Appendix A

Milwaukee County Sports Complex

Appendix A-1: Site Map

Appendix A-2: Inspection and Maintenance Logs

Appendix A-3: O&M Manual

Appendix A-4: Design Plans

A-1

12\in
CB
Well 1
Well 2
Well 3
Well 4
Spillway
Spillway
6" Underdrain 1
Well 7
Spillway
6" Underdrain 2
Well 6
6" Underdrain 3
Well 5
6" Underdrain 4
Milwaukee County Sports Complex
N
Stormwater Structure
Stormwater Sewer
Stormwater Ditchline

A-2

Milwaukee Sports Complex Pervious Pavement Inspection

Inspected By: _____ Date: _____

Observation Wells

Is there water in the obersrvation wells?

Location No.	Depth (ft)
Well 1	_____
Well 2	_____
Well 3	_____
Well 4	_____
Well 5	_____
Well 6	_____
Well 7	_____

Pavement

	Yes	No
Clogging	_____	_____
Plant growth	_____	_____
Storage of material on pavers	_____	_____
Cracking	_____	_____
Heaving	_____	_____
Settlement	_____	_____
Adequate joint material?	_____	_____
Other damage	_____	_____

Pavement Edge / Ribbon

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Underdrains and Outlets

	Flowing		Erosion		Tampering		Structural Integrity
	Yes	No	Yes	No	Yes	No	(Excellent / Good / Fair / Poor)
Drain 1							
Drain 2							
Drain 3							
Drain 4							

Inspection Comments: _____

_____

_____

_____

_____

Milwaukee Sports Complex Pervious Pavement Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Mechanical Sweeping Event	_____	_____
Replenish Paver Joint Material	_____	_____
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

May	Yes	No
Light Surface Cleaning	_____	_____
Roundup Treatment	_____	_____

August	Yes	No
Light Surface Cleaning	_____	_____
Roundup Treatment	_____	_____

November	Yes	No
Light Surface Cleaning	_____	_____
Roundup Treatment	_____	_____

Maintenance Comments: _____

_____

_____

_____

_____

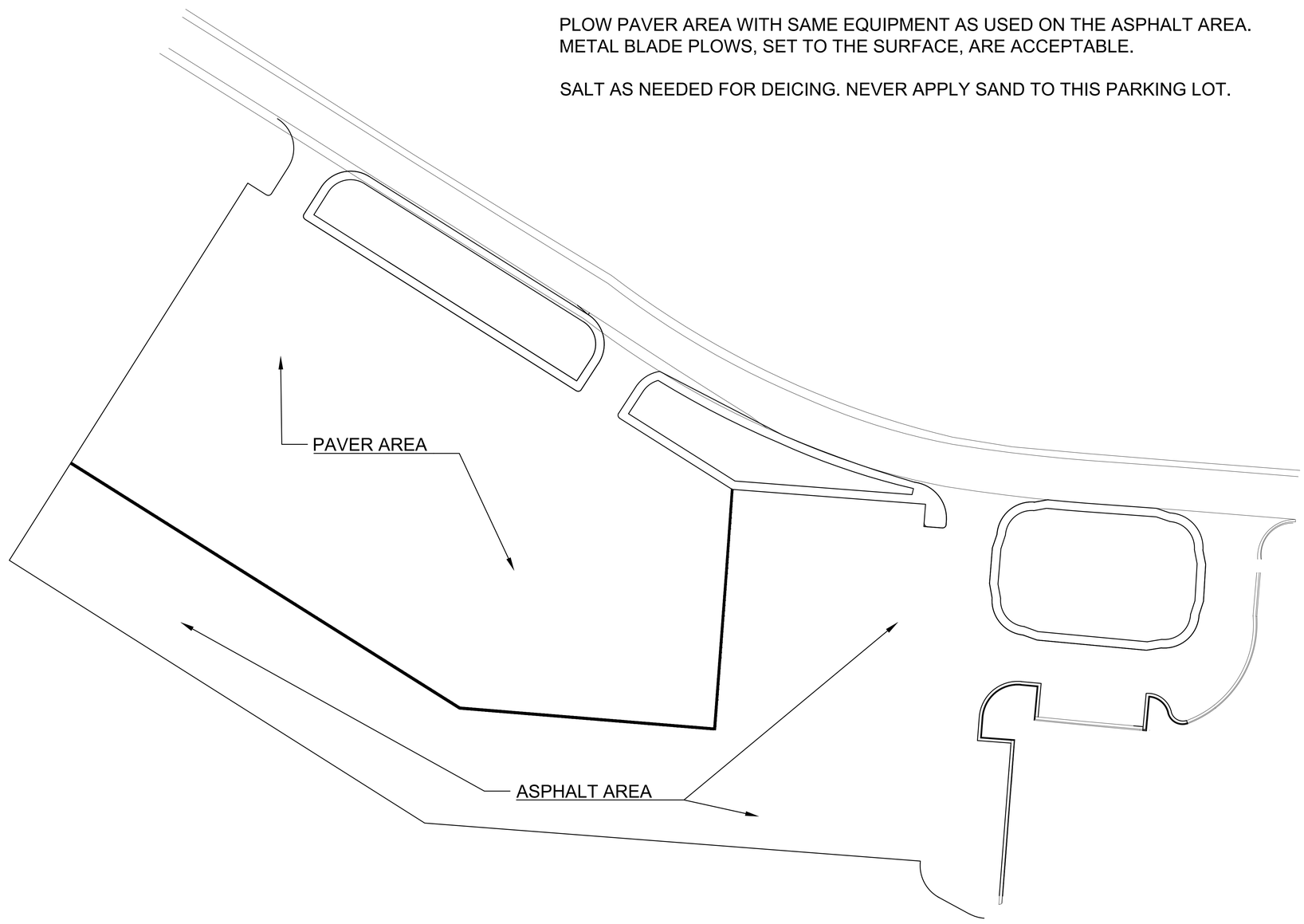
_____

A-3

CAUTION: DO NOT STORE PLOWED SNOW PILES ON THE PAVER AREA!!!
PUSH SNOW OFF OF PAVEMENT OR STORE ON THE ASPHALT AREA.
SNOW PILES CONTAIN LARGE AMOUNTS OF DEBRIS THAT CAN CLOG THE PAVERS.

PLOW PAVER AREA WITH SAME EQUIPMENT AS USED ON THE ASPHALT AREA.
METAL BLADE PLOWS, SET TO THE SURFACE, ARE ACCEPTABLE.

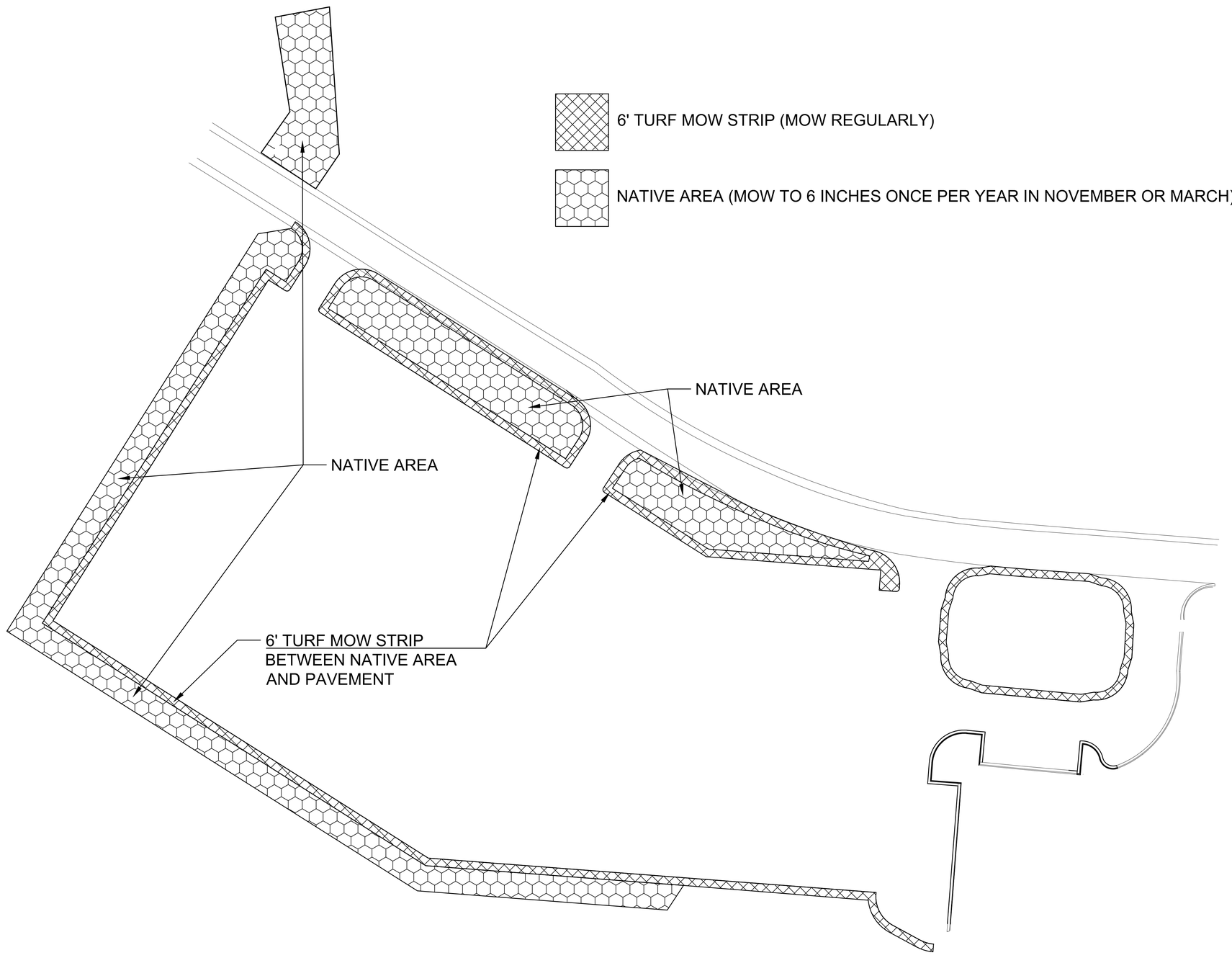
SALT AS NEEDED FOR DEICING. NEVER APPLY SAND TO THIS PARKING LOT.



H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

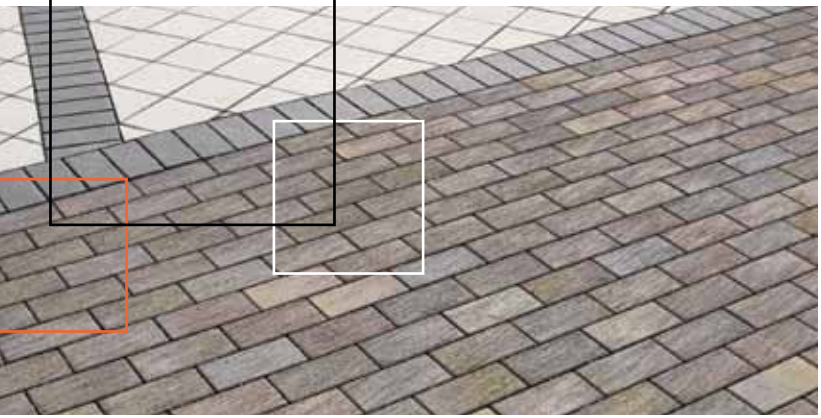
DRAWN BY: SJH	CHECKED BY: DSG
SCALE: 1" = 40'	DATE: 1/14/13
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX	
SHEET DESCRIPTION: WINTER MAINTENANCE PLAN	
SITE NO. 628	BUILDING NO. 5800
PROJECT NO. 0060-10617	
SHEET NO. 1 OF 1	FILE NO. 1



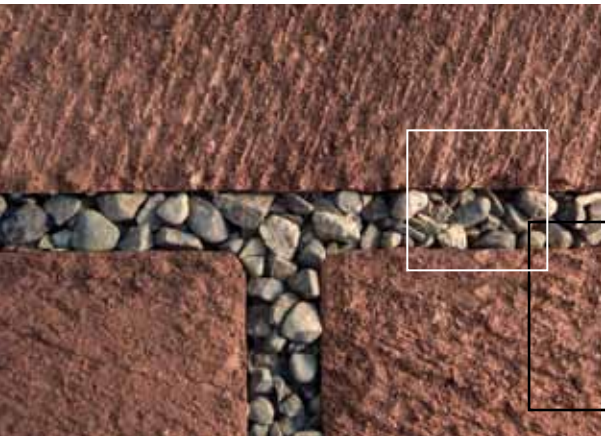
H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: SJH			
SCALE: 1" = 40'	CHECKED BY: DSG		
DATE: 1/14/13			
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX			
SHEET DESCRIPTION: SITE RESTORATION			
SITE NO. 628			
BUILDING NO. 5800			
PROJECT NO. 0060-10617			
SHEET NO. 1 OF 1			
FILE NO. 1			



Permeable Paver Maintenance Guide



UNILOCK

This guide is specific for Unilock permeable pavers as a maintainable system for stormwater runoff and does not cover cleaning concrete pavers themselves. Please see the Unilock Paver Care for information on cleaning concrete pavers. The maintenance information in this guide is intended for Unilock permeable paver systems only and not for other types of permeable pavers or pervious systems.

Much like any impervious paving surfaces with catch basins and underground infrastructure, maintenance is necessary with any type of permeable systems. Over the lifetime of the permeable paver system there will be a need to clean any sediment, soil, dirt and debris from the joint aggregate material to maintain a sufficient infiltration rate. Every project will vary in performance needs, as well as to the frequency in which the joint material must be cleaned. The surface infiltration rate must be greater than the regional, 100 year rainfall intensity to adequately ensure no runoff is generated, which is only one goal for using permeable pavers. Unilock suggests establishing a maintenance plan using the techniques in this document to prevent clogging.

Preceding Maintenance 3

Examples of Common Maintenance Issues 3

Maintenance Types 4

Maintenance Equipment 5

Strategic Procedures for Maintaining Infiltration 7

Recommended Seasonal Maintenance Schedule 8

Winter Maintenance and De-icing 9

Preceding Maintenance

Before providing maintenance on permeable paver systems, proper installation and protection during construction is required. Here are a few conditions to observe, require and prevent for establishing a successful system:

1. Verify correct installation and materials:
- Hire contractors with knowledgeable experience installing permeable pavers.
- Review and approve all sub-base, base and joint aggregate materials.
- Do not allow sand and dense-graded aggregates.

2. Prevent construction damage:
- Limit subgrade soil compaction when infiltration is necessary.
- Restrict vehicles with muddy tires from driving over newly placed pavers.
- Do not mix aggregate materials.

3. Refill joint material:
- Once between 3 and 6 months after initial installation.
- Repeat as needed - approximately every 5-10 years.

4. Avoid stockpiling of materials such as:
- Topsoil.
- Mulch.

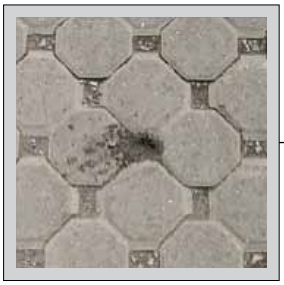
The proper materials and installation execution can be found in the Unilock specifications for permeable pavers. Both residential and commercial projects will utilize the same base, setting bed and joint aggregates. Some projects many not require sub-base materials, underdrainage or geotextile. It is not necessary to separate the setting bed from the base aggregates with a geotextile.

Examples of Common Maintenance Issues

Below are several warning signs and visual clues of common maintenance issues which must be prevented and addressed or remediated to ensure continued surface infiltration.

1. Slow Draining/Runoff:
- Verify with simple infiltration testing or observe after rain storms.
- Surface should drain immediately.

2. Ponding and Bird Baths:
- Rule of thumb: if more than a nickel deep one minute after a rainfall event, maintenance is necessary.
- Verify correct materials were installed.
- Exceptions at bottom of slopes.



3. Surface Crusting:
- Identify if there is a problem such as run on sediments.
- Increase cleaning frequency in troubled areas.
- Remove debris immediately.

4. Weeds:
- Weeds will not germinate unless there is a collection of soil or moisture.
- Remove weeds immediately.
- Clean sediment from joint material.
- Chemical treatment may be required prior to maintenance removal.

5. Covered Joint Material:
- Identify problem and correct.
- Remove immediately.
- Joint material should appear as photo on right.

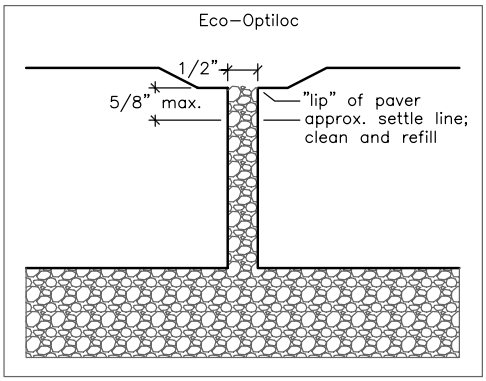
These common problems can often be easily remedied by maintaining the proper joint aggregate level.

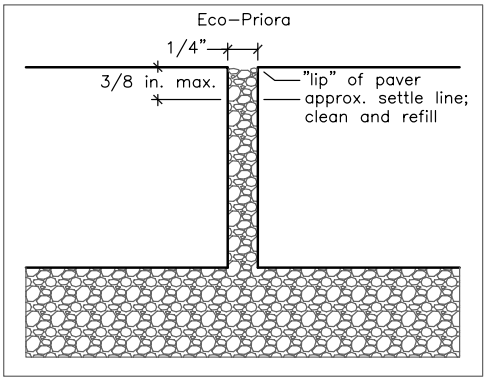
Maintenance Types

There are two service types for maintaining the integrity of a permeable paver system.

1. **Preventative** – removes most miscellaneous debris before being trapped in the joint aggregate material causing clogging. This usually does not require removal of any joint material to restore infiltration.

2. **Restorative** – requires some removal or complete removal of the joint material to renew infiltration. Occurs after miscellaneous debris has been captured and lodged in the joint aggregate.





***Note:** Both maintenance types will be most effective when the joint aggregate material is filled to the "lip" of the paver. If the joint material has settled more than the joint width, plus 1/8 inch below the paver lip, the maintenance equipment is significantly less effective and potentially more expensive.*

Maintenance Equipment

There are two service types for maintaining the integrity of a permeable paver system.

Project Type 1: For smaller pedestrian type areas such as sidewalks, driveways, plazas, patios or similar:

Preventative:

1. Hand-Held Bristle Broom

- Available at any hardware store.
- Sweep as needed to keep the surface clear of debris.
- Approximate cost: $15.

2. Leaf Blower

- Electric or gas powered.
- Minimum air speed of 120 mph.
- Joint aggregate material will remain in place while removing debris from paver surface.
- Approximate cost: $50 to $300.

Appendix pg 15

3. Rotary Brush

- Poly bristles only.
- Flips debris from joint.
- Will require slight refilling of the joint aggregate material.
- Approximate cost: varies depending on attachment vehicle.

Restorative:

1. Wet/Dry Shop Vacuum

- Minimum 4 HP (peak) motor with 130 cubic feet per minute suction.
- Will remove some joint aggregate material.
- Replenish removed joint aggregate material to "lip" of paver.
- Approximate cost: $50 to $150.

2. Riding Litter Vacuum

- Tennant ATLV 4300.
- 48 inch wide vacuum head.
- 110 gallon capacity.
- Can also be used as a preventative technique.
- Will evacuate most debris from joint except for aggregate material.
- Approximate cost: approx. $25K new.

3. Powerwasher

- Capable of spraying 1,400 to 1,800 psi.
- Spray at a 30 degree angle approximately 18 to 24 inches from the surface.
- Will evacuate joint material.
- Replenish removed joint aggregate material to "lip" of paver.
- Approximate cost: $125 to $500.

<u>Project Type 2:</u> For larger vehicular areas such as roads, parking lots, alleys, plazas or similar that can support vehicles:

Preventative:

1. Rotary Brush

- Poly bristles only.
- Flips debris from joint.
- Will require slight refilling of the joint aggregate material.
- Approximate cost: Varies depending on attachment vehicle.

Appendix pg 16

2. Broom Sweepers
- Typical "street sweeper" type.
- Rotating curb brushes with center pickup.
- Poly bristles only.
- Do not utilize water to clean the surface as this can have detrimental effects on the cleaning.
- Best for seasonal cleaning.
- Approximate cost: $100 to $120 per hour from a service company.

3. Regenerative Air Sweepers
- Light duty suction cleaning.
- Utilizes stream of air blowing horizontally across surface and vacuuming.
- No rotating brushes.
- Approximate cost: $45 to $65 per hour from a service company.

Restorative:

1. Vacuum Sweepers
- Vacall Dynamic Multi-Purpose Vacuum. *(top photo)*
- Elgin Whirlwind. *(bottom photo)*
- Heavy duty cleaning.
- Minimum suction of 14,000 cubic feet per minute.
- Complete evacuation of joint aggregate material.
- Replenish removed joint aggregate material to "lip" of paver.
- Approximate cost: $2.50 to $4.50 per parking space.

2. Powerwashers
- Capable of spraying 1,400 to 1,800 psi.
- Spray at a 30 degree angle approximately 18 to 24 inches from the surface.
- Will evacuate joint aggregate material.
- Replenish removed joint aggregate material to "lip" of paver.

Strategic Procedures for Maintaining Infiltration

Observe and implement the following habitual procedures to ensure longevity of the system.

1. Weekly – prevent contamination from routine landscape maintenance such as grass clippings from mowing, hedge trimming, mulching plant beds, etc. by implementing the following joint opening cleaning procedures immediately after contamination occurs:
- Hand broom debris from the paver surface.
- Blow debris from the paver surface with backpack blower type device, collect and dispose.
- Mechanically sweep paver surface.

2. **Monthly** – observe any collection areas of debris, dirt, topsoil, mulch, etc. after season events such as snowfall, rain storms, leaf litter, etc. and investigate if clogging is occurring. Immediately restore infiltration using the following cleaning options:
   - Break up any crust covering the joint aggregate material with hand broom for smaller areas or mechanically with a rotary sweeper for larger areas. Remove debris material.
   - When necessary, restore infiltration using wet/dry shop vacuum for small areas or vacuum truck for larger areas by removing debris from joint aggregate material.
   - Replenish joint aggregate material to "lip" of paver.

3. **Yearly** – establish a seasonal maintenance schedule that includes the following:
   - Sweep entire permeable paving surface with appropriate preventative sweeping devices.
   - Replenish joint aggregate material to "lip" of paver.

4. **Ten years plus** – plan long term maintenance to rejuvenate infiltration rates:
   - Complete restoration of the joint aggregate material.
   - Replenish joint with cleaned or new aggregate material to "lip" of paver.

Recommended Seasonal Maintenance Schedule

Unilock suggests establishing a best practices maintenance program to ensure longevity of the systems before restorative action is required. Biannual preventative maintenance is suggested as shown in the schedule below. This includes sweeping once in the early spring and once again in the late fall. Below is a preventative maintenance timeline that includes four maintenance suggestions:

1. After the snow melt – March 1 through April 15
- Broom, blow, rotary brush or sweep entire surface.
- Clean debris from paver surface in location of snow stockpile area.
- Replenish joint aggregate material after cleaning.
- Every fifth year, vacuum or power wash problem areas and refill joint material.

2. Late Spring – April 1 through May 15
- Broom, blow, rotary brush or sweep flowers from trees and shrubs.
- Collect any additional debris from areas mulched or planted with annual flowers.
- Replenish joint aggregate material as necessary.

3. Late Summer – July 15 through August 30
- Broom, blow, rotary brush or sweep lawn and shrub clippings or tree fruits.
- Collect any additional debris from summer activities such as charcoal coals inadvertently dumped on the permeable surface, beach sand, etc.
- Replenish joint aggregate material as necessary.

4. Late Fall – October 15 through November 30
- Broom, blow, rotary brush or sweep plant leaves.
- Replenish joint aggregate material as necessary.

Various factors will affect each project's preventative maintenance timeline and must be reviewed individually.

See the Recommended Seasonal Maintenance Schedule chart on next page.

Recommended Maintenance Schedule	Seasonal BMP			
	After Snow Melt	Late Spring	Late Summer	Late Fall
Techniques				
Project Type 1: Preventative - choose one		1x per season	optional	1x per season
Bristle Broom	**	*	*/**	*
Leaf Blower	**	*	*/**	*
Rotary Brush		*	*/**	*
Project Type 1: Restorative		**		**
Wet-Dry Vacuum	**	**	**	**
Riding Litter Vacuum		*	**1x every 5 yrs.	*
Powerwasher	**	**	**	**
Project Type 2: Preventative - choose one		1x per season	optional	1x per season
Rotary Brush		*	*	*
Broom Sweepers		*		*
Regenerative Air Sweepers		*		*
Project Type 2: Restorative				
Vacuum Sweepers			** 1x every 10 yrs.	
Powerwasher	**	**	**	**

* recommended

** as needed per Strategic Procedures

Winter Maintenance and De-icing

Durability is one benefit that Unilock paving stones are known for. Almost all Unilock paving stones have a slight bevel around the edge of the stone. This helps protect the edges from potential chipping by snow clearing equipment. Always use a plastic snow shovel for paving stones. Also fit snow blowers with plastic shoes on the adjustable gliders and on the scoop edge.

When using commercial snow removal companies, confirm in writing they have protective edges on the snowplow equipment to avoid scratching the surface. Although the metal on snow clearing equipment will not adversely affect Unilock paving stones structurally, the contact of any steel on concrete can potentially leave tiny particles of metal in the paver surface which will rust and leave unsightly brown streaks. (A good example of this can be seen on the municipal curbs at the street). To reduce aesthetic damage to the paver surface, only use a polymer or rubber cutting edge on the plow.

De-icing substances, when used in proper amounts, will not damage good-quality concrete. They will, however, speed up the surface wear on some styles of pavers. Many of the exposed aggregate products and tumbled products are unaffected by virtue of their style.

There are three primary types of de-icing salts:

- Sodium chloride (common rock salt) is the most popular de-icing salt. It is widely available and it will melt snow and ice at temperatures down to approximately 16° F. Below 16° F, rock salt stops melting snow and ice. Sodium chloride can damage adjacent grass, plants and metal. Apply with caution and use as sparingly as possible.

- Calcium chloride is another de-icing salt. It generally looks like small, white, round, pellets. It will melt snow down to about 0° F. It can irritate skin. Studies indicate that depending on the concentration, calcium chloride is less damaging to grass than sodium chloride is. Heavy concentrations of calcium chloride can chemically attack concrete.

- Potassium chloride is a de-icing salt available in some markets. It will not hurt skin or damage plants. However, it melts ice only when the air temperature is above 15° F, but it can be combined with sand to improve effectiveness.

Note: *Do not use Magnesium chloride.*

Note: *Do not use sand for anti-skid with permeable pavers as it will clog the joint material.*

Note: *Fertilizers that contain ammonium nitrate and ammonium sulfate should not be used for de-icing since these substances attack the integrity of concrete. Always read the manufacturer's recommendations for use and heed all warnings and cautions.*

Notes

"When we take care of the earth, it will ultimately take care of us."

BOSTON
35 Commerce Dr.
Uxbridge, MA 01569
Tel: (508) 278-4536
Fax: (508) 278-4572

BUFFALO
510 Smith St.
Buffalo, NY 14210
Tel: (716) 822-6074
Fax: (716) 822-6076

CHICAGO
301 E. Sullivan Rd.
Aurora, IL 60505
Tel: (630) 892-9191
Fax: (630) 892-9215

CLEVELAND
12560 Sheets Rd.
Rittman, OH 44270
Tel: (330) 927-4000
Fax: (330) 927-4100

DETROIT
12591 Emerson Dr.
Brighton, MI 48116
Tel: (248) 437-7037
Fax: (248) 437-4619

MILWAUKEE
W4814 Country Hwy A
Elkhorn, WI 53121
Tel: (262) 742-3890
Fax: (262) 742-2168

NEW YORK
51 International Blvd.
Brewster, NY 10509
Tel: (845) 278-6700
Fax: (845) 278-6788

26 Tetz Rd.
Chester, NY 10918
Tel: (845) 469-1230
Fax: (845) 469-1213

PHILADELPHIA
229 Route 541 Bypass
Lumberton, NJ 08048
Tel: (609) 914-0000
Fax: (609) 914-0209

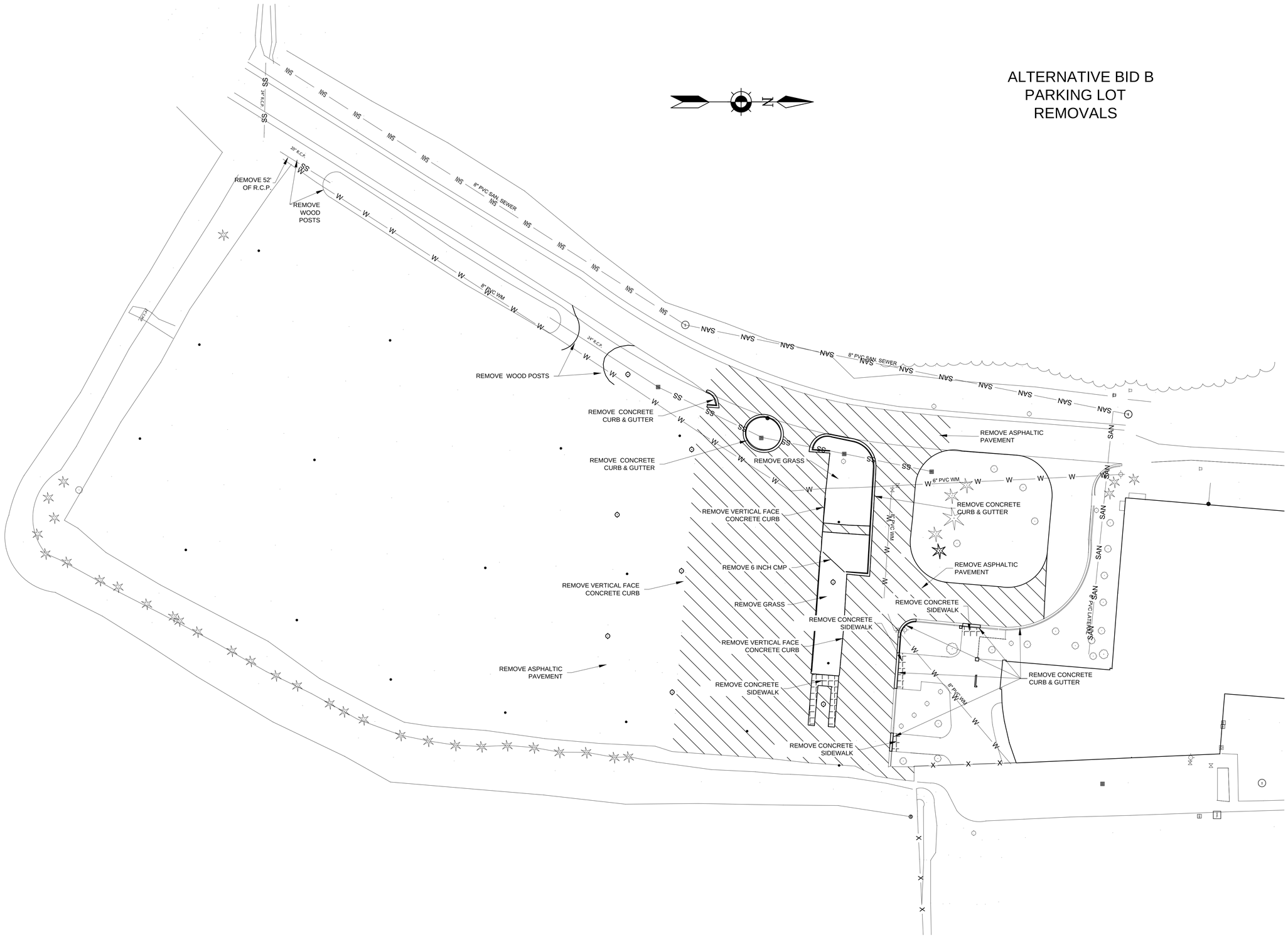
TORONTO
287 Armstrong Ave.
Georgetown, ON L7G 4X6
Tel: (416) 646-9000
Fax: (905) 874-3034

FSC
Mixed Sources
Product group from well-managed forests and other controlled sources
www.fsc.org Cert no. SW-COC-001832
© 1996 Forest Stewardship Council

www.unilock.com | 1-800-UNILOCK

©2011 Hengestone Holdings, Inc. Printed July, 2011.

