

## Memorandum

To: Program Projects and Operations Subcommittee  
From: Lori Laster, Stormwater Management Engineer  
Date: March 29, 2010  
Re: Stormwater Best Management Practices Program FY2011 Applications

---

The District received 7 applications for Fiscal Year 2011 for the Stormwater Best Management Practices Program.

City of Omaha – Benson Rain Garden Initiative – The City of Omaha will construct a bio-infiltration garden on the Benson Magnet High School Campus. They are requesting a cost share of \$10,000, the maximum of this program.

City of Omaha – Orchard Park Bio-Retention Garden – The City of Omaha will construct a bio-retention garden in Orchard Park as part of the Cole Creek Restoration Project. They are requesting a cost share of \$10,000, the maximum of this program.

City of Omaha – Pervious Pavement Bridge Embankments – The City of Omaha will install pervious concrete slab on the east side of the trail under the Blondo Street Bridge over West Papillion Creek and the trail along Big Papillion Creek near the 105<sup>th</sup> Street Bridge. They are requesting a cost share of \$10,000, the maximum of this program.

City of Omaha – Johnny Goodman Golf Course Bio-Retention Garden – The City of Omaha will construct a bio-retention garden on the Benson Johnny Goodman Golf Course. They are requesting a cost share of \$10,000, the maximum of this program.

Millard Public Schools – Cody Elementary School Drainage – Millard Public Schools will install 2 rain gardens and an infiltration trench to address drainage issues while providing outdoor classroom space for students. They are requesting a cost-share amount of \$8,510.

Bennington Public Schools – Wetland Restoration Project – Bennington Public Schools will convert a cornfield on their property located adjacent to Big Papillion Creek to a wetland and outdoor learning environment. They are requesting a cost share of \$10,000, the maximum of this program.

City of South Sioux City – Cardinal Park Rain Garden – The City of South Sioux City will install a rain garden in Cardinal Park. They are requesting a cost-share amount of \$6,778.

The FY 2010 budget for this program was \$33,290.

<b>Project Name</b>	<b>Total Project Cost</b>	<b>Cost Share Requested</b>
Benson Rain Garden Initiative	\$55,000	\$10,000
Orchard Park Bio-Retention Garden	\$41,000	\$10,000
Pervious Pavement Bridge Embankments	\$35,400	\$10,000
Johnny Goodman Golf Course Bio-Retention Garden	\$29,000	\$10,000
Cody Elementary School Drainage	\$17,020	\$8,510
Wetland Restoration Project	\$52,500	\$10,000
Cardinal Park Rain Garden	\$13,555	\$6,778
<b>Total</b>	<b>\$243,475</b>	<b>\$65,288</b>

- Staff recommends that the Subcommittee recommend to the Board of Directors that the District approve the Benson Rain Garden Initiative application for \$10,000, the Orchard Park Bio-Retention Garden application for \$10,000, the Pervious Pavement Bridge Embankments application for \$10,000, the Johnny Goodman Golf Course Bio-Retention Garden application for \$10,000, the Cody Elementary School Drainage application for \$8,510, the Wetland Restoration Project application for \$10,000, and the Cardinal Park Rain Garden application for \$6,778, a total of \$65,288 for District Program 17.41, Stormwater BMP Program, subject to funding the in Fiscal Year 2011 budget.



**17.41 STORMWATER BEST MANAGEMENT PRACTICES PROGRAM**

**SPECIAL PROJECT REQUEST APPLICATION**

1. DATE: 2/23/2010
2. PROJECT NAME: LIVING GREEN: BENSON RAINGARDEN INITIATIVE
3. PROJECT SPONSOR: CITY OF OMAHA - DIVISION OF ENVIRONMENTAL QUALITY  
ADDRESS: 5600 SOUTH 10th STREET  
OMAHA, NE 68107
4. CONTACT PERSON: NINA CUDAHY  
TITLE: \_\_\_\_\_
5. EMAIL AND PHONE: NINA.CUDAHY@CI.OMAHA.NE.US 402-444-3415

6. PROJECT LOCATION: OMAHA BENSON HIGH SCHOOL MAGNET  
5120 MAPLE STREET, OMAHA

7. DESCRIPTION OF STORMWATER BEST MANAGEMENT PRACTICE AND HOW IT WILL BE INCORPORATED IN THE PROJECT:

SEE ATTACHED DESCRIPTION

MAR - 4 2010

9. TOTAL ESTIMATED COST: \$55,000
10. COST SHARE REQUESTED: \$10,000
11. SIGNATURE/TITLE: Nina Cudahy, Quality Control Manager  
City of Omaha

### Douglas County-Omaha, NE



*Disclaimer:* Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

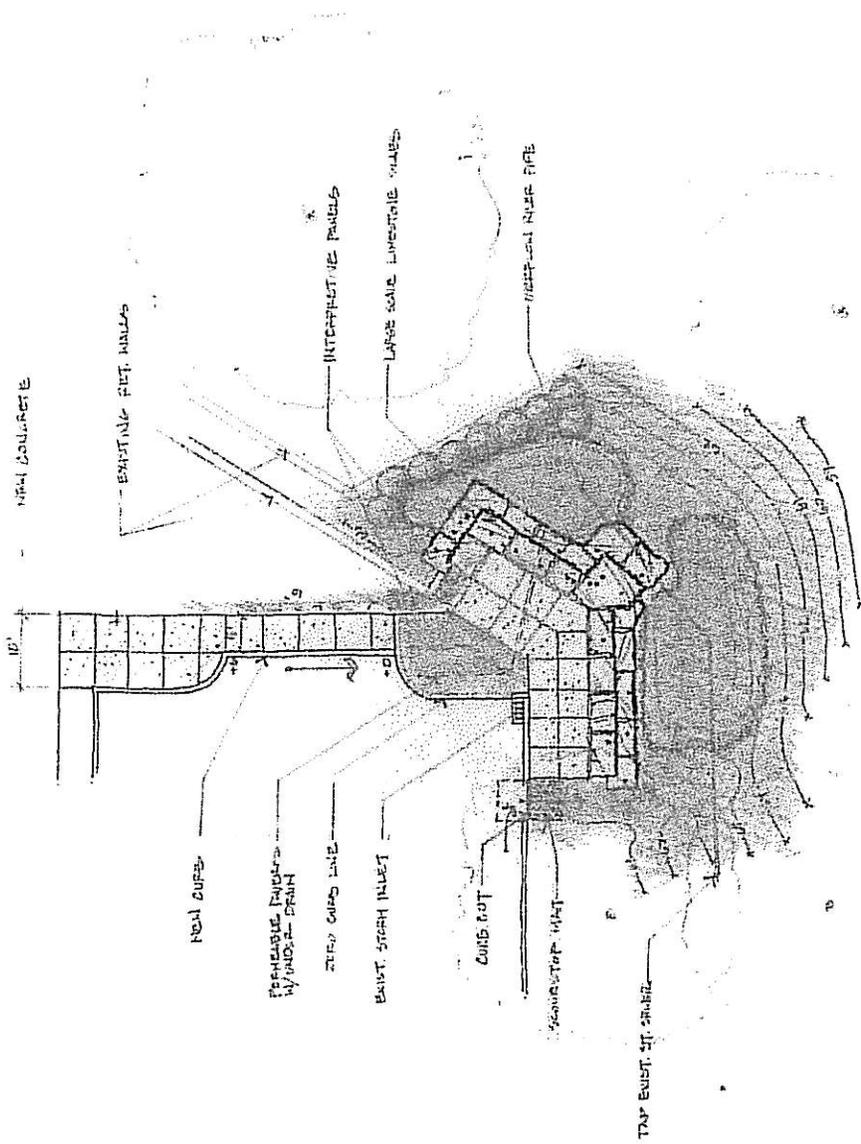
Map Scale  
1 inch = 346 feet

Living Green: Benson Raingarden Initiative  
P-MRNRD Stormwater BMP Program  
Statement of BMP Incorporation

