understory plants.



**21 Biofiltration Swales**  
 Drainage Area 4  
 Priority: Med  
 Cost: \$0

Create biofiltration swales along both sides of existing deck.



**22 Porous Pavement**  
 Drainage Area 4  
 Priority: Low  
 Cost: \$0

Provide porous pavement parking structure in wooded for the retention office.



**23 Rain Garden**  
 Drainage Area 2  
 Priority: Med  
 Cost: \$0

Convert lawn area of "U" wing. Install grade retention structure near building. Make inlet of catch basin and convert to down flow structure to remove for fully. A.K.A. Retain.



**24 Revegetate Slopes**  
**Rain Garden**  
 Drainage Area 2  
 Priority: Med  
 Cost: \$

Convert existing lawn area between "U" and "V" wing to erosion prevention structure and habitat plants to gain better hold. Provide shrubs for erosion control, habitat and understory plants.



**25 Biofiltration Swales**  
 Drainage Area 5  
 Priority: Low/Med  
 Cost: \$

Create biofiltration swales along north side of existing catch basin. Vegetate catch basin with erosion prevention measures and habitat plants.



**26 Biofiltration Swales**  
 Drainage Area 5  
 Priority: Med/High  
 Cost: \$0

Convert lawn of wide concrete walk to biofiltration swales. Create biofiltration swales along both sides of new deck walkway.



**27 Revegetate Slope**  
 Drainage Area 5  
 Priority: Med/Low  
 Cost: \$0

Revegetate steep slope with erosion prevention and habitat plants to gain better hold. Provide shrubs for erosion control, habitat and understory plants.



**28 Revegetate Slope / New Walk & Stairs**  
 Drainage Area 5  
 Priority: High  
 Cost: \$0

Revegetate slope with erosion prevention and habitat plants to gain better hold. Provide shrubs for erosion control, habitat and understory plants. Consider addition of concrete walk from existing walkway to stairs.



**29 Revegetate Slope**  
 Drainage Area 5  
 Priority: High  
 Cost: \$0

Revegetate steep slope with erosion prevention and habitat plants to gain better hold. Provide shrubs for erosion control, habitat and understory plants.



**30 Remove Pavement**  
 Drainage Area 5  
 Priority: Low  
 Cost: \$0

Convert asphalt road to porous pavement.

## Recommended Improvements



# HABITAT & VEGETATION IMPROVEMENTS

COSTS  
 \$ - \$4,700  
 \$5 - \$10,000  
 \$15 - \$30,000  
 \$35 - \$50,000



**1**  
**Define Edge with Low Invasives**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$

Accommodate environmental functions long-term by defining edge with low environmental sensitive vegetation.



**2**  
**Establish Gravel Viewing Area**  
**Define with Low Invasives**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$5

Define potential edge with gravel to reduce woody vegetation. Current wood chip coverage of base could be removed and replaced.



**3**  
**Define Edge with Low Invasives**  
**Wood/Bat Boxes**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$5

Define edge of field with low environmental sensitive vegetation and wood/bat boxes for structure and as a low-cost way to verify low environmental sensitive vegetation.



**4**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$

Remove invasives, establish natural forest for property line with low environmental sensitive vegetation.



**5**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 1  
 Priority: Low/Med  
 Cost: \$5

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings.



**6**  
**Remove Invasives**  
**Revegetate Slope**  
 Drainage Area 1  
 Priority: Med  
 Cost: \$

Remove invasives, establish slope with native grasses, shrubs and/or native forbs for slope stabilization, reduce maintenance & habitat value.



**7**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 1  
 Priority: Low  
 Cost: \$5

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings.



**8**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 2  
 Priority: Low  
 Cost: \$5

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings.



**9**  
**Butterfly/Bat Gardens**  
 Drainage Area 2  
 Priority: Med  
 Cost: \$

Create a 10' garden plot for habitat design and management by local Green Guardians. Local Green Guardians can assist with design.