A-4

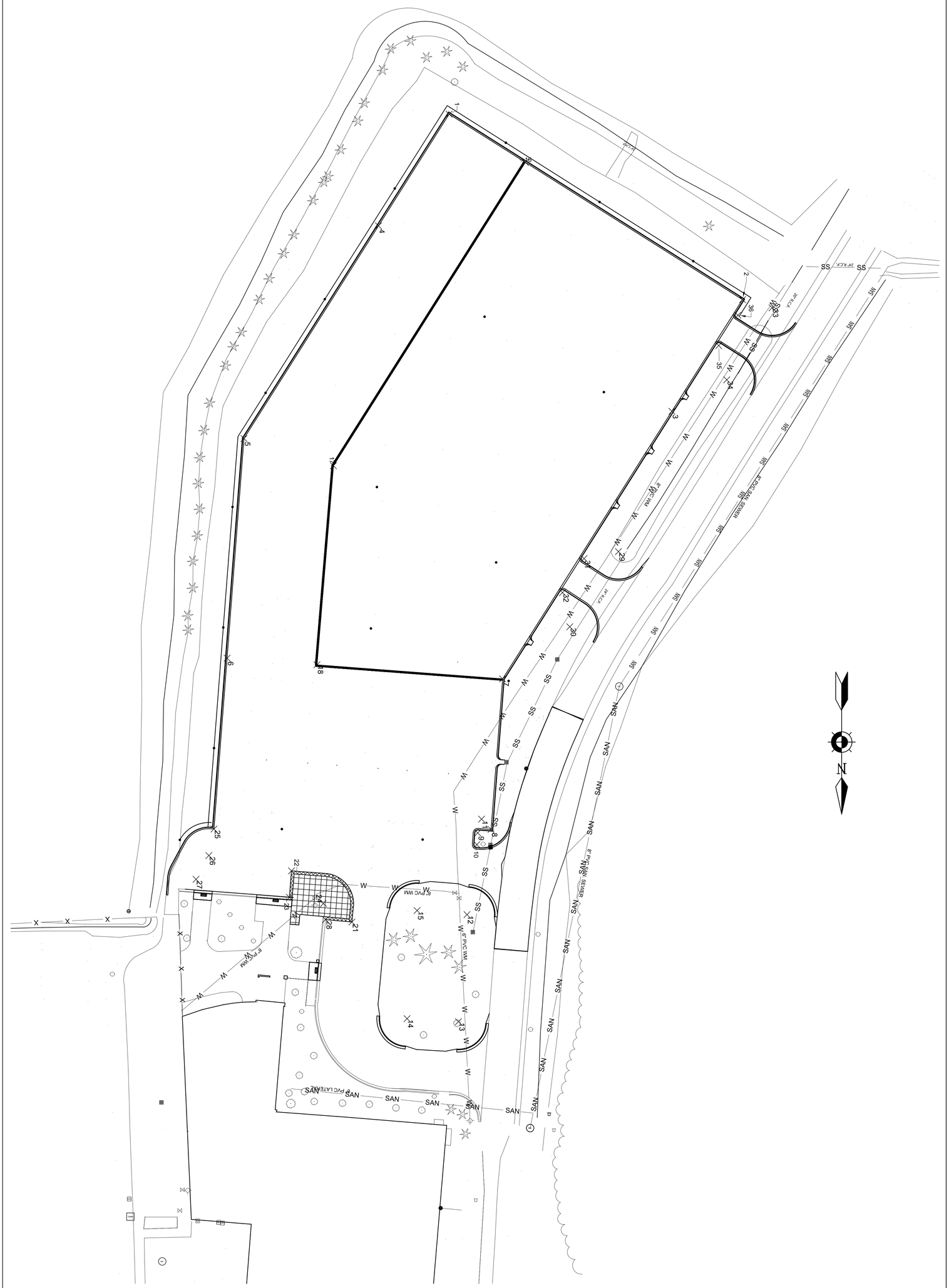


H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: DSG	SCALE: 1" = 40'
CHECKED BY: KDS	DATE: 10/14/11
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX	
SHEET DESCRIPTION: REMOVALS	
SITE NO. 628	BUILDING NO. 5800
PROJECT NO. 0060-10617	
SHEET NO. 7 OF 16	FILE NO. 7

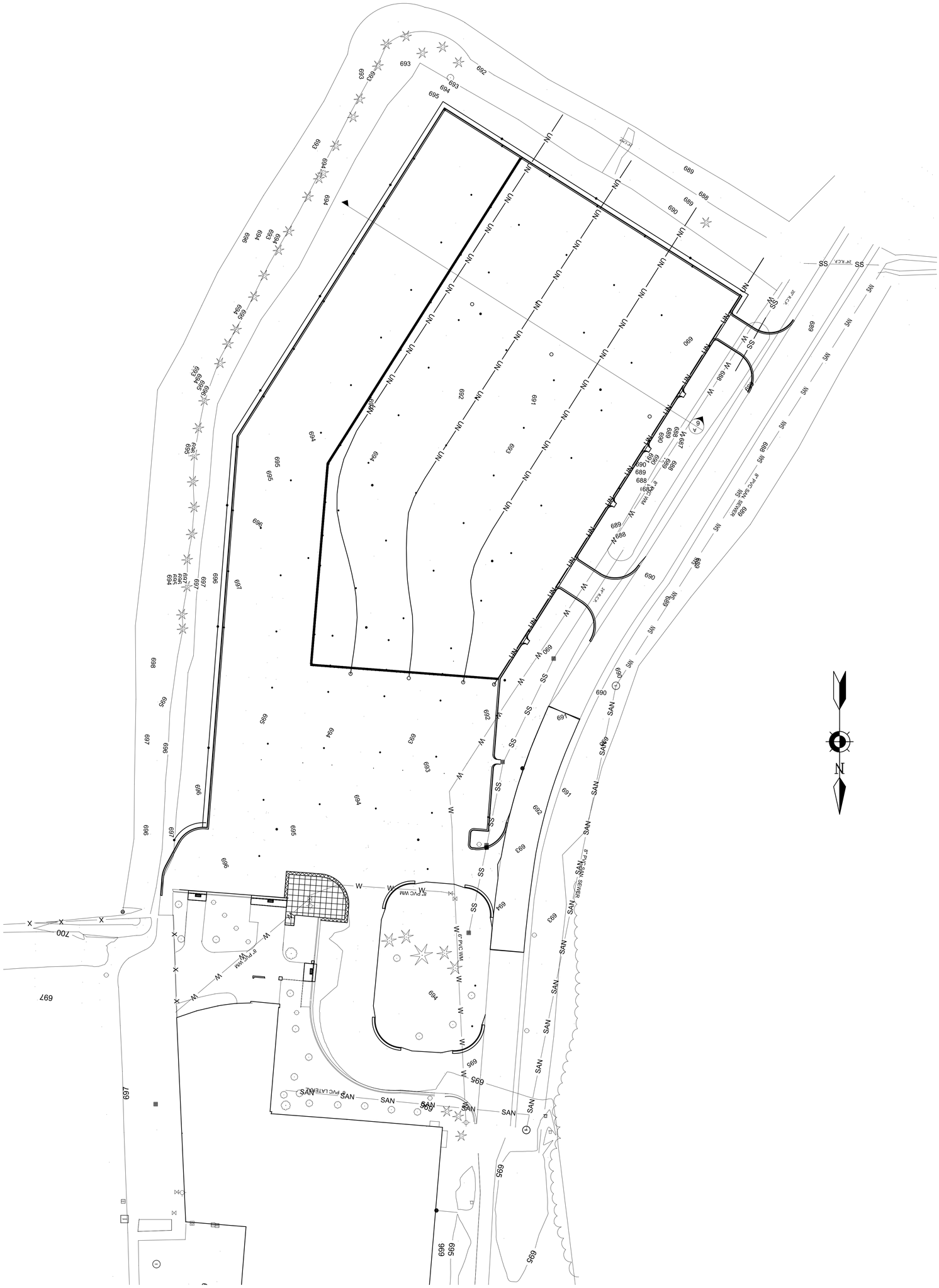
H:\CADD\O\0060\10617 SPORTS COMPLEX



SHEET NO.	PROJECT NO.	SITE NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
9 OF 16	0060-10617	628	MILWAUKEE COUNTY SPORTS COMPLEX	1" = 40'	DSG
9		BUILDING NO. 5800	SHEET DESCRIPTION: LOT LAYOUT	DATE: 10/14/11	CHECKED BY: SJH
FILE NO.					

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

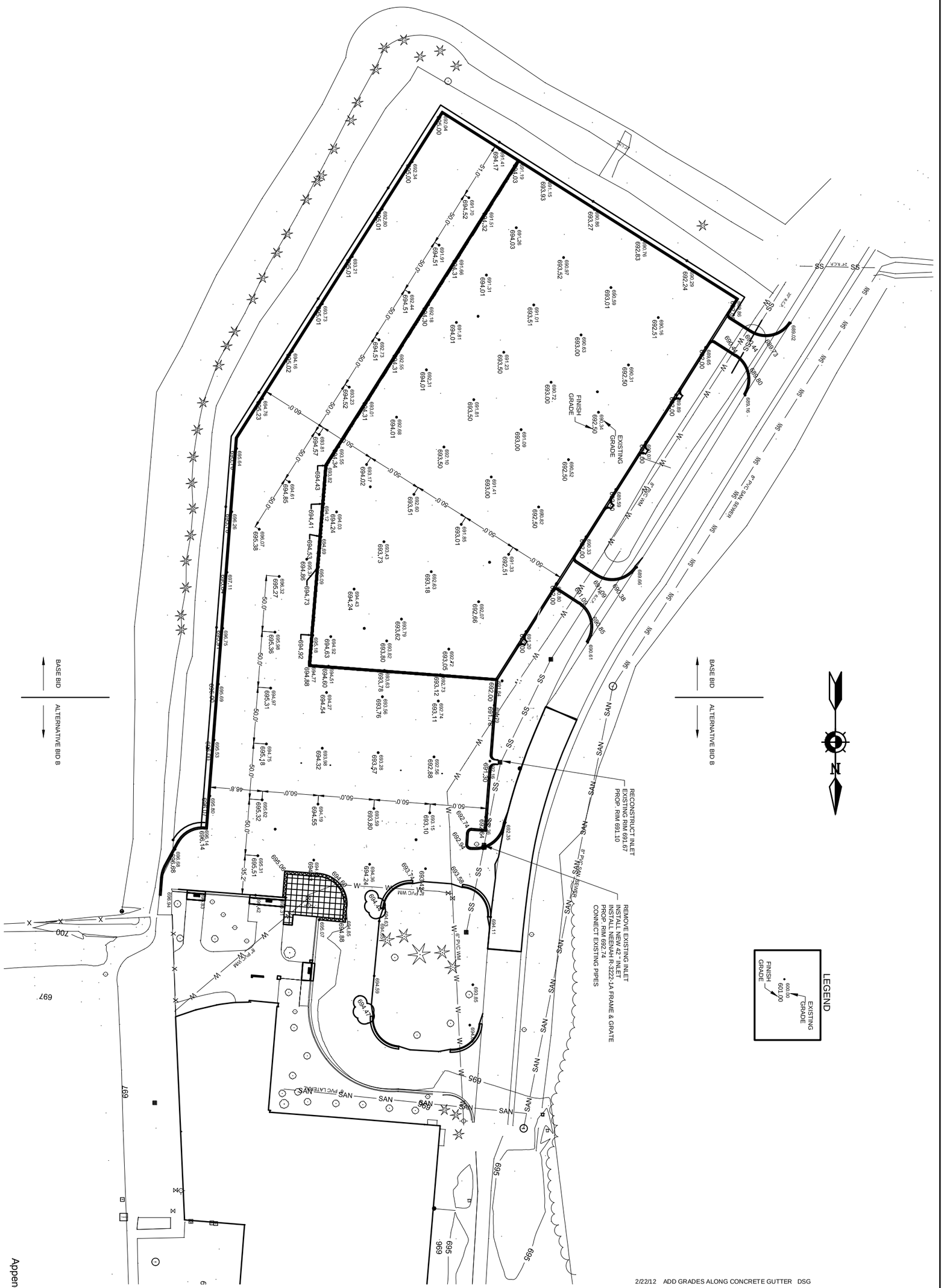
H:\CADD\O\0060\10617 SPORTS COMPLEX



SHEET NO.	PROJECT NO.	SITE NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
8 OF 16	0060-10617	628	MILWAUKEE COUNTY SPORTS COMPLEX	1" = 40'	DSG
8		BUILDING NO. 5800	SHEET DESCRIPTION: GRADING PLAN	DATE: 10/14/11	CHECKED BY: SJH
FILE NO.					

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

H:\CADD\O\0060\10617 SPORTS COMPLEX



2/2/12 ADD GRADES ALONG CONCRETE GUTTER DSG

SHEET NO.	PROJECT NO.	SITE NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
10 OF 16	0060-10617	628	MILWAUKEE COUNTY SPORTS COMPLEX	1" = 40'	DSG
10		BUILDING NO. 5800	SHEET DESCRIPTION: FINISH GRADES	DATE: 10/14/11	CHECKED BY: SJH
FILE NO.					

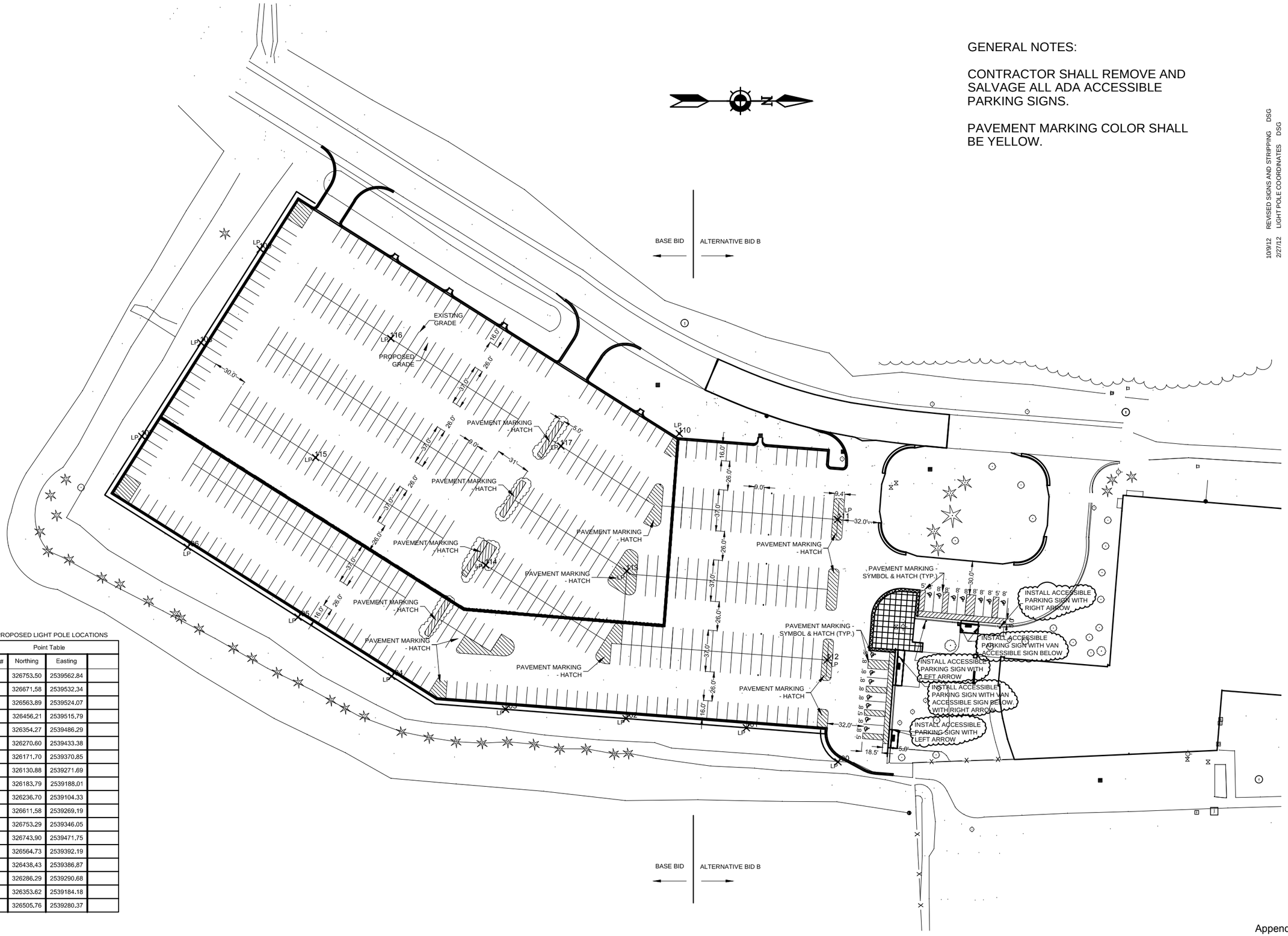
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

Appendix G

GENERAL NOTES:

CONTRACTOR SHALL REMOVE AND SALVAGE ALL ADA ACCESSIBLE PARKING SIGNS.

PAVEMENT MARKING COLOR SHALL BE YELLOW.



PROPOSED LIGHT POLE LOCATIONS

Point Table			
Point #	Northing	Easting	
100	326753.50	2539562.84	
101	326671.58	2539532.34	
102	326563.89	2539524.07	
103	326456.21	2539515.79	
104	326354.27	2539486.29	
105	326270.60	2539433.38	
106	326171.70	2539370.85	
107	326130.88	2539271.69	
108	326183.79	2539188.01	
109	326236.70	2539104.33	
110	326611.58	2539269.19	
111	326753.29	2539346.05	
112	326743.90	2539471.75	
113	326564.73	2539392.19	
114	326438.43	2539386.87	
115	326286.29	2539290.68	
116	326353.62	2539184.18	
117	326505.76	2539280.37	

H:\CADD\O\0060\10617 SPORTS COMPLEX

10/9/12 REVISED SIGNS AND STRIPPING DSG
2/27/12 LIGHT POLE COORDINATES DSG

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

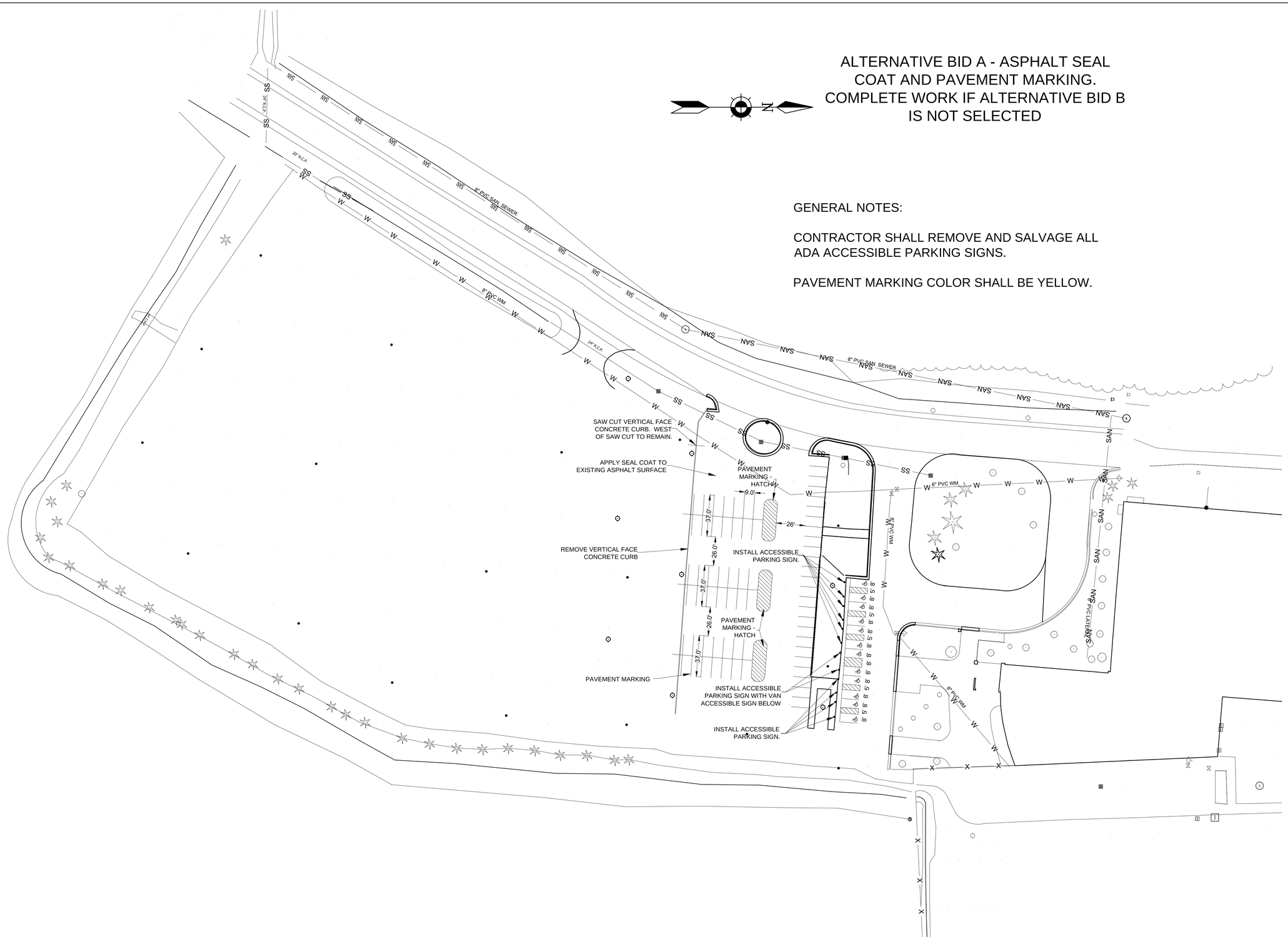
DRAWN BY: DSG	CHECKED BY: SJH
SCALE: 1" = 40'	DATE: 10/14/11
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX	SHEET DESCRIPTION: SIGNING & MARKING
SITE NO. 628	BUILDING NO. 5800
PROJECT NO. 0060-10617	
SHEET NO. 12 OF 16	FILE NO. 12

ALTERNATIVE BID A - ASPHALT SEAL COAT AND PAVEMENT MARKING. COMPLETE WORK IF ALTERNATIVE BID B IS NOT SELECTED

GENERAL NOTES:

CONTRACTOR SHALL REMOVE AND SALVAGE ALL ADA ACCESSIBLE PARKING SIGNS.

PAVEMENT MARKING COLOR SHALL BE YELLOW.



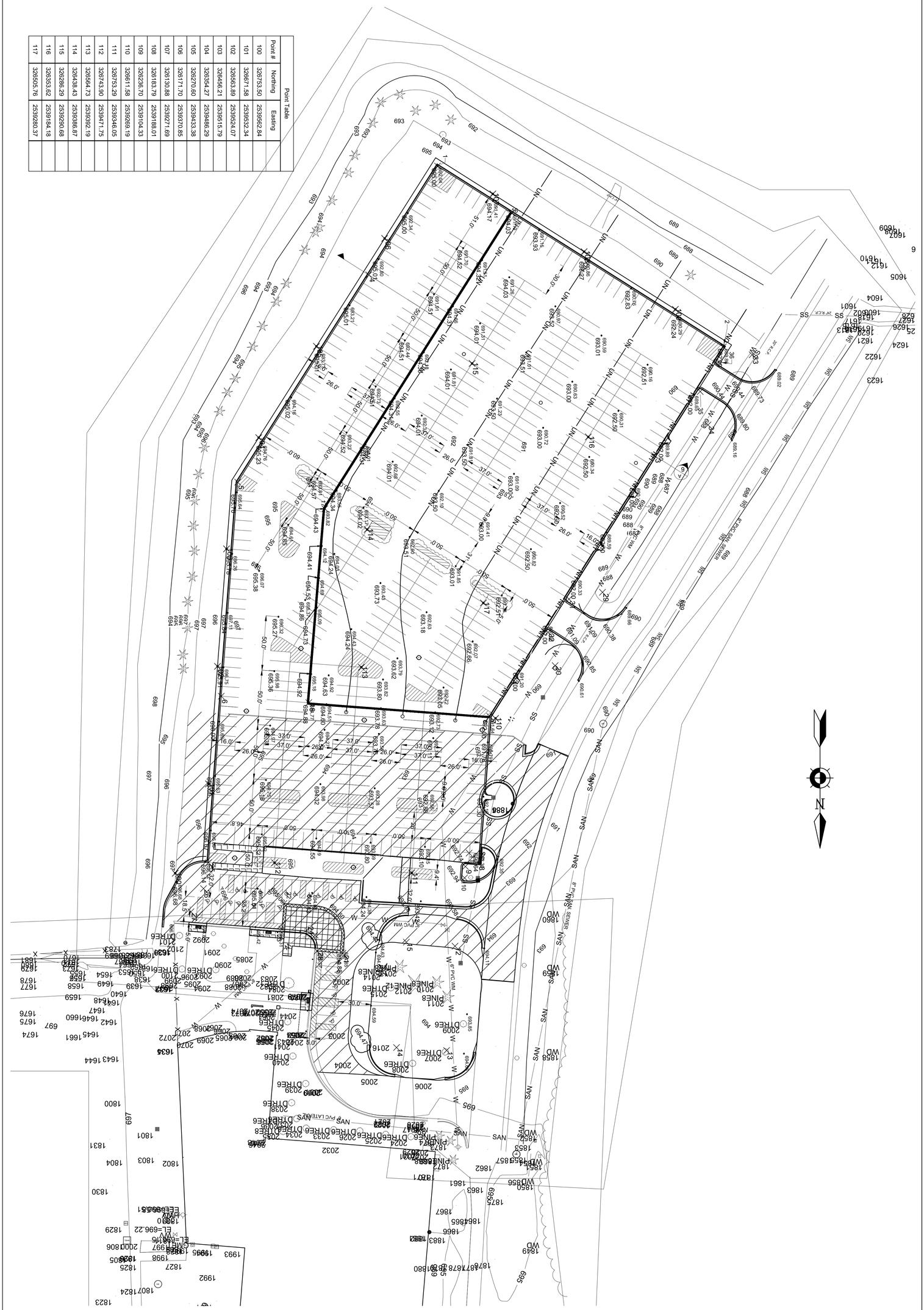
H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY:	DSG
CHECKED BY:	SJH
SCALE:	1" = 40'
DATE:	10/14/11
PROJECT TITLE:	MILWAUKEE COUNTY SPORTS COMPLEX
SHEET DESCRIPTION:	ALTERNATIVE BID A
SITE NO.	628
BUILDING NO.	5800
PROJECT NO.	0060-10617
SHEET NO.	13 OF 16
	13
FILE NO.	

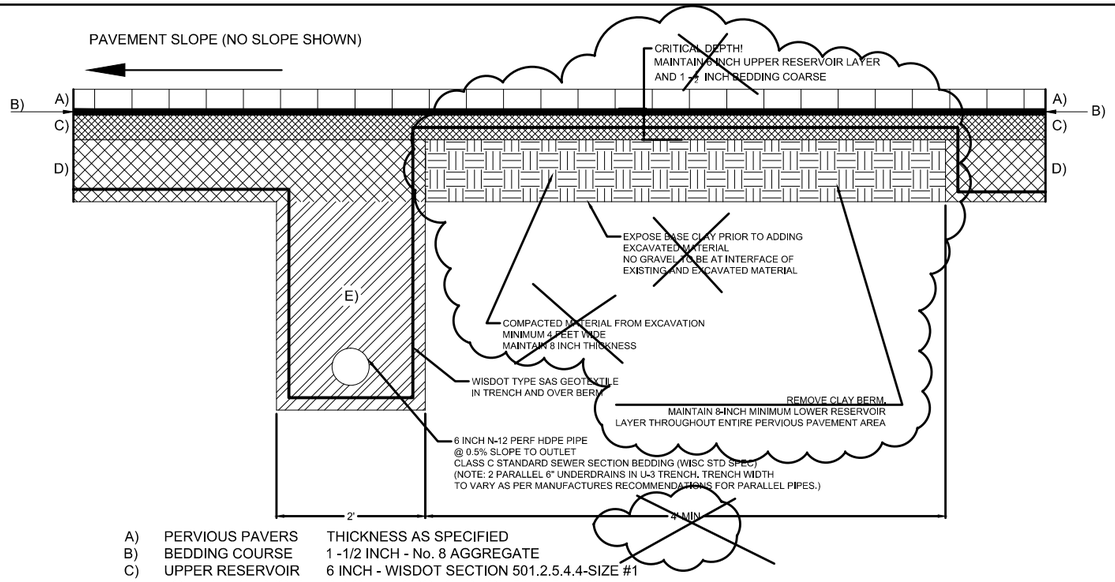
H:\CADD\O\0060\10617 SPORTS COMPLEX

Point Table		
Point #	Northing	Easting
100	326753.50	2539562.84
101	326671.58	2539532.34
102	326563.89	2539524.07
103	326456.21	2539515.79
104	326354.27	2539486.29
105	326270.60	2539433.38
106	326171.70	2539370.85
107	326130.88	2539271.69
108	326183.79	2539188.01
109	326236.70	2539104.33
110	326611.58	2539269.19
111	326753.29	2539346.05
112	326743.90	2539471.75
113	326564.73	2539392.19
114	326438.43	2539386.87
115	326286.29	2539290.68
116	326353.62	2539184.18
117	326505.76	2539280.37



SHEET NO.	PROJECT NO.	SITE NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
3 OF 3	0060-10617	628	MILWAUKEE COUNTY SPORTS COMPLEX	1" = 40'	DSG
3		BUILDING NO. 5800	SHEET DESCRIPTION: LOT LAYOUT	DATE: 10/29/10	CHECKED BY: KDS
FILE NO.					

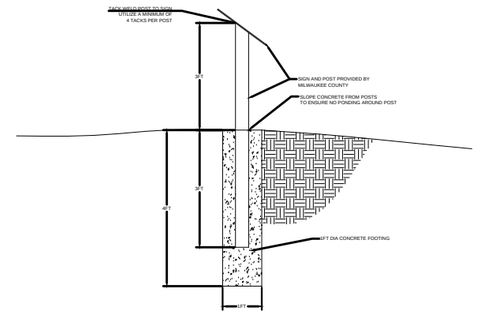
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208



A)	PERVIOUS PAVERS	THICKNESS AS SPECIFIED
B)	BEDDING COURSE	1 -1/2 INCH - No. 8 AGGREGATE
C)	UPPER RESERVOIR	6 INCH - WISDOT SECTION 501.2.5.4.4-SIZE #1
D)	LOWER RESERVOIR	8 INCH - WISDOT SECTION 501.2.5.4.4-SIZE #2
E)	TRENCH	DEPTH VARIES - PIPE BEDDING TO BE 3/8 INCH CRUSHED STONE CHIPS CONFORMING TO THE REQUIREMENTS OF TABLE 32 OF STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION FOR BEDDING. FOR COVER USE WISDOT SECTION 501.2.5.4.4 SIZE #2

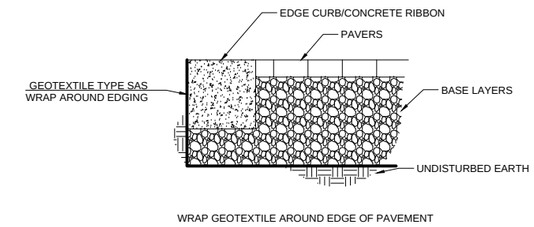
TYPICAL PAVEMENT AND UNDERDRAIN SECTION (F/5)

SCALE: NTS



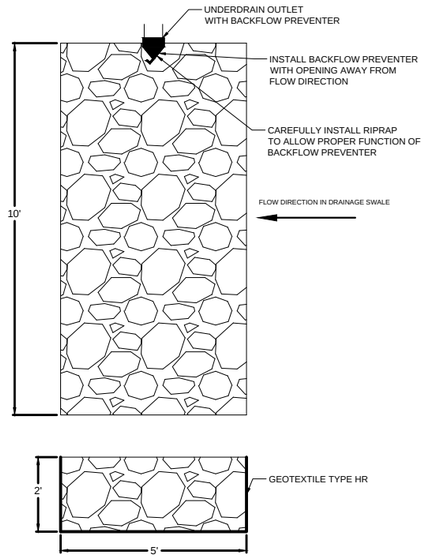
EDUCATIONAL SIGN INSTALL DETAIL (L/5)

SCALE: NTS



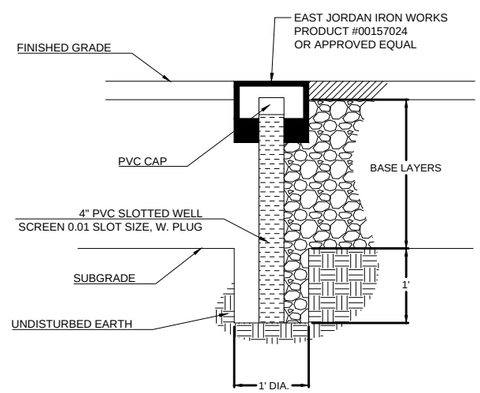
GEOTEXTILE EDGING (K/5)

SCALE: NTS



RIPRAP DETAIL (I/5)

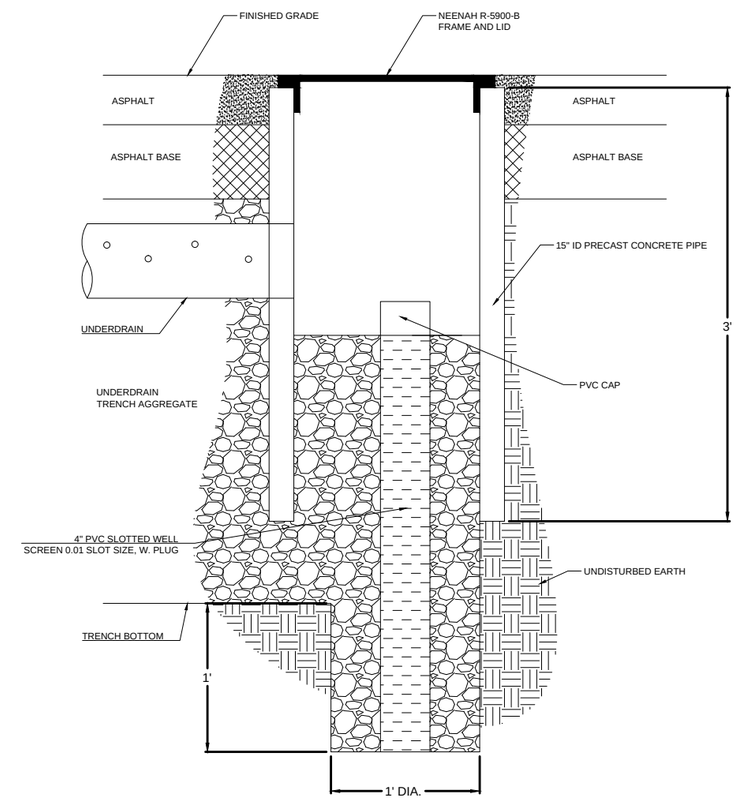
SCALE: NTS



NOTE: WELL COVER SHALL BE SECURED IN CONCRETE SURROUND (1'-6" TOTAL DIA.).

OBSERVATION WELL (H/5)

SCALE: NTS



UNDERDRAIN CLEAN OUT DETAIL (G/5)

SCALE: NTS

REVISED 7/30/12 BY SJH

H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: SJH	CHECKED BY: DSG
SCALE: NTS	DATE: 10/14/11
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX	SHEET DESCRIPTION: UNDERDRAIN PROFILE VIEW
SITE NO. 628	BUILDING NO. 5800
PROJECT NO. 0060-10617	
SHEET NO. 5 OF 16	5
	FILE NO.

NOTES:

1. PIPE TRENCH TO FOLLOW CONTOUR SPECIFIED.
2. USE 4' X 4' ANTISEEP COLLARS AT THE TRANSITION FROM PERFORATED TO NON PERFORATED PIPE. USE NRCS ANTI SEEP COLLAR FOR HDPE PIPE, NRCS DRAWING NUMBER: WI-246A OR APPROVED OTHER.

UNDERDRAIN SECTION A (A/6)
SCALE: H1"=30' V1"=3'

UNDERDRAIN 1 (B/6)
SCALE: H1"=40' V1"=4'

UNDERDRAIN 2 (C/6)
SCALE: H1"=40' V1"=4'

UNDERDRAIN 3 (D/6)
SCALE: H1"=40' V1"=4'

UNDERDRAIN 4 (E/6)
SCALE: H1"=40' V1"=4'

REVISED 7/30/12 BY SJH

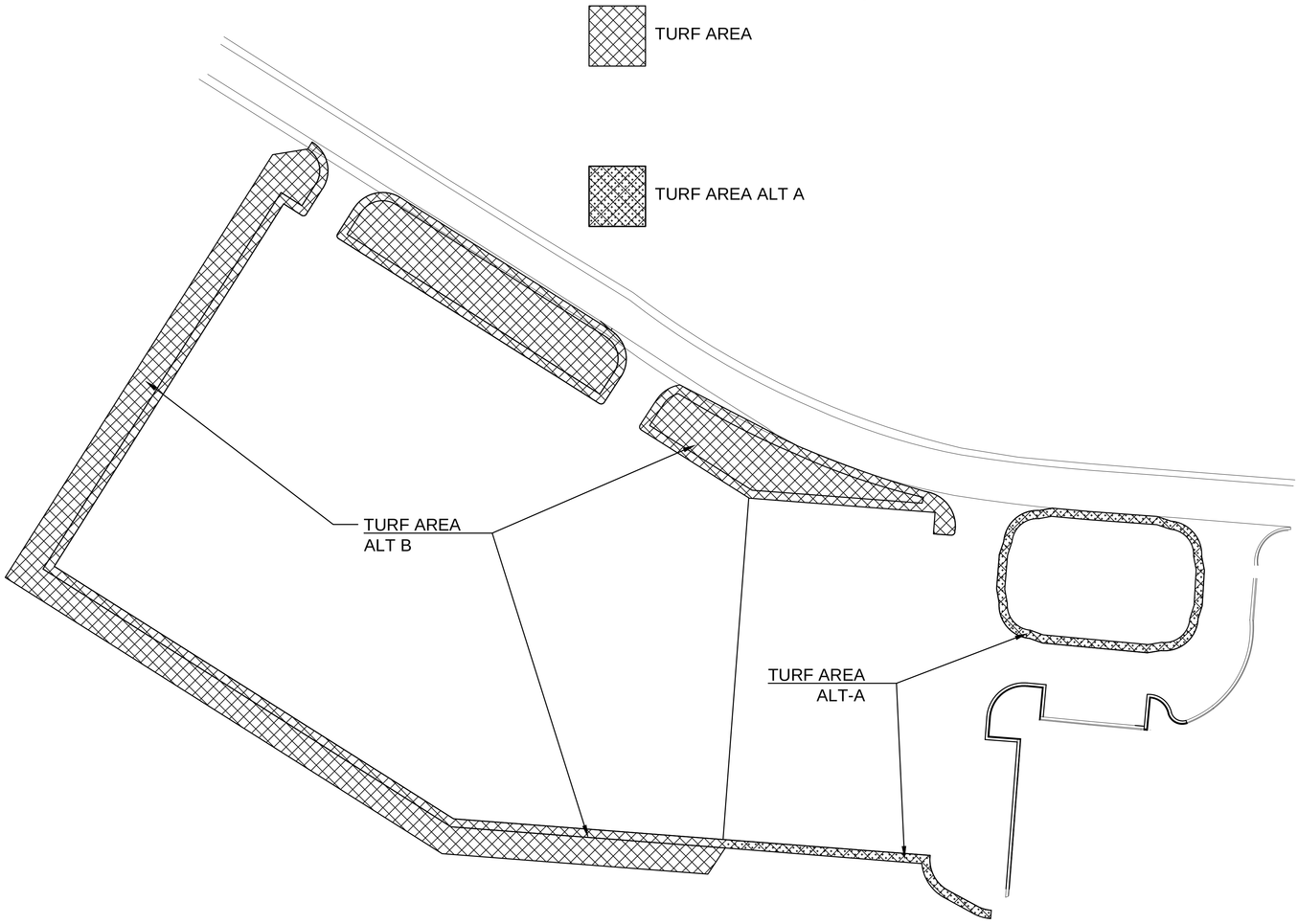
H:\CADD\O\0060\10617 SPORTS COMPLEX

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

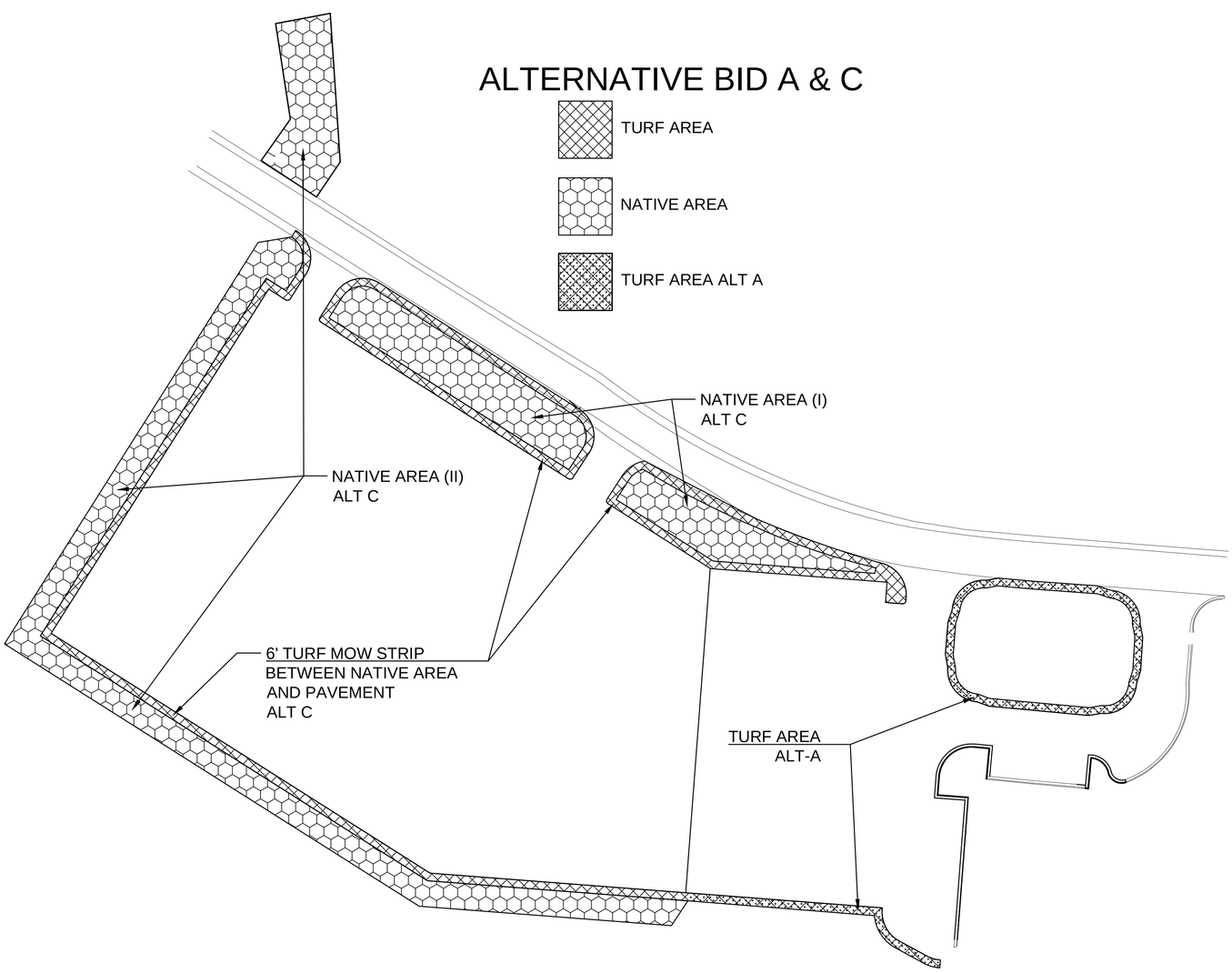
DRAWN BY: SJH	CHECKED BY: DSG
SCALE: NTS	DATE: 10/14/11
PROJECT TITLE: MILWAUKEE COUNTY SPORTS COMPLEX	SHEET DESCRIPTION: UNDERDRAIN PROFILE VIEW
SITE NO. 628	BUILDING NO. 5800
PROJECT NO. 0060-10617	
SHEET NO. 6 OF 13 6	FILE NO.