The exclusive focus and purpose of the proposed project is centered on the construction of a bio-infiltration garden on the Benson Magnet High School Campus. The project has been a public awareness and student educational process between the City of Omaha, Omaha Public Schools, and Community ReDesigned as design consultant.

A pair of bio-infiltration gardens shall be constructed adjacent to the faculty parking area and will be sized to infiltrate, at a minimum, the ½" 'first flush' from the contributing watershed. Transference of water from the parking area to the gardens will be achieved from two drainage ways via both curb cut to vegetated swale and permeable pavers filtering and discharging into the gardens.

Upon completion, the gardens are intended to be utilized for classroom experiments and activities by faculty and students. Additionally they are to serve as a community awareness example to further educate achievable stormwater management opportunities at the single property owner scale.



BENSON MAGNET H.S.  
 RAIN GARDEN  
 12/31/09  
 1" = 10' - 0"  
 ASD # 1015

**Benson Raingarden**  
 Opinion of Probable Costs

Item	Estimated Quantity	Unit	Unit Price	Total
<b>Site Demolition</b>				
Concrete removal	175	SF	\$2.50	\$437.50
Sawcutting Pavement	55	LF	\$10.00	\$550.00
Clear and grub	4,700	SF	\$0.50	\$2,350.00
Stump Removal	1	allow	\$250.00	\$250.00
			<b>Subtotal</b>	<b>\$3,587.50</b>
<b>Earthwork and restoration</b>				
Silt Fence and sediment/erosion control	1	allow	\$1,000.00	\$1,000.00
Earthwork on Site	250	CY	\$3.50	\$875.00
Earthwork haul in	75	CY	\$12.00	\$900.00
			<b>Subtotal</b>	<b>\$2,775.00</b>
<b>On Site Improvements</b>				
4" concrete	735	sf	\$3.50	\$2,572.50
6" concrete paving	4	sy	\$60.00	\$240.00
Permeable pavers with Aggregate	180	sf	\$13.00	\$2,340.00
Limestone Slabs	1	allow	\$12,000.00	\$12,000.00
HDPE pipe	145	lf	\$12.00	\$1,740.00
Drain basin and riser with rock surround	2	each	\$350.00	\$700.00
ScourStop	3	panels	\$250.00	\$750.00
			<b>Subtotal</b>	<b>\$20,342.50</b>
<b>Planting</b>				
Amended soil material	40	CY	\$45.00	\$1,800.00
2 gallon perennial	75	each	\$45.00	\$3,375.00
1 gallon perennial	100	each	\$20.00	\$2,000.00
6" pot perennial	450	each	\$12.00	\$5,400.00
Ornamental Trees	4	each	\$275.00	\$1,100.00
Mulch	53	SY	\$25.00	\$1,325.00
RTF Fescue Sod	3,000	sf	\$0.75	\$2,250.00
			<b>Subtotal</b>	<b>\$17,250.00</b>
<b>Sub-Total:</b>				<b>\$43,955.00</b>
<b>Contractor conditions and markup</b>		12%		<b>\$5,274.60</b>
<b>Contingency</b>		10%		<b>\$4,922.96</b>
<b>Total:</b>				<b>\$54,152.56</b>

**17.41 STORMWATER BEST MANAGEMENT PRACTICES PROGRAM**

**SPECIAL PROJECT REQUEST APPLICATION**

1. DATE: 3/16/10
2. PROJECT NAME: Orchard Park Bioretention Gardens (tennis courts)
3. PROJECT SPONSOR: City of Omaha Public Works  
ADDRESS: 5600 So 10<sup>th</sup> Street  
Omaha, NE 68107
4. CONTACT PERSON: Nina Cudahy  
TITLE: Quality Control Manager
5. EMAIL AND PHONE: [ncudahy@ci.omaha.ne.us](mailto:ncudahy@ci.omaha.ne.us)  
444-3915 x 229
6. PROJECT LOCATION: Orchard Park, 66<sup>th</sup> Street south of Hartman Ave, bioretention gardens are on the east side of the tennis courts.
7. DESCRIPTION OF STORMWATER BEST MANAGEMENT PRACTICE AND HOW IT WILL BE INCORPORATED IN THE PROJECT:  
Bioretention gardens will be located just east of the tennis courts in Orchard Park. Prior to the stream restoration project in this part of Orchard Park, there was significant stream bank erosion that was close to undermining the tennis courts. The gardens are planned to take stormwater that sheet flows off of the tennis courts and from the surrounding drainage area and allow the water to infiltrate. This will help to reduce the erosive flows into Cole Creek, protect the bank that was recently re-graded, and provide water quality treatment. The bioretention gardens are sized to treat the water quality control volume (the first ½ inch of runoff) and allow the larger storm events to discharge through an underdrain into Cole Creek. The bioretention gardens are one of the stormwater best management practices implemented in the Cole Creek Restoration Project. Plans and the contactors bid price are attached.
9. TOTAL ESTIMATED COST: \$ 41,000

