# GREEN INFRASTRUCTURE LESSONS FROM THE FIELD

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# RISE OF GREEN INFRASTRUCTURE:

- IMPLEMENTATION – GI has seen a significant expansion of use in past decade.
- SUCCESS – GI is becoming more widely accepted as a water quantity and quality tool.
- FAILURE – GI design, placement and maintenance has proven more difficult than traditional “bury it” infrastructure.

# COMMON PERCEPTIONS OF GREEN INFRASTRUCTURE:

- COST – GI is expensive when compared to traditional infrastructure.
- AESTHETICS – GI looks weedy and unkempt.
- MAINTENANCE – GI is more expensive and difficult to maintain than traditional infrastructure.




# CHALLENGES & PERCEPTIONS


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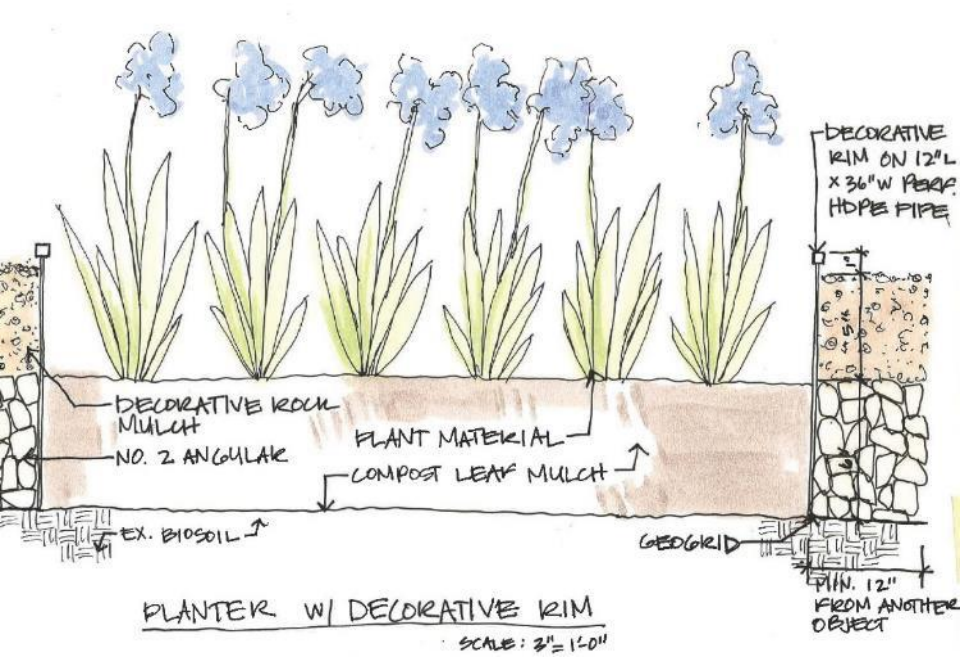
# MINIMIZE COMPLEXITY