H:\CADD\O\0060\10617 SPORTS COMPLEX

ALTERNATIVE BID A & B



ALTERNATIVE BID A & C



SHEET NO.	PROJECT NO.	SITE NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
11 OF 16	0060-10617	628	MILWAUKEE COUNTY SPORTS COMPLEX	1" = 50'	SJH
11		BUILDING NO. 5800	SHEET DESCRIPTION: SITE RESTORATION	DATE: 10/14/11	CHECKED BY: DSG
FILE NO.					

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

Appendix B

McKinley Park

Appendix B-1: Site Map

Appendix B-2: Inspection and Maintenance Logs

Appendix B-3: O&M Manual

Appendix B-4: Design Plans

B-1

McKinley Beach
N
BMP Limits
Stormwater Structure
Stormwater Sewer
Appendix pg 35
MH
CB
Tomuc
Infiltration MH
Sedimentation MH
Outfall
Rain Garden Inlet
Rain Garden Outlet

B-2

Bradford and McKinley Beach Infiltration Cell Inspections

Location (circle): BBOF0 BBOF2 BBOF3 BBOF4 BBOF5 BBOF6 BBOF7 MBOF

Inspected By: _____ Date: _____

Basin

	Yes	No
Sedimentation	_____	_____
Erosion	_____	_____
Ponding	_____	_____
Trash	_____	_____
Weeds	_____	_____
Hydrocarbon Contamination	_____	_____
Other Damage	_____	

Water in basin should be gone within 48-hours of a rain event.

Embankments

	Yes	No
Slumping	_____	_____
Seepage	_____	_____
Animal Holes	_____	_____
Weeds	_____	_____
Erosion	_____	_____
Other Damage	_____	

Inlet Pipes

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Outlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Spillway Integrity

Excellent _____ Good _____

Fair Poor

Other Damage _____

Inspection Comments: _____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Bradford and McKinley Beach Infiltration Cell Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

November	Yes	No
Native Species Mowed to Six Inches	_____	_____

As Needed	Methods Used	Species Targeted
Invasive Species Control	_____	_____

Maintenance Comments: _____

_____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Bradford & Mckinley Beach Sedimentation Chamber Inspection

Sedimentation Chamber (circle): _____ Bradford Beach _____ McKinley Beach _____

Inspected By: _____ Date: _____

Outlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Inlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Sedimentation Structure

	Yes	No
Excessive Floatable	_____	_____
Clogging	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Depth (ft)

Sediment Depth _____

Other Damage _____

Inspection comments: _____

_____

_____

_____

Bradford & Mckinley Beach Sedimentation Chamber Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Vacuumed and Cleaned Sump	_____	_____
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

Maintenance comments: _____

_____

_____

_____

_____

_____

B-3

Table 1: Surface-Infiltration Maintenance

Schedule	Action
April 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris, trash and decaying/loose plant material. **Replair** eroded areas. **Log** activity in maintenance log.
June 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. Pull or **spot-treat** invasive species (weeds and woody vegetation). **Log** activity in maintenance log.
August 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash.
October 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. Pull or **spot-treat** invasive species (weeds and woody vegetation). **Log** activity in maintenance log.
November 1st	**Optional: Cut** back grasses and forbs to 4"-6" above ground and remove cuttings. **Log** activity in maintenance log.
Winter and after snowmelt/runoff event	**Inspect*** for: outlet clogging and structure stability. Remove debris, trash and decaying/loose plant material. **Log** activity in maintenance log.
After each 1" rainfall	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. **Log** activity in maintenance log. **Note** # of hours after rainfall ended and depth of water in each cell. Log details in maintenance log.

* Schedule follow-up repair work if inspection results in repair needs.

Table 2: Troubleshoot for Surface-Infiltration Concerns

Concern	Action/Solution
Ponding water for longer than 48 hours	Cell must be dry prior to any work. Allow longer dry time or pump down cell and subsurface soil prior to any work (dig sump pit for pumping). Use the following measures independently until a solution is found: 1) Using hand shovel, remove obvious sedimentation in areas of ponding. 2) Use tilling or hoeing to break up surface soil. 3) Remove 2-4" of surface soil and replace with soil as prescribed in original construction specifications. 4) Consult a stormwater design professional for remediation.
Dead or strained vegetation	Refer to plant list from construction specifications and replace dead plants. Cell bottom should have a plant density of 90%. Watering of plant may be necessary during dry periods until the second growing season.
Invasive species/weed growth in infiltration cell	Pull weeds by hand or apply a biodegradable herbicide such as Round Up. Replant desirable species in bare areas. Areas with invasive species should be inspected and corrected weekly.
Plant fatality due to Waterfowl or other predators	Install goose-protection fencing consisting of stakes placed 6' apart and stringline placed at 4" and 12" above ground surrounding the cell. 1) If stringline is ineffective, chicken-wire cages shall be constructed to surround plants on 4 sides and top. Either method shall be removed after one growing season or when plants reach sufficient height and density.
Erosion, gullies, slope stability concerns	In areas of steady or channeling flow, install additional field-stone rip rap with underlying filter fabric. Inflow or overflow areas where water is expected to flow should be formed so that the lowest areas are within the rock sections, ensuring that edges where soil and rock meet are higher. Fill sand/soil gully areas with soil composition required as part of the construction contract.
Other concerns	Consult a stormwater design specialist for special concerns.

McKinley Beach Stormwater Improvement BMP Inspection Log

BMP Name/Location

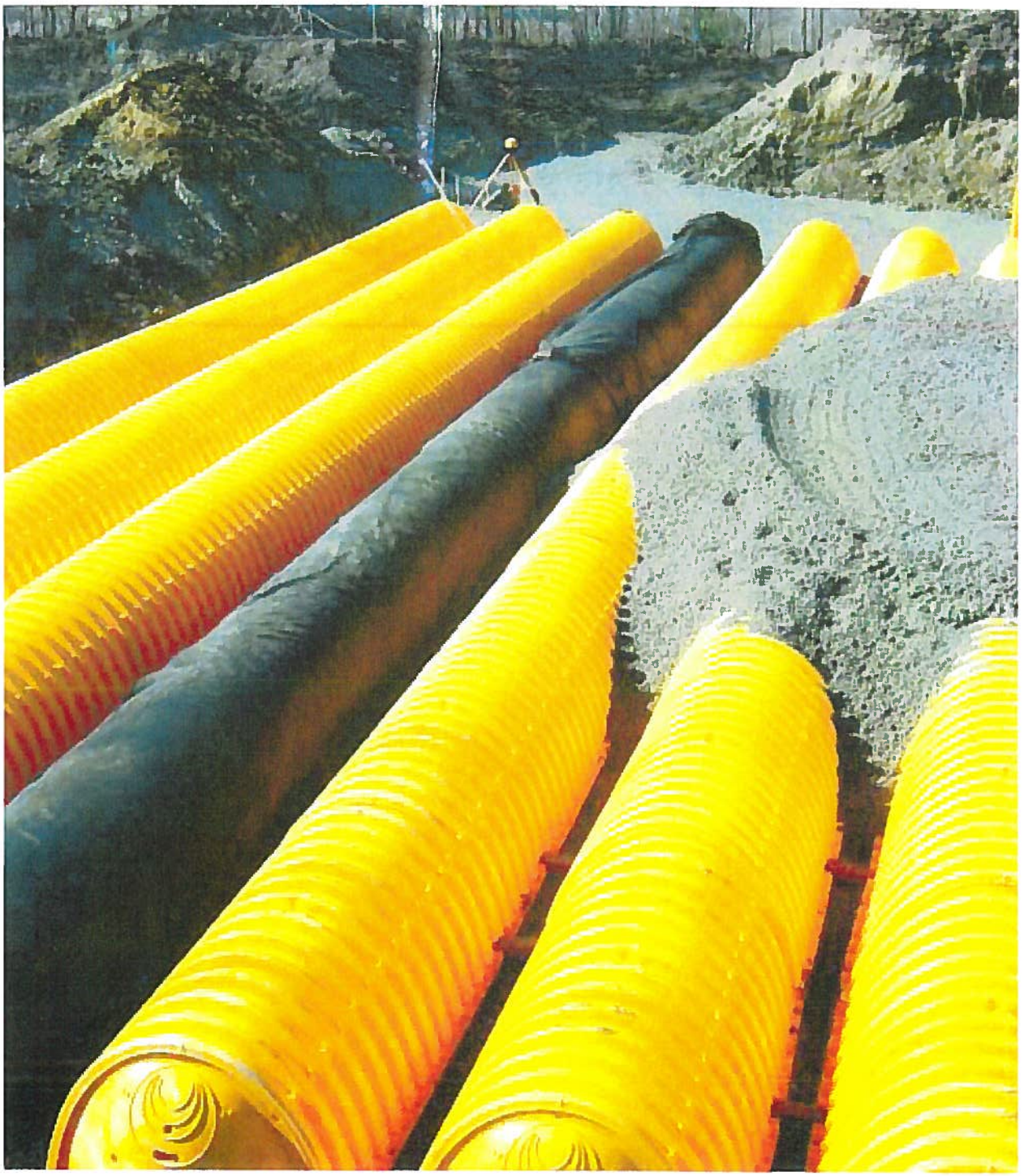
Name of Inspector	Date of Inspection	Time of Inspection	Date of last rain event	Depth of last rainfall (in.)	Depth of water ponding in BMP	Condition of Structures	Erosion or sedimentation present? (yes/no)	Condition of Vegetation	Action Needed

NOTE: The inspector shall prepare two copies to be updated at each visit. One copy of the site inspection log shall be submitted to Parks Supervisor. The inspector shall keep a second copy.
The site shall be inspected per schedule or within 24 hours of each rain event over 1".

StormTech®

Detention • Retention • Recharge

Subsurface Stormwater Management℠



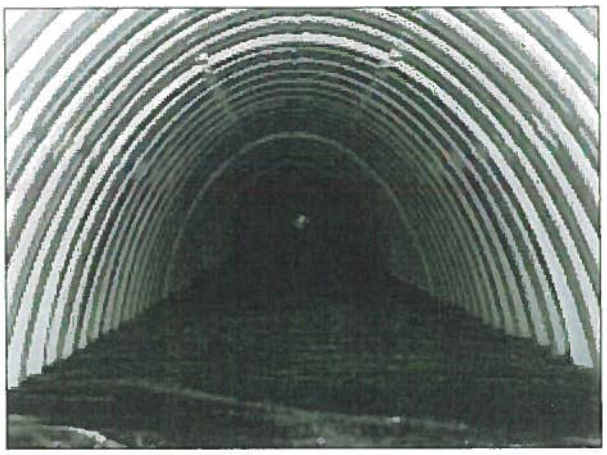
Isolator™ Row O&M Manual

StormTech® Chamber System for Stormwater Management

1.0 The Isolator™ Row

1.1 INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patent pending technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.



Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

1.2 THE ISOLATOR™ ROW

The Isolator Row is a row of StormTech chambers, either SC-740 or SC-310 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

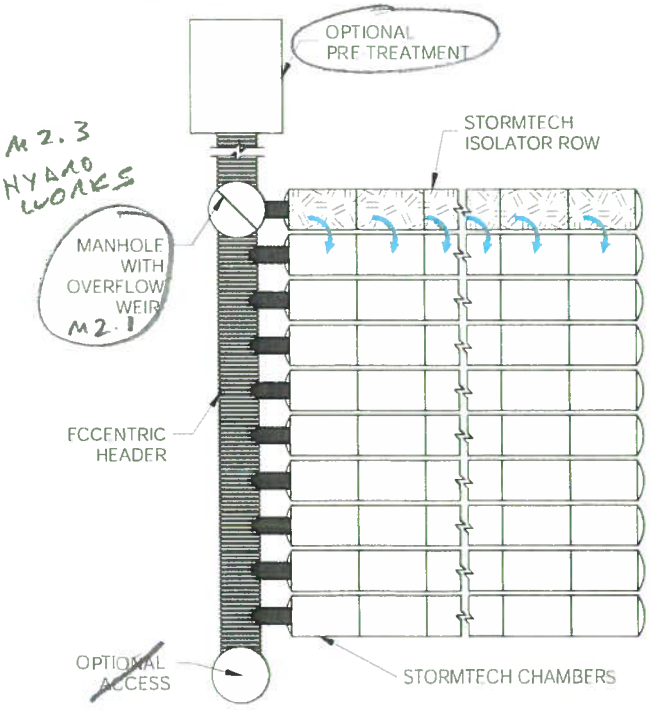
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber.

The Isolator Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

StormTech Isolator Row with Overflow Spillway
(not to scale)



2.0 Isolator Row Inspection/Maintenance

StormTech

2.1 INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

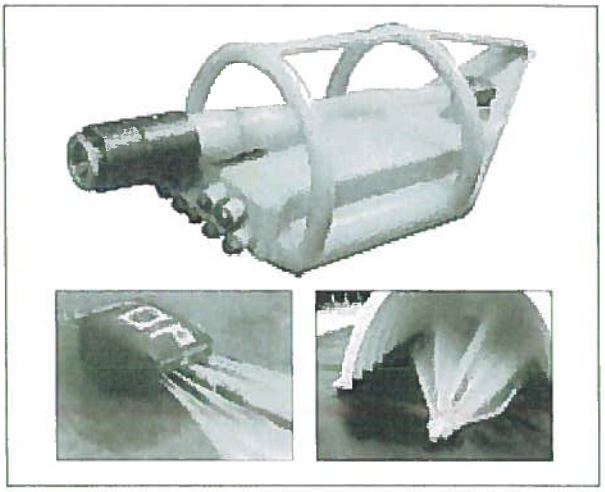
At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

2.2 MAINTENANCE

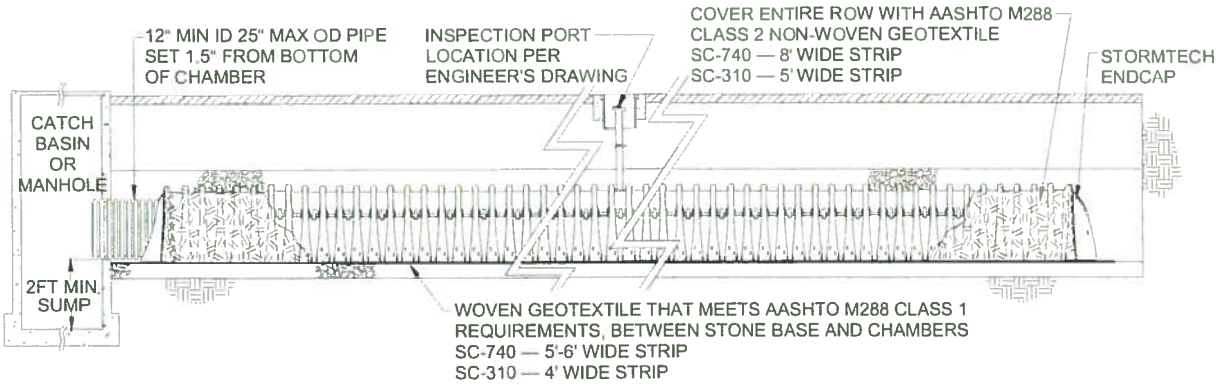
The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.



Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)



3.0 Isolator Row Step By Step Maintenance Procedures

Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.

iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows

i. Remove cover from manhole at upstream end of Isolator Row

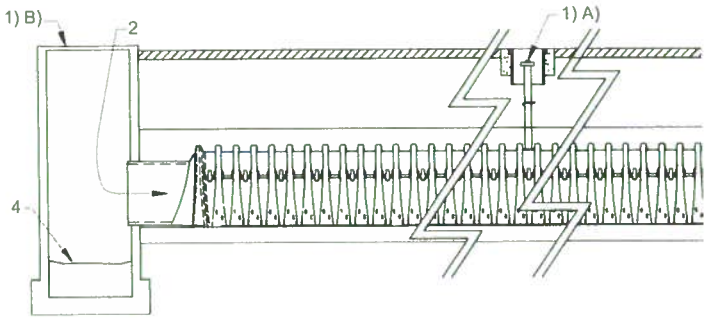
ii. Using a flashlight, inspect down Isolator Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry

2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

StormTech Isolator Row (not to scale)



Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until backflush water is clean

C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system

Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1) - (2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/01	6.3 ft.	none		New installation. Fixed point is CI frame at grade	djm
9/24/01		6.2	0.1 ft.	Some grit felt	sm
6/20/03		5.8	0.5 ft.	Mucky feel, debris visible in manhole and in Isolator row, maintenance due	rv
7/7/03	6.3 ft.		0	System jetted and vacuumed	djm

StormTech®

Detention • Retention • Recharge

Subsurface Stormwater Management℠

20 Beaver Road, Suite 104 | Wethersfield | Connecticut | 06109

860.529.8188 | 888.892.2694 | fax 866.328.8401 | www.stormtech.com

StormTech products are covered by one or more of the following patents: U.S. Patents: 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844; Canadian Patents: 2,158,418. Other U.S. and Foreign Patents Pending.Printed in U.S.A.

© Copyright. All rights reserved. StormTech LLC, 2004

S090104-1

Infiltration Cell Operation & Maintenance

The following plants species were part of the original landscape plan. Use the photos for identification purposes.

Grasses and Sedges

Fringed Brome

Needle Spike-Rush

Great Spike-Rush

Soft Rush

Torrey Rush

Bebbs Sedge

Bristly Sedge

Fox Sedge

Brown Fox Sedge

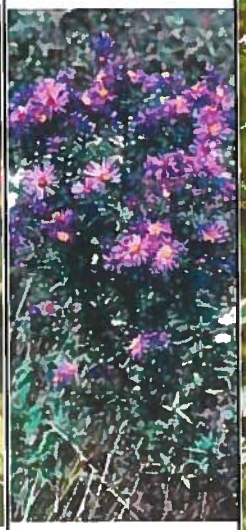
Dark Green Bulrush

Wool Grass

Wildflowers

Sweet Flag

Red Marsh Milkweed



New-England Aster

Red-Stemmed Aster

Spotted Joe Pye Weed

Boneset

Sneezeweed

Blue Flag Iris

Ohio Goldenrod

Riddell's Goldenrod

Blue Vervain

Ironweed

Culver's Root

Table 1: Surface-Infiltration Maintenance

Schedule	Action
April 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris, trash and decaying/loose plant material. **Replair** eroded areas. **Log** activity in maintenance log.
June 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. Pull or **spot-treat** invasive species (weeds and woody vegetation). **Log** activity in maintenance log.
August 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash.
October 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. Pull or **spot-treat** invasive species (weeds and woody vegetation). **Log** activity in maintenance log.
November 1st	**Optional: Cut** back grasses and forbs to 4"-6" above ground and remove cuttings. **Log** activity in maintenance log.
Winter and after snowmelt/runoff event	**Inspect*** for: outlet clogging and structure stability. Remove debris, trash and decaying/loose plant material. **Log** activity in maintenance log.
After each 1" rainfall	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. **Log** activity in maintenance log. **Note** # of hours after rainfall ended and depth of water in each cell. Log details in maintenance log.

* Schedule follow-up repair work if inspection results in repair needs.

Table 2: Troubleshoot for Surface-Infiltration Concerns

Concern	Action/Solution
Ponding water for longer than 48 hours	Cell must be dry prior to any work. Allow longer dry time or pump down cell and subsurface soil prior to any work (dig sump pit for pumping). Use the following measures independently until a solution is found: 1) Using hand shovel, remove obvious sedimentation in areas of ponding. 2) Use tilling or hoeing to break up surface soil. 3) Remove 2-4" of surface soil and replace with soil as prescribed in original construction specifications. 4) Consult a stormwater design professional for remediation.
Dead or strained vegetation	Refer to plant list from construction specifications and replace dead plants. Cell bottom should have a plant density of 90%. Watering of plant may be necessary during dry periods until the second growing season.
Invasive species/weed growth in infiltration cell	Pull weeds by hand or apply a biodegradable herbicide such as Round Up. Replant desirable species in bare areas. Areas with invasive species should be inspected and corrected weekly.
Plant fatality due to Waterfowl or other predators	Install goose-protection fencing consisting of stakes placed 6' apart and stringline placed at 4" and 12" above ground surrounding the cell. 1) If stringline is ineffective, chicken-wire cages shall be constructed to surround plants on 4 sides and top. Either method shall be removed after one growing season or when plants reach sufficient height and density.
Erosion, gullies, slope stability concerns	In areas of steady or channeling flow, install additional field-stone rip rap with underlying filter fabric. Inflow or overflow areas where water is expected to flow should be formed so that the lowest areas are within the rock sections, ensuring that edges where soil and rock meet are higher. Fill sand/soil gully areas with soil composition required as part of the construction contract.
Other concerns	Consult a stormwater design specialist for special concerns.

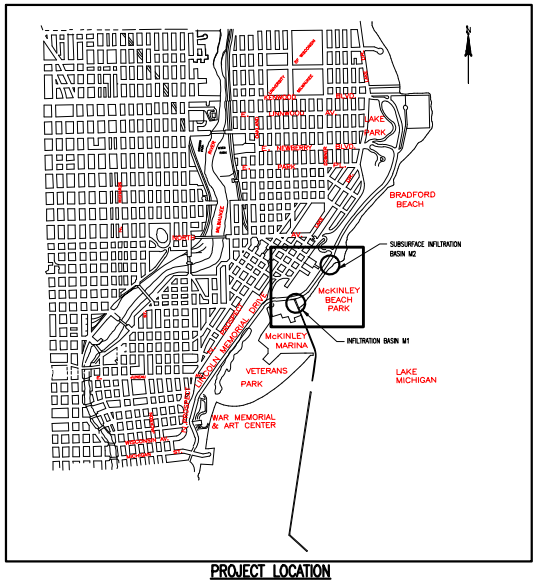
McKinley Beach Stormwater Improvement BMP Inspection Log

BMP Name/Location									
Name of Inspector	Date of Inspection	Time of Inspection	Date of last rain event	Depth of last rainfall (in.)	Depth of water ponding in BMP	Condition of Structures	Erosion or sedimentation present? (yes/no)	Condition of Vegetation	Action Needed

NOTE: The inspector shall prepare two copies to be updated at each visit. One copy of the site inspection log shall be submitted to Parks Supervisor. The inspector shall keep a second copy.
The site shall be inspected per schedule or within 24 hours of each rain event over 1".

B-4

McKINLEY BEACH STORM WATER CONTROL



PROJECT LOCATION

GENERAL NOTES:

1. APPLICATION SPECIFICATIONS: STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2008 EDITION, WITH AMENDMENTS TO DATE, AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, 6th EDITION.
2. INFORMATION SHOWN ON EXISTING CONDITIONS IS BASED ON RECORDS AVAILABLE TO MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS. THE COUNTY IN NO WAY GUARANTEES THE INFORMATION AS BEING ENTIRELY ACCURATE IN THE EVENT PERSONS PERFORMING WORK FOR MILWAUKEE COUNTY SHOULD ENCOUNTER ERRORS OR OMISSIONS IN THESE DRAWINGS DURING CONSTRUCTION OF THIS PROJECT, IT SHALL BE THEIR RESPONSIBILTY TO INFORM THE COUNTY AS SOON AS
3. ALL ELEVATIONS ON THESE DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM. (CITY OF MILWAUKEE DATUM)
4. THE LOCATION OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. THE CONTRACTOR SHALL NOTIFY DIGGERS HOTLINE ((414) 259-1181), PARKS MAINTENANCE DIVISION ((414) 258-2322), AND ALL UTILITIES IN THE VICINITY OF THE PROJECT TO LOCATE THEIR FACILITIES AT LEAST TWO WEEKS PRIOR TO BEGINNING WORK.
5. NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER UNLESS SHOWN ON THE PLANS.
6. DISTURBED AREAS WITHIN THE RIGHT OF WAY ARE TO BE COVERED WITH TOPSOIL, FERTILIZER (TYPE A), AND SODDED AS SHOWN IN THE PLANS, OR AS DIRECTED BY THE ENGINEER.
7. MISCELLANEOUS REMOVAL ITEMS REQUIRING RESTORATION OF CONCRETE OR ASPHALTIC CONCRETE PAVEMENTS, DRIVEWAYS, SIDEWALKS OR SIDE STREETS SHALL BE REMOVED TO AN EXISTING JOINT OR SAWED AS DETERMINED BY THE ENGINEER.
8. DIMENSIONS AND RADII ARE TO EDGE OF PAVEMENT OR FACE OF CURB.
9. CONCRETE CURB AND GUTTER GRADES ARE TO THE GUTTER, UNLESS OTHERWISE NOTED.
10. CURB AND GUTTER JOINT SPACING SHALL MATCH PAVEMENT JOINTING.
11. THE ORIGINAL GROUND AT THE SLOPE INTERCEPT IN CUT AND FILL SECTIONS SHALL BE ROUNDED. ROUNDING BEGINS APPROXIMATELY THREE FEET EITHER SIDE OF THE THEORETICAL SLOPE INTERCEPTS.
12. SET INLET CASTINGS 1/2 -INCH BELOW FINISHED GRADE WITH SMOOTH TROWELED EDGES.
13. PIPE ELEVATIONS SHOWN ON THE PLANS MAY BE ADJUSTED BY THE ENGINEER TO FIT EXISTING FIELD CONDITIONS.
14. ALL CONCRETE PIPE SHALL HAVE JOINT TIES INSTALLED ON THE LAST TWO JOINTS AT BOTH ENDS.
15. THE CONTRACTOR SHALL OBTAINS ALL PERMITS PRIOR TO CONSTRUCTION.

ABBREVIATIONS:

ASP	ASPHALT	MIN	MINIMUM
AVE	AVENUE	MH	MANHOLE
C-C	CENTER TO CENTER	N	NORTHING
CABC	CRUSHED AGGREGATE BASE COURSE	OHWM	ORDINARY HIGH WATER MARK
CB	CATCH BASIN	OC	ON CENTER
CI	CAST IRON	PAVT	PAVEMENT
℄	CENTERLINE	PKG	PARKING
C&G	CONCRETE CURB & GUTTER	PKWY	PARKWAY
CMP	CORRUGATED METAL PIPE	PROP	PROPOSED
CONC	CONCRETE	PVC	POLYVINYL CHLORIDE
COND	CONDUIT	R	RADIUS
DIA	DIAMETER	REQD	REQUIRED
DR	DRIVE	℞	REFERENCE LINE
ELEC	ELECTRICAL	RT	RIGHT
EL	ELEVATION	R/W	RIGHT OF WAY
EXIST	EXISTING	RCP	REINFORCED CONCRETE PIPE
E	EASTING	RD	ROAD
F TO F	FACE TO FACE	SAN	SANITARY SEWER
G	GAS	SALV	SALVAGED
GWI	GALVANIZED WROUGHT IRON	SI	SLOPE INTERCEPT
HDPE	HIGH DENSITY POLYETHYLENE	SS	STORM SEWER
HOR	HORIZONTAL	ST	STREET
HP	HIGH POINT	STA	STATION
HR	HOUR	T	TELEPHONE
IE	INVERT ELEVATION	TYP	TYPICAL
INL	INLET	UD	UNDERDRAIN
LT	LEFT	VERT	VERTICAL
LTG	LIGHTING CABLE/CONDUIT	W	WATER
LF	LINEAR FOOT	X	EXTRA
MAX	MAXIMUM		

LEGEND:

PLAN

BENCHMARK
CONTROL POINT/REFERENCE MARK
REFERENCE MONUMENT
SLOPE INTERCEPT
REFERENCE LINE
BURIED ELECTRICAL
COMBUSTIBLE FLUIDS — CAUTION
MARSH AREA
WOODED OR SHRUB AREA
CONIFEROUS TREE/SHRUB
DECIDUOUS TREE/SHRUB
GENERIC FENCE
CONTOUR LINES — 580
RIP RAP
SILT FENCE
WATER FLOW ARROW
SAW CUT — XXXXX
CONSTRUCTION FENCE SAFETY

PROFILE

GRADE LINE
EXISTING GROUND
MARSH OR ROCK PROFILE (To be noted as such) — ROCK
CULVERT OR PIPE (Profile View)

UTILITIES

ELECTRIC
FIBER OPTIC
GAS
OVERHEAD
SANITARY SEWER
EXISTING STORM SEWER
PROPOSED STORM SEWER
PROPOSED PIPE UNDERDRAIN
TELEPHONE
WATER
UTILITY PEDESTAL
POWER POLE
TELEPHONE POLE
EXISTING MANHOLE
EXISTING INLET
PROPOSED MANHOLE
PROPOSED INLET

SHEET DESCRIPTION:
PROJECT LOCATION & GENERAL NOTES

PROJECT TITLE: McKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

DESIGN FIRM: URS CORPORATION

DRAWN BY: _
SCALE: _
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO: 780
BUILDING NO:
SHEET NO. T02

Department of Transportation and Public Works

McKinley Beach Park Storm Water Control Measures

1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION
AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

SHEET INDEX

T01	COVER SHEET
T02	PROJECT LOCATION & GENERAL NOTES

CIVIL ENGINEERING & SITE WORK

C01	INFILTRATION BASIN M1 PLAN
C02	M1 EXISTING ELEVATIONS
C03	M1 GRADING PLAN
C04	M1 GRADING PROFILE
C05	M1 PATH INTERSECTION DETAIL
C06	M1 EROSION CONTROL PHASE 1
C07	M1 EROSION CONTROL PHASE 2
C08	M1 TRAFFIC CONTROL
C09	CURB & GUTTER DETAILS
C10	OUTFALL STRUCTURE AND TRENCH DETAILS
C11	MANHOLE 1.1 DETAILS
C12	EMERGENCY SPILLWAY DETAILS
C13	M1 OUTFALL CHECK VALVE PLAN
C14	SUBSURFACE INFILTRATION BASIN M2 PLAN
C15	M2 PROFILE
C16	M2 EROSION CONTROL
C17	MANHOLE 2.1 DETAILS
C18	PATH DETOUR

LANDSCAPING

L01	M1 LANDSCAPING PLAN
L02	M1 LANDSCAPING DETAILS

ELECTRICAL

E01	M1 LIGHTING PLAN

Project Number: V013-08801
Site Number: 780
Building Number: N/A
Date: OCT-27-2008

PREPARED FOR:
Milwaukee County Department of Transportation and Public Works
Tel.(414) 278-4355, Fax (414) 223-1853
2711 W. Wells Street, 2nd Floor
Milwaukee, Wisconsin 53208

PREPARED BY:
URS Corporation
Tel.(414) 831-4100, Fax(414) 831-4101
Address: 6737 W. Washington Street, Suite 2265
Milwaukee, WI 53214

PROJECT SIGNATURES

OWNER REPRESENTATIVE :

DATE

DEPARTMENT OF TRANSPORTATION
AND PUBLIC WORKS DIRECTOR :

DATE

PROJECT MANAGER :

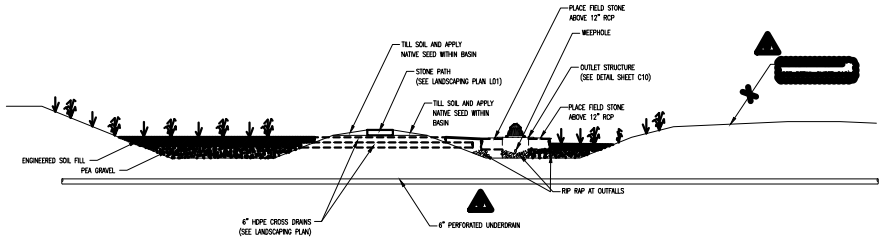
DATE

McKINLEY BEACH PARK
Storm Water Control Measures
1750 Lincoln Memorial Drive
Milwaukee, Wisconsin 53202

PLANT SCHEDULE

POND BOTTOM PLUGS

SYMBOL	BOTANICAL NAME	COMMON NAME	QUANTITY	ROOT	SPACING	HEIGHT	Comments
	Grasses and Sedges						
BC	Bromus ciliatus	Fringed Brome	40	2.5" Potted	18" O.C.	2-4'	
EA	Eleocharis acicularis	Needle Spike Rush	160	2.5" Potted	12" O.C.	6-10"	
EP	Eleocharis palustris	Great Spike Rush	96	2.5" Potted	12" O.C.	8-12"	
JE	Juncus effusus	Soft Rush	96	2.5" Potted	12" O.C.	2-4'	
JT	Juncus torreyi	Torrey Rush	128	2.5" Potted	12" O.C.	2-3'	
CB	Carex bebbii	Bebbs Sedge	144	2.5" Potted	15" O.C.	1-2'	
CC	Carex comosa	Bristly Sedge	32	2.5" Potted	18" O.C.	1-3.5"	
CS	Carex stipata	Fox Sedge	64	2.5" Potted	15" O.C.	1-4'	
CV	Carex vulpinoidea	Brown Fox Sedge	80	2.5" Potted	18" O.C.	1-4'	
SA	Scripus atrovirens	Dark Green Bulrush	96	2.5" Potted	18" O.C.	3-6'	
SC	Scirpus cyperinus	Wool Grass	128	2.5" Potted	18" O.C.	3-6'	
	Wildflowers						
AA	Aconus alamus	Sweet Flag	64	2.5" Potted	Groupings of 3,5,7,9	2-6'	
AI	Asclepias incarnata	Red Marsh Milkweed	32	2.5" Potted	Groupings of 3,5,7,9	3-4'	
AN	Aster novae-angliae	New England Aster	64	2.5" Potted	Groupings of 3,5,7,9	1-6'	
AP	Aster puniceus	Red-Stemmed Aster	64	2.5" Potted	Groupings of 3,5,7,9	1-5'	
EM	Eupatorium maculatum	Spotted Joe Pye Weed	32	2.5" Potted	Groupings of 3,5,7,9	3-5'	
EP	Eupatorium perfoliatum	Boneset	32	2.5" Potted	Groupings of 3,5,7,9	2-3'	
HA	Helenium autumnale	Sneezeweed	32	2.5" Potted	Groupings of 3,5,7,9	3-5'	
IV	Iris virginica shrevei	Blue Flag Iris	64	2.5" Potted	Groupings of 3,5,7,9	2.5-3'	
SO	Solidago ohioensis	Ohio Goldenrod	32	2.5" Potted	Groupings of 3,5,7,9	2-3'	
SR	Solidago riddellii	Riddell's Goldenrod	32	2.5" Potted	Groupings of 3,5,7,9	2-3'	
VH	Verbena hastata	Blue Vervain	64	2.5" Potted	Groupings of 3,5,7,9	2-4'	
VF	Vernonia fasciculata	Ironweed	64	2.5" Potted	Groupings of 3,5,7,9	3-5'	
VV	Veronicastrum virginicum	Culver's Root	64	2.5" Potted	Groupings of 3,5,7,9	3-6.5'	
	Trees and shrubs						
	SHRUBS						
	Cornus sericea 'Cardinal'	Cardinal Dogwood	18	5 gal. cont.	5' O.C.		
	Cornus sericea 'Baileyi'	Red twigged Dogwood	14	5 gal. cont.	5' O.C.		
	[redacted]	[redacted]	23	5 gal. cont.	5' O.C.	6-8'	
	[redacted]	[redacted]	15	5 gal. cont.	48" O.C.	4-6'	
	[redacted]	[redacted]	5	5 gal. cont.	6' O.C.	10-15'	
	[redacted]	[redacted]	6	5 gal. cont.	6' O.C.	10-15'	



PROFILE

NOTES:

1. SEE SHEET L01 FOR LANDSCAPING PLAN DETAILS
2. SOME SYMBOLS NOT SHOWN ON L01.
3. LANDSCAPING WILDFLOWER SYMBOLS NOT SHOWN TO BE DISTRIBUTED ON INFILTRATION BASIN SIDE SLOPES PER LANDSCAPING SUBCONTRACTOR DIRECTION.