10. COST SHARE REQUESTED: \$ 10,000

11. SIGNATURE/TITLE: Nma Cardak, Quality Control manager

FORM 17.41

### Douglas County-Omaha, NE



*Disclaimer:* Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

Map Scale  
1 inch = 346 feet

Type	Line #	Item #	Description	Quantity	Price	Total
	85	900.085	LIVE STAKES IN CHANNEL BANK			
		Engineer's Estimate		325	@	
		TAB Construction Company			\$50.00 EACH	\$16,250.00
		Luxa Construction Co., Inc.			\$47.70 EACH	\$15,502.50
		M. E. Collins Contracting Co., Inc.			\$50.00 EACH	\$16,250.00
		General Excavating			\$81.80 EACH	\$26,585.00
		R & B Excavating, Inc.			\$55.00 EACH	\$17,875.00
					\$49.00 EACH	\$15,925.00
	86	900.086	BAREROOT TREES & SHRUBS			
		Engineer's Estimate		1	@	
		TAB Construction Company			\$11,500.00 per LS	\$11,500.00
		Luxa Construction Co., Inc.			\$34,000.00 per LS	\$34,000.00
		M. E. Collins Contracting Co., Inc.			\$33,330.00 per LS	\$33,330.00
		General Excavating			\$44,814.90 per LS	\$44,814.90
		R & B Excavating, Inc.			\$35,000.00 per LS	\$35,000.00
					\$38,000.00 per LS	\$38,000.00
	87	900.087	BIORETENTION BASIN PLANTINGS			
		Engineer's Estimate		1	@	
		TAB Construction Company			\$13,500.00 per LS	\$13,500.00
		Luxa Construction Co., Inc.			\$41,000.00 per LS	\$41,000.00
		M. E. Collins Contracting Co., Inc.			\$39,550.00 per LS	\$39,550.00
		General Excavating			\$84,272.20 per LS	\$84,272.20
		R & B Excavating, Inc.			\$40,000.00 per LS	\$40,000.00
					\$42,000.00 per LS	\$42,000.00
	88	900.088	SEEDING - TYPE "TEMPORARY SEED"			
		Engineer's Estimate		5	@	
		TAB Construction Company			\$1,200.00 per AC	\$6,000.00
		Luxa Construction Co., Inc.			\$424.00 per AC	\$2,120.00
		M. E. Collins Contracting Co., Inc.			\$444.40 per AC	\$2,222.00
		General Excavating			\$853.00 per AC	\$4,265.00
		R & B Excavating, Inc.			\$3,200.00 per AC	\$16,000.00
					\$600.00 per AC	\$3,000.00
	89	900.089	SEEDING - TYPE "TURFGRASS SEED"			
		Engineer's Estimate		1	@	
		TAB Construction Company			\$3,100.00 per AC	\$3,100.00
		Luxa Construction Co., Inc.			\$2,014.00 per AC	\$2,014.00
		M. E. Collins Contracting Co., Inc.			\$2,111.00 per AC	\$2,111.00
		General Excavating			\$1,869.00 per AC	\$1,869.00
		R & B Excavating, Inc.			\$4,000.00 per AC	\$4,000.00
					\$2,100.00 per AC	\$2,100.00
	90	900.090	SEEDING - TYPE "NATIVE GRASS SEED - TYPE A"			
		Engineer's Estimate		6	@	
		TAB Construction Company			\$2,600.00 per AC	\$15,600.00
		Luxa Construction Co., Inc.			\$1,696.00 per AC	\$10,176.00
		M. E. Collins Contracting Co., Inc.			\$1,777.00 per AC	\$10,662.00
		General Excavating			\$1,271.30 per AC	\$7,827.80
		R & B Excavating, Inc.			\$3,600.00 per AC	\$21,600.00
					\$1,900.00 per AC	\$11,400.00
	91	900.091	SEEDING - TYPE "NATIVE GRASS SEED - TYPE B"			
		Engineer's Estimate		2	@	
		TAB Construction Company			\$2,000.00 per AC	\$4,000.00
		Luxa Construction Co., Inc.			\$1,749.00 per AC	\$3,498.00
		M. E. Collins Contracting Co., Inc.			\$1,833.00 per AC	\$3,666.00
		General Excavating			\$1,380.00 per AC	\$2,760.00
		R & B Excavating, Inc.			\$4,000.00 per AC	\$8,000.00
					\$1,900.00 per AC	\$3,800.00













17.41 STORMWATER BEST MANAGEMENT PRACTICES PROGRAM

SPECIAL PROJECT REQUEST APPLICATION

1. DATE: 3/12/10  
2. PROJECT NAME: JOHNNY GOODMAN GOLF COURSE STORMWATER MANAGEMENT  
3. PROJECT SPONSOR: CITY OF OMAHA PUBLIC WORKS  
ADDRESS: 5600 S 10<sup>TH</sup> ST  
OMAHA NE. 68107  
4. CONTACT PERSON: SELMA KESSLER  
TITLE: CE II  
5. EMAIL AND PHONE: SELMA.KESSLER@CI.OMAHA.NE.US

6. PROJECT LOCATION:  
JOHNNY GOODMAN GOLF COURSE  
6111 S 99<sup>TH</sup> ST, OMAHA, NE 68127

7. DESCRIPTION OF STORMWATER BEST MANAGEMENT PRACTICE AND HOW IT WILL BE INCORPORATED IN THE PROJECT:  
AREAS DAMAGED BY STORMWATER RUNOFF WILL BE REPAIRED AND GRADED TO ACCOMMODATE A RAEN/BIORETENTION GARDEN.  
THIS REQUEST PERTAINS TO AREA 3 REFERENCED IN ATTACHED DRAINAGE STUDY.  
ADDITIONAL BACKGROUND PROVIDED ON ATTACHED SUMMARY SHEET.

9. TOTAL ESTIMATED COST: \$ 29,000  
10. COST SHARE REQUESTED: \$ 10,000  
11. SIGNATURE/TITLE: Selma C. Kessler



## Proposed Solution (Additional Information)

The proposed solution for the damage to the golf course involves a combination of regrading the site to create bioretention areas with appropriate plants, reinforcing the soil at the point where stormwater flows on to City property, and slope stabilization along the overflow areas.

There are a total of 4 impact points where storm water is discharged directly on to the golf course. The municipal code no longer allows this practice; however, damage has occurred and the damaged areas are continuing to degrade. This particular project was brought to the Public Works Department's attention when a contractor applied for a plumbing permit for a project at the Cimarron Hill's Apartment complex. The permit dealt with discharging a new storm sewer installed to pick up roof drains onto the golf course.

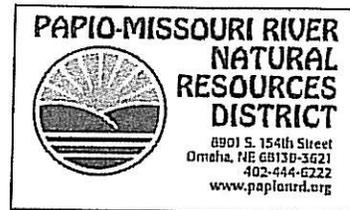
The City coordinated with the engineer for Cimarron Hills, E&A Consulting, to develop a series of detention/infiltration basins and drop structures at the apartment complex in lieu of discharging directly on to the golf course, and this work was completed in August, 2009. The work done by the apartment complex should mitigate both the volume and velocity of runoff, but stormwater still discharges onto City property, the existing damage needs to be repaired and the potential for additional damage remains.

The City followed up with E&A with a contract to develop additional survey and drainage data for all discharge points. The funds requested with this application will be directed toward the damage repair and long term management of stormwater runoff at impact point 3. The drainage report and detailed topo data at all discharge points studied is included as an attachment with this submittal.

The estimated volume of each bioretention/rain garden is based on the City's standard of treating the first ½" of runoff from the contributing drainage area. The corresponding surface area is based on an assumed maximum depth of 0.5 ft. The estimated construction cost is \$5/sq ft. Table 1 summarizes the estimated volume, area and cost of bioretention gardens at impact point 3.