# GOOD DESIGN & MAINTENANCE

# LIMIT SPECIES & COVERAGE OF PLANTS

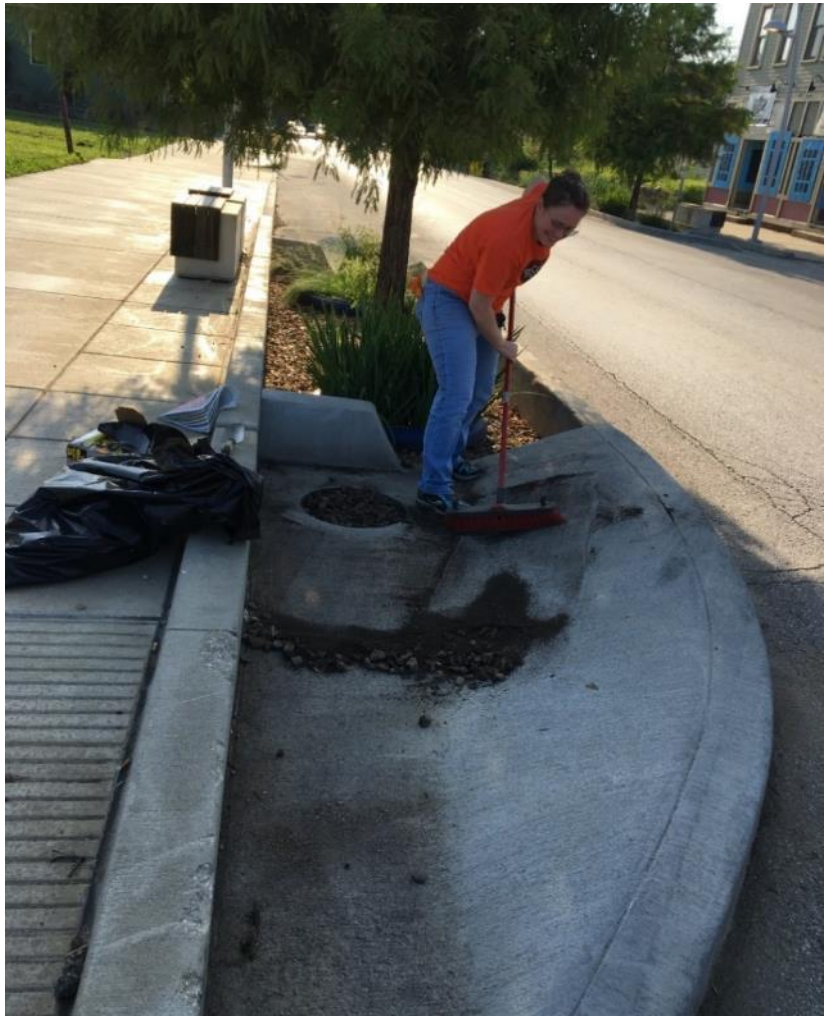


## GOOD DESIGN & MAINTENANCE

# CONSIDER SEDIMENTS & SURROUNDING CONDITION

## GOOD DESIGN & MAINTENANCE

# MAINTENANCE IS MANDATORY



## GOOD DESIGN & MAINTENANCE

# CREATE A PLACE OF SIGNIFICANCE


## GOOD DESIGN & MAINTENANCE

# GENEVA MIDDLE SCHOOL


# BIOSWALE YEAR 3

# BIOSWALE CURB CUT