INFILTRATION BASIN M1
LANDSCAPING DETAILS

DATE	REVISION NO.	REMARKS
/30/2009	1	REMOVED COMMON WHITE LILAC AND COMMON PURPLE LILAC FROM CONTRACT. ADDED FRAGRANT SUMAC NINEBARK TO CONTRACT.
/30/2009	2	REMOVED COMMON WHITE LILAC AND COMMON PURPLE LILAC FROM CONTRACT. ADDED AMERICAN HAZELNUT TO CONTRACT.
/30/2009	3	REMOVED CONCRETE EMERGENCY SPILLWAY FROM CONTRACT.
8/27/2009	4	RECORD DRAWINGS (CMP)

SHEET DESCRIPTION:
M1 LANDSCAPING DETAILS

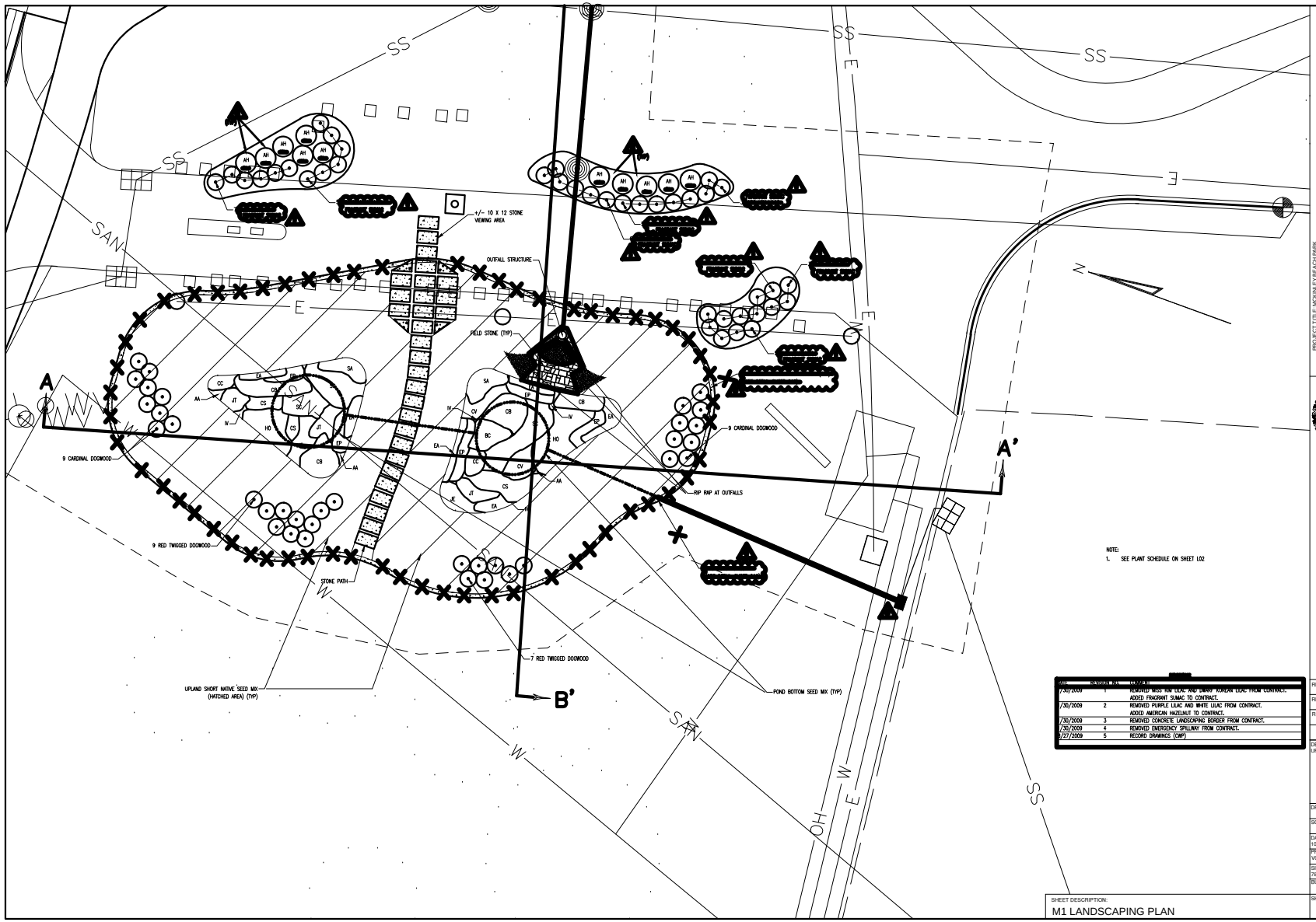
PROJECT TITLE: McKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
REV. 1-3: 1/30/2009
REV. 4: 8/27/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _
SCALE: 1"=10' @ 24"x36"
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO: 780
BUILDING NO:
SHEET NO. L02



NOTE:
1. SEE PLANT SCHEDULE ON SHEET L02

DATE	SHEET NO.	REVISION
/30/2009	1	REMOVED MISS KIM LILAC AND DWARF KOREAN LILAC FROM CONTRACT. ADDED FRAGRANT SUMAC TO CONTRACT.
/30/2009	2	REMOVED PURPLE LILAC AND WHITE LILAC FROM CONTRACT. ADDED AMERICAN HAZELNUT TO CONTRACT.
/30/2009	3	REMOVED CONCRETE LANDSCAPING BORDER FROM CONTRACT.
/30/2009	4	REMOVED EMERGENCY SPILLWAY FROM CONTRACT.
/27/2009	5	RECORD DRAWINGS. (CMF)

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

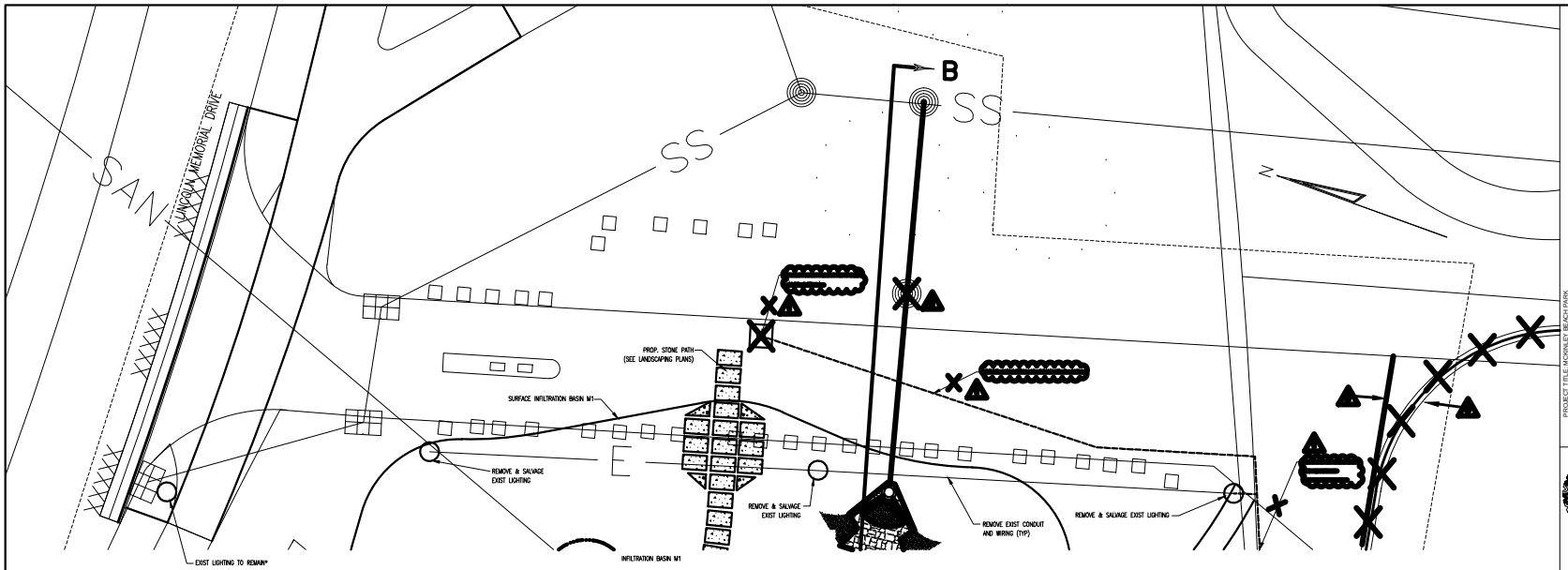
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
REV. 1-4: 1/30/2009
REV. 5: 8/27/2009

DESIGN FIRM: URS CORPORATION

DRAWN BY: _
SCALE: 1"=10'_@_24"x36"
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO.: 780
BUILDING NO.:

SHEET DESCRIPTION: M1 LANDSCAPING PLAN
SHEET NO. L01



* IF EXIST LIGHT REQUIRES REMOVAL DURING CONSTRUCTION, SALVAGE AND REINSTALL

DATE	REVISION NO.	REMARKS
/30/2009	1	REMOVED LIGHTING AND ELECTRICAL WORK FROM CONTRACT.
/30/2009	2	REMOVED STORMCEPTOR FROM CONTRACT.
/30/2009	3	ADDED ASPHALTIC SAW CUT TO CONTRACT.
/30/2009	4	REMOVED MOUNTABLE CURB FROM CONTRACT.

PLAN

NOTES:

[redacted]

3. REMOVE EXISTING LIGHTING ASSEMBLIES AS SHOWN IN THE PLANS AND DELIVER THEM TO THE OWNER FOR STORAGE.

4. REMOVE ALL CONDUIT, WIRE, CONCRETE BASES, POLES, STANDARDS, LUMINARIES AND ANCILLARY EQUIPMENT ASSOCIATED WITH THE LIGHTING POLES AND ASSEMBLIES.

5. PRIOR TO REMOVAL, PREPARE AN INVENTORY AND CONDITION SURVEY, INCLUDING PHOTOGRAPHS, OF ALL EQUIPMENT THAT IS TO BE DELIVERED TO THE OWNER. USE CARE TO DOCUMENT ANY EXISTING DAMAGE TO THE EQUIPMENT. IF DAMAGE IS FOUND AFTER DELIVERY, AND THE DAMAGE IS NOT DOCUMENTED IN THE CONDITION SURVEY, THEN IT WILL BE ASSUMED THAT THE CONTRACTOR CAUSED THE DAMAGE.

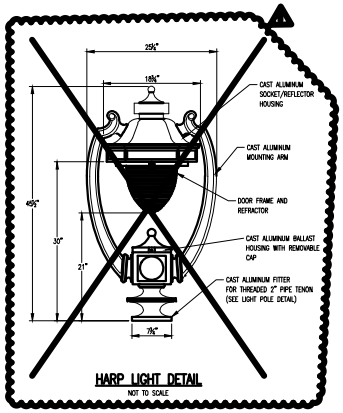
6. STOCKPILE AND PROTECT ALL REMOVED EQUIPMENT UNTIL IT CAN BE DELIVERED TO THE OWNER AS A SINGLE DELIVERY. NO PARTIAL DELIVERIES ARE TO BE MADE.

7. REPAIR OR REPLACE, AT THE OWNER'S REQUEST, ANY ITEM THAT WAS DAMAGED IN ITS REMOVAL, STORAGE, DELIVERY OR UNLOADING.

[redacted]

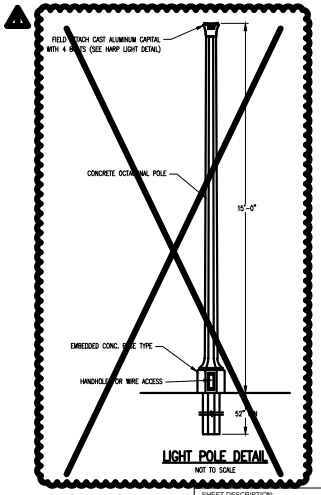
9. PROVIDE POWER AT NIGHTTIME TO ADJUSTED LIGHT ALONG LINCOLN MEMORIAL DRIVE. WORK TO BE COMPLETED IN ONE DAY DURING FORMWORK FOR CURB & GUTTER.

10. REINSTALL ASSEMBLIES IN ACCORDANCE TO SUBSECTIONS 657.3 AND 659.3 OF THE WISDOT STANDARD SPECIFICATIONS AND/OR LOCAL REQUIREMENTS.



HARP LIGHT DETAIL

NOT TO SCALE



LIGHT POLE DETAIL

NOT TO SCALE

PROJECT TITLE: MOONLET BEACH PARK

Department of Transportation and Public Works

Storm Water Control Measures

1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

REV. 1-4: 1/30/2009

DESIGN FIRM: URS CORPORATION

DRAWN BY: _

SCALE: 1"=10'_@_24"x36"

DATE: 10/27/2008

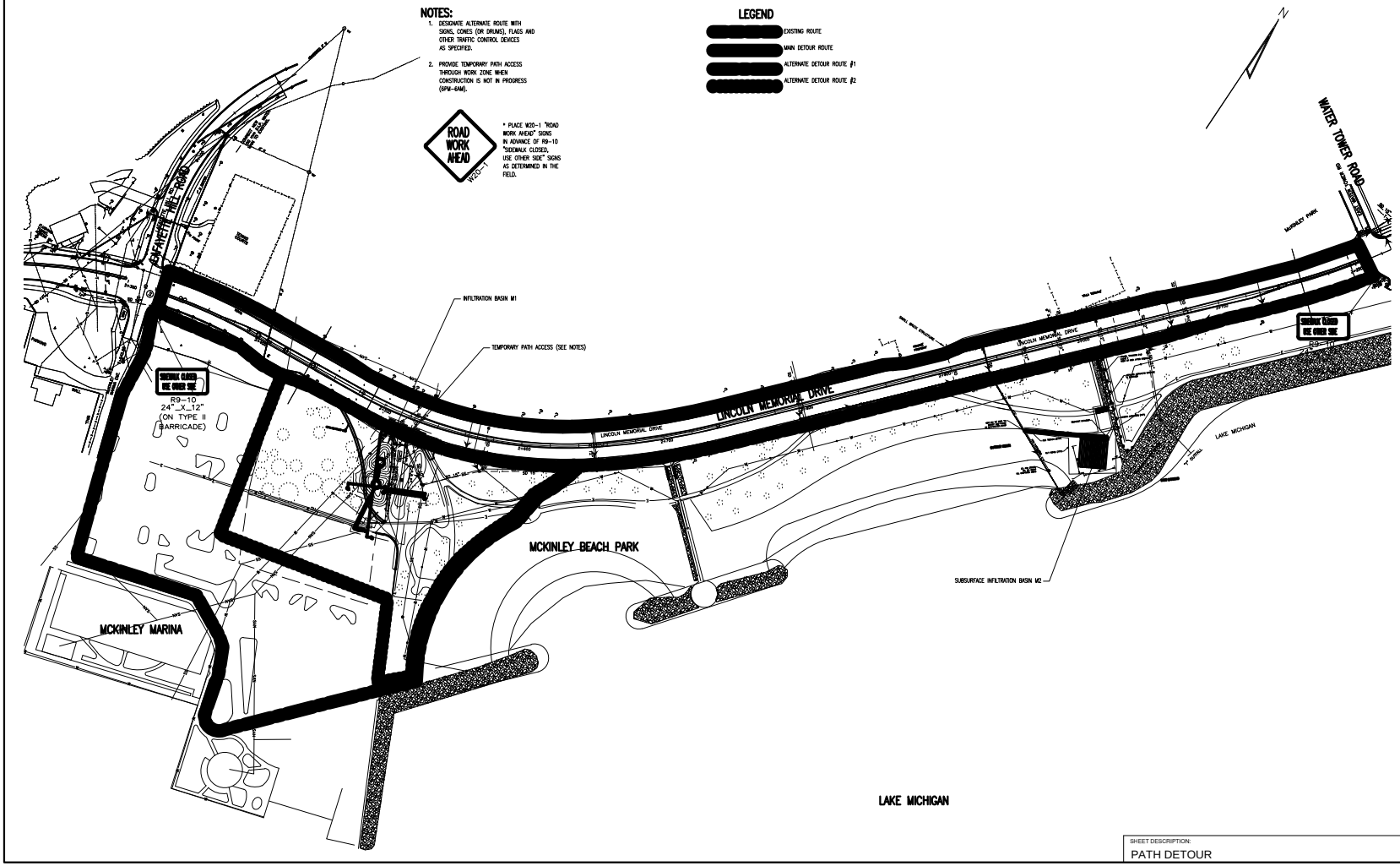
PROJECT: V013-08801

SITE NO: 780

BUILDING NO:

SHEET DESCRIPTION: LIGHTING DETAILS

SHEET NO: E01



PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works

Storm Water Control Measures

1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _

SCALE: 1"=100'_@_24"x36"

DATE:
10/27/2008

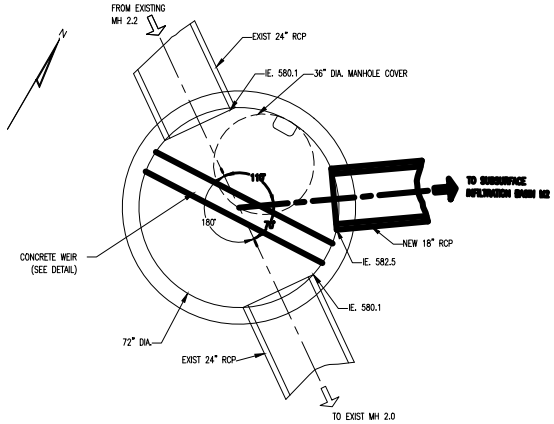
PROJECT
V013-08801

SITE NO:
760

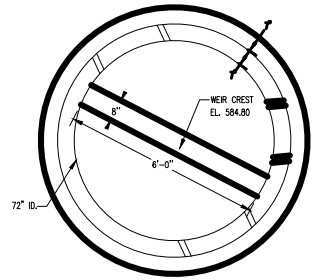
BUILDING NO:

SHEET DESCRIPTION:
PATH DETOUR

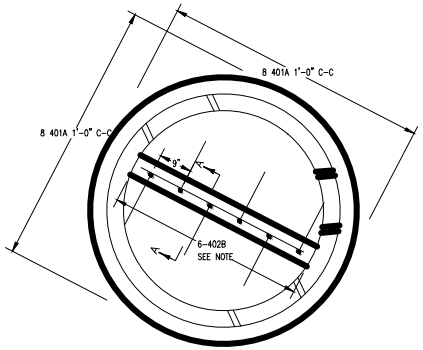
SHEET NO. C18



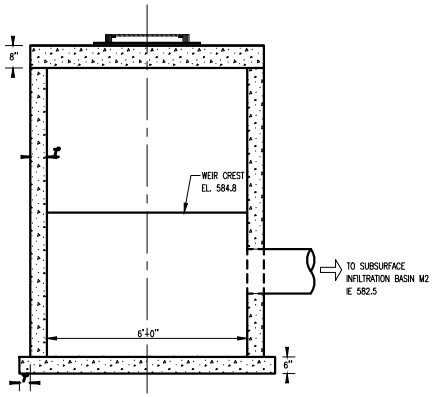
PLAN



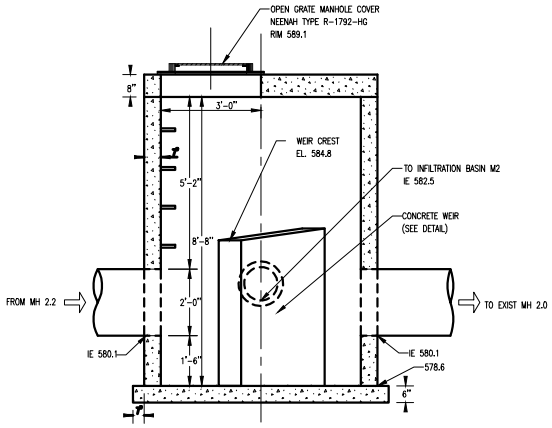
PLAN – M2 WEIR DETAIL



PLAN – M2 WEIR REINFORCEMENT DETAIL



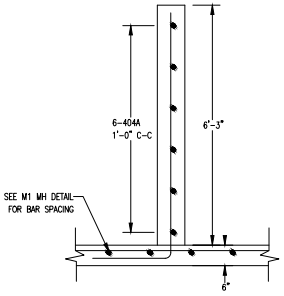
PROFILE



SIDE

NOTES:

1. ALL LIFTING HOLES SHALL BE PLUGGED WITH CONCRETE MORTAR OR RUBBER PLUGS.
2. SEE M1 MH DETAILS SHEET FOR BILL OF BARS.
3. DOWEL INTO MANHOLE FOR WEIR SUPPORT.



SECTION A-A

NOT TO SCALE

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53233

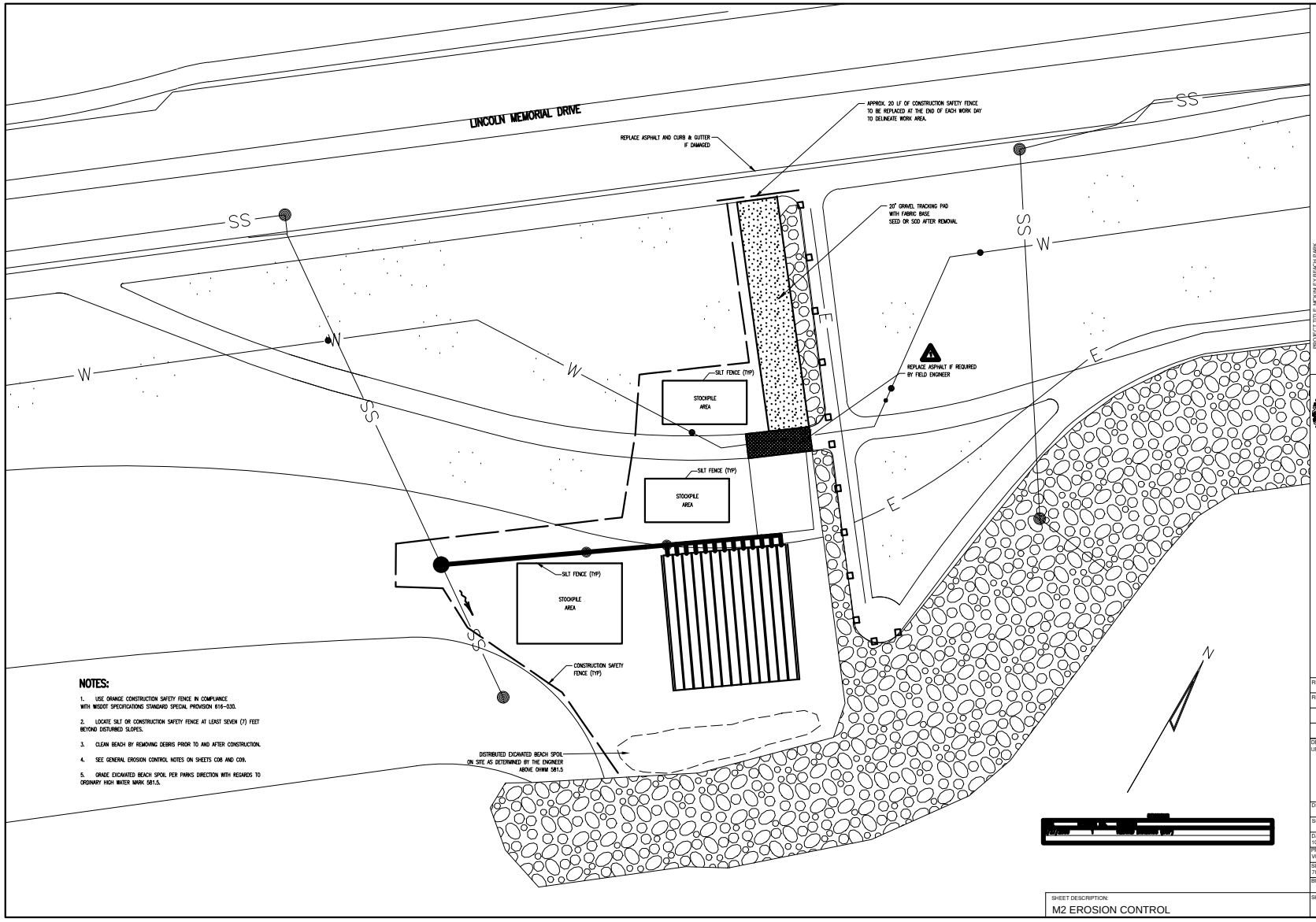
REVISIONS
REV. 1: 1/29/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY: ..
SCALE: 1"=1.5'_@_24"x36"
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO.: 760
BUILDING NO.:

SHEET DESCRIPTION:
MH 2.1 DETAILS

SHEET NO. C17



NOTES:

1. USE ORANGE CONSTRUCTION SAFETY FENCE IN COMPLIANCE WITH WISDOT SPECIFICATIONS STANDARD SPECIAL PROVISION 616-030.
2. LOCATE SILT OR CONSTRUCTION SAFETY FENCE AT LEAST SEVEN (7) FEET BEYOND DISTURBED SLOPES.
3. CLEAN BEACH BY REMOVING DEBRIS PRIOR TO AND AFTER CONSTRUCTION.
4. SEE GENERAL EROSION CONTROL NOTES ON SHEETS C08 AND C09.
5. GRADE EXCAVATED BEACH SPOIL PER PARKS DIRECTION WITH REGARDS TO ORDINARY HIGH WATER MARK 581.5.

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works

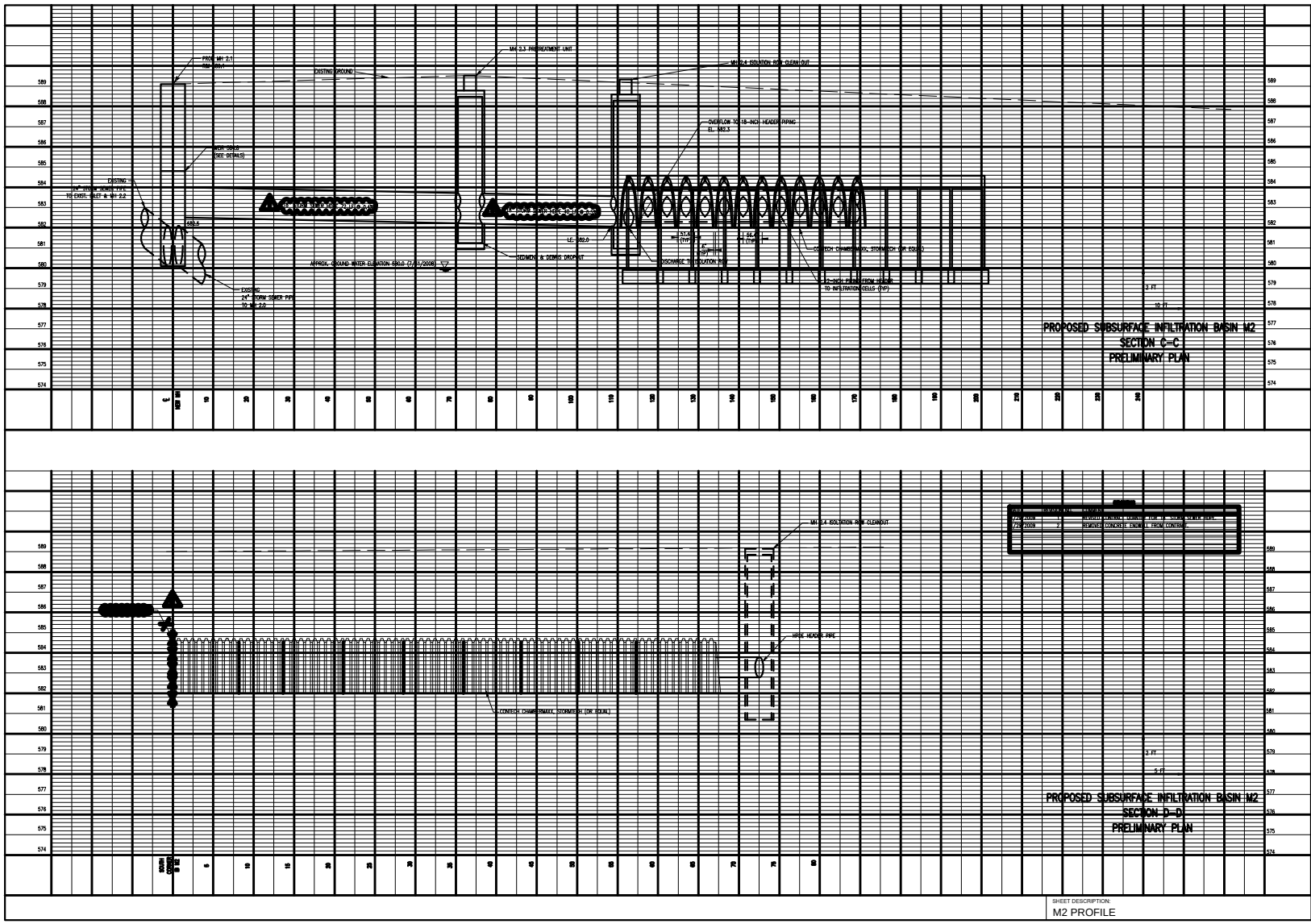
Storm Water Control Measures

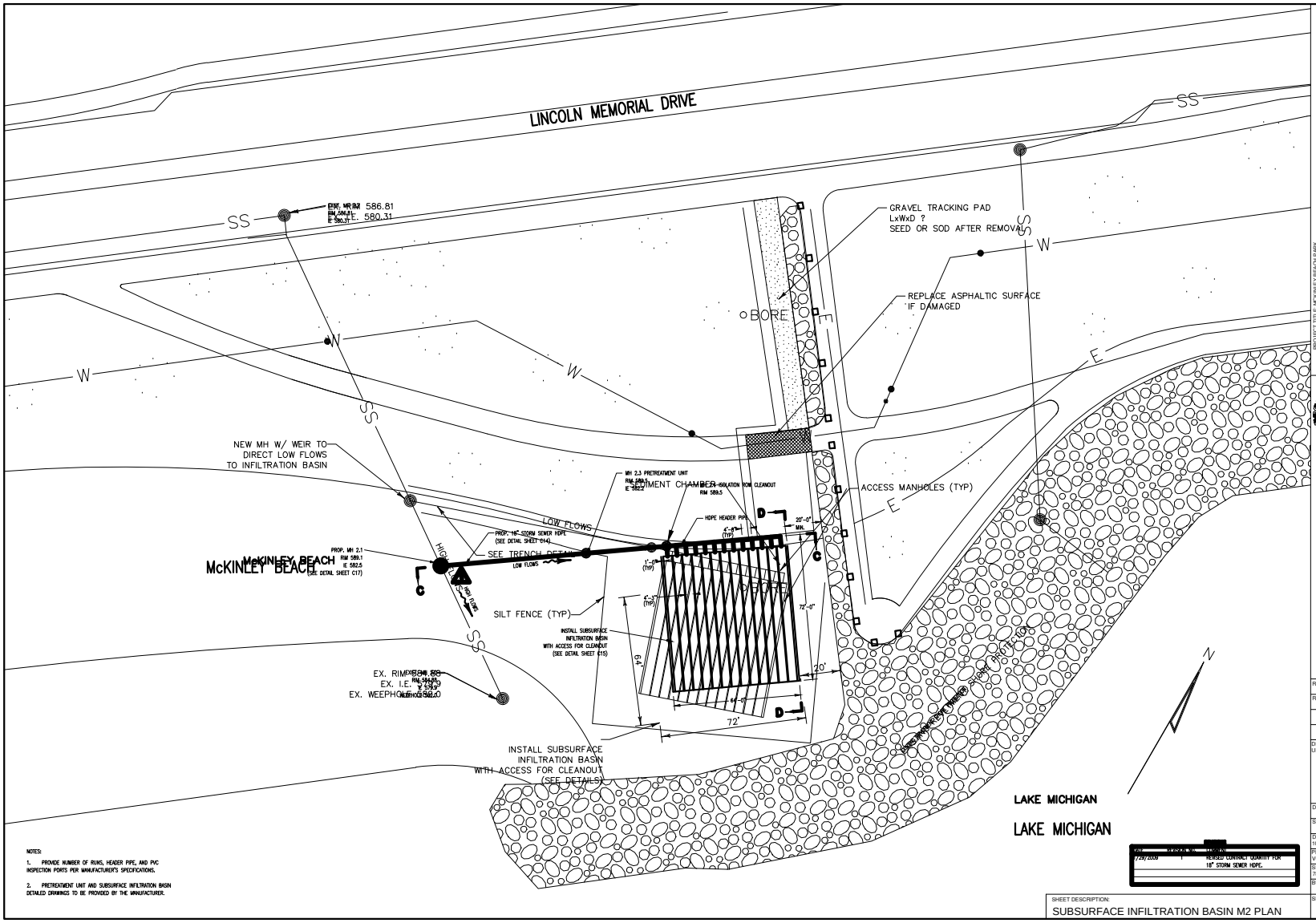
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