**Table 1**

	Contributing Area, Acres	Volume, Ft <sup>3</sup> (based on ½" runoff)	Garden Area, Ft <sup>2</sup> (0.5' depth)	Estimated Cost (\$5/ft <sup>2</sup> )
Area 3	1.6	2904	5808	\$29,040
<i>Total Estimated Cost</i>				<b>\$29,040</b>



**17.41 STORMWATER BEST MANAGEMENT PRACTICES PROGRAM**

**SPECIAL PROJECT REQUEST APPLICATION**

1. DATE: 3-12-2010

2. PROJECT NAME: Pervious Pavement Bridge Embankments

3. PROJECT SPONSOR: City of Omaha Parks Recreation and Public Property

ADDRESS: 18 19 Farnam Street, Suite 701  
Omaha Nebraska 68183

4. CONTACT PERSON: Barbara Kohles

TITLE: Park Planner

5. EMAIL AND PHONE: bkohles1@ci.omaha.ne.us 402-444-5943

MAR 16 2010

**6. PROJECT LOCATION:**

First, the proposed pervious concrete bridge embankment will be located at West Papio creek Trail and the Blondo Street Bridge at approximately 162<sup>nd</sup> Street, Omaha Nebraska. Second, the proposed pervious concrete bridge embankment will be located at Big Papio creek Trail and the 105<sup>th</sup> Street Bridge, near Pacific Street.

**7. DESCRIPTION OF STORMWATER BEST MANAGEMENT PRACTICE AND HOW IT WILL BE INCORPORATED IN THE PROJECT:**

The storm water Best Management Practices will be a 50' x 15' pervious concrete slab on the high or east side of the trail under the Blondo Street Bridge. The 105<sup>th</sup> street bridge pervious concrete slab will be 50' x 50' on the high side or east side of the trail. The concrete slab will be large enough to cover the bare soil and 5' beyond to catch water coming from the surrounding surfaces. There will be a 36" bed of aggregate, on filter fabric, under the concrete, for the water to flow to a low point adjacent to the trail. There the water will be caught and piped under the trail, down the slope to the creek. The pipe will be braced in the typical Natural Resource District method at the creek edge.

Currently, there is bare soil eroding away. The source of the erosion is from:

- The car sloshing water over the sides of the bridge,
- Wind swept rain hitting the sides of the bridge and retaining walls then running down the embankment,
- 4 drain and seep holes releasing water on to the embankment
- Normal overland rain flowing down the embankment
- Wind erosion
- Rain from the bridge surface and sidewalks