EROSION

# MOWED BIOSWALE DUE TO TREE PLACEMENT

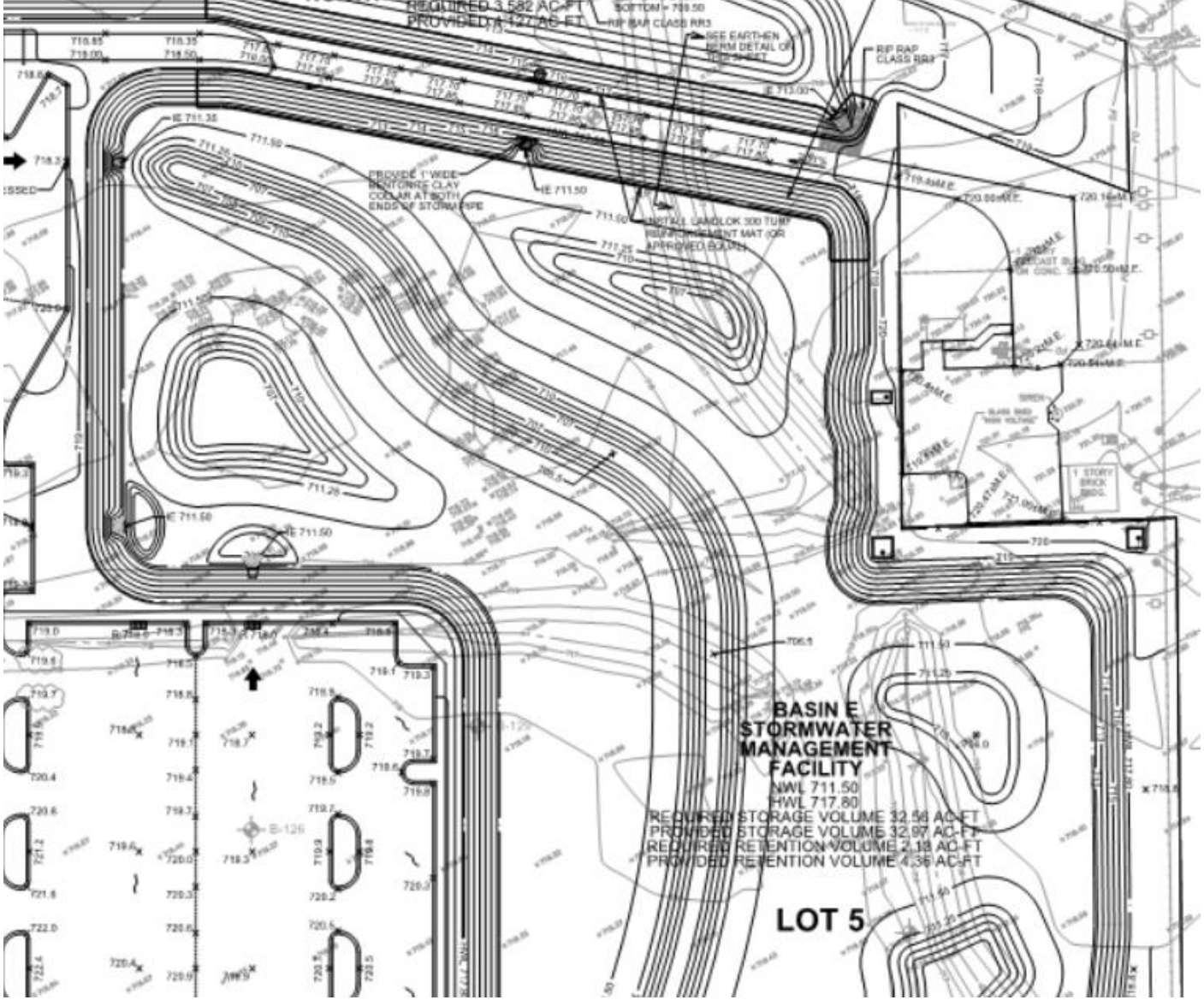
# SUCCESSFUL NATURALIZED BASIN YEAR 3

# ROMEOVILLE VILLAGE HALL


# BIOSWALE SHOWING SALT IMPACT

# BIOSWALE PROTECTED FROM SALT

# CPO EXPANSION




# GRD PLAN BIOSWALE DRAINAGE

# BASIN E 2016 – FAILED 2015 PLANTING

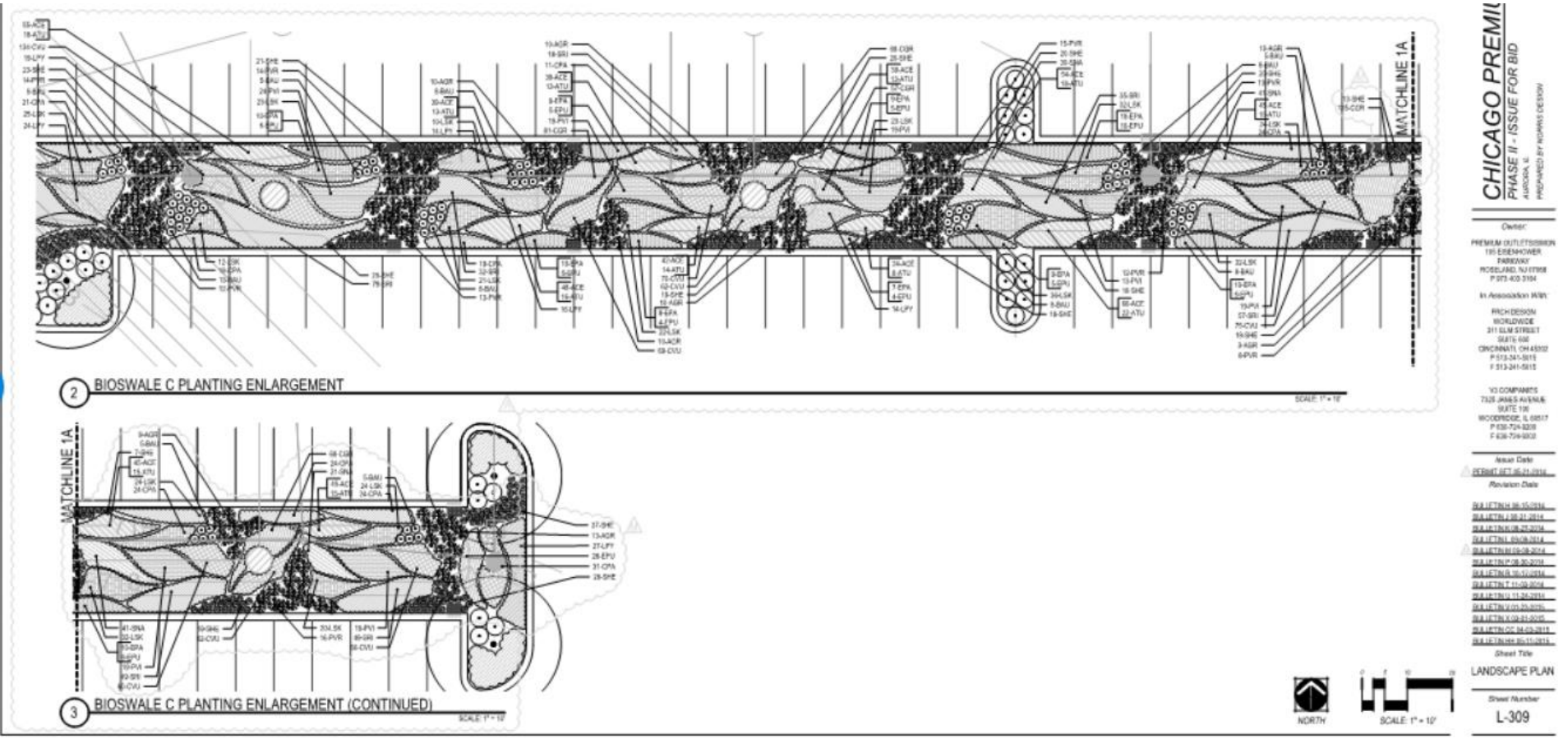
# BASIN E 2016 – SHORELINE DEAD ZONE FROM FLOODING