**10**  
**Green Roof / Blue Roof**  
 All Drainage Areas  
 Priority: Low  
 Cost: N/A

Potential to convert flat portions of existing roof to help conditions for green infrastructure or blue infrastructure. Add habitat and reduce urban heat island.



**11**  
**Selective Clear Cut**  
**Remove Invasives**  
**Native Display Garden**  
**Bat/Bat Boxes**  
 Drainage Area 2  
 Priority: Low  
 Cost: \$50

Remove invasives, selective clear cut to provide habitat visibility. Establish native display garden with woody vegetation and seedlings. Add habitat and reduce urban heat island.



**12**  
**Ornamental Sustainability Garden**  
 Drainage Area 3  
 Priority: Low/Med  
 Cost: \$5

Remove existing plants and install design with ornamental natives for sustainability and habitat value.



**13**  
**Selective Clear Cut**  
**Remove Invasives**  
**Woodland Buffer**  
 Drainage Area 4  
 Priority: Low  
 Cost: \$55

Remove invasives, establish native buffer with woody vegetation and seedlings. Selective clear cut to provide habitat visibility & energy.



**14**  
**Remove Invasives**  
**Woodland Buffer**  
 Drainage Area 4  
 Priority: Low  
 Cost: \$55

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings. Local Green Guardians can assist with design.



**15**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 3  
 Priority: Med  
 Cost: \$

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings.



**16**  
**Woodland Buffer**  
**Remove Invasives**  
 Drainage Area 4  
 Priority: Low  
 Cost: \$5

Remove invasives to width 10'-15' of woodland edge. Establish native buffer with woody vegetation and seedlings.

# EDUCATIONAL OPPORTUNITIES



**1**  
**Native Plant Identification**  
 Trail  
 Drainage Area 1  
 Priority: N/A  
 Cost: N/A

Provide signage to identify native plants in demonstration trail. Establish trails.



**2**  
**Outdoor Classroom & Learning Gardens**  
 Drainage Area 1  
 Priority: N/A  
 Cost: N/A

Construct cap of field to establish classroom and learning garden space. Include signage of local plants. Opportunity to build only field use trail adjacent.



**3**  
**Perennial Power & Rain Garden**  
**UID Demonstration Area**  
 Drainage Area 1  
 Priority: N/A  
 Cost: N/A

Convert perennial power field to demonstration area. Convert field to trail to rain garden. Use in conjunction to both trail & rain garden.



**4**  
**Classroom-Managed Butterfly/Bat Gardens**  
 Drainage Area 2  
 Priority: N/A  
 Cost: N/A

Create a 10' garden plot for habitat design and management by local Green Guardians. Local Green Guardians can assist with design.



**5**  
**Native Habitat Display Garden**  
 Drainage Area 2  
 Priority: N/A  
 Cost: N/A

Establish display garden with ornamental natives. Provide green infrastructure & demonstration of low water usage. Use signage to identify native plants of local area. Local Green Guardians can assist with design.