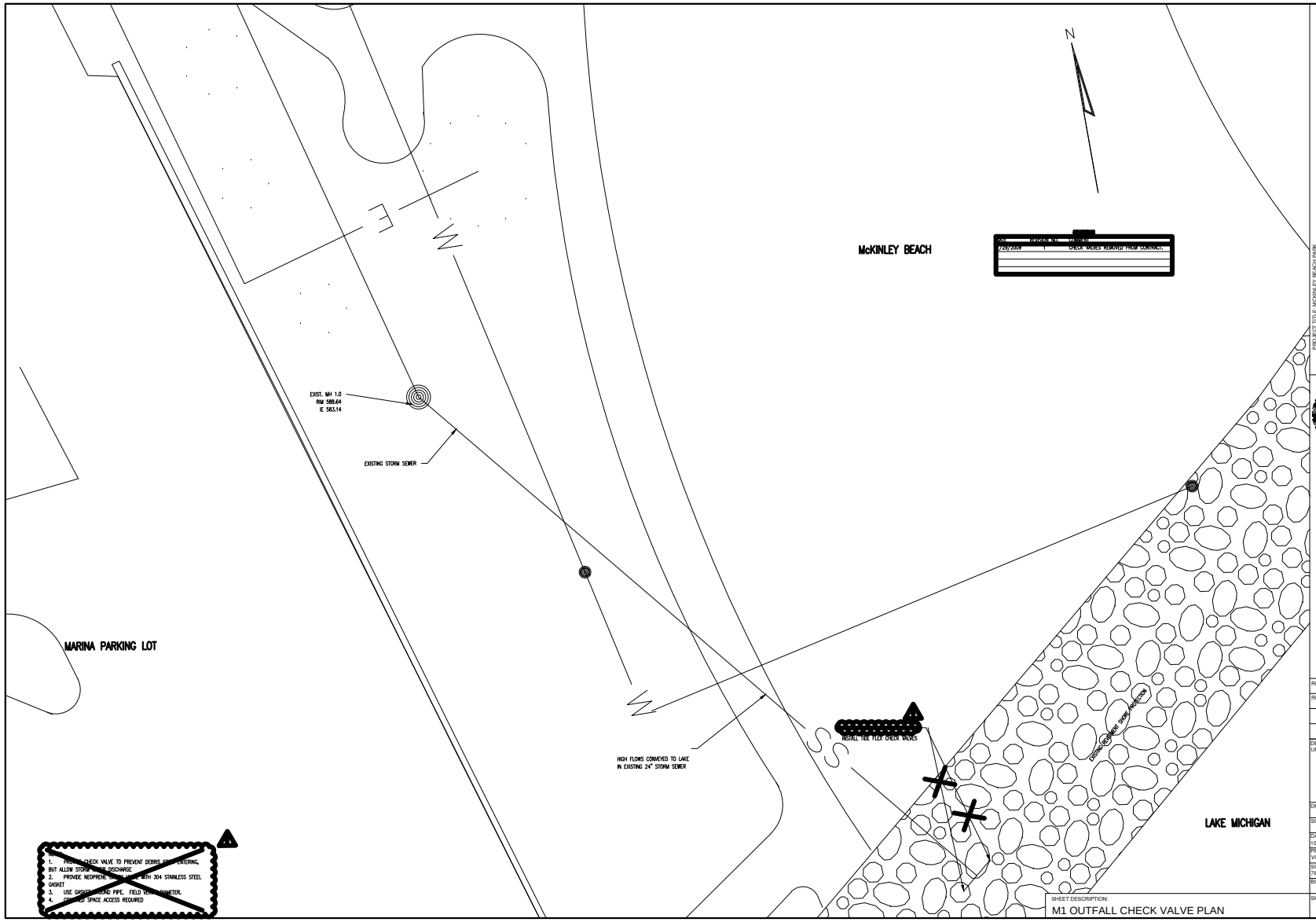
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

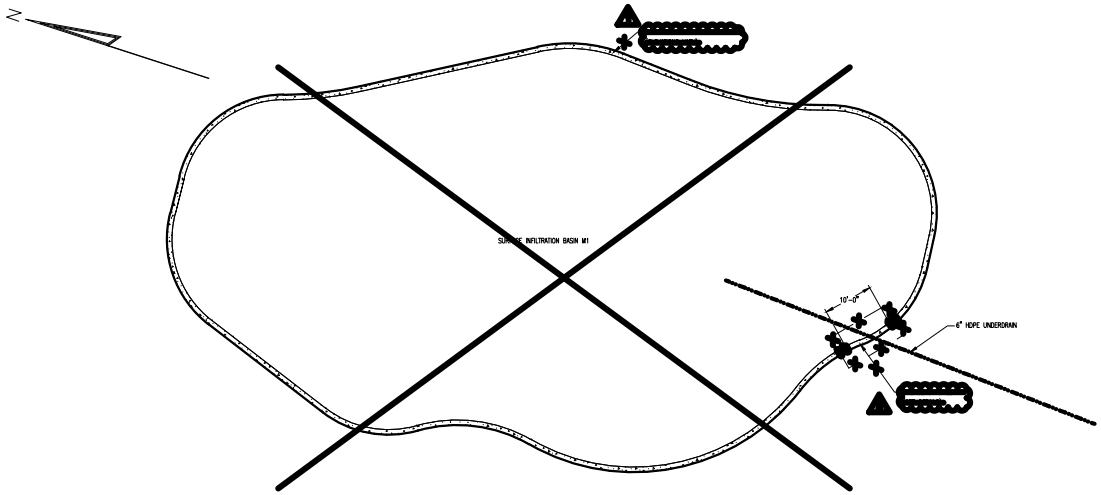
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53200

REVISIONS	
REV. 1: 8/27/2009	
DESIGN FIRM: URS CORPORATION	
DRAWN BY: _	
SCALE: 1"=20'_@_24"x36"	
DATE: 10/27/2008	
PROJECT: V013-08801	
SITE NO: 780	
BUILDING NO:	
SHEET DESCRIPTION: M2 EROSION CONTROL	SHEET NO. C16

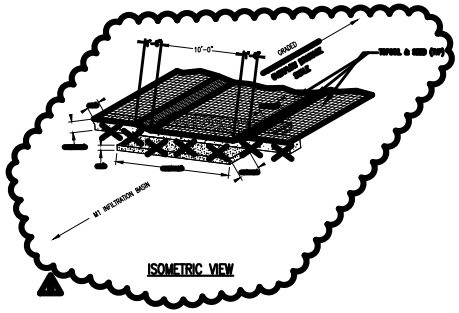

PROPOSED SUBSURFACE INFILTRATION BASIN M2
SECTION C–C
PRELIMINARY PLAN
PROPOSED SUBSURFACE INFILTRATION BASIN M2
SECTION D–D
PRELIMINARY PLAN
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208
REVISIONS
REV. 1 & 2: 1/29/2009
DESIGN FIRM:
URS CORPORATION
DRAWN BY:
SCALE: SEE PROFILES
DATE
10/27/2008
PROJECT
V013-08801
SITE NO:
TBD
BUILDING NO:
SHEET NO.
C15
SHEET DESCRIPTION:
M2 PROFILE


LINCOLN MEMORIAL DRIVE
SS
W
E
PROP. MH 2.2
RIM 586.81
IE 580.31
IE: 580.31
GRAVEL TRACKING PAD
LxWxD ?
SEED OR SOD AFTER REMOVAL
REPLACE ASPHALTIC SURFACE
IF DAMAGED
BORE
NEW MH W/ WEIR TO
DIRECT LOW FLOWS
TO INFILTRATION BASIN
MH 2.3 PRETREATMENT UNIT
RIM 589.5
IE 582.2
SEDIMENT CHAMBER
INFILTRATION VOIDS CLEANOUT
RIM 589.5
HDPE HEADER PIPE
ACCESS MANHOLES (TYP)
LOW FLOWS
PROP. 18" STORM SEWER HDPE
(SEE DETAIL SHEET 014)
SEE TRENCH DETAIL
PROP. MH 2.1
RIM 589.1
IE 582.5
(SEE DETAIL SHEET C17)
McKINLEY BEACH
HIGH FLOWS
SILT FENCE (TYP)
INSTALL SUBSURFACE
INFILTRATION BASIN
WITH ACCESS FOR CLEANOUT
(SEE DETAIL SHEET 015)
20'-0"
MIN.
72'-0"
64'
20'
72'
EX. RIM
EX. I.E.
EX. WEEPHOLE
INSTALL SUBSURFACE
INFILTRATION BASIN
WITH ACCESS FOR CLEANOUT
(SEE DETAILS)
LAKE MICHIGAN
LAKE MICHIGAN
N
NOTES:
1. PROVIDE NUMBER OF RUNS, HEADER PIPE, AND PVC INSPECTION PORTS PER MANUFACTURER'S SPECIFICATIONS.
2. PRETREATMENT UNIT AND SUBSURFACE INFILTRATION BASIN DETAILED DRAWINGS TO BE PROVIDED BY THE MANUFACTURER.
DATE
REVISION
7/29/2009
1
REVISED CONTRACT COUNTY FOR
18" STORM SEWER HDPE.
SHEET DESCRIPTION:
SUBSURFACE INFILTRATION BASIN M2 PLAN
SHEET NO.
C14
PROJECT TITLE: MCKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208
REVISIONS
REV. 1: 1/29/2009
DESIGN FIRM:
URS CORPORATION
DRAWN BY:
SCALE: 1"=20', @ 24"x36"
DATE:
10/27/2008
PROJECT:
V013-08801
SITE NO:
780
BUILDING NO:


N
McKINLEY BEACH
MARINA PARKING LOT
LAKE MICHIGAN
EXIST. MH 1.0
RIM 585.64
IE 583.14
EXISTING STORM SEWER
HIGH FLOWS CONVEYED TO LAKE
IN EXISTING 24" STORM SEWER
INSTALL TIDE FLEX CHECK VALVES
DISPERSED ENERGY SCOUR PROTECTION
1. PROVIDE CHECK VALVE TO PREVENT DEBRIS FROM ENTERING, BUT ALLOW STORM WATER DISCHARGE
2. PROVIDE NEOPRENE [illegible] WITH 304 STAINLESS STEEL GASKET
3. USE GASKETED BOND PIPE. FIELD VERIFY DIAMETER.
4. [illegible] SPACE ACCESS REQUIRED
DATE
7/29/2009
1
CHECK VALVES REMOVED FROM DRAWING.
PROJECT TITLE: McKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208
REVISIONS
REV. 1: 1/29/2009
DESIGN FIRM:
URS CORPORATION
DRAWN BY: _
SCALE: 1"=10' @ 24"x36"
DATE
10/27/2008
PROJECT
V013-08801
SITE NO:
780
BUILDING NO:
SHEET DESCRIPTION:
M1 OUTFALL CHECK VALVE PLAN
SHEET NO.
C13



PLAN



ISOMETRIC VIEW

DATE	REVISION NO.	REMARKS
7/29/2009	1	REMOVED CONCRETE LANDSCAPING BORDER FROM CONTRACT.
7/29/2009	2	REMOVED CONCRETE EMERGENCY SPILLWAY FROM CONTRACT.

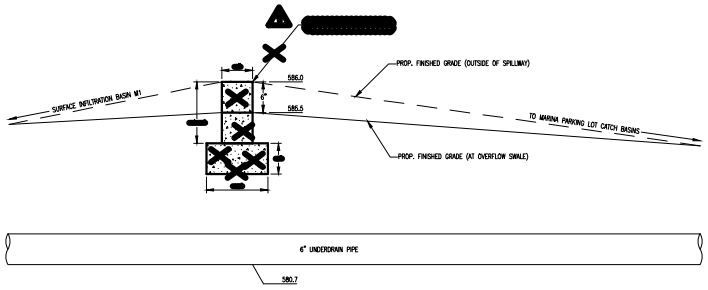
NOTES:

1. TO MATCH FINISHED GRADE ALLOW 6 INCHES FOR TOPSOIL & SEED, AND [redacted] FOR [redacted]

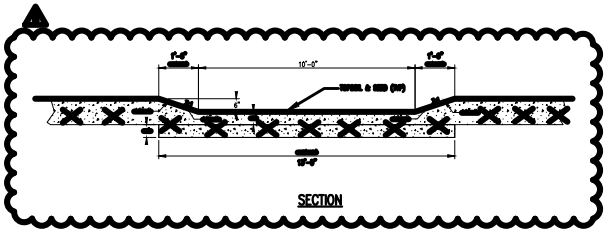
[redacted]

3. [redacted] ONLY. [redacted]

4. THE ELEVATION OF THE OVERFLOW SWALE OUTLET IS SHOWN BELOW. THE ELEVATION OF THE GROUND TO VARY AT LOCATIONS AROUND THE PERIMETER OF SURFACE INFILTRATION BASIN M1 BUT SHOULD BE NO LOWER THAN SWLO. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A UNIFORM, FREE-DRAINING SLOPE NEAR THE PERIMETER AND FOR PROTECTING THE INFILTRATION BASIN DURING GRADING OPERATIONS.



ELEVATION



SECTION

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works

Storm Water Control Measures

1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

11/11/2008

REV. 1 & 2: 1/29/2009

DESIGN FIRM: URS CORPORATION

DRAWN BY: JPH

SCALE: NOT TO SCALE

DATE: 10/27/2008

PROJECT: W013-08801

SITE NO: 780

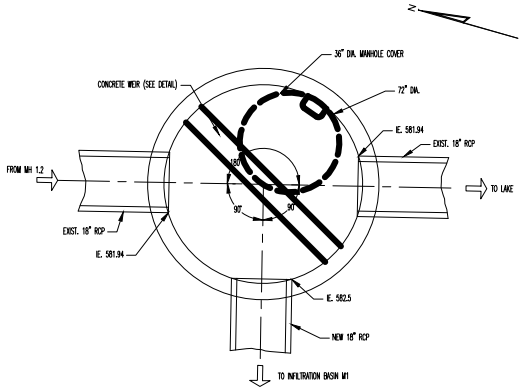
BUILDING NO:

SHEET DESCRIPTION: EMERGENCY SPILLWAY DETAILS

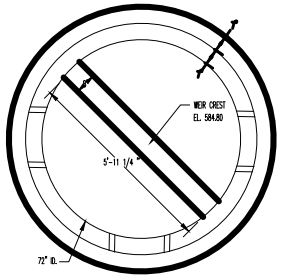
SHEET NO. C12

BILL OF BARS (FOR MH 1.1 & MH 2.1)

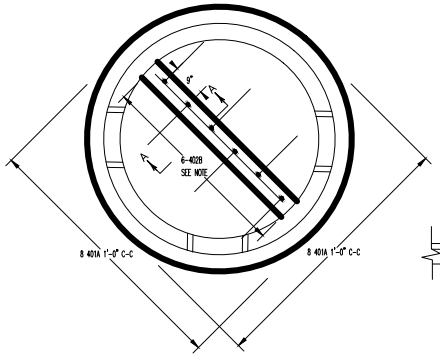
MARK	LOCATION	QTY.	WEIGHT	LENGTH	EPOXY COATED	A LEG	B LEG
401A	M1 FOOTING	16	78.4	7'-4"	X	7'-4"	
401A	M2 FOOTING	16	78.4	7'-4"	X	7'-4"	
402B	M1 FOOTING DOWEL	6	22.7	5'-8"	X	4'-0"	1'-8"
403B	M2 FOOTING DOWEL	6	30.7	7'-8"	X	6'-0"	1'-8"
404A	M1 WEIR WALL	4	14.9	5'-7"	X	5'-7"	
404A	M2 WEIR WALL	6	22.4	5'-7"	X	5'-7"	



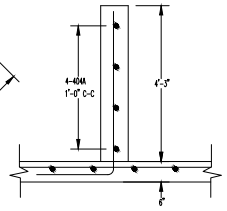
PLAN



PLAN – M1 WEIR DETAIL



PLAN – M1 WEIR REINFORCEMENT DETAIL

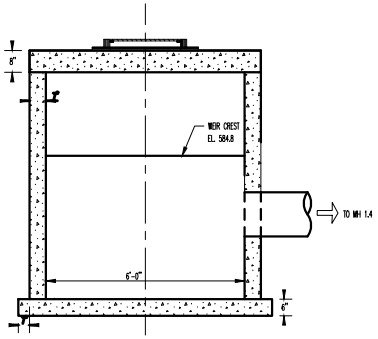


SECTION A–A

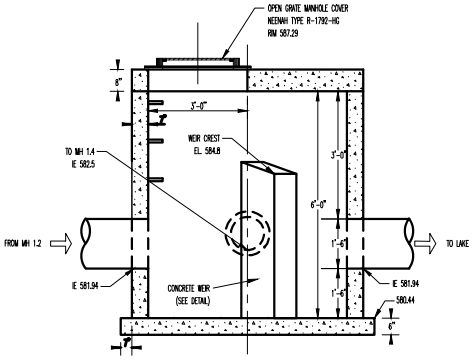
NOT TO SCALE

NOTES:

1. ALL LIFTING HOLES SHALL BE PLUGGED WITH CONCRETE MORTAR OR RUBBER PLUGS.
2. BARS SPACED AT 9" C-C
3. GRANULAR SUBBASE
4. DOWEL INTO MANHOLE FOR SUPPORT.



PROFILE



PROFILE

SHEET DESCRIPTION:
MANHOLE MH 1.1 DETAILS

PROJECT TITLE: MCKINLEY BEACH PARK

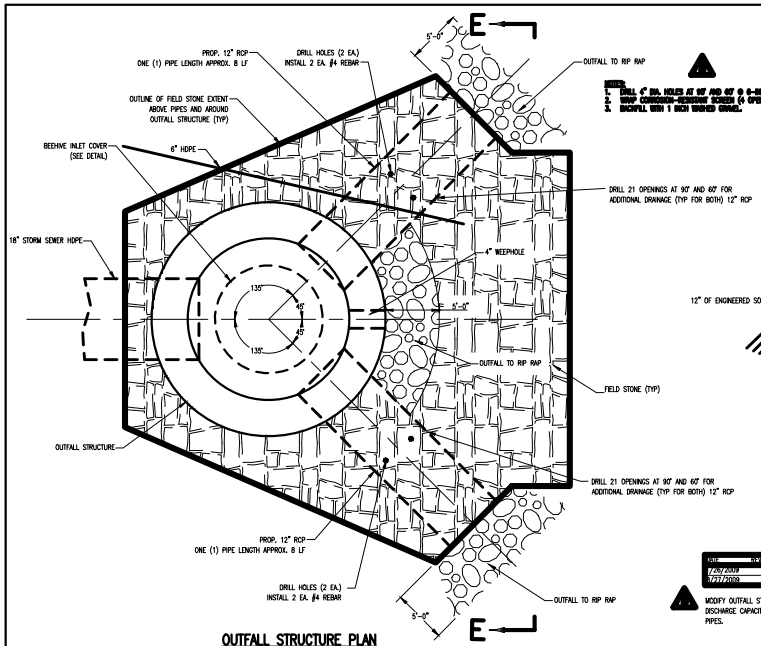
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53233

REVISIONS
REV. 1/28/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _
SCALE: 1"=1'-5"_@_24"x36"
DATE _
10/27/2008
PROJECT
V013-08801
SITE NO:
780
BUILDING NO:
SHEET NO. C11

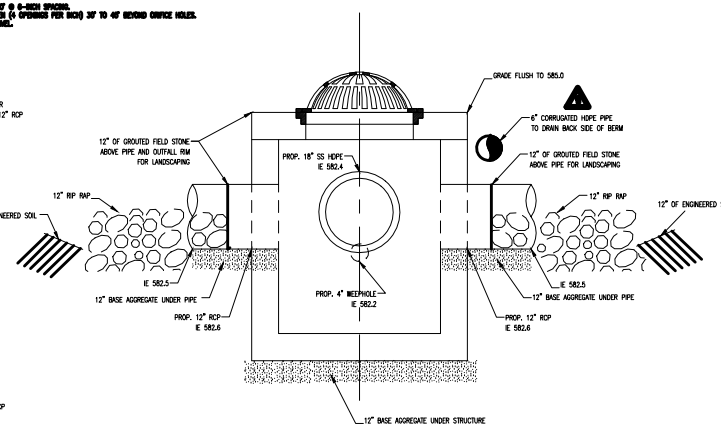


NOTES:
1. DRILL 4" DIA. HOLES AT 90° AND 60° @ 6-INCH SPACING.
2. WRAP CONCRETE-SCREENS SCREEN (6 OPENINGS PER INCH) 30" TO 48" BEYOND ORIFICE HOLES.
3. BACKFILL WITH 1 INCH WASHED GRAVEL.

OUTFALL STRUCTURE PLAN

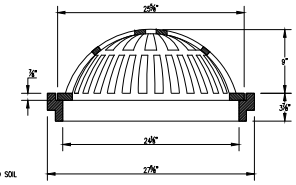
REVISIONS		
DATE	REVISION NO.	REVISION
7/26/2009	1	
8/27/2009	2	RECORD DRAWINGS (CMP)

MODIFY OUTFALL STRUCTURE WITH RETROFITS THAT INCREASE THE DISCHARGE CAPACITY BY DRILLING ADDITIONAL HOLES IN THE CONCRETE PIPES.



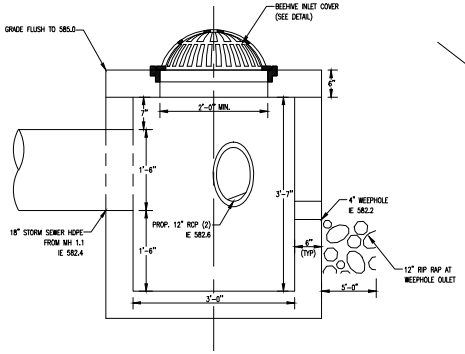
OUTFALL STRUCTURE SIDE VIEW

(LOOKING EAST SEE ELEVATION DETAIL BELOW)



BEEHIVE CATCH BASIN GRATE

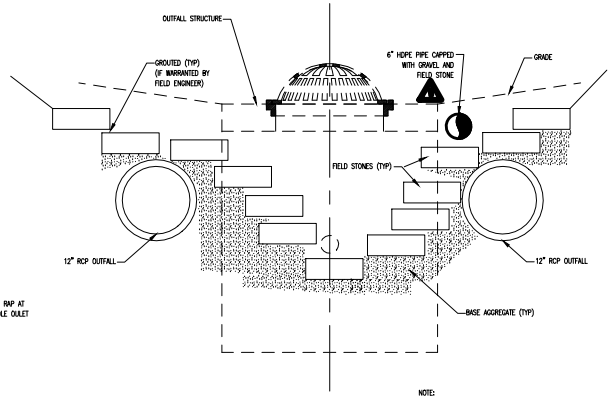
NEENAH FOUNDRY CAT. NO. R-4353



OUTFALL STRUCTURE ELEVATION

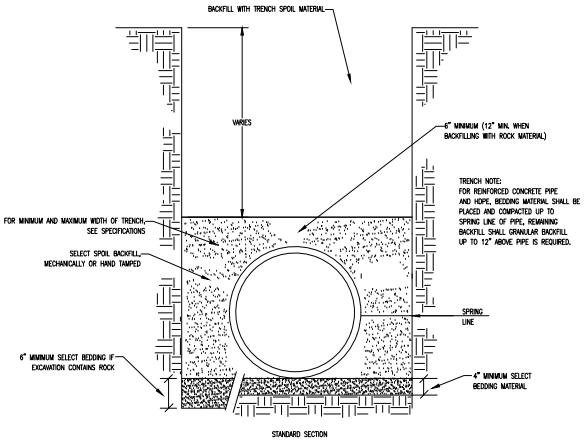
(LOOKING SOUTH)

ADHERE TO WISDOT STANDARD DETAIL DRAWINGS



NOTE:
PROVIDE FIELD STONE WEIGHING NO LESS THAN 50 LBS TO ENSURE STABILITY.

SECTION E–E



STANDARD SECTION

TRENCH DETAIL

SHEET DESCRIPTION:
OUTFALL STRUCTURE AND TRENCH DETAILS

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

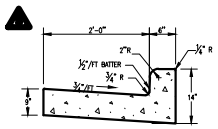
MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
REV. 1: 1/26/2009
REV. 2: 8/27/2009

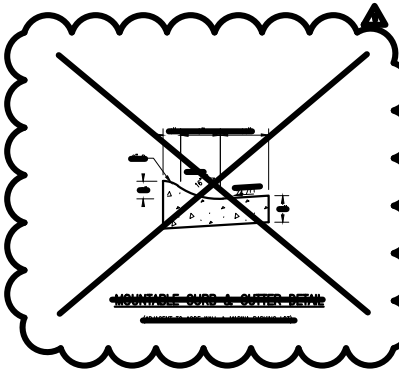
DESIGN FIRM:
URS CORPORATION

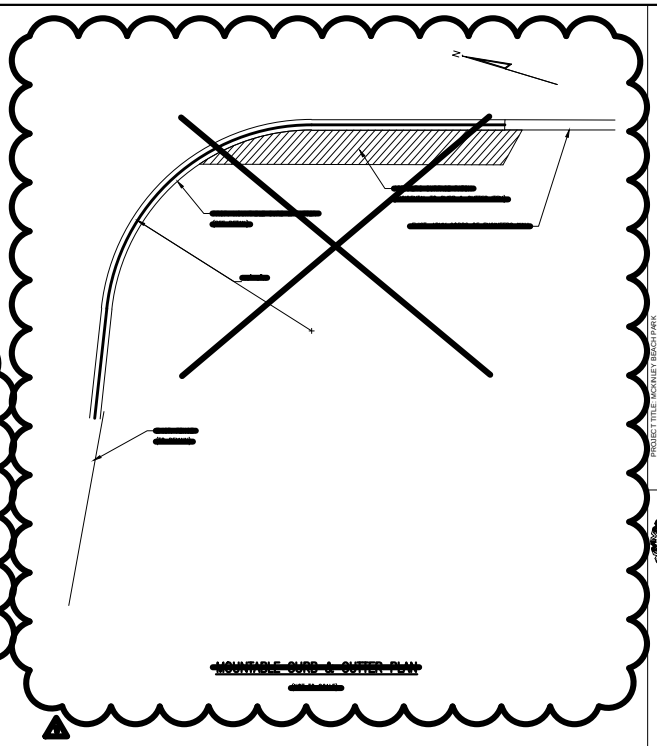
DRAWN BY: _
SCALE: NOT TO SCALE
DATE _
10/27/2008
PROJECT
V013-08801
SITE NO:
780
BUILDING NO:
SHEET NO.
C10

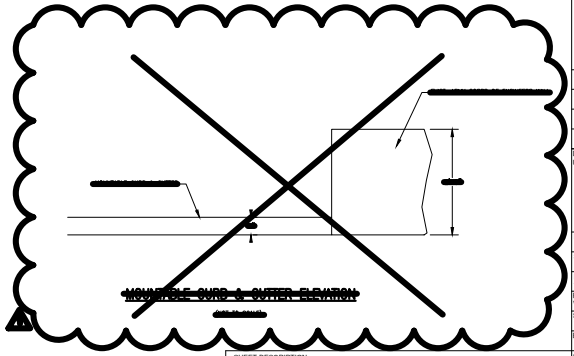
DATE	REVISION NO.	REVISION
1/26/2009	1	REMOVED MOUNTABLE CURB & GUTTER FROM CONTRACT.
8/27/2009	2	RECORD DRAWINGS (CMP)



CONCRETE CURB & GUTTER
30-INCH TYPE D
(TO MATCH EXISTING 95 LINEAR FEET ALONG LINCOLN MEMORIAL DRIVE)







NOTES:
1. FOLLOW WISDOT STANDARD DETAIL DRAWINGS FOR CURB & GUTTER (EXCEPT AS SHOWN ABOVE).
2. FOLLOW WISDOT STANDARD DETAIL DRAWINGS FOR INLETS & CATCH BASINS.
3. MATCH EXISTING CONCRETE CURB & GUTTER.

PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST SECOND FLOOR MILWAUKEE, WI 53233

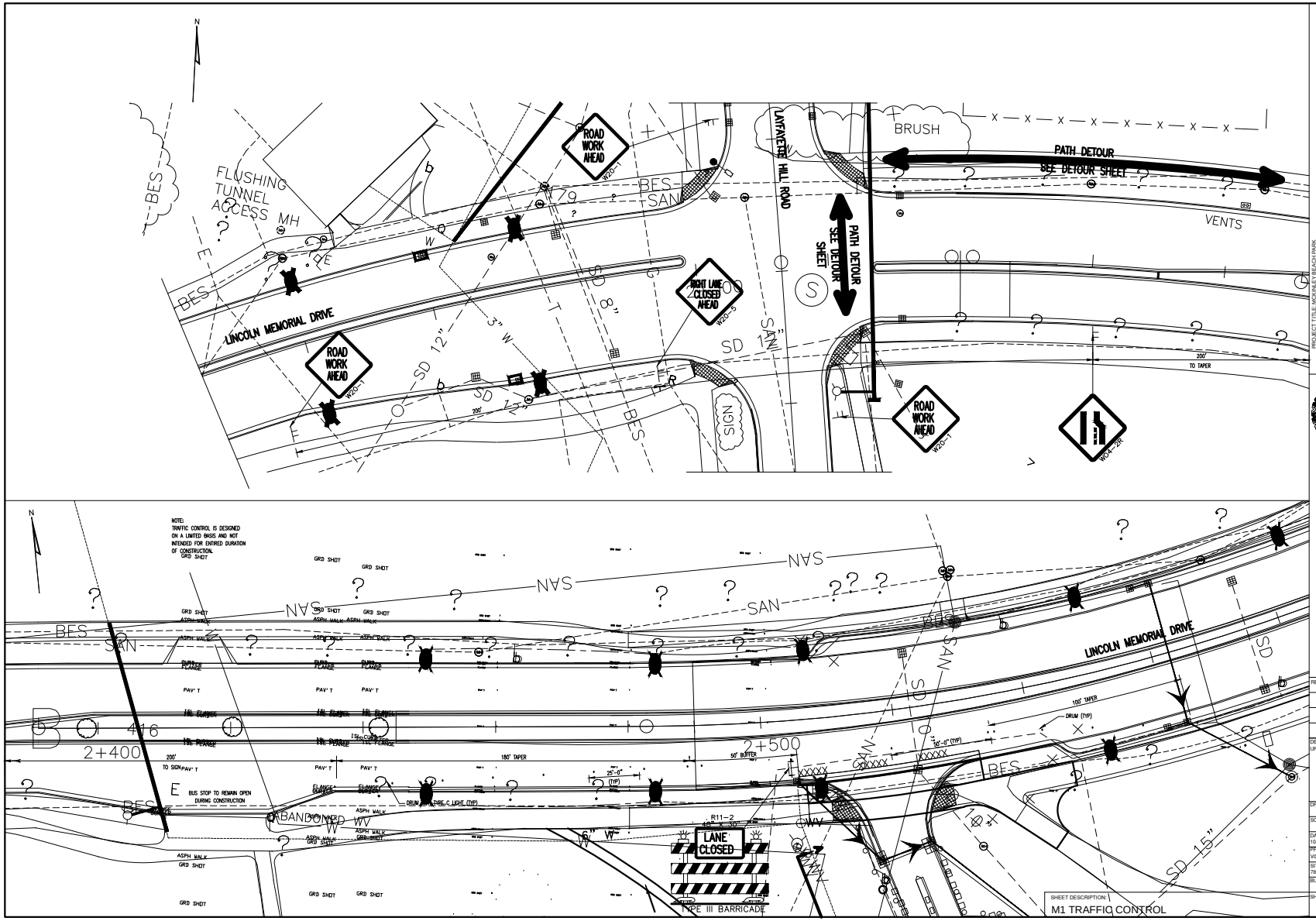
REVISIONS
REV. 1: 1/26/2009
REV. 2: 8/27/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _
SCALE: 1"=1'_@_24"x36"
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO.: 780
BUILDING NO:

SHEET DESCRIPTION:
CURB & GUTTER DETAILS

SHEET NO. C09



PROJECT TITLE: MCKINLEY BEACH PARK

Department of Transportation and Public Works

Storm Water Control Measures

1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR, MILWAUKEE, WI 53208

REVISIONS

DESIGN FIRM: URS CORPORATION

DRAWN BY: _

SCALE: 1"=20' @ 24"x36"

DATE: 10/27/2008

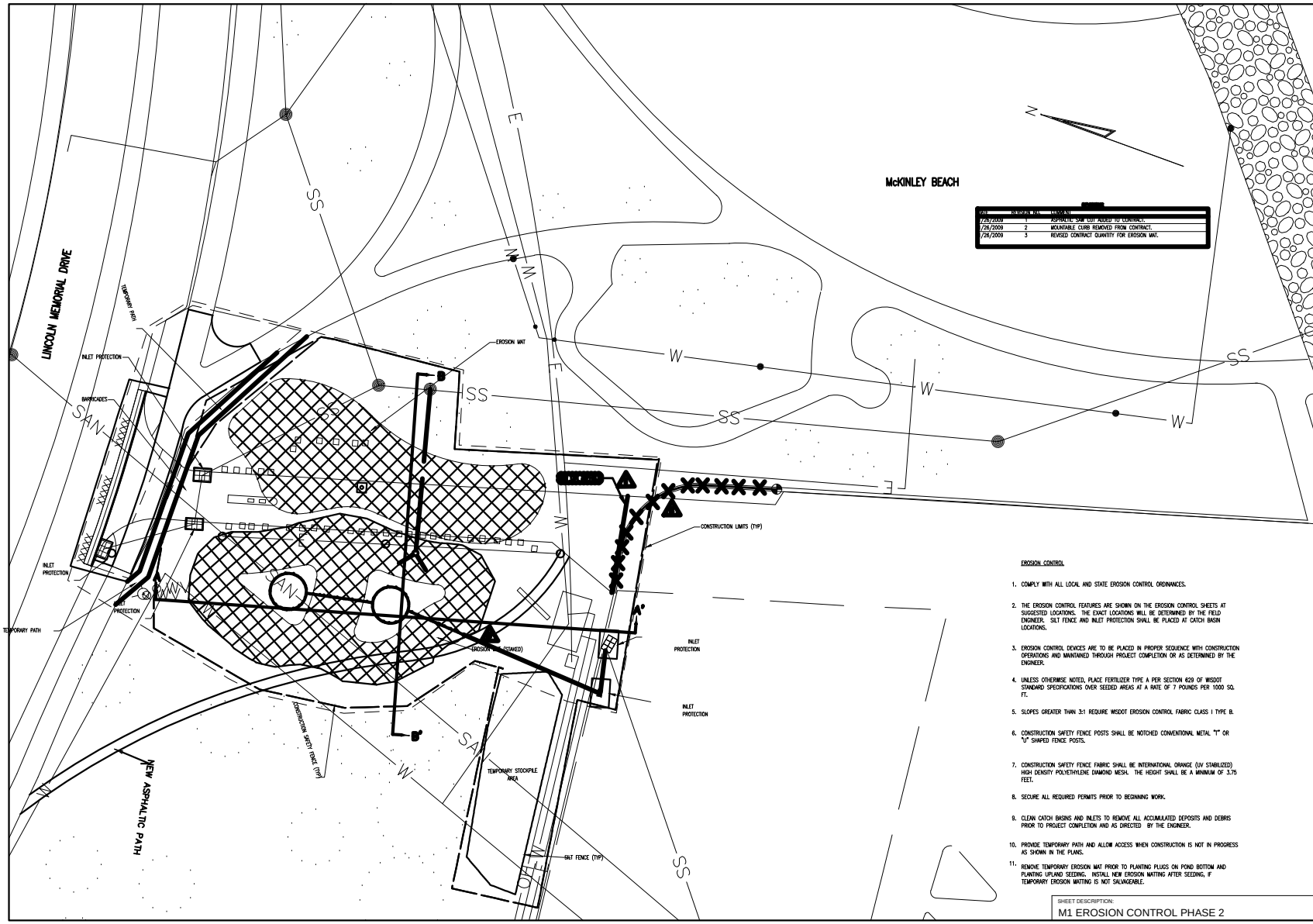
PROJECT: W013-08801

SITE NO: 780

BUILDING NO:

SHEET NO: C08

SHEET DESCRIPTION: M1 TRAFFIC CONTROL



DATE	REVISION NO.	REVISION
1/26/2009	1	ASPHALTIC SAW CUT ADDED TO CONTRACT.
1/26/2009	2	MOUNTABLE CURB REMOVED FROM CONTRACT.
1/26/2009	3	REVISED CONTRACT QUANTITY FOR EROSION MAT.