# BASIN E 2016 – IDENTIFYING POTENTIAL FUTURE PLANTING

# BASIN E 2017 – POST V3 REPLANTING

# BASIN E 2017 – POST V3 REPLANTING

# BASIN E 2018 – SUBSTANTIAL INCREASE IN VEGETATIVE COVER



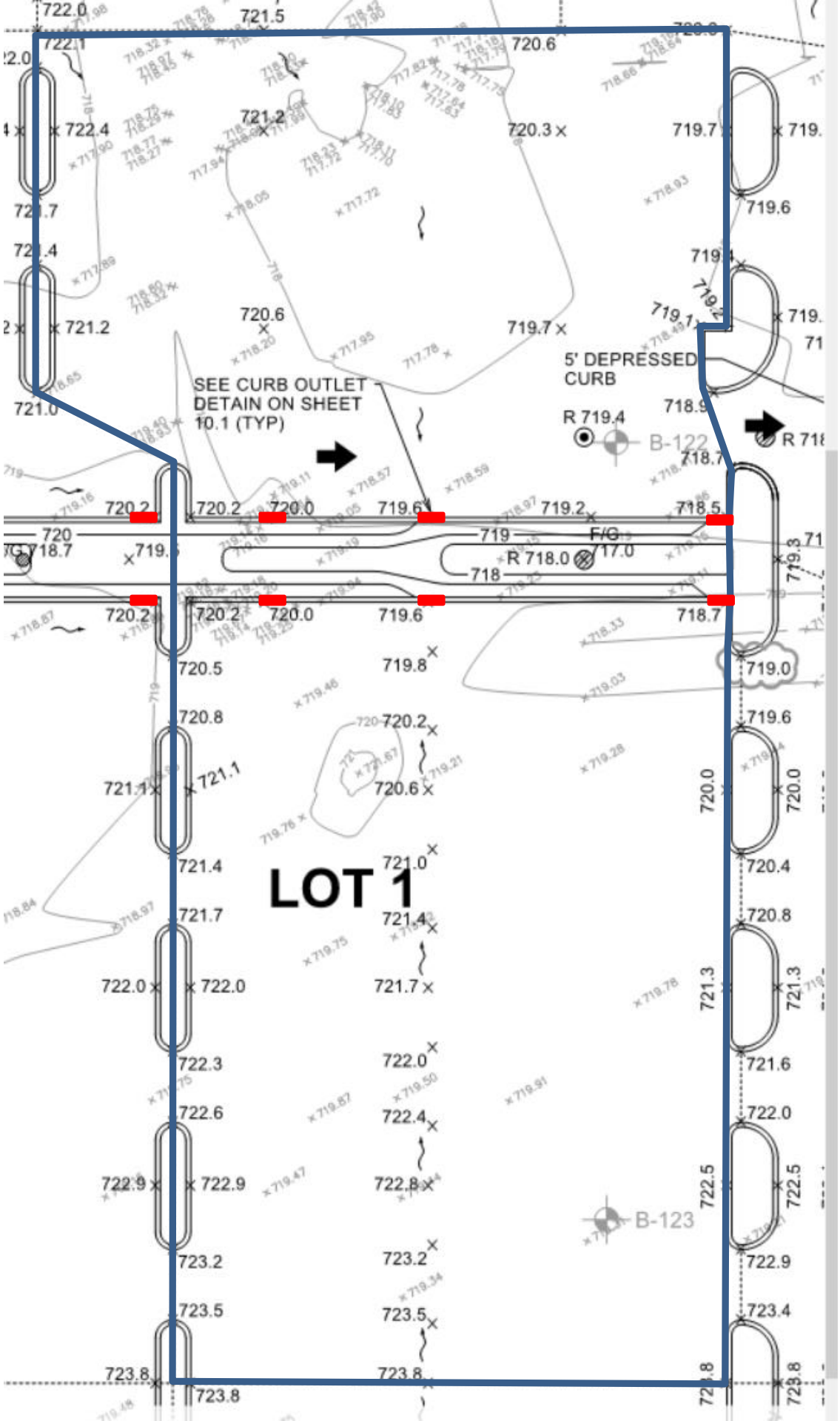

# BIOSWALE LANDSCAPE PLAN SHEET

# BIOSWALE 2017 – PRE-HERBICIDE APPLICATION

# BIOSWALE 2017 – POST-HERBICIDE APPLICATION

# BIOSWALE 2017 – FALL RESEEDING

# BIOSWALE 2018 - MOWED



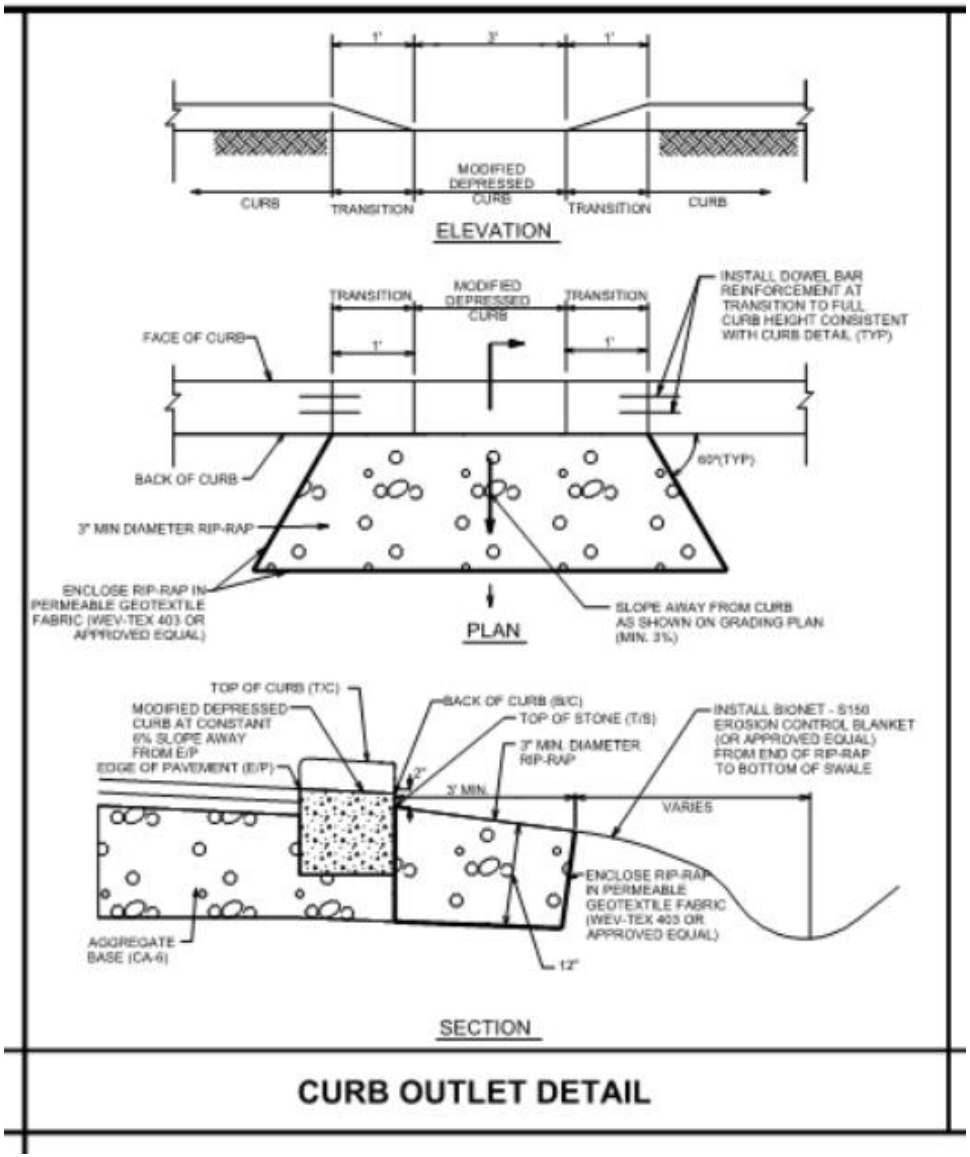

# GRD PLAN BIOSWALE DRAINAGE

# MARCH 2016 STORM FLOW

# MARCH 2016 STORM FLOW

# MARCH 2016 STORM FLOW

# RAIN