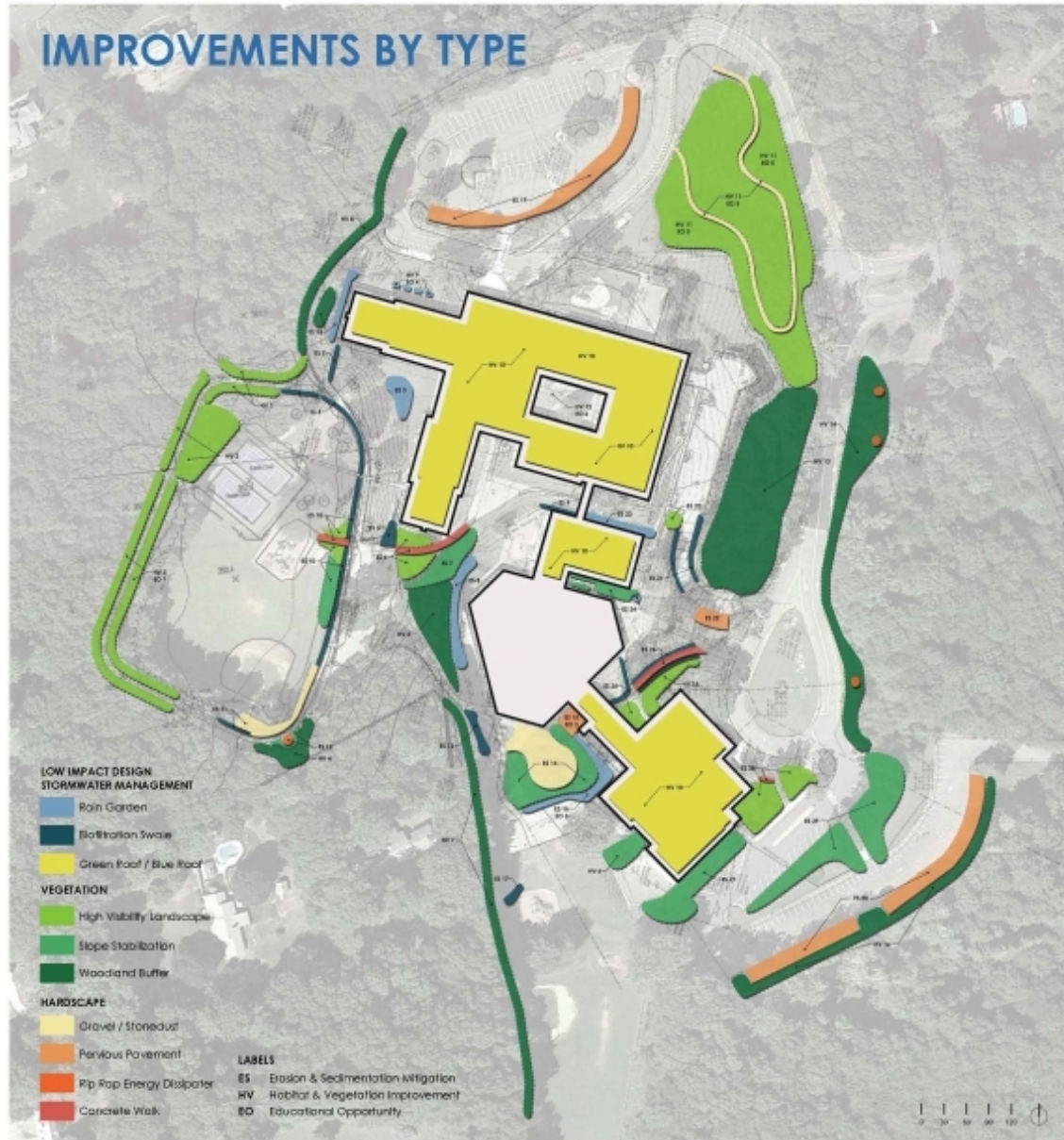
**6**  
**Rainwater Collection / Sustainability Garden**  
 Drainage Area 3  
 Priority: N/A  
 Cost: N/A

Establish display garden with ornamental natives & provide green infrastructure & demonstration of low water usage. Use signage to identify native plants of local area. Local Green Guardians can assist with design.