EROSION CONTROL

1. COMPLY WITH ALL LOCAL AND STATE EROSION CONTROL ORDINANCES.
2. THE EROSION CONTROL FEATURES ARE SHOWN ON THE EROSION CONTROL SHEETS AT SUGGESTED LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED BY THE FIELD ENGINEER. SILT FENCE AND INLET PROTECTION SHALL BE PLACED AT CATCH BASIN LOCATIONS.
3. EROSION CONTROL DEVICES ARE TO BE PLACED IN PROPER SEQUENCE WITH CONSTRUCTION OPERATIONS AND MAINTAINED THROUGH PROJECT COMPLETION OR AS DETERMINED BY THE ENGINEER.
4. UNLESS OTHERWISE NOTED, PLACE FERTILIZER TYPE A PER SECTION 629 OF WISDOT STANDARD SPECIFICATIONS OVER SEEDED AREAS AT A RATE OF 7 POUNDS PER 1000 SQ. FT.
5. SLOPES GREATER THAN 3:1 REQUIRE WISDOT EROSION CONTROL FABRIC CLASS I TYPE B.
6. CONSTRUCTION SAFETY FENCE POSTS SHALL BE NOTCHED CONVENTIONAL METAL "T" OR "U" SHAPED FENCE POSTS.
7. CONSTRUCTION SAFETY FENCE FABRIC SHALL BE INTERNATIONAL ORANGE (UV STABILIZED) HIGH DENSITY POLYETHYLENE DIAMOND MESH. THE HEIGHT SHALL BE A MINIMUM OF 3.75 FEET.
8. SECURE ALL REQUIRED PERMITS PRIOR TO BEGINNING WORK.
9. CLEAN CATCH BASINS AND INLETS TO REMOVE ALL ACCUMULATED DEPOSITS AND DEBRIS PRIOR TO PROJECT COMPLETION AND AS DIRECTED BY THE ENGINEER.
10. PROVIDE TEMPORARY PATH AND ALLOW ACCESS WHEN CONSTRUCTION IS NOT IN PROGRESS AS SHOWN IN THE PLANS.
11. REMOVE TEMPORARY EROSION MAT PRIOR TO PLANTING PLUGS ON POND BOTTOM AND PLANTING UPLAND SEEDING. INSTALL NEW EROSION MATTING AFTER SEEDING, IF TEMPORARY EROSION MATTING IS NOT SALVAGEABLE.

SHEET DESCRIPTION:
M1 EROSION CONTROL PHASE 2

PROJECT TITLE: McKINLEY BEACH PARK

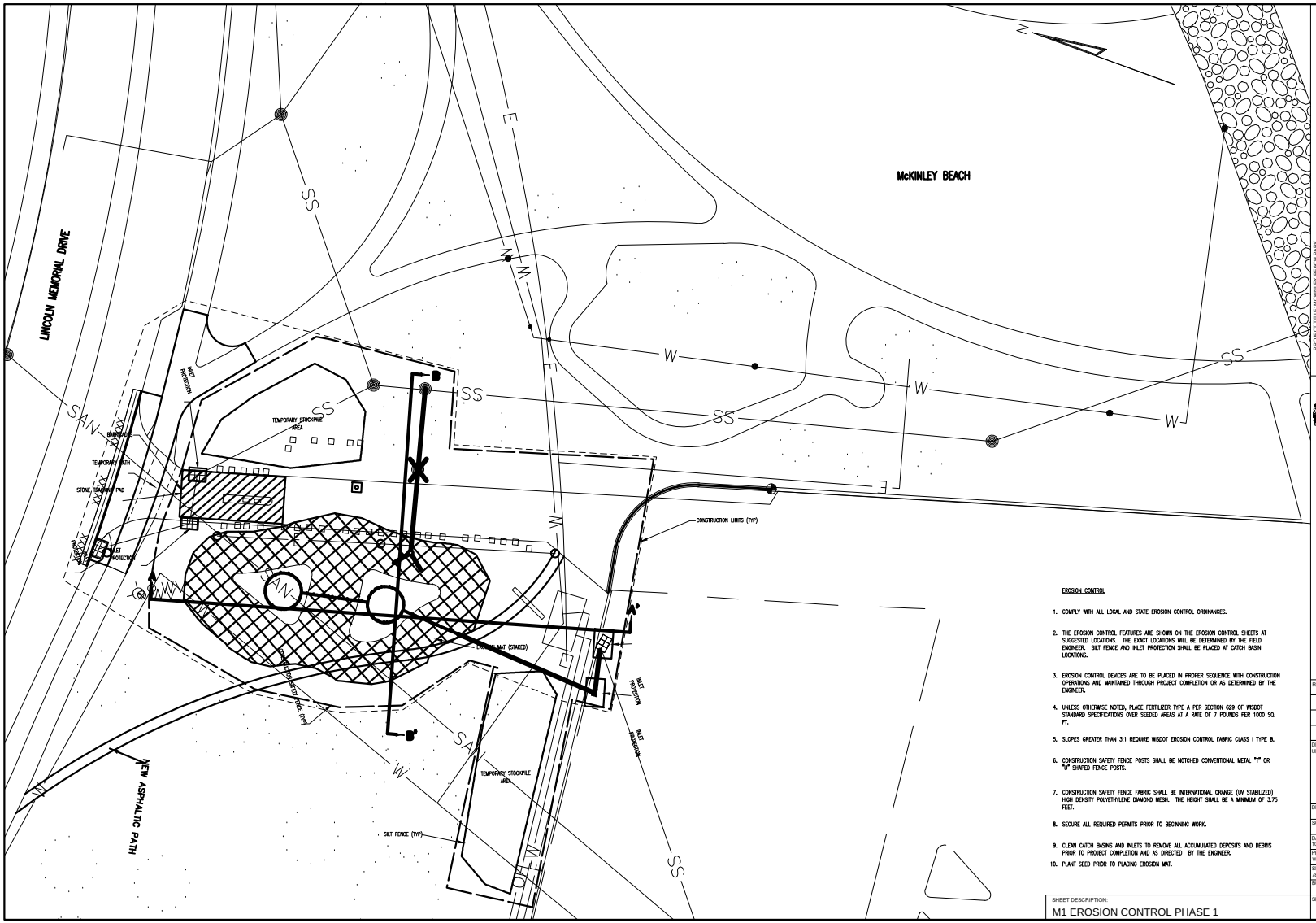
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
REV. 1 & 2: 1/26/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _
SCALE: 1"=20' @ 24"x36"
DATE: 10/27/2008
PROJECT: V013-08801
SITE NO: 760
BUILDING NO:
SHEET NO. C07



EROSION CONTROL

1. COMPLY WITH ALL LOCAL AND STATE EROSION CONTROL ORDINANCES.
2. THE EROSION CONTROL FEATURES ARE SHOWN ON THE EROSION CONTROL SHEETS AT SUGGESTED LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED BY THE FIELD ENGINEER. SILT FENCE AND INLET PROTECTION SHALL BE PLACED AT CATCH BASIN LOCATIONS.
3. EROSION CONTROL DEVICES ARE TO BE PLACED IN PROPER SEQUENCE WITH CONSTRUCTION OPERATIONS AND MAINTAINED THROUGH PROJECT COMPLETION OR AS DETERMINED BY THE ENGINEER.
4. UNLESS OTHERWISE NOTED, PLACE FERTILIZER TYPE A PER SECTION 629 OF WISDOT STANDARD SPECIFICATIONS OVER SEEDED AREAS AT A RATE OF 7 POUNDS PER 1000 SQ. FT.
5. SLOPES GREATER THAN 3:1 REQUIRE WISDOT EROSION CONTROL FABRIC CLASS I TYPE B.
6. CONSTRUCTION SAFETY FENCE POSTS SHALL BE NOTCHED CONVENTIONAL METAL "T" OR "U" SHAPED FENCE POSTS.
7. CONSTRUCTION SAFETY FENCE FABRIC SHALL BE INTERNATIONAL ORANGE (UV STABILIZED) HIGH DENSITY POLYETHYLENE DIAMOND MESH. THE HEIGHT SHALL BE A MINIMUM OF 3.75 FEET.
8. SECURE ALL REQUIRED PERMITS PRIOR TO BEGINNING WORK.
9. CLEAN CATCH BASINS AND INLETS TO REMOVE ALL ACCUMULATED DEPOSITS AND DEBRIS PRIOR TO PROJECT COMPLETION AND AS DIRECTED BY THE ENGINEER.
10. PLANT SEED PRIOR TO PLACING EROSION MAT.

SHEET DESCRIPTION:
M1 EROSION CONTROL PHASE 1

PROJECT TITLE: McKINLEY BEACH PARK

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS

DESIGN FIRM:
URS CORPORATION

DRAWN BY:

SCALE: 1"=20' @ 24"x36"

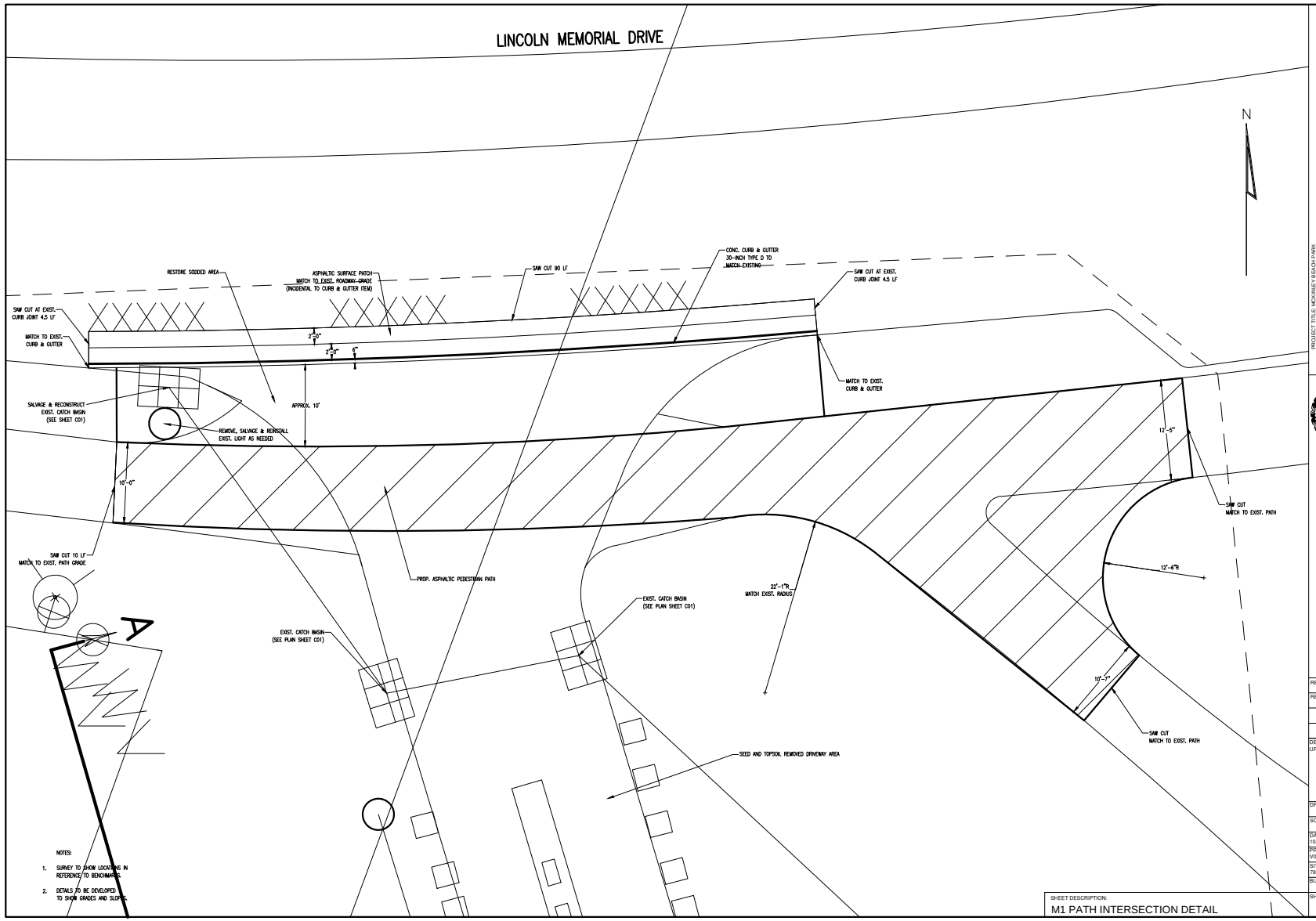
DATE:
10/27/2008

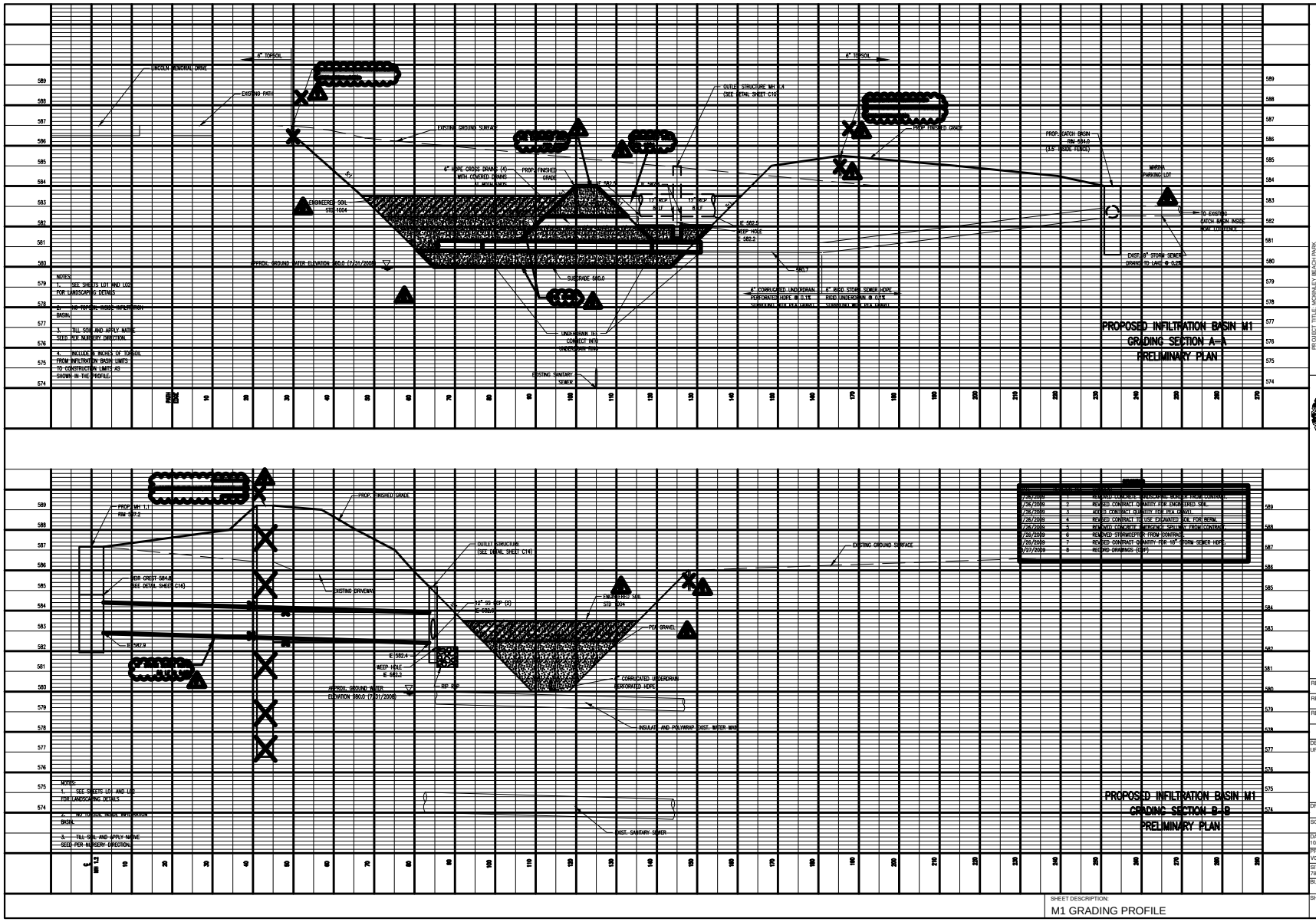
PROJECT
V013-08801

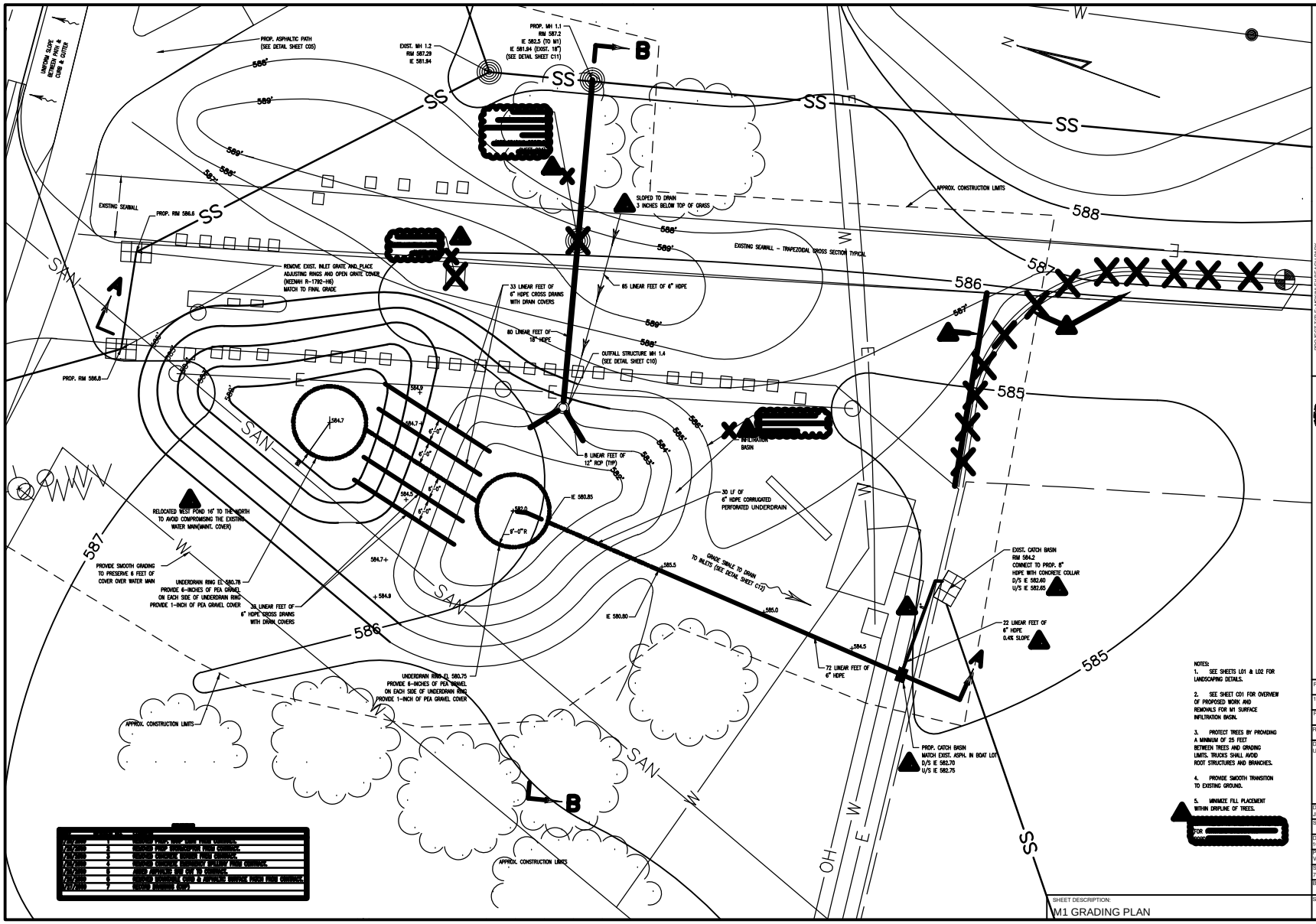
SITE NO:
780

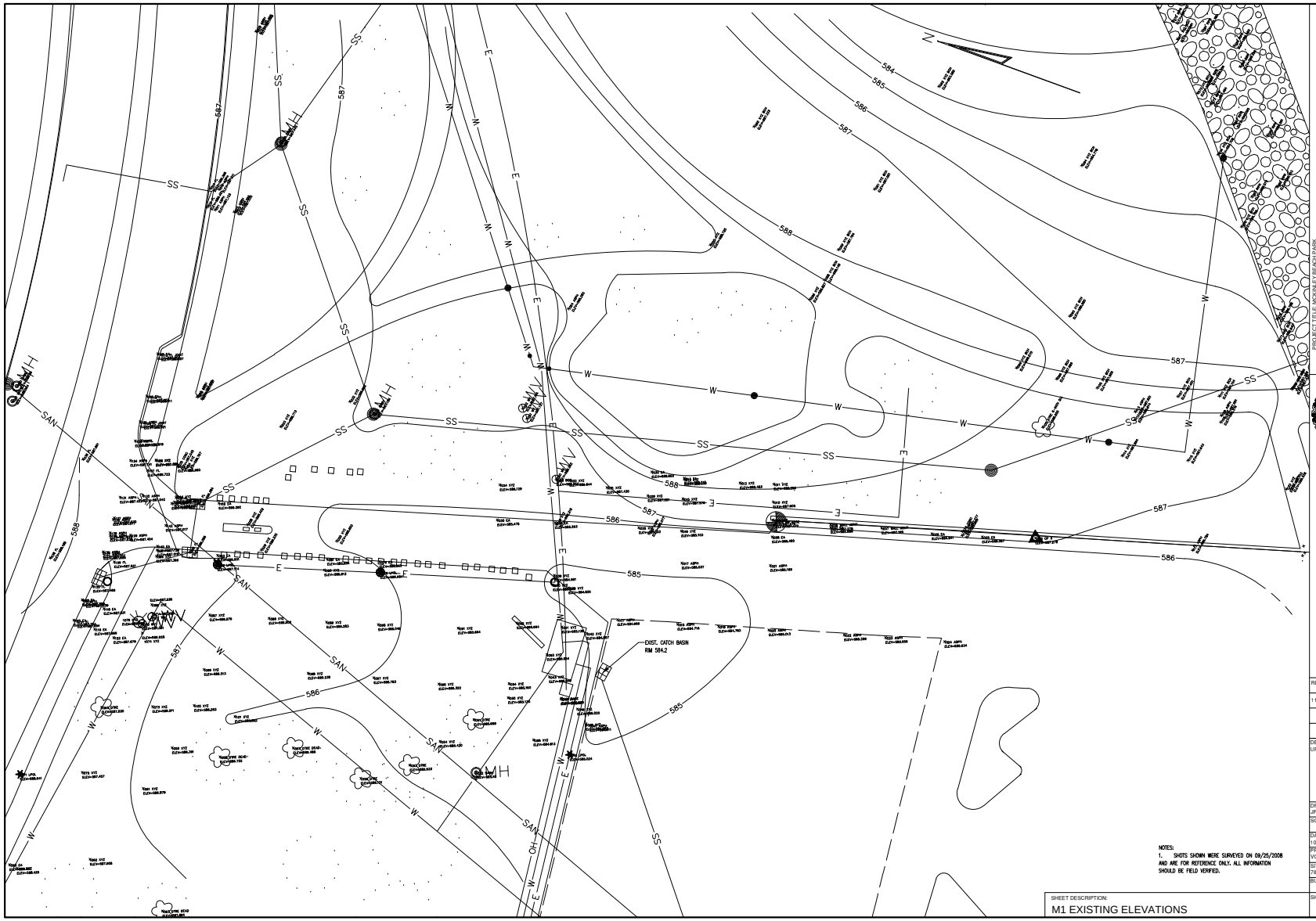
BUILDING NO:

SHEET NO.
C06


LINCOLN MEMORIAL DRIVE
N
RESTORE SODDED AREA
ASPHALTIC SURFACE PATCH
MATCH TO EXIST. ROADWAY GRADE
(INCIDENTAL TO CURB & GUTTER ITEM)
SAW CUT 90 LF
CONC. CURB & GUTTER
30-INCH TYPE D TO
MATCH EXISTING
SAW CUT AT EXIST.
CURB JOINT 4.5 LF
SAW CUT AT EXIST.
CURB JOINT 4.5 LF
MATCH TO EXIST.
CURB & GUTTER
2'-0"
2'-0"
6"
MATCH TO EXIST.
CURB & GUTTER
SALVAGE & RECONSTRUCT
EXIST. CATCH BASIN
(SEE SHEET C01)
APPROX. 10'
REMOVE, SALVAGE & REINSTALL
EXIST. LIGHT AS NEEDED
12'-5"
10'-0"
SAW CUT
MATCH TO EXIST. PATH
SAW CUT 10 LF
MATCH TO EXIST. PATH GRADE
PROP. ASPHALTIC PEDESTRIAN PATH
12'-6"R
22'-1"R
MATCH EXIST. RADIUS
EXIST. CATCH BASIN
(SEE PLAN SHEET C01)
A
EXIST. CATCH BASIN
(SEE PLAN SHEET C01)
10'-7"
SAW CUT
MATCH TO EXIST. PATH
SEED AND TOPSOIL REMOVED DRIVEWAY AREA
NOTES:
1. SURVEY TO SHOW LOCATIONS IN REFERENCE TO BENCHMARKS.
2. DETAILS TO BE DEVELOPED TO SHOW GRADES AND SLOPES.
SHEET DESCRIPTION:
M1 PATH INTERSECTION DETAIL
PROJECT TITLE: MCKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208
REVISIONS
REV. 1: 1/26/2009
DESIGN FIRM:
URS CORPORATION
DRAWN BY: _
SCALE: 1"=5' @ 24"x36"
DATE
10/27/2008
PROJECT
V013-08801
SITE NO:
780
BUILDING NO:
SHEET NO.
C05


PROPOSED INFILTRATION BASIN M1
GRADING SECTION A-A
PRELIMINARY PLAN
PROPOSED INFILTRATION BASIN M1
GRADING SECTION B-B
PRELIMINARY PLAN
NOTES:
1. SEE SHEETS L01 AND L02 FOR LANDSCAPING DETAILS
2. NO TOPSOIL WITHIN INFILTRATION BASIN.
3. TILL SOIL AND APPLY NATIVE SEED PER NURSERY DIRECTION.
4. INCLUDE 6 INCHES OF TOPSOIL FROM INFILTRATION BASIN LIMITS TO CONSTRUCTION LIMITS AS SHOWN IN THE PROFILE.
LINCOLN MEMORIAL DRIVE
EXISTING PATH
EXISTING GROUND SURFACE
OUTLET STRUCTURE M1-1A
SEE DETAIL SHEET C10
PROP. FINISHED GRADE
PROP. CATCH BASIN
RIM 584.0
(3.5' SIDE TOPSOIL)
MARINA PARKING LOT
TO EXISTING CATCH BASIN INSIDE MAR. LOT FENCE
EXIST. 8" STORM SEWER DRAINS TO LAKE @ 0.2%
4" HDPE CROSS DRAINS (4) WITH COVERED DRAINS
ENGINEERED SOIL
STD. 1004
APPROX. GROUND WATER ELEVATION 580.0 (7/31/2008)
SUBGRADE 580.0
UNDERDRAIN TO CONNECT INTO EXISTING STORM SEWER
EXISTING SANITARY SEWER
4" CORRUGATED UNDERDRAIN PERFORATED HDPE @ 0.1%
4" RIGID STORM SEWER HDPE RIGID UNDERDRAIN @ 0.5%
PROP. MH 1.1
RIM 587.2
PROP. FINISHED GRADE
EXISTING DRIVEWAY
OUTLET STRUCTURE
(SEE DETAIL SHEET C14)
EXISTING GROUND SURFACE
EOR CREST 584.8
SEE DETAIL SHEET C14)
12" SS PIPE (2)
E 580.0
ENGINEERED SOIL
STD. 1004
PEA GRAVEL
WEEP HOLE
E 582.4
E 582.4
4" CORRUGATED UNDERDRAIN PERFORATED HDPE
APPROX. GROUND WATER ELEVATION 580.0 (7/31/2008)
INSULATE AND POLYWRAP EXIST. WATER MAIN
EXIST. SANITARY SEWER
NOTES:
1. SEE SHEETS L01 AND L02 FOR LANDSCAPING DETAILS
2. NO TOPSOIL WITHIN INFILTRATION BASIN.
3. TILL SOIL AND APPLY NATIVE SEED PER NURSERY DIRECTION.
7/28/2009 1 REVISED TO INCLUDE LANDSCAPING BORDER FROM CONTRACT
7/28/2009 2 REVISED CONTRACT QUANTITY FOR ENGINEERED SOIL
7/28/2009 3 ADDED CONTRACT QUANTITY FOR PEA GRAVEL
7/28/2009 4 REVISED CONTRACT TO USE EXCAVATED SOIL FOR BERM
7/28/2009 5 REVISED CONCRETE EMERGENCY SPILLWAY FROM CONTRACT
7/28/2009 6 REVISED STORMCEPTOR FROM CONTRACT
7/28/2009 7 REVISED CONTRACT QUANTITY FOR 18" STORM SEWER HDPE
8/27/2009 8 RESTAMP DRAWINGS (CDP)
PROJECT TITLE: MCKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1730 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR, MILWAUKEE, WI 53208
REVISIONS
REV. 1-7: 1-26-2009
REV. 8: 8-27-2009
DESIGN FIRM:
URS CORPORATION
DRAWN BY:
SCALE: 1"=20' @ 24"x36"
DATE
10/27/2008
PROJECT
V013-08801
SITE NO:
780
BUILDING NO:
SHEET DESCRIPTION:
M1 GRADING PROFILE
SHEET NO.
C04


PROP. ASPHALTIC PATH (SEE DETAIL SHEET C05)
EXIST. MH 1.2 RIM 587.28 IE 581.94
PROP. MH 1.1 RIM 587.2 IE 582.5 (TO M1) IE 581.94 (EXIST. 18") (SEE DETAIL SHEET C11)
B
SS
SLOPED TO DRAIN 3 INCHES BELOW TOP OF GRASS
APPROX. CONSTRUCTION LIMITS
EXISTING SEAWALL
PROP. RIM 586.6
EXISTING SEAWALL – TRAPEZOIDAL CROSS SECTION TYPICAL
REMOVE EXIST. INLET GRATE AND PLACE ADJUSTING RINGS AND OPEN GRATE COVER (NEENAH R-1792-H6) MATCH TO FINAL GRADE
33 LINEAR FEET OF 6" HDPE CROSS DRAINS WITH DRAIN COVERS
85 LINEAR FEET OF 6" HDPE
80 LINEAR FEET OF 18" HDPE
OUTFALL STRUCTURE MH 1.4 (SEE DETAIL SHEET C10)
PROP. RIM 586.8
INFILTRATION BASIN
8 LINEAR FEET OF 12" RCP (TYP)
30 LF OF 6" HDPE CORRUGATED PERFORATED UNDERDRAIN
IE 580.85
RELOCATED WEST POND 16' TO THE NORTH TO AVOID COMPROMISING THE EXISTING WATER MAIN(MAINT. COVER)
PROVIDE SMOOTH GRADING TO PRESERVE 6 FEET OF COVER OVER WATER MAIN
UNDERDRAIN RING EL 580.78 PROVIDE 6-INCHES OF PEA GRAVEL ON EACH SIDE OF UNDERDRAIN RING PROVIDE 1-INCH OF PEA GRAVEL COVER
33 LINEAR FEET OF 6" HDPE CROSS DRAINS WITH DRAIN COVERS
GRADE SWALE TO DRAIN TO INLETS (SEE DETAIL SHEET C12)
IE 580.80
72 LINEAR FEET OF 6" HDPE
EXIST. CATCH BASIN RIM 584.2 CONNECT TO PROP. 8" HDPE WITH CONCRETE COLLAR D/S IE 582.60 U/S IE 582.65
22 LINEAR FEET OF 6" HDPE 0.4% SLOPE
UNDERDRAIN RING EL 580.75 PROVIDE 6-INCHES OF PEA GRAVEL ON EACH SIDE OF UNDERDRAIN RING PROVIDE 1-INCH OF PEA GRAVEL COVER
PROP. CATCH BASIN MATCH EXIST. ASPH. IN BOAT LOT D/S IE 582.70 U/S IE 582.75
APPROX. CONSTRUCTION LIMITS
SAN
OH
W
E
587
586
585
588
NOTES:
1. SEE SHEETS L01 & L02 FOR LANDSCAPING DETAILS.
2. SEE SHEET C01 FOR OVERVIEW OF PROPOSED WORK AND REMOVALS FOR M1 SURFACE INFILTRATION BASIN.
3. PROTECT TREES BY PROVIDING A MINIMUM OF 25 FEET BETWEEN TREES AND GRADING LIMITS. TRUCKS SHALL AVOID ROOT STRUCTURES AND BRANCHES.
4. PROVIDE SMOOTH TRANSITION TO EXISTING GROUND.
5. MINIMIZE FILL PLACEMENT WITHIN DRIPLINE OF TREES.
SHEET DESCRIPTION:
M1 GRADING PLAN
SHEET NO.
C03
PROJECT TITLE: MCKINLEY BEACH PARK
Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53233
REVISIONS
11/11/2008
REV. 1-6: 1/26/2009
REV. 7: 8/27/2009
DESIGN FIRM: URS CORPORATION
DRAWN BY: JPH
SCALE: 1"=10' @ 24"x36"
DATE 10/27/2008
PROJECT V013-08801
SITE NO: 790
BUILDING NO:



SHEET DESCRIPTION:
M1 EXISTING ELEVATIONS

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

PROJECT TITLE MCKINLEY BEACH PARK

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST - SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
11/11/2008

DESIGN FIRM:
URS CORPORATION

DRAWN BY: _
JPH

SCALE: 1"=20' @ 24"x36"

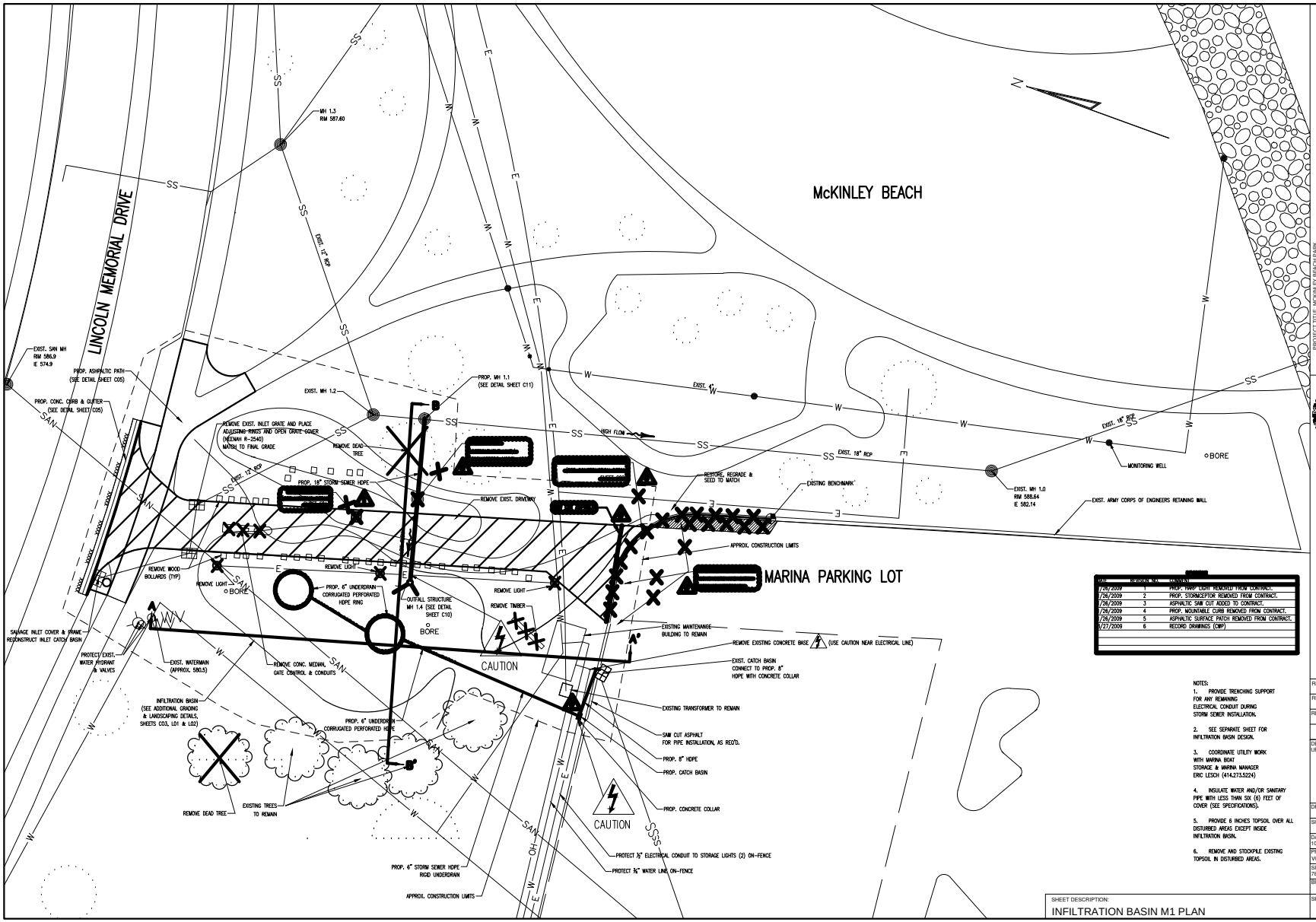
DATE
10/27/2008

PROJECT:
U013-08801

SITE NO:
780

BUILDING NO:

SHEET NO.
C02



DATE	REVISION NO.	REMARKS
1/26/2009	1	PROP. TRAIL HEIGHT REMOVED FROM CONTRACT.
1/26/2009	2	PROP. STORMCEPTOR REMOVED FROM CONTRACT.
1/26/2009	3	ASPHALTIC SAW CUT ADDED TO CONTRACT.
1/26/2009	4	PROP. MOUNTABLE CURB REMOVED FROM CONTRACT.
1/26/2009	5	ASPHALTIC SURFACE PATCH REMOVED FROM CONTRACT.
8/27/2009	6	RECORD DRAWINGS (CMP)

NOTES:

1. PROVIDE TRENCHING SUPPORT FOR ANY REMAINING ELECTRICAL CONDUIT DURING STORM SEWER INSTALLATION.
2. SEE SEPARATE SHEET FOR INFILTRATION BASIN DESIGN.
3. COORDINATE UTILITY WORK WITH MARINA BOAT STORAGE & MARINA MANAGER ERIC LESCH (414.273.5224)
4. INSULATE WATER AND/OR SANITARY PIPE WITH LESS THAN SIX (6) FEET OF COVER (SEE SPECIFICATIONS).
5. PROVIDE 6 INCHES TOPSOIL OVER ALL DISTURBED AREAS EXCEPT INSIDE INFILTRATION BASIN.
6. REMOVE AND STOCKPILE EXISTING TOPSOIL IN DISTURBED AREAS.