EVENT INUNDATION



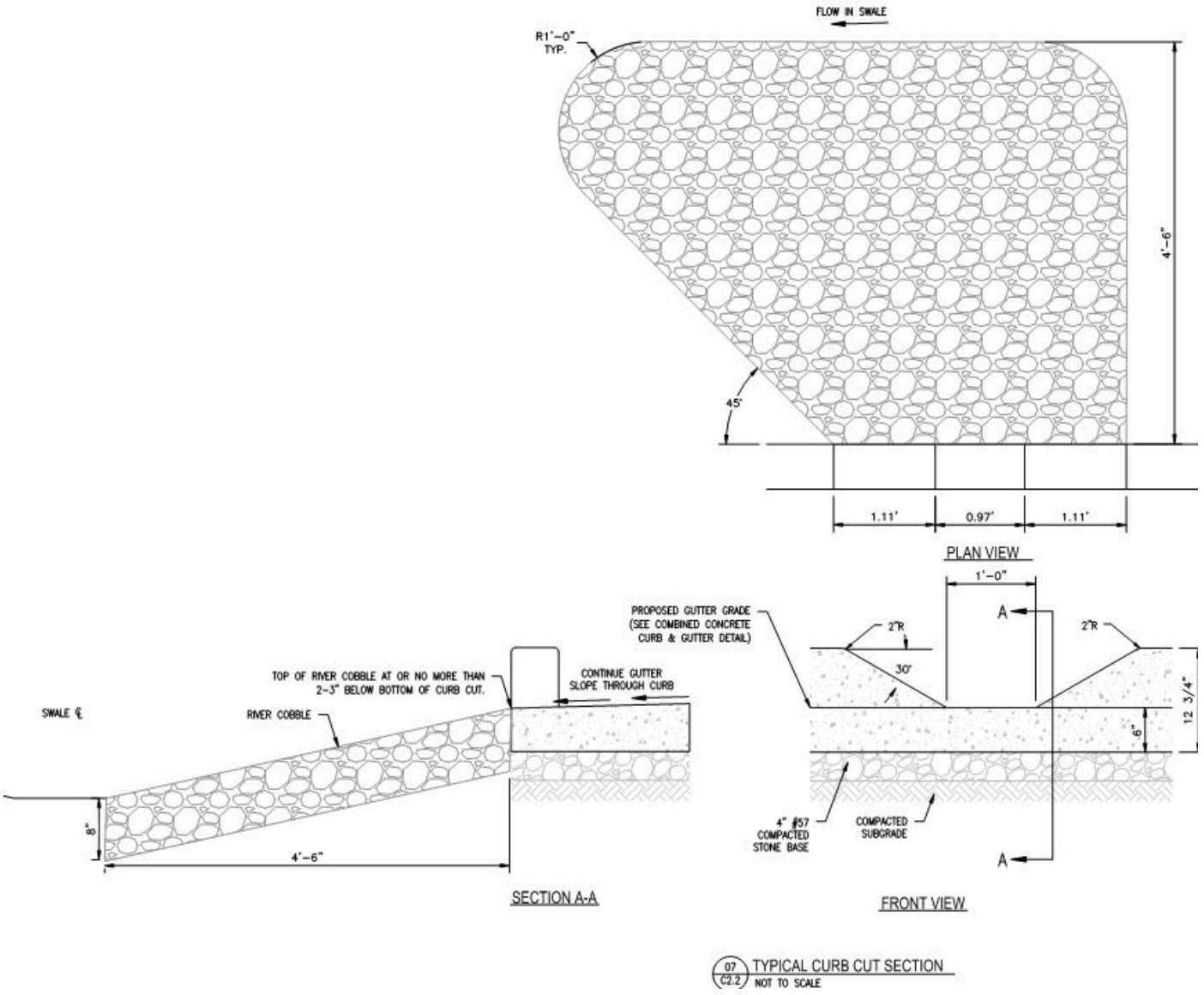

# CURB CUT DETAIL

# FAILED CURB CUT

# FAILED CURB CUT

# FAILED CURB CUT

# FAILED CURB CUT 4




# CURB CUT DETAIL

# ELMHURST CHRISTIAN REFORMED CHURCH

# ECRC 2009 – NEWLY PLANTED

# ECRC 2010 –ESTABLISHED SECOND