# Recommended Improvements



# IMPROVEMENTS BY TYPE







## Green Roof / Blue Roof



## Pervious Pavement



Example Improvements – Higher-cost Solutions



# Rain Garden

ES-3



Site Specific Improvements

# Revegetate Slope / Formalize Walk

ES-6



Site Specific Improvements



# Establish Gravel Gathering Area / Revegetate Slope

ES-14



Site Specific Improvements



# Rain Garden

ES-18



Site Specific Improvements

# Selective Clear Cut / Remove Invasives / Native Display Garden / Bird Boxes



EO-5 / HV-11

## Site Specific Improvements



# Ornamental Sustainability Garden

EO-6 / HV-12



Site Specific Improvements



# Biofiltration Swale

ES-21



Site Specific Improvements

# Pervious Pavers / Revegetate Slope

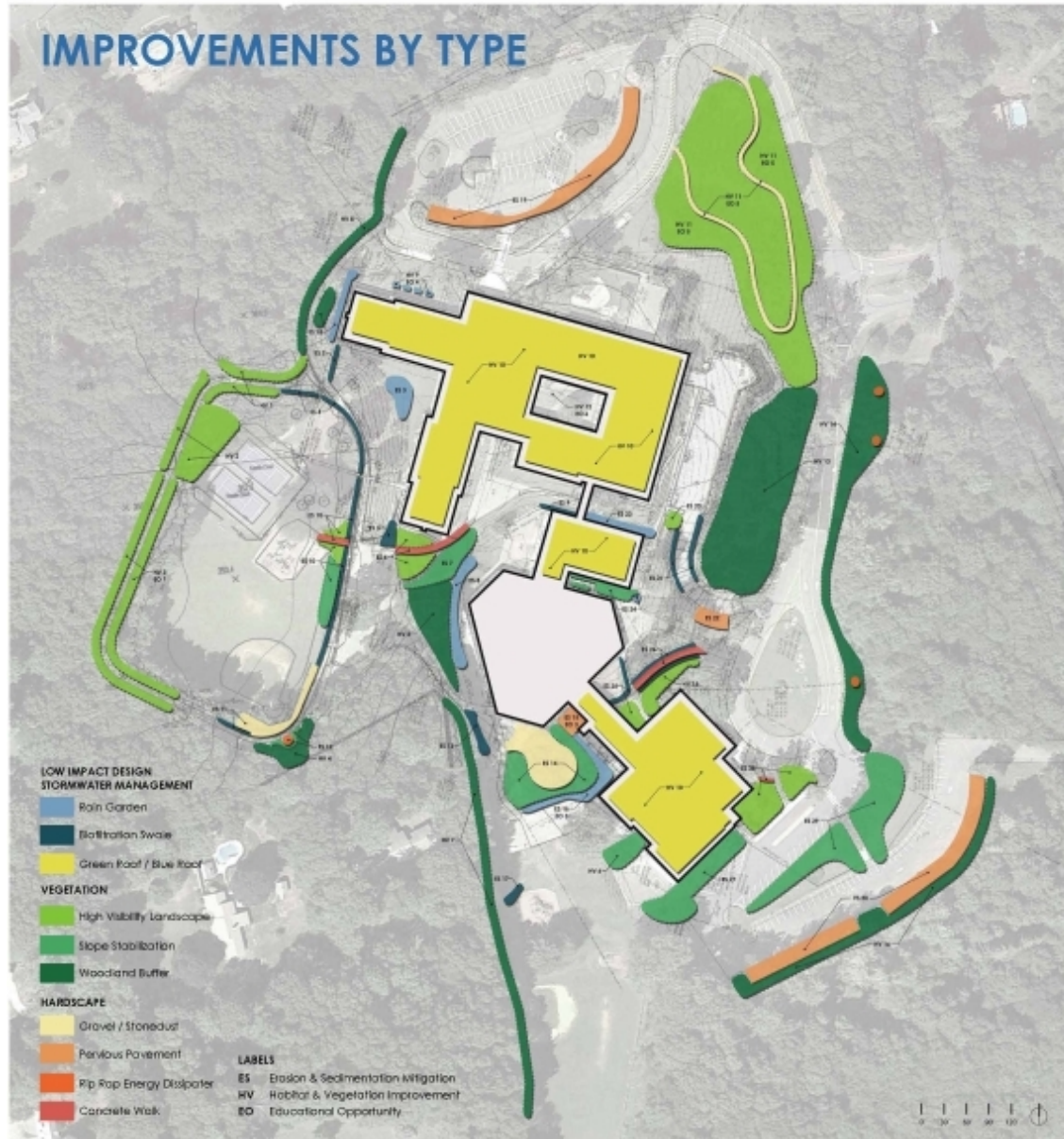
ES-29&30 / HV-16



Site Specific Improvements



# IMPROVEMENTS BY TYPE



Thank You!