SHEET DESCRIPTION:
INFILTRATION BASIN M1 PLAN

Department of Transportation and Public Works
Storm Water Control Measures
1750 N. Lincoln Memorial Drive, Milwaukee, WI 53202

PROJECT TITLE: MCKINLEY BEACH PARK

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS
REV. 1-5: 1/26/2009
REV. 6: 8/27/2009

DESIGN FIRM:
URS CORPORATION

DRAWN BY:
SCALE: 1"=20' @ 24"x36"
DATE: 10/27/2008
PROJECT: V013-06801
SITE NO: 780
BUILDING NO:
SHEET NO. C01

Appendix C

Bradford Beach / Lake Park

Appendix C-1: Site Map

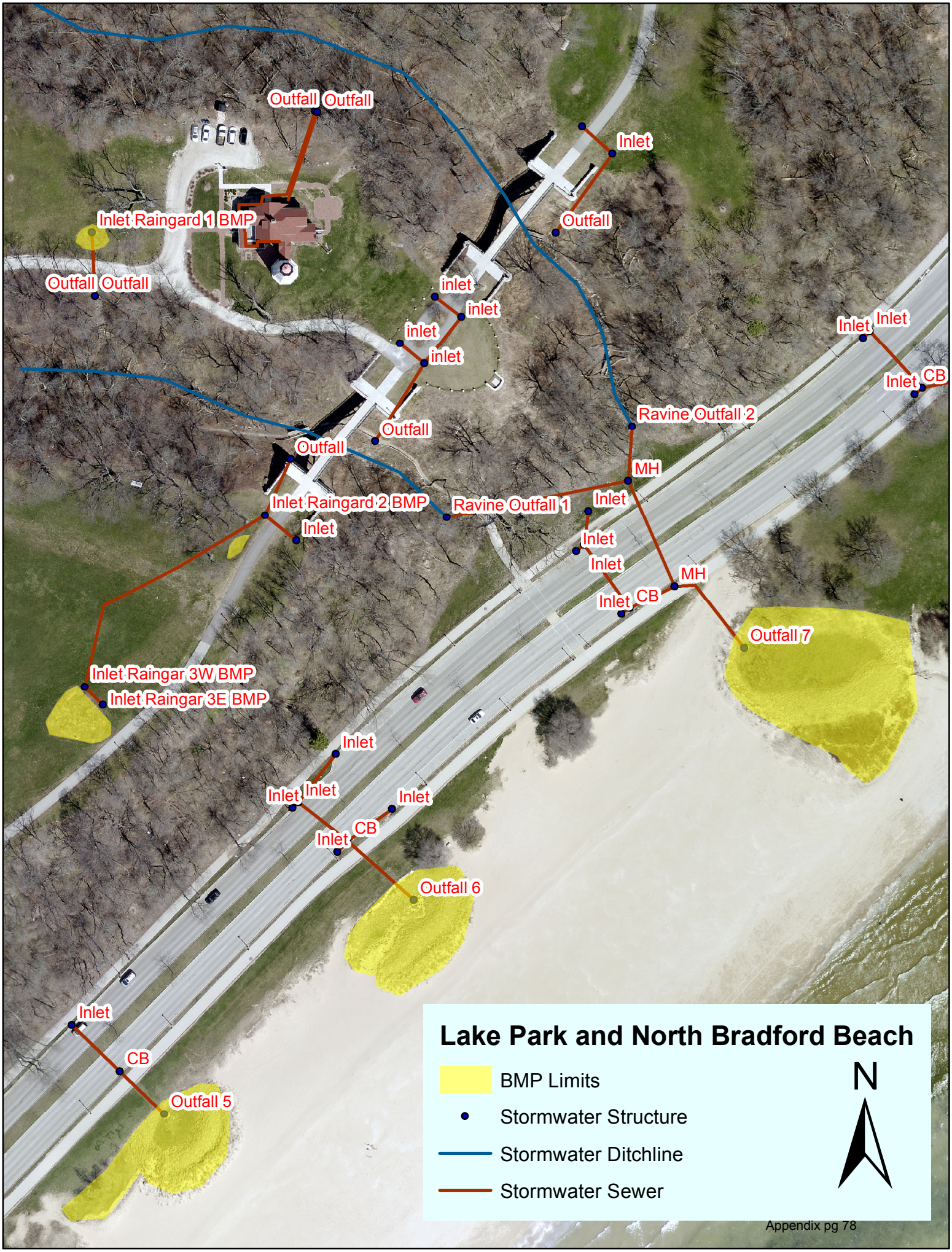
Appendix C-2: Inspection and Maintenance Logs

Appendix C-3: O&M Manual

Appendix C-4: Design Plans

Appendix C-5: Photos of Spillway Clogging

C-1


Lake Park and North Bradford Beach
BMP Limits
Stormwater Structure
Stormwater Ditchline
Stormwater Sewer
N
Outfall
Outfall
Inlet
Inlet Raingard 1 BMP
Outfall
Outfall
Outfall
inlet
inlet
inlet
inlet
Inlet
Inlet
Inlet
CB
Ravine Outfall 2
Outfall
Outfall
MH
Inlet Raingard 2 BMP
Ravine Outfall 1
Inlet
Inlet
Inlet
Inlet
MH
Inlet
CB
Outfall 7
Inlet Raingar 3W BMP
Inlet Raingar 3E BMP
Inlet
Inlet
Inlet
Inlet
CB
Inlet
Outfall 6
Inlet
CB
Outfall 5

South Bradford Beach
BMP Limits
Stormwater Structure
Stormwater Sewer
N
MH
CB
Inlet
Outfall 4
Outfall 3
Manhole
Outfall 2
Emergency Spillway
Inlet 1 OF2 BMP
Inlet 2 OF2 BMP
Inlet 3 OF2 BMP
Inlet 3 OF0 BMP
Inlet 2 OF0 BMP
Inlet 1 OF0 BMP
Fromuc
S-1 SEDMNT MH BMP
Outfall 0
Outfall
Assumed OFs1_11_08

C-2

Bradford and McKinley Beach Infiltration Cell Inspections

Location (circle): BBOF0 BBOF2 BBOF3 BBOF4 BBOF5 BBOF6 BBOF7 MBOF

Inspected By: _____ Date: _____

Basin

	Yes	No
Sedimentation	_____	_____
Erosion	_____	_____
Ponding	_____	_____
Trash	_____	_____
Weeds	_____	_____
Hydrocarbon Contamination	_____	_____
Other Damage	_____	

Water in basin should be gone within 48-hours of a rain event.

Embankments

	Yes	No
Slumping	_____	_____
Seepage	_____	_____
Animal Holes	_____	_____
Weeds	_____	_____
Erosion	_____	_____
Other Damage	_____	

Inlet Pipes

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Outlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Spillway Integrity

Excellent _____ Good _____

Fair Poor

Other Damage _____

Inspection Comments: _____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Bradford and McKinley Beach Infiltration Cell Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

November	Yes	No
Native Species Mowed to Six Inches	_____	_____

As Needed	Methods Used	Species Targeted
Invasive Species Control	_____	_____

Maintenance Comments: _____

_____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Bradford & Mckinley Beach Sedimentation Chamber Inspection

Sedimentation Chamber (circle): _____ Bradford Beach _____ McKinley Beach _____

Inspected By: _____ Date: _____

Outlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Inlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Other Damage _____

Sedimentation Structure

	Yes	No
Excessive Floatable	_____	_____
Clogging	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Depth (ft)

Sediment Depth _____

Other Damage _____

Inspection comments: _____

_____

_____

_____

Bradford & Mckinley Beach Sedimentation Chamber Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Vacuumed and Cleaned Sump	_____	_____
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

Maintenance comments: _____

_____

_____

_____

_____

_____

Bardford Beach Parking Lot Rain Garden Inspection

Inspected By: _____ Date: _____

Basin

	Yes	No
Sedimentation	_____	_____
Erosion	_____	_____
Ponding	_____	_____
Trash	_____	_____
Weeds	_____	_____
Hydrocarbon Contamination	_____	_____
Other Damage	_____	

Water in basin should be gone within 48-hours of a rain event.

Embankments

	Yes	No
Slumping	_____	_____
Seepage	_____	_____
Animal Holes	_____	_____
Weeds	_____	_____
Erosion	_____	_____
Other Damage	_____	

Inlets

	Clogging		Erosion		Tampering		Structural Integrity
	Yes	No	Yes	No	Yes	No	(Excellent / Good / Fair / Poor)
Inlet 1, OF0							
Inlet 2, OF0							
Inlet 3, OF0							
Inlet 1, OF2							
Inlet 2, OF2							
Inlet 3, OF2							

Inspection Comments: _____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Bardford Beach Parking Lot Rain Garden Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

November	Yes	No
Native Species Mowed to Six Inches	_____	_____

As Needed	Methods Used	Species Targeted
Invasive Species Control	_____	_____

Maintenance Comments: _____

_____

_____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Lake Park Rain Garden Inspection

Inspected By: _____ Date: _____

Basins

	Garden 1		Garden 2		Garden 3	
	Yes	No	Yes	No	Yes	No
Sedimentation						
Erosion						
Ponding						
Trash						
Weeds						

Water in basin should be gone within 48-hours of a rain event.

Embankments

	Garden 1		Garden 2		Garden 3	
	Yes	No	Yes	No	Yes	No
Slumping						
Seepage						
Animal Holes						
Weeds						
Erosion						

Outlet Structures and Pipes

	Garden 1		Garden 2		Garden 3	
	Yes	No	Yes	No	Yes	No
Clogging						
Erosion						
Tampering						

Ravine Outfalls

	Clogging		Erosion		Tampering		Structural Integrity
	Yes	No	Yes	No	Yes	No	(Excellent / Good / Fair / Poor)
Ravine Outfall 1							
Ravine Outfall 2							

Inspection Comments:

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

Lake Park Rain Garden Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

April	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

August	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

November	Yes	No
Native Species Mowed to Six Inches	_____	_____

As Needed	Methods Used	Species Targeted
Invasive Species Control	_____	_____

Maintenance Comments: _____

_____

_____

_____

* DO NOT walk within infiltration cell while soils are wet

Ver: 8/14

C-3

Milwaukee County Department of Transportation and Public Works

Bradford Beach Stormwater Improvement Project

Operations and Maintenance Guidance FOR:

Infiltration Cells

BioGardens
(Bioretention Cells / Raingardens)

Settling Manhole

Table of Contents

I. INFILTRATION CELLS **3**

A. General Maintenance **3**

B. Vegetated Areas **3**

C. Structural Components **3**

D. Other Maintenance Criteria **3**

E. Restoration Procedures **4**
Table 1: Regular Infiltration Cell Maintenance 4
Table 2: Troubleshoot for Infiltration Cell Concerns 5

II. BIOGARDENS (BIORETENTION CELLS / RAINGARDENS) **6**

A. General Maintenance **6**

B. Vegetated Areas **6**

C. Structural Components **7**

D. Other Maintenance Criteria **7**

E. Restoration Procedures **7**
Table 3: Regular BioGarden Maintenance 7
Table 4: Troubleshoot for BioGarden Concerns 8

III. SETTLING MANHOLE **9**

A. General Maintenance **9**

B. Structural Components **10**

C. Other Maintenance Criteria **10**
Table 5: Regular Settling Manhole Maintenance 10
Table 6: Troubleshoot for Settling Manhole Concerns 11

I. Infiltration Cells

Located along Bradford beach are six (6) infiltration cells, designed to capture Stormwater discharge from storm sewer outfalls providing residence time for infiltration and passive stormwater treatment to occur. The infiltration cells are sand filled with fieldstone rip-rap areas and native wet and mesic prairie planting.

A. General Maintenance

All infiltration cell components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding 1 inch of rainfall. Trash shall be removed as quickly as possible once observed. The inspection shall include the outfall structure, cell sand bottom, fieldstone rip-rap and plantings. Sand fence must also be inspected until such time as it is removed. Sediment/debris removal should take place when the basin is thoroughly dry. Care should be taken to not walk within the infiltration cell when soils are wet, or compaction could take place, prohibiting infiltration. Disposal of debris, trash, sediment, and other waste material should be disposed of in a suitable disposal/recycling site and in compliance with all applicable local, state, and federal waste regulations. Note signs of petroleum hydrocarbon contamination and handle properly.

B. Vegetated Areas

Native vegetation does not require mowing once established. Vegetated areas must also be inspected twice annually (mid summer and late fall) for erosion and scour. The structure must be inspected for unwanted tree growth at least once a year. When establishing or restoring vegetation, biweekly inspections of vegetation health should be performed during the first growing season or until the vegetation is established. Once established, inspections of vegetation health, density, and diversity must be performed quarterly. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications and the inspection requirements presented above. No fertilizers or pesticides shall be used, and only spot treatment with a biodegradable herbicide (such as Round-Up) may be used on invasive species. All vegetated areas should be inspected at least twice annually (mid-summer and late fall) for unwanted growth, which should be removed with minimum disruption to the remaining vegetation and basin subsoil.

C. Structural Components

All structural components must be inspected for cracking, subsidence, spalling, erosion, and deterioration at least annually.

D. Other Maintenance Criteria

Stormwater drainage into the infiltration cell should infiltrate within 48 hours (no standing water should be visible after 48 hours). If possible, each cell should be monitored after a few rain events, to determine the average drawdown time per cell. This normal drawdown time should then be used to evaluate the basin's actual performance. If significant increases in drawdown time are observed, the basin is clogged and measures should be undertaken to unclog it. Annual tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces.

E. Restoration Procedures

Tilling or hoeing of the surface to minimize crusting or breakup clogging should be performed as needed. If ponding continues for greater than 48 hours, the top 2 to 3 inches of soil should be removed and replaced with the soil composition required as part of the original project specifications. Topsoil (no clay content) and compost may also be added to the soil mix. No work should take place within the cell while wet. If necessary, the area must be pumped dry prior to work. If tilling is used, the basin shall be drained and the soils dried to a depth of 8 inches. The disturbed areas must then be replanted with the plant schedule included in the original construction contract.

Table 1: Regular Infiltration Cell Maintenance

Schedule	Action
April 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash. **Replair** eroded areas.
June 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash
August 1st	Pull or **spot-treat** invasive species (weeds and woody vegetation). **Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash
October 1st	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove debris and trash.
November 1st	**Cut** back grasses and forbs to 4"-6" above ground and remove cuttings.
Winter and after snowmelt/runoff event	**Inspect*** for: outlet clogging and structure stability. Remove debris and trash.
After each 1" rainfall	**Inspect*** for: clogging, erosion, plant health and structure stability. Remove

	debris and trash. **Note** # of hours after rainfall ended and depth of water in each cell. Log details in maintenance log.

* Schedule follow-up repair work if inspection results in repair needs.

Table 2: Troubleshoot for Infiltration Cell Concerns

Concern	Action/Solution
Ponding water for longer than 48 hours	Cell must be dry prior to any work. Allow longer dry time or pump down cell and subsurface soil prior to any work (dig sump pit for pumping). Use the following measures independently until a solution is found: 1) Using hand shovel, remove obvious sedimentation in areas of ponding. 2) Use tilling or hoeing to break up surface soil. 3) Remove 2-4" of surface soil and replace with soil as prescribed in original construction specifications. 4) Consult a stormwater design professional for remediation.
Dead or strained vegetation	Refer to plant list from construction specifications and replace dead plants. Cell bottom should have a plant density of 90%. Watering of plant may be necessary during dry periods until the second growing season.
Invasive species/weed growth in infiltration cell	Pull weeds by hand or apply a biodegradable herbicide such as Round Up. Replant desirable species in bare areas. Cells with invasives should be inspected and corrected weekly.
Plant fatality due to Waterfowl or other predators	Install goose-protection fencing consisting of stakes placed 6' apart and stringline placed at 4" and 12" above ground surrounding the cell. 1) If stringline is ineffective, chicken-wire cages shall be constructed to surround plants on 4 sides and top. Either method shall be removed after one growing season or when plants reach sufficient height and density.
Rodent inhabitation	Call for pest/vector control for live-trapping
Erosion, gullies, slope stability concerns	In areas of steady or channeling flow, install additional field-stone rip rap with underlying filter fabric. Inflow or overflow areas where water is expected to flow should be formed so that the lowest areas are within the rock sections, ensuring that edges where soil and rock meet are higher. Fill sand/soil gully areas with soil composition required as

	part of the construction contract.
Other concerns	Consult a stormwater design specialist for special concerns.

II. BioGardens (Bioretention Cells / Raingardens)

Bradford beach parking lot Bioretention Cells and Lake Park Raingardens are essentially the same type of best management practice. For discussion purposes, we will refer to them all as "BioGardens". Stormwater runoff is directed toward the devices through natural passive routes. The BioGardens hold stormwater temporarily on the surface and allow water to infiltrate to the engineered soils, underlying pea gravel and slotted underdrain. The underdrains are connected to the storm sewer system, therefore water that doesn't infiltrate into surrounding soils, exits to the storm sewer. This water has been treated by running through the filtering media (soils) and leaves through the storm sewer cleaner than it came into the BioGardens. The BioGardens are planted with native vegetation that should need little to no maintenance once established, and assists in filtering the stormwater and increasing infiltration.

A. General Maintenance

The BioGardens receive and trap debris and sediment while allowing stormwater to infiltrate (soak into the ground). The BioGardens must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding 1 inch of rainfall. Trash shall be removed as quickly as possible once observed. Inspection shall include that of the outfall structure, BioGarden floor (for sedimentation, clogging, loss of mulch) and plantings. Sediment/debris removal should take place when the soils are thoroughly dry. Care should be taken to not walk within the BioGarden when soils are wet, or compaction could take place, prohibiting infiltration. Disposal of debris, trash, sediment, and other waste material should be disposed of in a suitable disposal/recycling site and in compliance with all applicable local, state, and federal waste regulations.

B. Vegetated Areas

Native vegetation does not require mowing once established. Vegetated areas must also be inspected twice annually (mid summer and late fall) for erosion and scour. The structure must be inspected for unwanted tree growth at least once a year. When establishing or restoring vegetation, biweekly inspections of vegetation health should be performed during the first growing season or until the vegetation is established. Once established, inspections of vegetation health, density, and diversity must be performed quarterly. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the

original specifications and the inspection requirements. No fertilizers or pesticides shall be used, and only spot treatment with a biodegradable herbicide (such as Round-Up) may be used on invasive species. All vegetated areas should be inspected at least twice annually (mid-summer and late fall) for unwanted growth, which should be removed with minimum disruption to the remaining vegetation and basin subsoil.

C. Structural Components

All structural components must be inspected for cracking, subsidence, spalling, erosion, and deterioration at least annually.

D. Other Maintenance Criteria

Stormwater drainage into the BioGarden should infiltrate within 48 hours (no standing water should be visible after 48 hours). If possible, each BioGarden should be monitored after a few rain events, to determine the average drawdown time per unit. This normal drawdown time should then be used to evaluate the BioGarden's actual performance. If significant increases in drawdown time are observed, the floor is clogged and measures should be undertaken to unclog it. Annual tilling by light equipment can assist in maintaining infiltration capacity and break up clogged surfaces.

E. Restoration Procedures

Tilling or hoeing of the surface to minimize crusting or breakup clogging should be performed as needed. If ponding continues for greater than 48 hours, the top 2 to 3 inches of soil should be removed and replaced with the soil composition required as part of the original project specifications. No work should take place within the BioGarden while wet. If necessary, the area must be pumped dry prior to work. If tilling is used, the basin shall be drained and the soils dried to a depth of 8 inches. The disturbed areas must then be replanted with the plant schedule included in the original construction contract. Reinstall 2" of hardwood mulch to restored areas.

Table 3: Regular BioGarden Maintenance

Schedule	Action
April 1st	**Inspect*** for: clogging, erosion, plant health, bare areas, outlet and structure stability. Remove debris and trash. **Replair** eroded areas and replenish 2" depth of hardwood mulch in bare areas and where needed.
June 1st	**Inspect*** for: clogging, erosion, plant health, bare areas, outlet and structure

	stability. Remove debris and trash.
August 1st	Pull or **spot-treat** invasive species (weeds and woody vegetation). **Inspect*** for: clogging, erosion, plant health, bare areas, outlet and structure stability. Remove debris and trash.
October 1st	**Inspect*** for: clogging, erosion, plant health, bare areas, outlet and structure stability. Remove debris and trash.
November 1st	**Cut** back grasses and forbs to 4”-6” above ground and remove cuttings.
Winter and after snowmelt/runoff event	**Inspect*** for: outlet clogging and structure stability. Remove debris and trash.
After each 1” rainfall	**Inspect*** for: clogging, erosion, plant health, bare areas, outlet and structure stability. Remove debris and trash. **Note** # of hours after rainfall ended and depth of water in each BioGarden. Log details in maintenance log.

* Schedule follow-up repair work if inspection results in repair needs.

Table 4: Troubleshoot for BioGarden Concerns

Concern	Action/Solution
Ponding water for longer than 48 hours	BioGarden must be dry prior to any work. Allow longer dry time or pump down BioGarden and subsurface soil prior to any work (dig sump pit for pumping). Use the following measures independently until a solution is found and replenish 2” of hardwood mulch where needed after the following steps are followed: 1) Using hand shovel, remove obvious sedimentation in areas of ponding. 2) Use tilling or hoeing to break up surface soil. 3) Remove 2-4” of surface soil and replace with soil as prescribed in original construction specifications. 4) The underdrain may be plugged. A plumber’s snake may be inserted into underdrain through the outlet structure or the clean-out. Clear water may be used to backflush the underdrain by inserting a hose through the same route. 4) Consult a stormwater design professional for remediation.
Dead or strained vegetation	Refer to plant list from construction specifications and replace dead plants. BioGarden bottom should have a

	plant density of 90%. Watering of plant may be necessary during dry periods until the second growing season.
Invasive species/weed growth in BioGarden	Pull weeds by hand or apply a biodegradable herbicide such as Round Up. Replant desirable species and mulch with 2" depth of hardwood mulch in bare areas. BioGardens with invasives should be inspected and corrected weekly.
Plant fatality due to Waterfowl or other predators	Install goose-protection fencing consisting of stakes placed 6' apart and stringline placed at 4", 12" and 18" above ground surrounding the BioGarden. 2) If stringline is ineffective, chicken-wire cages shall be constructed to surround plants on 4 sides and top. Either method shall be removed after one growing season or when plants reach sufficient height and density.
Rodent inhabitation	Call for pest/vector control for live-trapping
Erosion, gullies, slope stability concerns	In areas of steady or channeling flow, install fieldstone rip-rap with underlying filter fabric. Inflow or overflow areas where water is expected to flow should be formed so that the lowest areas are within the rock sections, ensuring that edges where soil and rock meet are higher. Fill sand/soil gully areas with soil composition required as part of the construction contract.
Other concerns	Consult a stormwater design specialist for special concerns.

III. Settling Manhole

At Outfall 0, east of the southern Bradford beach parking lot is a 72" diameter Settling Manhole with a 4' deep sump section. The purpose of the Settling Manhole is to allow for heavier suspended solids (sand, gravel, etc.) to be removed or settle out of the Stormwater runoff, prior to it discharging to Lake Michigan. The Settling Manhole is a precast concrete structure with a steel cover for monitoring and maintenance access. The Settling Manhole is fitted with a trap to prevent oil and floatables from exiting the manhole.

A. General Maintenance

The Settling Manhole traps debris, sediment and floating materials while allowing stormwater to be discharged to Lake Michigan. The Settling Manhole must be inspected for clogging and excessive debris and sediment accumulation at least four times annually. Inspection shall include opening the access manhole, checking for clogging of the trap, volume of floating debris, and depth of

sediment. Inspection of the discharge pipe to Lake Michigan should also be done to ensure no blockage or evidence of inhabitation by animals. The sediment shall be removed via vacuum extraction no less than twice per year. It was commonly accepted that once the depth of material reaches 60% of the storage (2.4 feet deep), resuspension of settled particles occurs. This would lead maintenance programs to conclude that allowing the depth to reach 60% before vacuuming was acceptable. More recently, research has shown that smaller particles that become trapped may resuspend automatically when disturbed, therefore a regularly scheduled vacuum schedule is the best practice. Debris, trash, sediment, and other waste material should be disposed of in a suitable disposal/recycling site and in compliance with all applicable local, state, and federal waste regulations.

B. Structural Components

The Settling Manhole structural components must be inspected for cracking, subsidence, spalling, and deterioration at least annually.

C. Other Maintenance Criteria

Floating debris is "seasonal". During periods of high beach usage, such as fireworks displays, festivals, volleyball events, etc, the amount of paper, plastic and other trash volume is great. As a result, the Settling Manhole should be inspected and floating debris removed with vacuum or a hand-skimming device at a more frequent schedule than sediment removal.

Table 5: Regular Settling Manhole Maintenance

Schedule	Action
February 1st and after snowmelt/runoff event	**Inspect*** (by removing the manhole cover) for: clogging, floating material, sediment volume, frozen outlet conditions. Remove floating debris and trash by skimming or vacuuming. Inspect discharge pipe to the Lake.
April 1st	**Inspect*** (by removing the manhole cover) for: clogging, floating material, sediment volume, frozen outlet conditions. Remove floating debris and trash by skimming or vacuuming. Inspect discharge pipe to the Lake. **Vacuum** sediment from bottom of manhole.
June 1st	**Inspect*** (by removing the manhole cover) for: clogging, floating material, sediment volume, frozen outlet

	conditions. Remove floating debris and trash by skimming or vacuuming. Inspect discharge pipe to the Lake.
August 1st	**Inspect*** (by removing the manhole cover) for: clogging, floating material, sediment volume, frozen outlet conditions. Remove floating debris and trash by skimming or vacuuming. Inspect discharge pipe to the Lake.
October 1st	**Inspect*** (by removing the manhole cover) for: clogging, floating material, sediment volume, frozen outlet conditions. Remove floating debris and trash by skimming or vacuuming. Inspect discharge pipe to the Lake. **Vacuum** sediment from bottom of manhole.

* Schedule follow-up repair work if inspection results in repair needs.

Table 6: Troubleshoot for Settling Manhole Concerns

Concern	Action/Solution
Plugged outlet	1) Inspect discharge point at the Lake to ensure no blockage or pest inhabitation. 2) Remove floating debris from Settling Manhole and clear trap. 3) A plumber's snake may be used to clear the outlet. Care is to be taken that any flushed debris is removed from the outlet end and disposed of (not flushed into the Lake) 4) If during winter, steam may be used to clear the outlet pipe.
Excessive sediment build-up between vacuuming	Increase vacuum frequency.
Plant fatality due to Waterfowl or other predators	Install goose-protection fencing consisting of stakes placed 6' apart and stringline placed at 4", 12" and 18" above ground surrounding the BioGarden. 3) If stringline is ineffective, chicken-wire cages shall be constructed to surround plants on 4 sides and top. Either method shall be removed after one growing season or when plants reach sufficient height and density.

Rodent inhabitation	Call for pest/vector control for live-trapping
Other concerns	Consult a stormwater design specialist for special concerns.

C-4

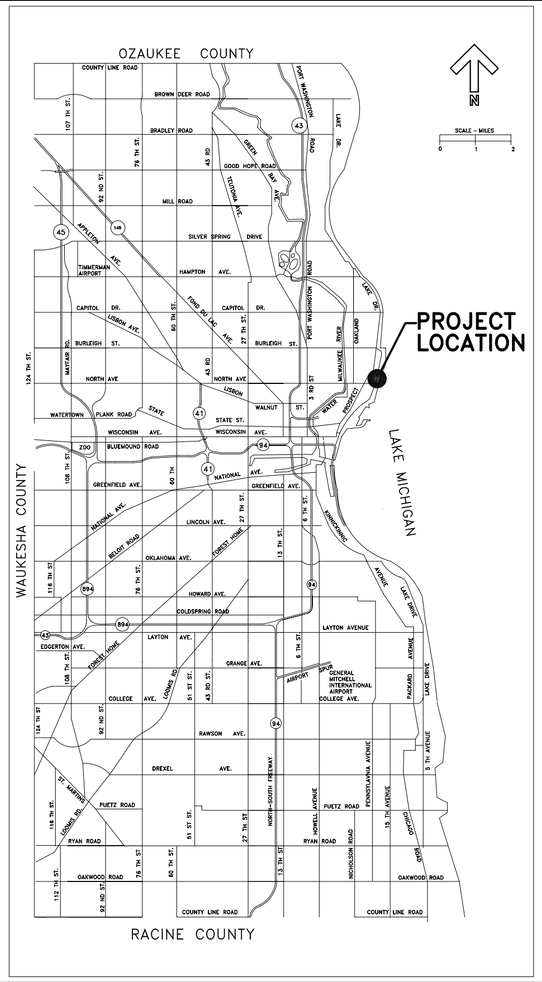
BRADFORD BEACH PARK

2500 N. LINCOLN MEMORIAL DRIVE

STORMWATER IMPROVEMENT PROJECT

V011–06613

SEPTEMBER, 2007



LOCATION MAP

ABBREVIATIONS:

ASP	ASPHALT	MH	MANHOLE
CABC	CRUSHED AGGREGATE BASE COURSE	N	NORTHING
CB	CATCH BASIN	O.C.	ON CENTER
C.I.	CAST IRON	PAVT	PAVEMENT
CL	CENTERLINE	PKG	PARKING
CMP	CORUGATED METAL PIPE	PKWY	PARKWAY
CONC	CONCRETE	PROP	PROPOSED
COND	CONDUIT	PVC	POLYVINYL CHLORIDE
DIA.	DIAMETER	R	RADIUS
ELEC	ELECTRICAL	RT	RIGHT
EL	ELEVATION	RCP	REINFORCED CONRETE PIPE
EXST	EXISTING	RD	ROAD
E	EASTING	SAN	SANITARY SEWER
F TO F	FACE TO FACE	SS	STORM SEWER
G	GAS	ST	STREET
G.W.I.	GALVANIZED WROUGHT IRON	STA	STATION
HOR	HORIZONTAL	T	TELEPHONE
HP	HIGH POINT	TYP	TYPICAL
I.E.	INVERT ELEVATION	UD	UNDER DRAIN
LT	LEFT	VERT	VERTICAL
L	LIGHTING CABLE/CONDUIT	W	WATER
MAX	MAXIMUM	WEPCO	WI ELECTRICAL POWER CO
MIN	MINIMUM	X	EXTRA

XXXXX

LEGEND:

EXISTING GAS METER	IRON PIPE (PROPERTY CORNER)
EXISTING TELEPHONE BOX	SURVEY CONTROL POINT
EXISTING TRANSFORMER	BUTT JOINT
EXISTING MANHOLE	SOD AREA
EXISTING LIGHT POLE	PROPOSED LIGHT POLE
EXISTING CATCH BASIN OR INLET	PROPOSED CATCH BASIN
X EXISTING FENCE	X PROPOSED FENCE
EXISTING PAVEMENT	PROPOSED PAVEMENT
EXISTING CURBFACE	PROPOSED CURBFACE
EXISTING TREE/BUSH LINE	PROPOSED TREE/BUSH LINE
700 EXISTING CONTOURS	700 PROPOSED CONTOURS
EXISTING CONIFEROUS TREE	TREE TO BE REMOVED
EXISTING DECIDUOUS TREE	PROPOSED DECIDUOUS TREE
SS EXISTING STORM SEWER	SS PROPOSED STORM SEWER
W EXISTING WATER LINE	W PROPOSED WATER LINE
E EXISTING ELECTRIC (BURIED)	E PROPOSED ELECTRIC (BURIED)
L EXISTING LIGHTING (BURIED)	L PROPOSED LIGHTING (BURIED)
EXISTING PROFILE	PROPOSED PROFILE

CONSTRUCTION SITE EROSION CONTROL

1. FENCE SHALL BE INSTALLED PRIOR TO CONSTRUCTION.

2. EROSION CONTROL MEASURES SHALL BE TAKEN WHERE SHOWN ON THE DRAWING OR AS DIRECTED BY THE ENGINEER, EROSION CONTROL MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BEEN RE–ESTABLISHED AND ACCEPTED BY THE OWNER IN ALL DISTURBED TURF AREAS.

3. EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK.

4. COMPLY WITH ALL LOCAL AND STATE EROSION CONTROL ORDINANCES.

5. EROSION CONTROL MEASURES SHALL BE TAKEN AT EACH INLET STRUCTURE WHICH DRAINS STORM WATER AFFECTED BY THIS PROJECT.

6. TOPSOIL STOCKPILE LOCATION SHALL BE WITHIN AREA PROTECTED BY EROSION AND SEDIMENT CONTROL MEASURES.

GENERAL NOTES

1. APPLICATION SPECIFICATIONS – STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2003 EDITION, WITH AMMENDMENTS TO DATE, AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.

2. CONTRACTOR SHALL CALL DIGGERS HOTLINE ((414) 259–1181) AND PARKS MAINTENANCE DIVISION AT (414) 258–2322 FOR UTILITIES LOCATION PRIOR TO START OF CONSTRUCTION.

3. ALL INFORMATION SHOWN ON EXISTING CONDITIONS IS BASED ON RECORDS AVAILABLE TO MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS AS OF JANUARY 2004, ALTHOUGH THE COUNTY IN NO WAY GUARANTEES THE INFORMATION AS BEING ENTIRELY ACCURATE IN THE EVENT PERSONS PERFORMING WORK FOR MILWAUKEE COUNTY SHOULD ENCOUNTER ERRORS OR OMISSIONS IN THESE DRAWINGS DURING CONSTRUCTION OF THIS PROJECT, IT SHALL BE THEIR RESPONSIBILITY TO INFORM THE COUNTY AS SOON AS POSSIBLE.