9. TOTAL ESTIMATED COST: \$35,400.00

10. COST SHARE REQUESTED: \$10,000.00

11. SIGNATURE/TITLE:

FORM 17.41

*Melinda Pearson, Director*



Project location

N 164th St

States St

N 162nd Ave

Patrick Ave

Blondo St

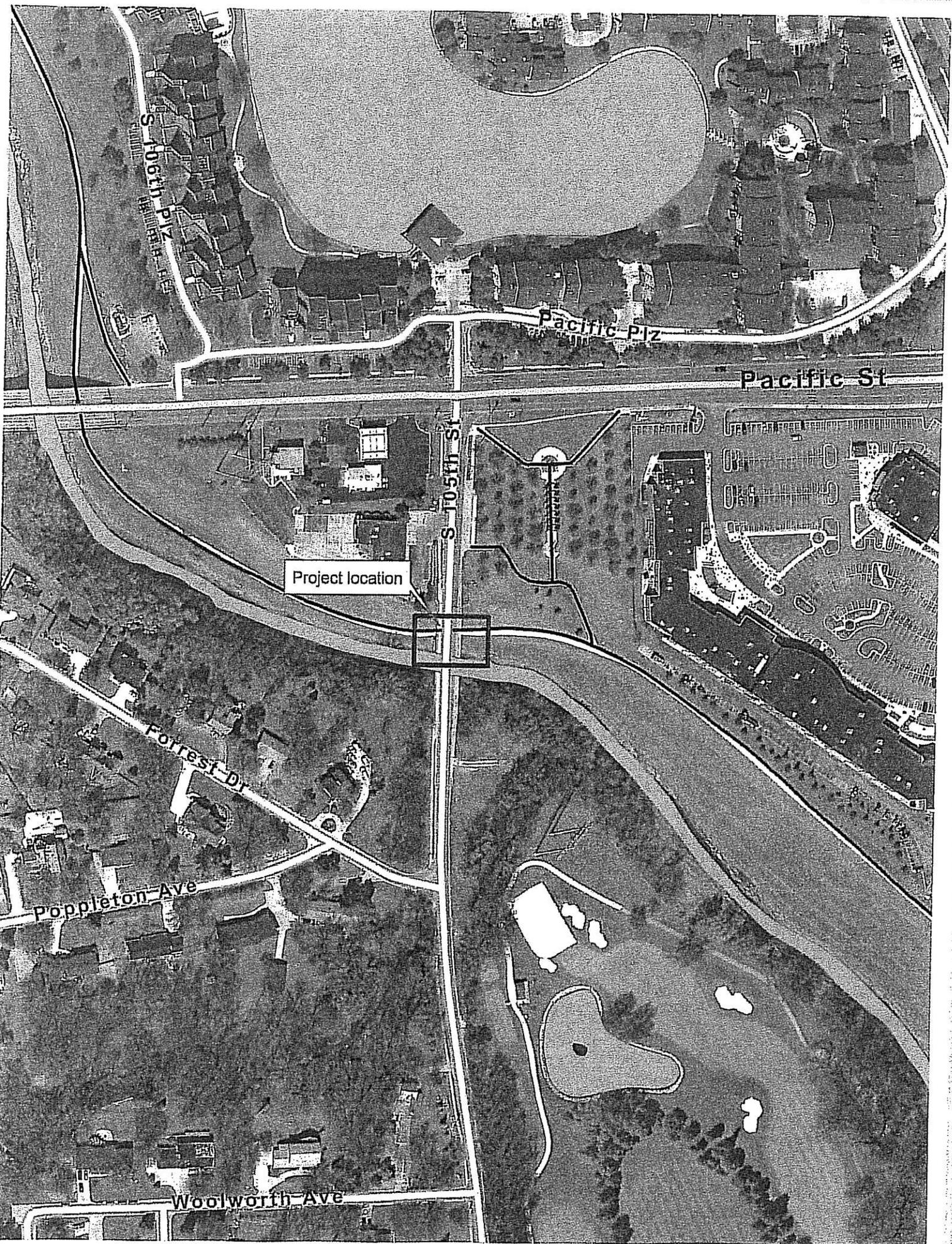
N 160th St

Parker St

Decatur Cir

N 164th St

N 162nd St



Project location

S 106th Plz

Pacific Plz

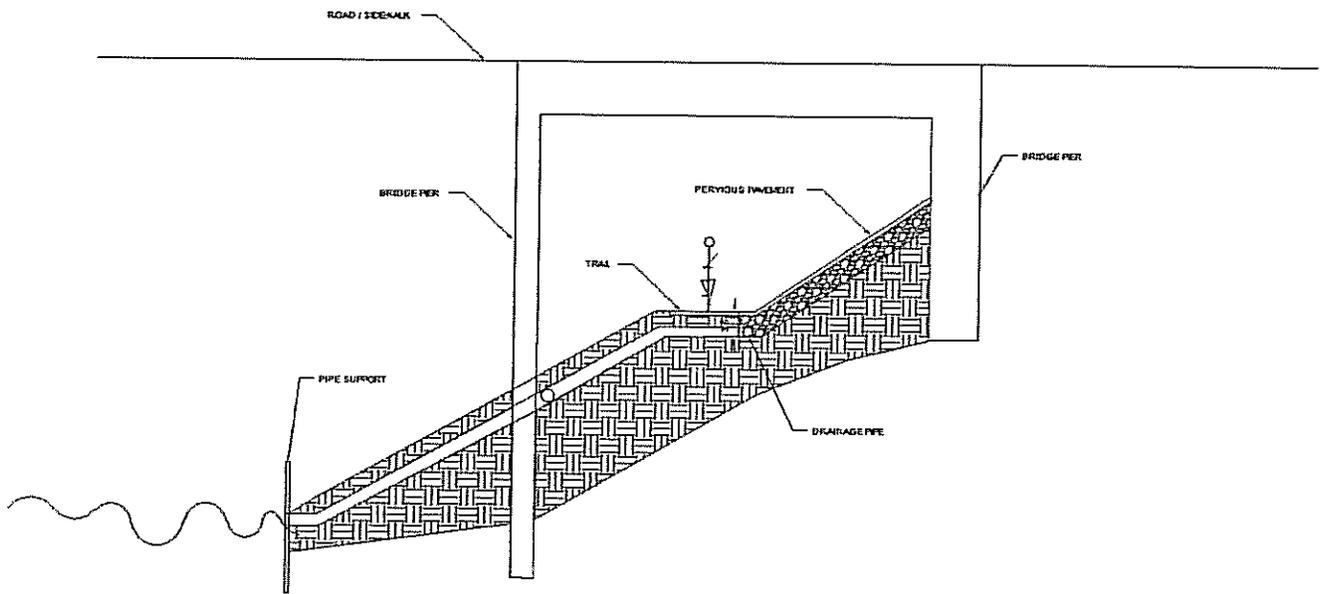
Pacific St

S 105th St

Forrest Dr

Poppleton Ave

Woolworth Ave



PERVIOUS PAVEMENT CROSS SECTION FOR BIKE TRAIL



**17.41 STORMWATER BEST MANAGEMENT PRACTICES PROGRAM**

**SPECIAL PROJECT REQUEST APPLICATION**

**1. DATE:** March 12, 2010

**2. PROJECT NAME:** Cody Stormwater Best Management Practices

**3. PROJECT SPONSOR:** Millard Public Schools

**ADDRESS:** 5606 S. 147th Street  
Omaha, NE 68137

**4. CONTACT PERSON:** Susan McAdam

**TITLE:** Grants Coordinator

**5. EMAIL AND PHONE:** skmoadam@mpsomaha.org, (402) 715-8250

**6. PROJECT LOCATION:**  
 Cody Elementary School  
 3320 S. 127th Street  
 Omaha, NE 68144

**7. DESCRIPTION OF STORMWATER BEST MANAGEMENT PRACTICE AND HOW IT WILL BE INCORPORATED IN THE PROJECT:**

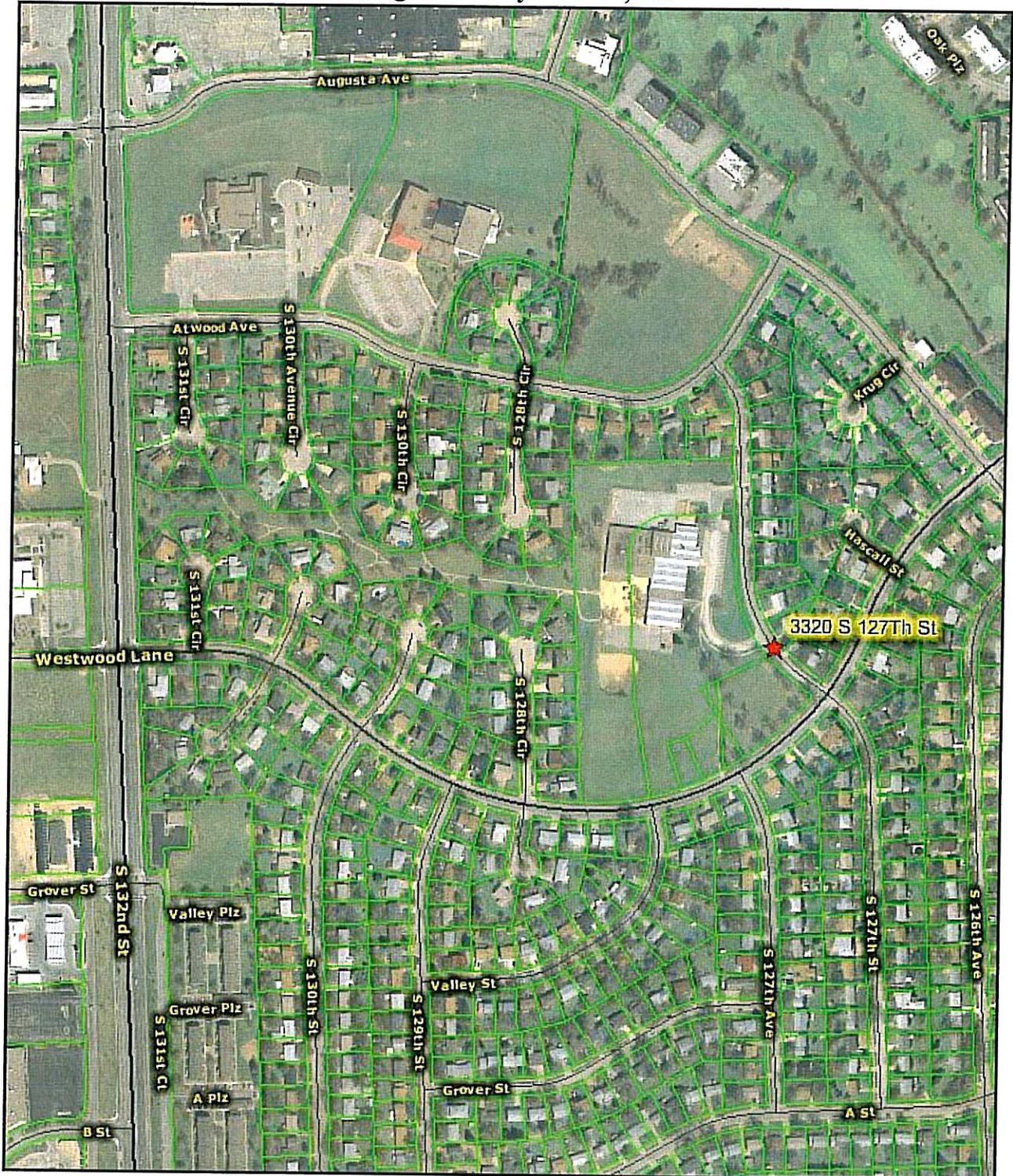
During the planning phase for the parking lot renovation at Cody Elementary School, drainage issues were discovered. After consulting with an engineer, Millard Public Schools (MPS) decided to address the the issues utilizing environmentally sound practices that would also provide outdoor classroom areas for more than 210 students annually, 65% of whom are from low income families. The outdoor classroom areas include two rain gardens and an infiltration trench that in addition to benefiting the students will slow and filter stormwater runoff.