YEAR PLANTS

# ECRC 2010 – JULY FLOODING

# ECRC 2010 – LOWERING WATER LEVELS TO REDUCE PLANT STRESS

# ECRC 2010 – SLOPE IMPACT FROM FLOODING

# ECRC 2010 – POST FLOODING

# ECRC 2010 – PLANT MORTALITY

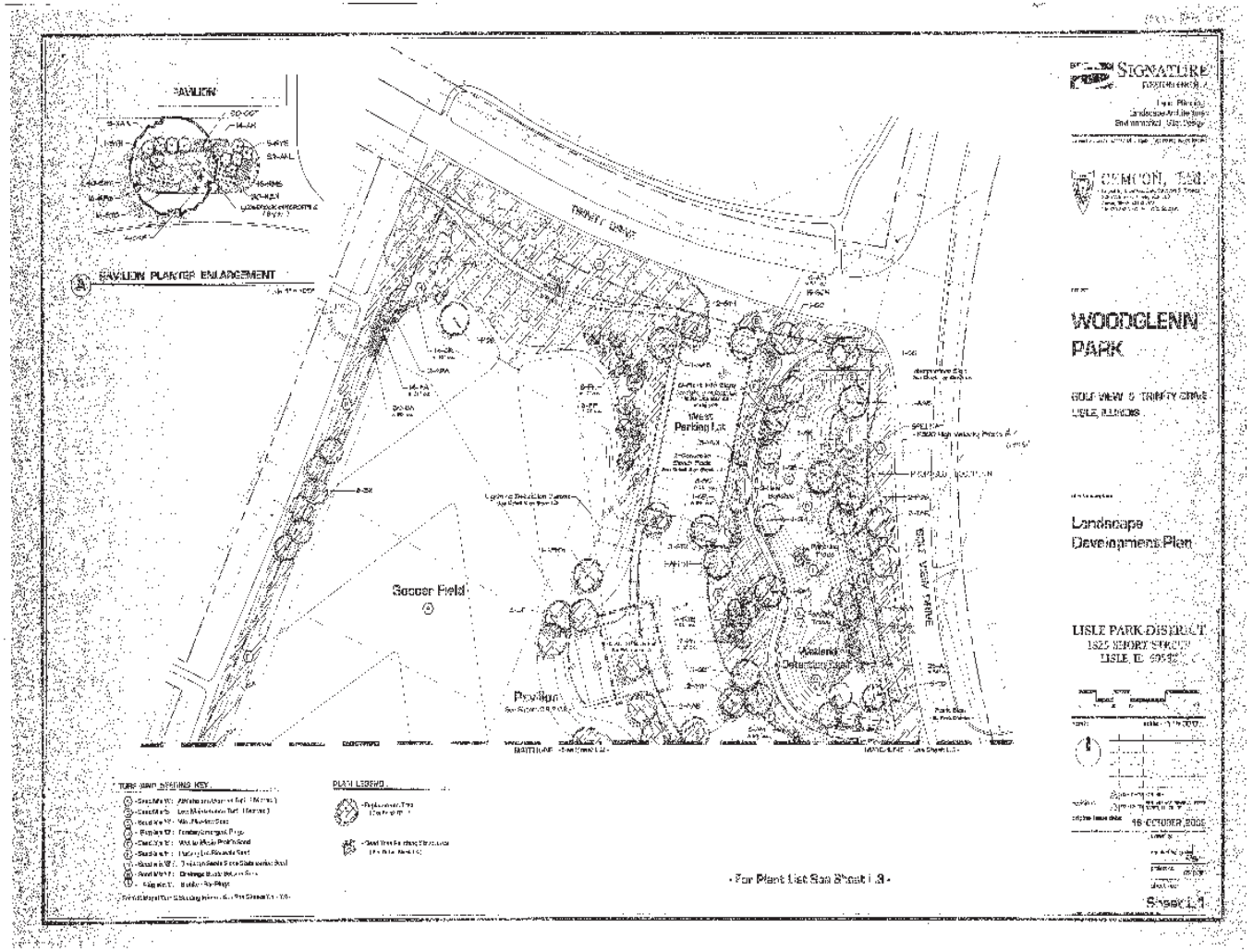
# ECRC 2011 – POST SUPPLEMENTAL PLANTING