# Drainage Area 1



Kucinkas Loop

# Drainage Area 1



## B Wing Playground Access



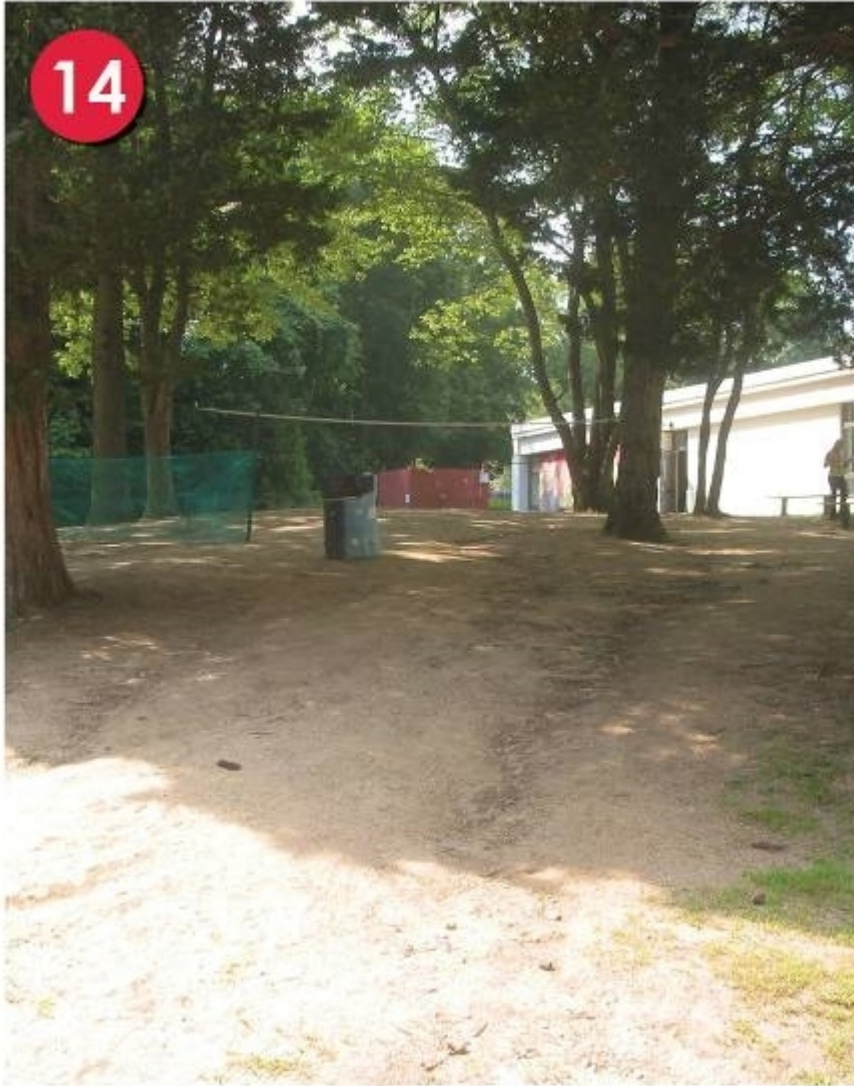
# Drainage Area 1



Baseball Field & Southern Property Line



# Drainage Area 1



Art & Science (S Wing)

## Drainage Area 2



**A Wing / 1<sup>st</sup> Grade Classrooms**



## Drainage Area 2



North Parking Lot Entry



# Drainage Area 3



## Interior Courtyard

## Drainage Area 4



Upper Eastern Drive / D Wing Access



# Drainage Area 5



## Recreation Office Entry (E Wing)



## Drainage Area 6



**District Office Entry (E Wing)**

## Drainage Area 6



**E Wing (Pool) Parking Lots**