**9. TOTAL ESTIMATED COST:** \$ 17,020

**10. COST SHARE REQUESTED:** \$ 8,510

**11. SIGNATURE/TITLE:** Associate Superintendent/General Administration  
Millard Public Schools

### Douglas County-Omaha, NE



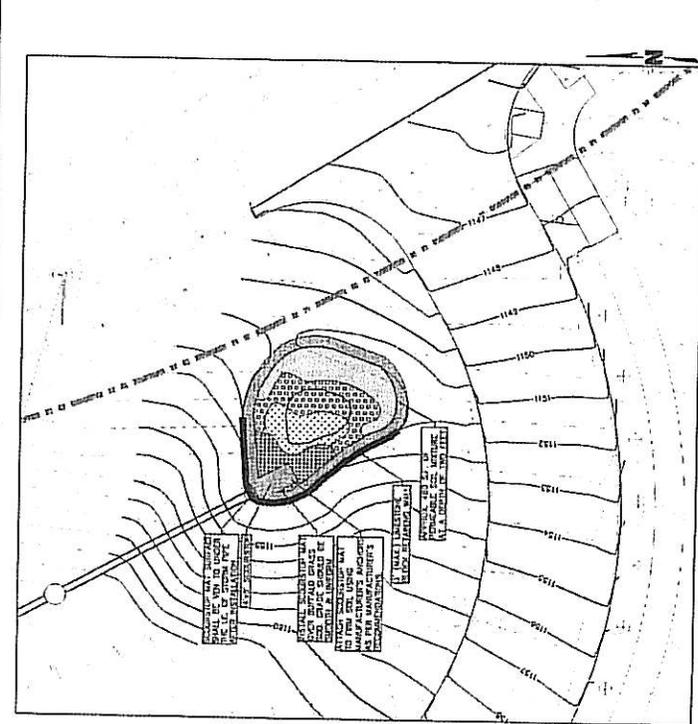
*Disclaimer:* Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

Map Scale  
1 inch = 400 feet

Millard Public Schools  
Cody Stormwater Best Management Practices Program

The Millard Public Schools Board of Education has given approval to renovate the parking lot at Cody Elementary School during the summer of 2010. Olson and Associates estimates the total cost of the project at \$355,000. The Stormwater Best Storm Management Practices grant request by Millard Pubic Schools is for eligible costs associated with the construction of two rain gardens and an infiltration trench described on the preceding page. Cost estimates are indicted below.

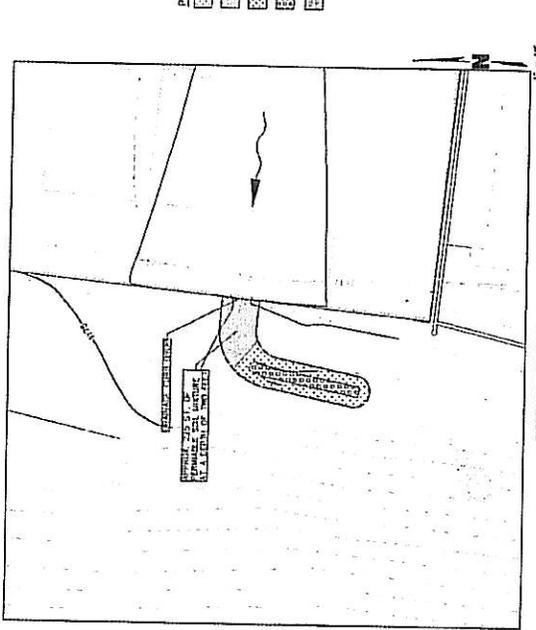
Excavation	400
Retaining wall	8,400
Scour Stop erosion control at pipe outlet	450
Native plants	4,270
Permeable soil mix	<u>3,500</u>
Total Eligible Costs	\$17,020



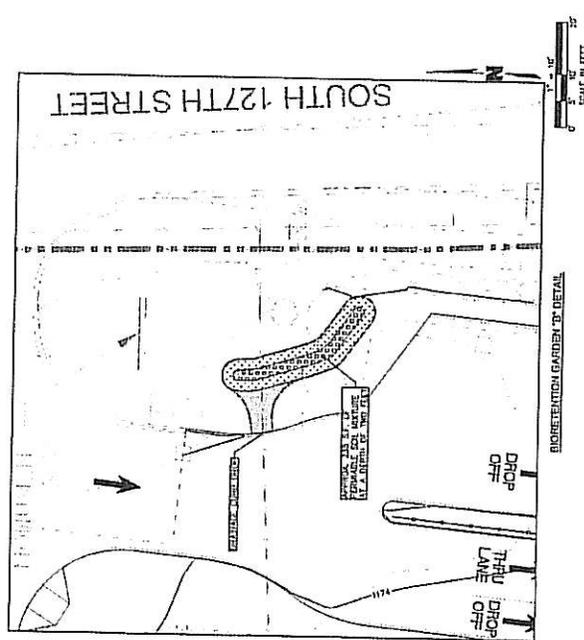
- PLANTING LEGEND**
- 01 WHITE BLOSSOM
  - 02 BLUE GRAMA
  - 03 PRUNIC DROPPED
  - 04 FLAVOUR RED GRASS
  - 05 BUFFALO GRASS