# ECRC 2012 – SIGNS OF LOWER-SLOPE IMPACT FROM FLOODING


# ECRC 2012 – WETLAND PLANTS STILL THRIVING IN FOURTH YEAR

# ECRC – 2018 CONDITIONS

# WOODGLEN




# WOODGLEN BMP PLANTING PLAN

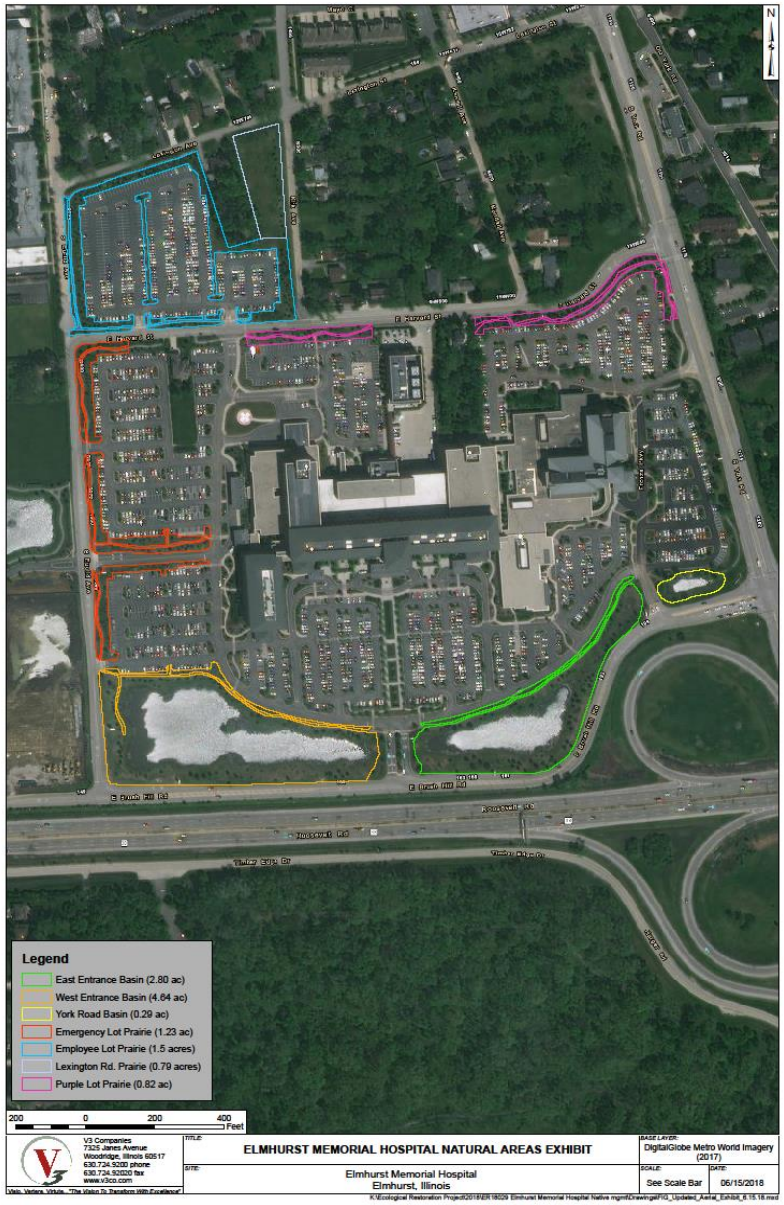
## VERY DENSE WOODY PLANTING RATES WITHIN PRAIRIE (153 SHRUBS/ACRE & 50 TREES/ACRE)

- Dense woody planting rate resulted in 50% shrub and 75% tree  mortality (100% was standard – 90% is typical).
- Did not achieve desired prairie establishment - standards failed.
- Recommend no greater than 15 trees/acre - if required.
- Avoid installing shrubs in prairie entirely.

# VEGETATIVE SWALE

# VEGETATED SWALE

# ELMHURST MEMORIAL HOSPITAL




# FIG UPDATED AERIAL EXHIBIT 6.15.18

# WEEDY PARKING LOT ISLAND

# OVERGROWN & UNMANAGED

# EXPANSION OF WOODY VEGETATION INTO PRAIRIE ISLANDS

# NARROW PRAIRIE STRIP

# DENSE WOODY VEGETATION ON BASIN PRAIRIE SLOPES

# SOUTH WEST QUAD BASIN 5

# NATURALIZED BASIN SUCCESS

# SUCCESSFUL VEGETATION ESTABLISHMENT ON SHORELINE & SLOPE – YEAR 3

# BUR REED ALONG SHORELINE

# 966 CORPORATE

# 2017 - VOLUME CONTROL BASIN WITH UNDERDRAIN

# 2017 FLOODING

# UNDERDRAIN ROCK INLET


# BASIN OVERVIEW 2018

# NO GROUND COVER ESTABLISHED UNDER TREES

# GREEN INFRASTRUCTURE DESIGN:

- HYDROLOGY IS KEY. Floodplains, Creeks, and Volume Control Basins Present More Complex Conditions for Plant Establishment.
- DON'T OVERDESIGN NATIVE LANDSCAPE - INTERGRATE INTO SURROUNDINGS. Focus on providing function and good aesthetics and facilitate long-term management.
- CONSIDER EROSION – When we take stormwater and keep it at the surface, rather than in pipe, we create soil/water erosion problems.

## TAKE HOME MESSAGE

# ENGINEER & SCIENTIST ROLE - GREEN INFRASTRUCTURE BMP:

- DESIGN– Integrate civil, stormwater, landscape and ecological design.
- AESTHETICS – Review construction documents. Does the BMP, stormwater & landscaping WORK?
- ENGAGE EXPERTS – Water/Science design, construction, & MAINTENANCE!

## TAKE HOME MESSAGE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