BIORETENTION GARDEN #2 DETAIL

- BIORETENTION GARDEN NOTES**
1. EXISTING SOIL MATERIAL SHALL BE REMOVED TO A DEPTH OF 18 INCHES FROM THE FINISHED GRADE AND REPLACED WITH 18 INCHES OF LEAN SAND OR EQUIVALENT MATERIAL.
  2. EXISTING SOIL SHALL BE LOAN OR SAND, CONTAINING TYPICALLY OF LESS THAN 10% CLAY, AND THE CLAY AND ORGANIC MATTER.
  3. CONSTRUCTION AND PLANTING SHOULD BE DURING THE SPRING IN ACCORDANCE WITH THE LANDSCAPE PLANE.
  4. UNPAVED CONNECTION OF BOTH THE BASE AND THE SANDAL TO DISCHARGE PROPER FUNCTION OF THE SYSTEM.
  5. PAVES SHALL NOT BE CONSTRUCTED UNTIL EXCAVATION IS COMPLETED. UNTIL ALL CONTAMINATING DRAINAGE AREA HAS BEEN STABILIZED.
  6. VEGETATION SHALL BE CONSIDERED ON ALL EXPOSED SURFACES.
  7. EXISTING VEGETATION SHALL NOT BE REMOVED UNLESS NECESSARY. IF ANY REMOVAL IS REQUIRED, IT SHALL BE REPLACED WITH EQUIVALENT MATERIAL.
  8. THE MAIN GARDEN SHALL NOT BE USED AS A SEWAGE CONTROL FACILITY.
  9. NO HEAVY EQUIPMENT SHALL BE PLACED ON THE MAIN GARDEN, OR BOTTOM OF THE MAIN VEGETATION SHALL BE DAMAGED.
  10. THE MAIN GARDEN SHALL BE EXCAVATED TO THE FINISHED ELEVATION, AND SET BACKS ON THE EXISTING SECTION.
  11. THE EXCAVATION MATERIALS SHALL INCLUDE THE MAIN GARDEN, AND MAIN VEGETATION SHALL.
  12. EXISTING MATERIALS SHALL BE REMOVED FROM THE MAIN GARDEN SITE AND EXPOSED OF IN CONFORMANCE WITH THE SPECIFICATIONS.
  13. ALL EXISTING MATERIALS SHALL BE REMOVED FROM THE BOTTOM OF THE EXCAVATION SHALL BE RE-PAVED TO A MINIMUM DEPTH OF 6 INCHES TO ALTERNATE ANY EXISTING DRIVE SURFACES.
  14. THE SPECIFIED FINISHED GRADE SHALL BE PLACED AND GRADED WITH LOW CROWN-CONTACT PAVEMENT EQUIPMENT OR BY EXCAVATORS AND/OR BACKHOES OPERATING ON THE GRADED SURFACE TO THE MAIN GARDEN.
  15. NO HEAVY EQUIPMENT SHALL BE USED WITHIN THE PERIMETER OF THE MAIN GARDEN EXCEPT DURING OR AFTER THE PLACEMENT OF THE FINISHED GRADE.
  16. EXISTING MATERIALS SHALL BE REMOVED AND PLACED IN SUCCESSIVE HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE DRAINAGE MAIN GARDEN AREA. EXISTING MATERIALS SHALL BE REMOVED AND PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE DRAINAGE MAIN GARDEN AREA.
  17. TO THE FINISHED GRADE, MATERIALS SHALL BE PLACED IN SUCCESSIVE HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE DRAINAGE MAIN GARDEN AREA. EXISTING MATERIALS SHALL BE REMOVED AND PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 12 INCHES FOR THE DRAINAGE MAIN GARDEN AREA.
  18. FINISHED GRADE SHALL BE PERFORMED AFTER A 24-HOUR SETBACK PERIOD. PAUL EXCAVATIONS SHALL BE WITHIN 2 FEET OF EXISTING GRADE ON THE EXISTING MAIN GARDEN.
  19. FINISHED GRADE SHALL BE PERFORMED BY OTHER THAN CONTRACTOR. THE FINISHED GRADE SHALL BE PERFORMED BY OTHER THAN CONTRACTOR. THE FINISHED GRADE SHALL BE PERFORMED BY OTHER THAN CONTRACTOR.



BIORETENTION GARDEN #3 DETAIL



BIORETENTION GARDEN #4 DETAIL



**17.41 Stormwater Best Management  
Practices Program Special Project  
Request  
Application**



8901 S. 154th Street  
Omaha, NE 68138-3621  
402-444-6222  
[www.papionrd.org](http://www.papionrd.org)

**Project Information**

**Date:** March 10, 2010

**Project Name:** Wetland Restoration and Education Project

**Project Sponsor:** Bennington Public Schools

**City ST ZIP Code:** Bennington, NE 68007

**Contact Person/Title:** Kate Schumacher, Science Teacher

**E-Mail/Phone:** [cschumacher@esu3.org](mailto:cschumacher@esu3.org) 402-238-2447

**Project Location:** On Bennington Public Schools property located at 168<sup>th</sup> Street and Bennington Road, Bennington, NE. The wetland would be located adjacent to the main channel of the Papio Creek.

**Project Description:** To convert a monoculture cornfield into a wetland and outdoor learning environment. Adding a wetland would increase the species diversity for wildlife and vegetation. To collect water for the wetland we would use precipitation as well as collecting storm water runoff from the road ditch on 168th St. The wetland vegetation will help to maintain water quality and soil health by filtering out pollutants and preventing sedimentation.

**Cost Estimate**

**Total Estimated Cost:** \$52,500

**Cost Share Requested:** \$10,000

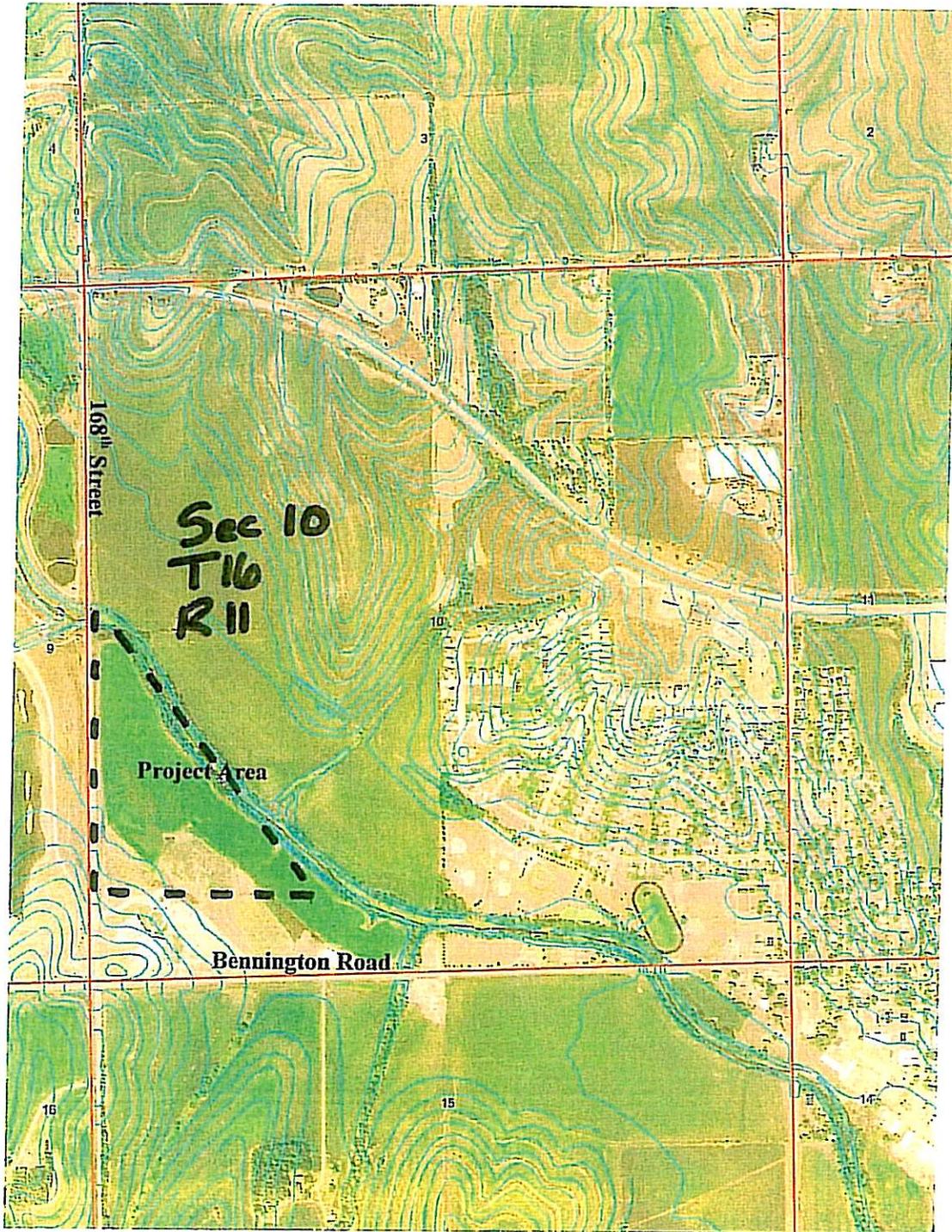
**Agreement and Signature**

**Name (printed):** Dr. Terry Haack, Superintendent, Bennington Public Schools

**Signature:**

**Date:** March 10, 2010

# Project Location



**Budget:**

<b>Budget Category</b>	<b>Budget Amount</b>
<b>Engineering and Project Management</b>	<b>7,000</b>
<b>Earthwork</b>	<b>19,000</b>
<b>Vegetation</b>	<b>20,000</b>
<b>Structures</b>	<b>5,000</b>
<b>Maintenance</b>	<b>1,500</b>
<b>TOTAL</b>	<b>52,500</b>

**Schedule:**

<b>Month/Year</b>	<b>Task Description:</b>
April 2010	Contact engineers to assess the site and begin engineering and layout plans
May 2010	Begin construction of wetland, plant vegetation, work on trail and observation docks
June 2010 – July 2010	Project to be completed (depending on weather). Work with science teachers to create new curriculum to reflect environmental aspects of the project. Start initial species population study. Publicize project, conduct tours and public information seminars about the project.
August 2010	Monitor maintenance
September 2010	Monitor maintenance
October 2010	Develop a program for maintenance
November – March 2011	Monitor the site for potential problems and issues.
April 2011	Perform maintenance tasks as needed

## Construction and Design of the Wetland

The project site for the 2-acre wetland and outdoor classroom is on school property located at the intersection of 168<sup>th</sup> Street and Bennington Rd, Bennington, NE and is part of the Papio Creek Watershed. The construction of the actual wetland for our site would be a surface water depression. This type of wetland results from water pooling in a shallow basin. The hydrology depends on natural precipitation and overland water flow.

To collect water for the wetland we would use precipitation as well as the storm water runoff from the road ditch on 168<sup>th</sup> Street. The storm water runoff comes from an agricultural area draining about 30 acres south of Bennington Road. It flows through the road ditch along 168<sup>th</sup> Street. Although there aren't any discharge records for the flow in this ditch, observations by the Bennington High School staff indicate that significant water is collected by the ditch during heavy rainfall and snowmelt. The natural flow in the ditch would be diverted to our proposed wetland by building a weir in the ditch and redirecting some of the flow into a 200-foot long and 4-foot wide diversion channel connected to the wetland.

This wetland would be constructed so that even in drought conditions it would still have some water pooling in the basin. The shallow water area would be created by excavating soil to the appropriate elevation and placing the fill material to create berms. The overall size for our wetland, based on hydrology, would be about two acres. The depth for our wetland would be about 3-4ft. To maintain a pool of water, berms and a water control structure would be installed as well as to allow for future maintenance of the wetland.

### Structures

For student experiments and easy access to the actual wetland site, we would construct observation docks. These would be low to the ground to allow accessibility to visitors of all physical abilities to the water and vegetation. These docks would be 8-foot wide by 45-foot long and would be constructed out of recycled plastic lumber with concrete footings. All of the physical structures would be designed to meet ADA standards.

### Vegetation

Wetlands support a variety of vegetation specific to their physiology. Wetland vegetation is grouped into two general ecological categories, dependent mainly on growth position in relation to water level. Naturally, water levels tend to vary in wetlands due to seasonal rains and other climatic conditions. While some wetland plants can easily adapt to changes in soil moisture and water level, others have strict water requirements for survival. Thus, the following groups represent only a general guide to typical wetland plant habitats.

Wetland Edge – plants that grow in wet soil on the shorelines at or above water level; some may be rooted in shallow water.

Emergent – plants that are rooted in soil that is completely underwater, much of the body is underwater.

The purpose of wetland vegetation is to maintain water quality and soil health by filtering out pollutants and preventing sedimentation. Another benefit of plants is that they provide food, shelter, and breeding habitat for both aquatic and terrestrial fauna. In addition, they help prevent erosion.

To create a naturalized look around the wetland, we plan to grow successive layers of vegetation. Next to the natural wetland plants, prairie grasses, shrubs, and an arboretum will be implemented. There will be a focus on native and well-adapted plants, demonstrating native plant conservation

Legal Description	County	#Acres
Lands SEC-TWN-RGE 10-16-11 – EX E 17 W 50 N 190. 17 FT & RDS & N 559.96 S 600.26 E 2196.44 W 2246.44 FT – PART S OF PAPHILLION CREEK SW ¼ 46.18 AC	Douglas	46.18

**URBAN CONSERVATION ASSISTANCE PROGRAM**

**SPECIAL PROJECT REQUEST APPLICATION**

1. Date: March 11, 2010
  2. Project Name: Cardinal Park Rain Garden
  3. Project Sponsor: City of South Sioux City  
Address: 1615 1st Avenue  
City/State/Zip: South Sioux City, NE 68776
  4. Contact Person: Brent Clark Title: Assistant Grant Administrator
  5. Telephone: (402) 494-7591
  6. Project Location: Cardinal Park is located at 3633 G Street, South Sioux City, Nebraska.
  7. Description of Problem: \* Drainage issues in one corner of the 17 acre park.
  8. Proposed Solution: \* The City proposes a rain garden will solve the drainage issues, as well as, dress up the area which is located on a street corner with a nice garden.
  9. Total Estimated Cost: \$ 13,555
  10. Cost Share Request: \$ 8,133
  11. Signature/Title: Brent Clark Assistant Grant Admin.
- Attach additional sheets as necessary.



### Cardinal Park Rain Garden

#### Construction Costs

Clearing, Grubbing, & Grading	300.00 CY	11.00	\$3,300
Plants & Mulching	900.00 SF	7.50	\$6,750
Construction Costs			<b>\$10,050</b>
Construction Subtotal			\$10,050
Contingency 10%			\$1,005
Design			\$2,500
<b>PROJECT TOTAL</b>			<b>\$13,555</b>
60% Cost Share Request			\$8,133
City's Cost			\$5,422



Cardinal  
Rain  
Garden

© 2008 Google

Eyealt 148811

© 2010 Google

Image USA Farm Service Agency  
42-27-13.87-N 88-24-25.17-W elev 0ft

Imagery Date: Jul 7, 2008