4. ALL ELEVATIONS ON THESE DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM. (CITY OF MILWAUKEE DATUM)

5. EXISTING SIGNS AFFECTED BY CONSTRUCTION SHALL BE PROTECTED OR RELOCATED AS DIRECTED BY THE ENGINEER.

6. CONTRACTOR SHALL PROTECT ALL TREES NOT SHOWN FOR REMOVAL.

7. CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS.

DRAWING INDEX:

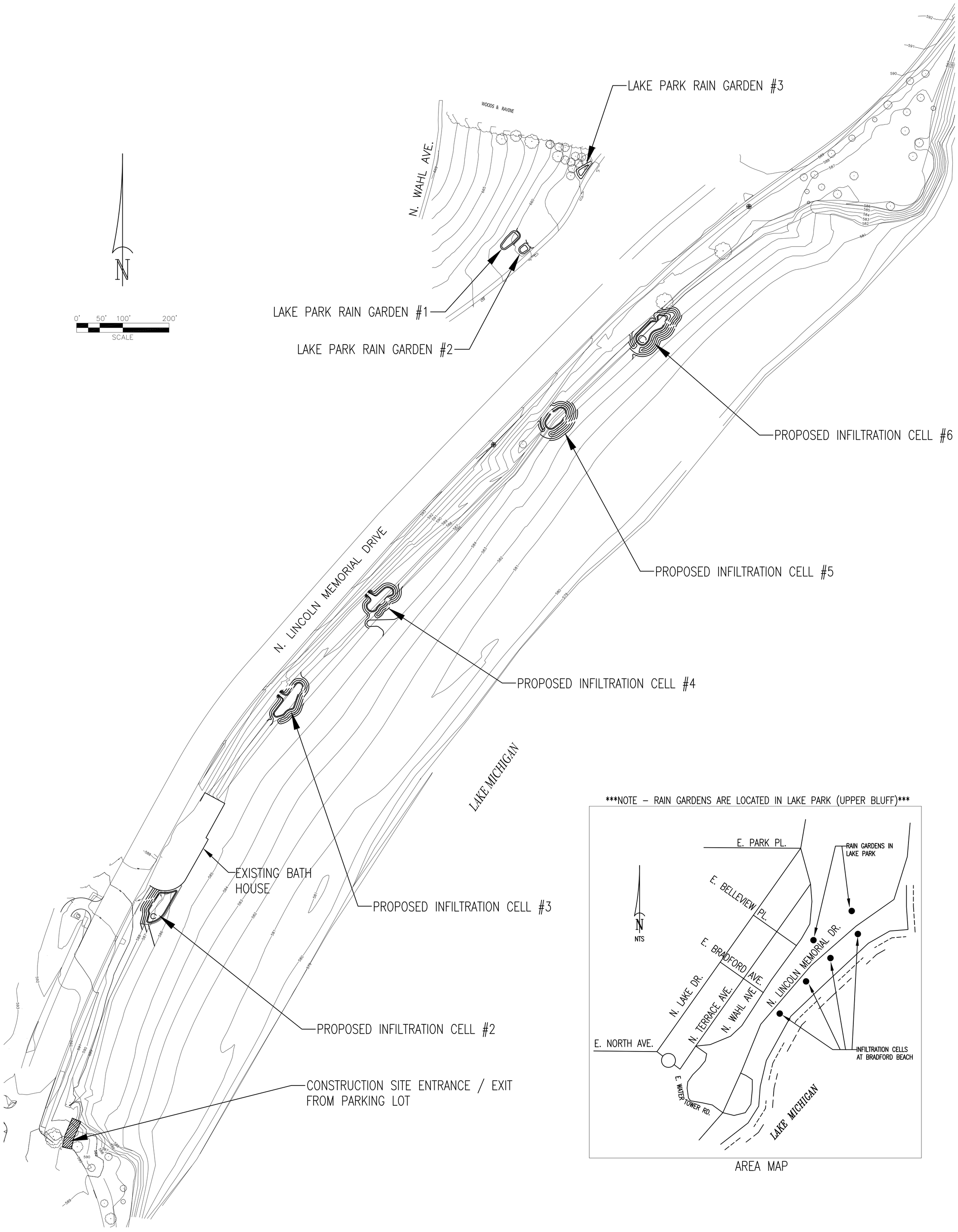
T101	TITLE SHEET	1 OF 9
C101	OVERVIEW PLAN	2 OF 9
C102	GRADING PLAN – INFILTRATION CELL 2	3 OF 9
C103	GRADING PLAN – INFILTRATION CELLS 3 & 4	4 OF 9
C104	GRADING PLAN – INFILTRATION CELLS 5 & 6	5 OF 9
C105	RAIN GARDENS GRADING/LANDSCAPE PLAN	6 OF 9
C106	CONSTRUCTION DETAILS	7 OF 9
L101	LANDSCAPE PLAN	8 OF 9
S101	STRUCTURAL DETAILS	9 OF 9

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

RECOMMENED FOR APPROVAL BY
DATE
PROJECT APPROVAL BY
DIRECTOR–DTPW
DATE
PROJECT MANAGER REVIEW BY:
DATE:

REVISIONS:

BUILDING NO. XXXXX
SITE NO. XXXXX
PROJECT NO. V011–06613
SHEET NO. T101
FILE NO.



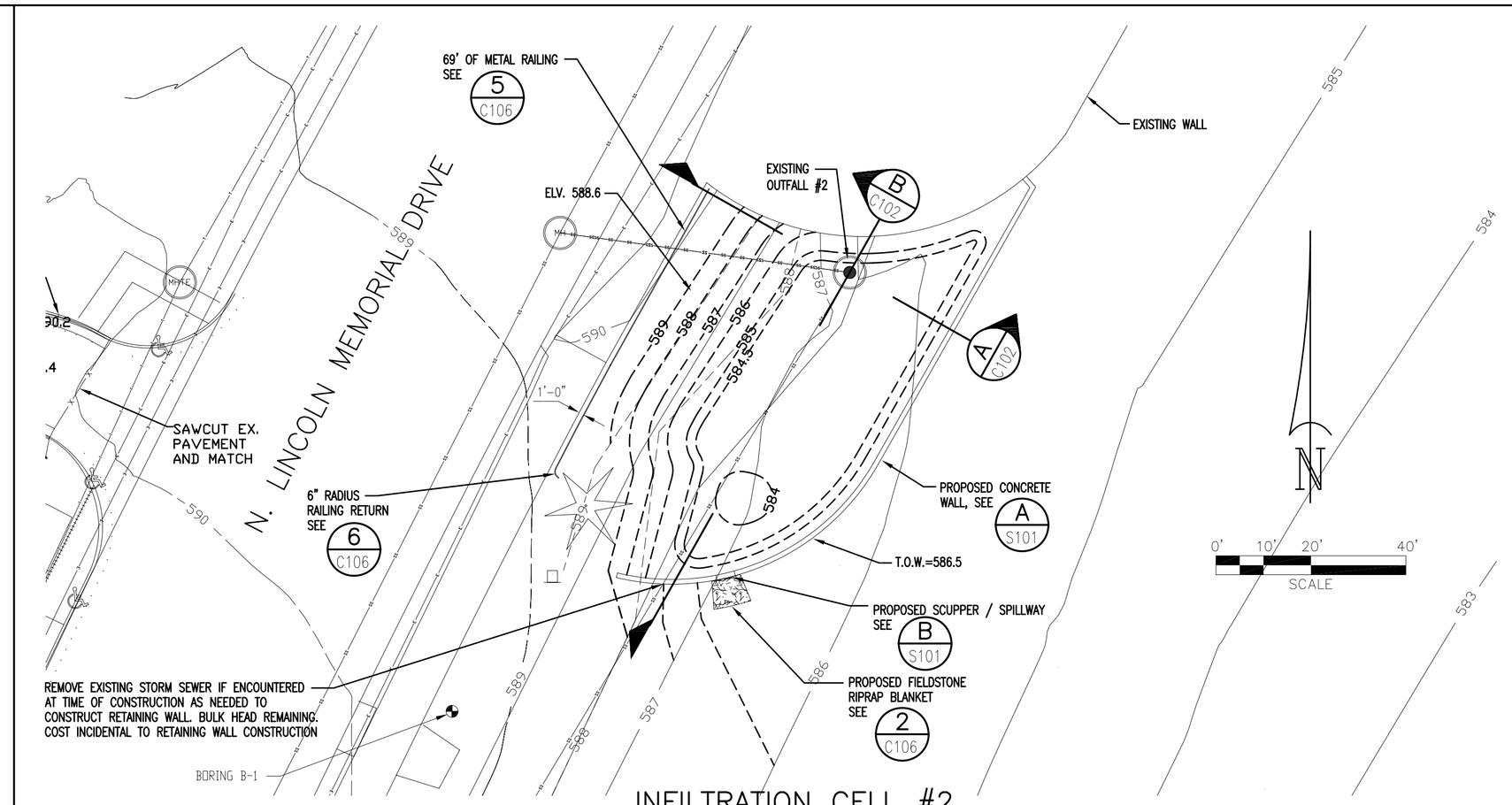
NOTE – RAIN GARDENS ARE LOCATED IN LAKE PARK (UPPER BLUFF)

AREA MAP

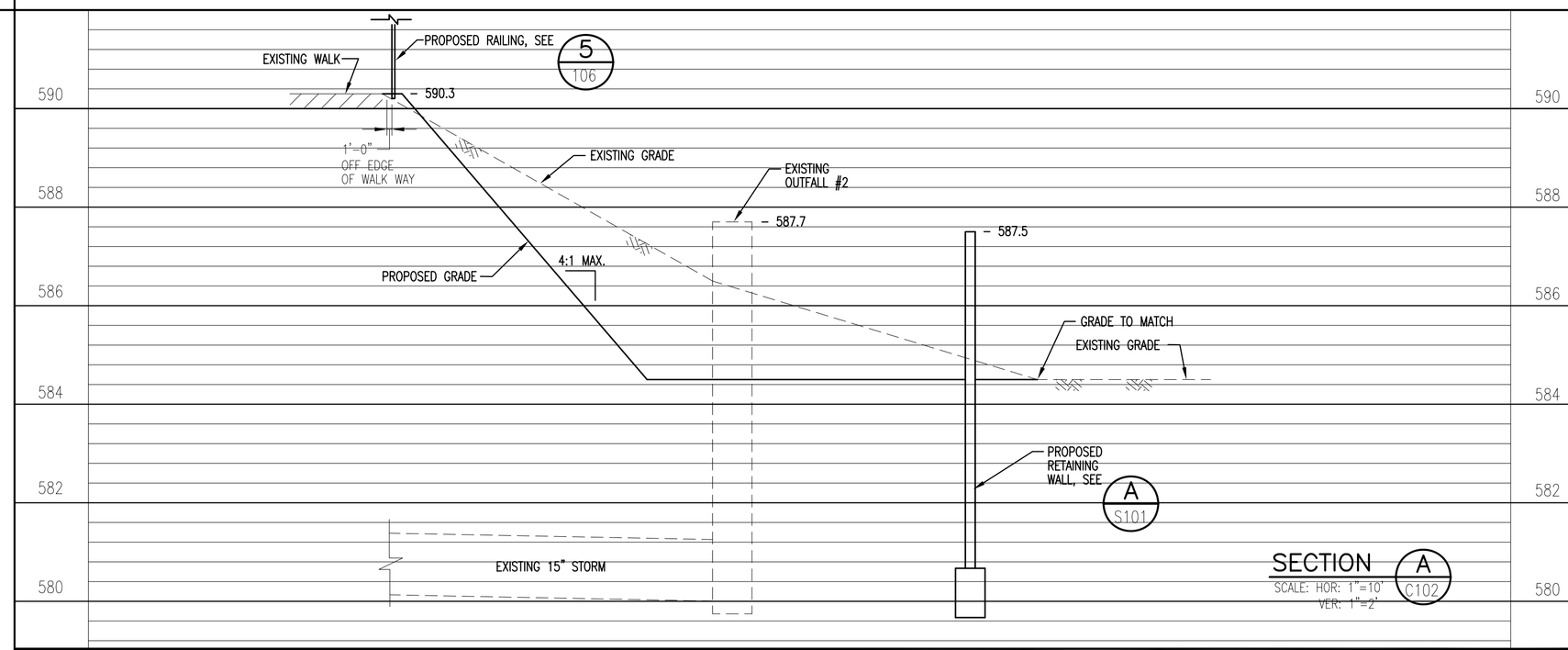
SHEET NO.	PROJECT NO.	PROJECT TITLE:	SCALE:	DRAWN BY:
C101 2 OF 9	V011-06613	BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT	1"= 100'	LMJ
FILE NO.	REVISIONS:	SHEET DESCRIPTION: OVERVIEW PLAN	DATE: 09/14/07	CHECKED BY: JJH

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

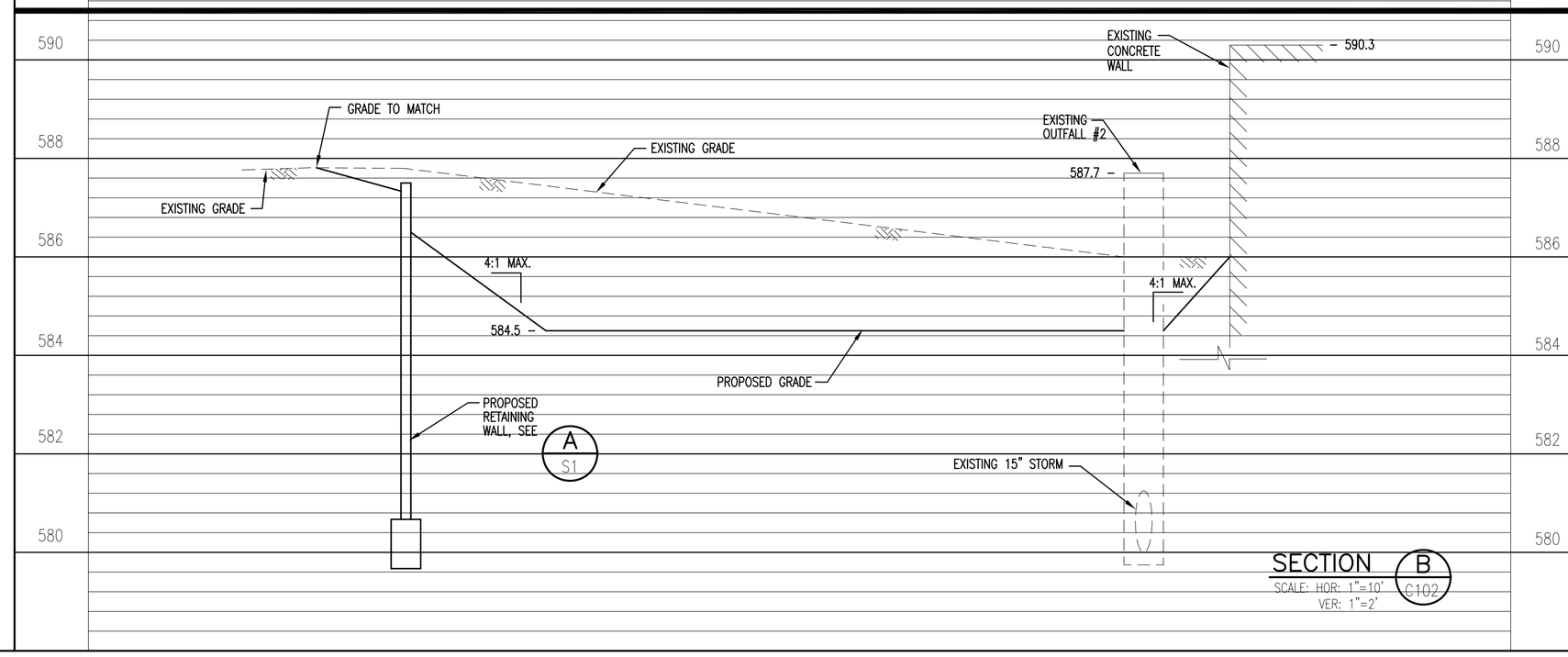
GENERAL NOTES
1. NEW BERMS TO BE CONSTRUCTED FROM BEACH SAND EXCAVATED FROM INFILTRATION CELLS.
2. EXISTING RIP-RAP TO BE REMOVED FROM SITE. COST INCIDENTAL TO CONSTRUCTION.
3. EXCESS EXCAVATED SAND MAY BE DISPOSED BY FLATTENING NEW BERMS RATHER THAN REMOVING FROM SITE.



INFILTRATION CELL #2



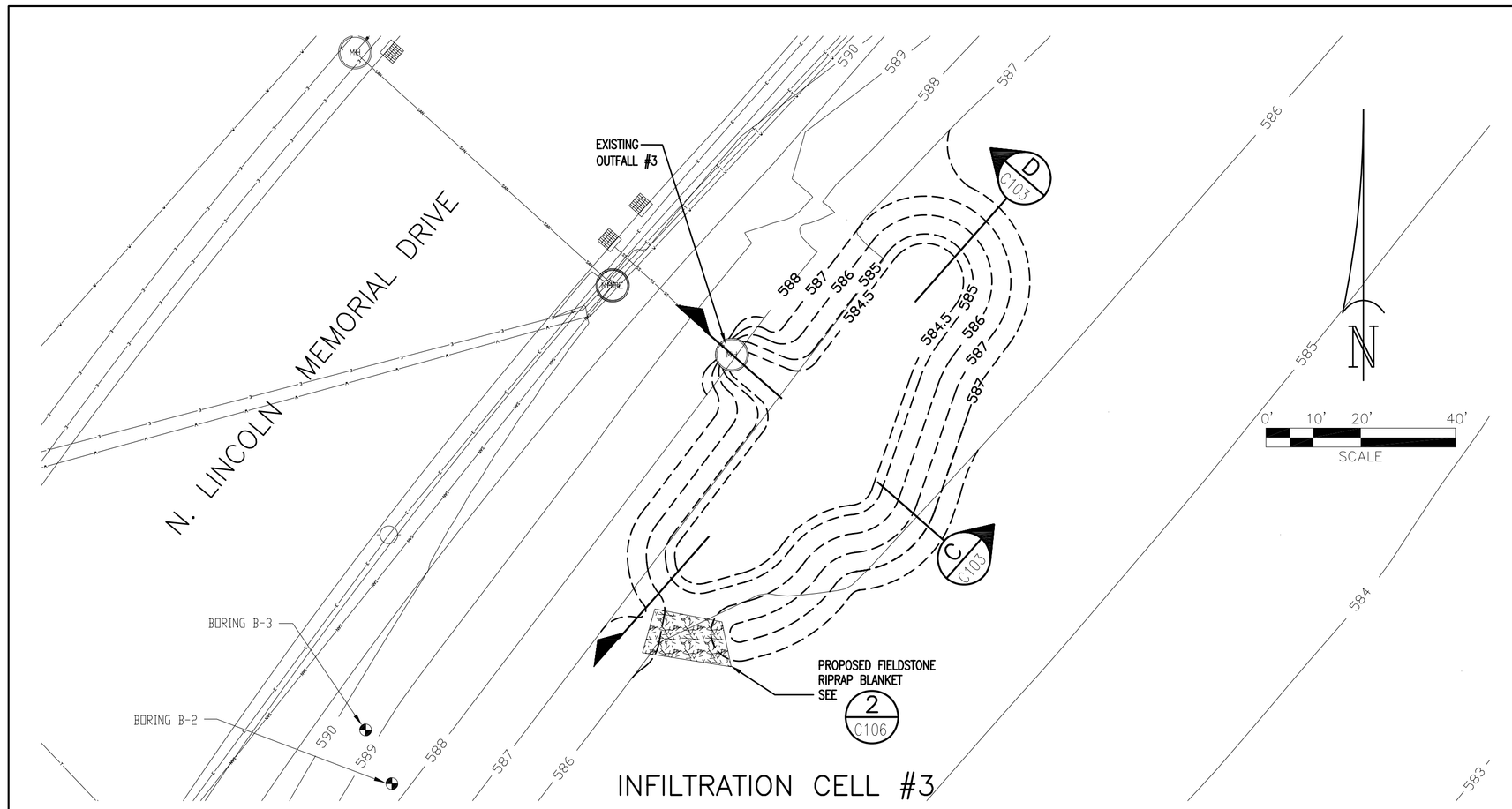
SECTION A C102
SCALE: HOR: 1"=10' VER: 1"=2'



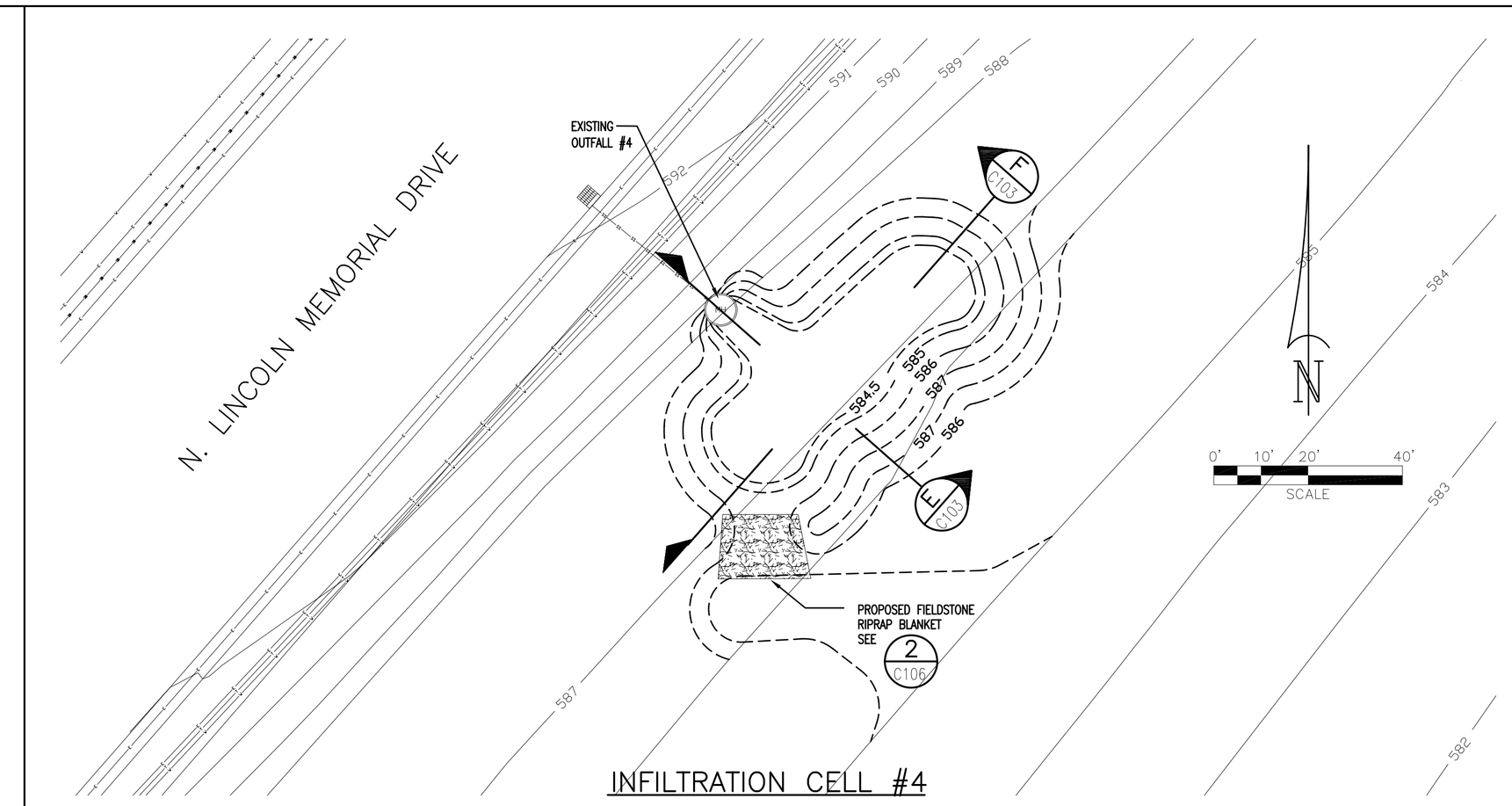
SECTION B C102
SCALE: HOR: 1"=10' VER: 1"=2'

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

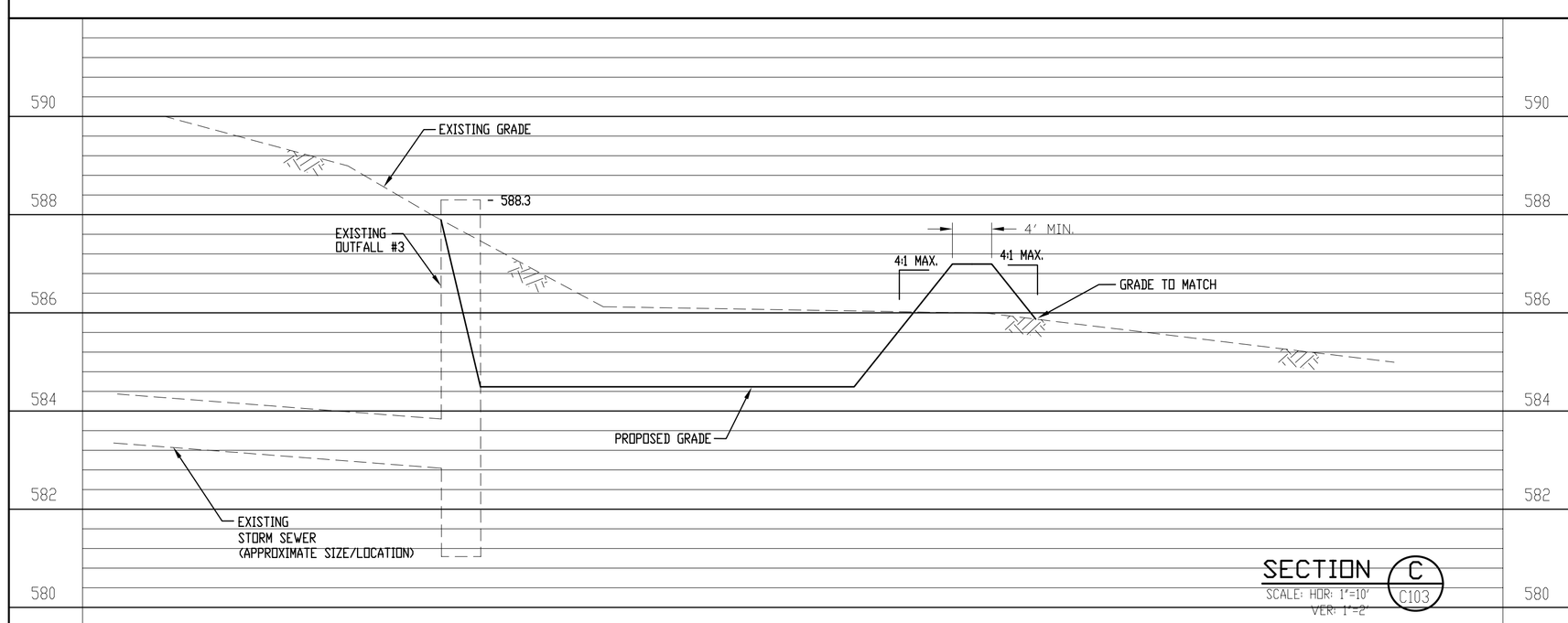
DRAWN BY: LMJ
CHECKED BY: JJH
SCALE: 1" = 20'
DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: GRADING PLAN INFILTRATION CELL 2
PROJECT NO. V011-06613
REVISIONS:
SHEET NO. C102 3 OF 9
FILE NO.



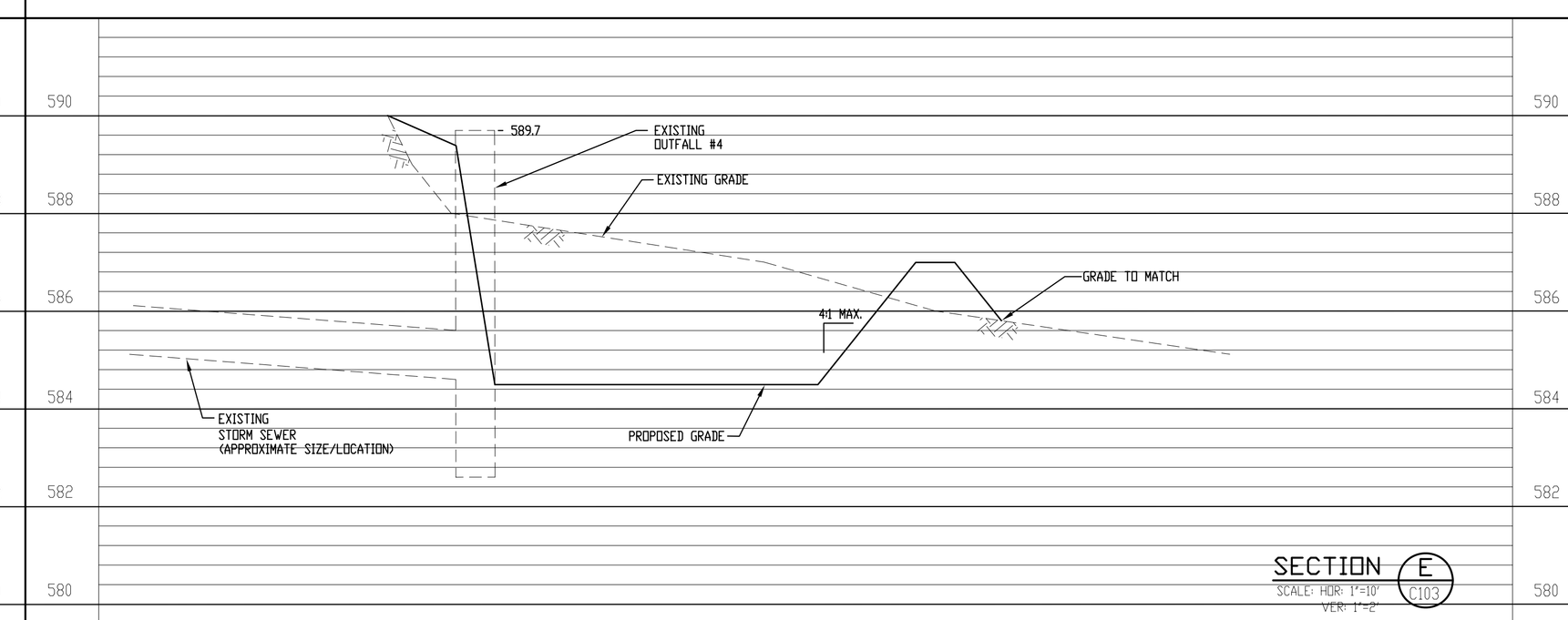
INFILTRATION CELL #3



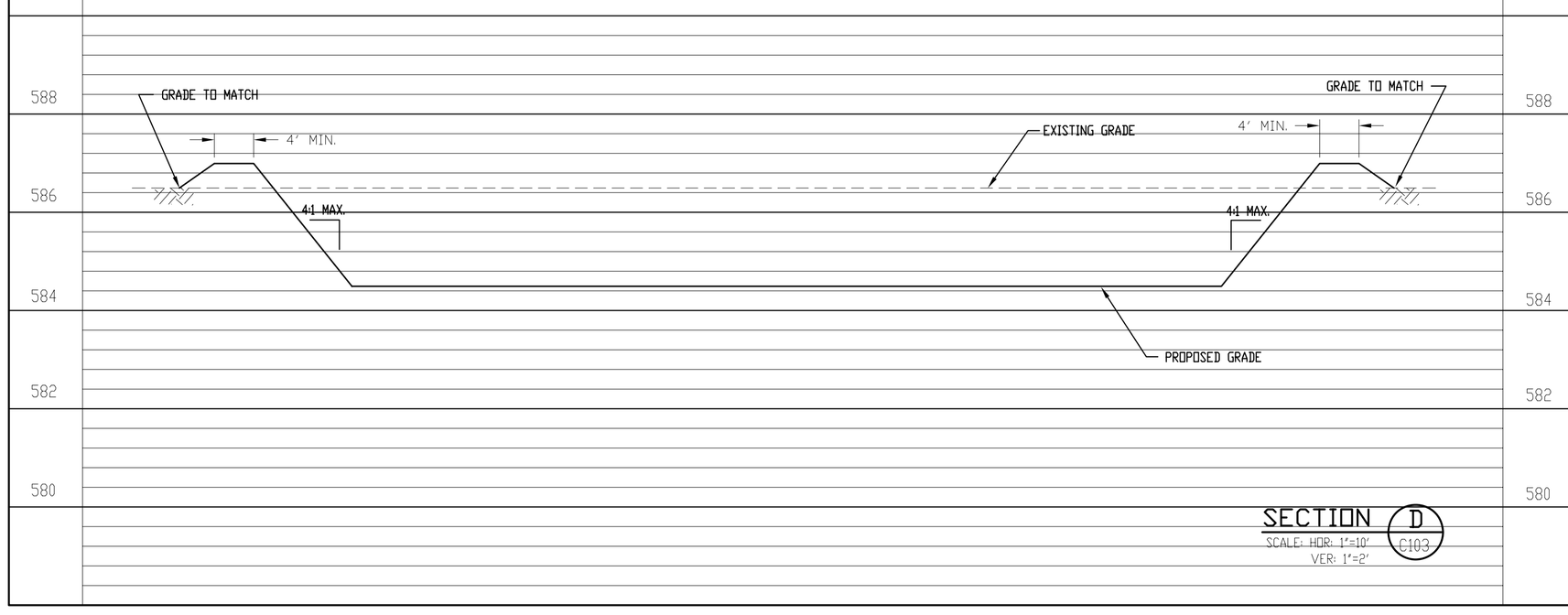
INFILTRATION CELL #4



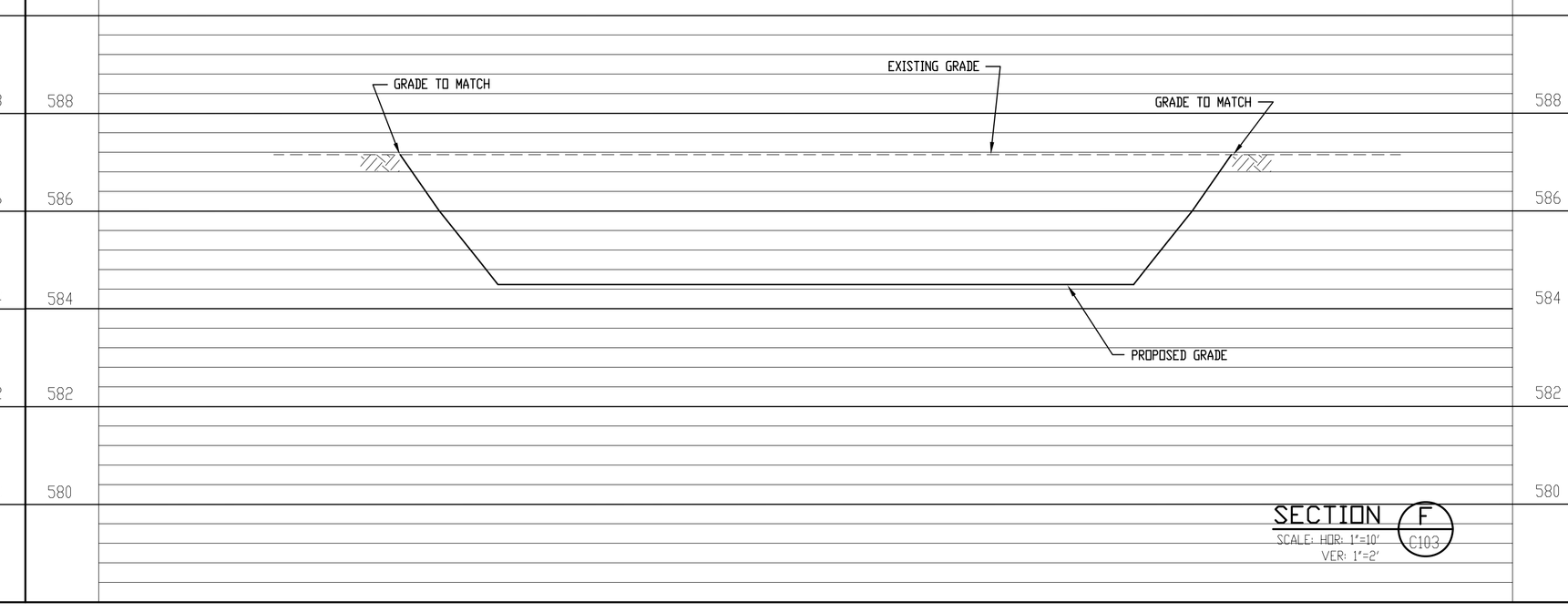
SECTION C
SCALE: HOR: 1"=10' VER: 1"=2' C103



SECTION E
SCALE: HOR: 1"=10' VER: 1"=2' C103



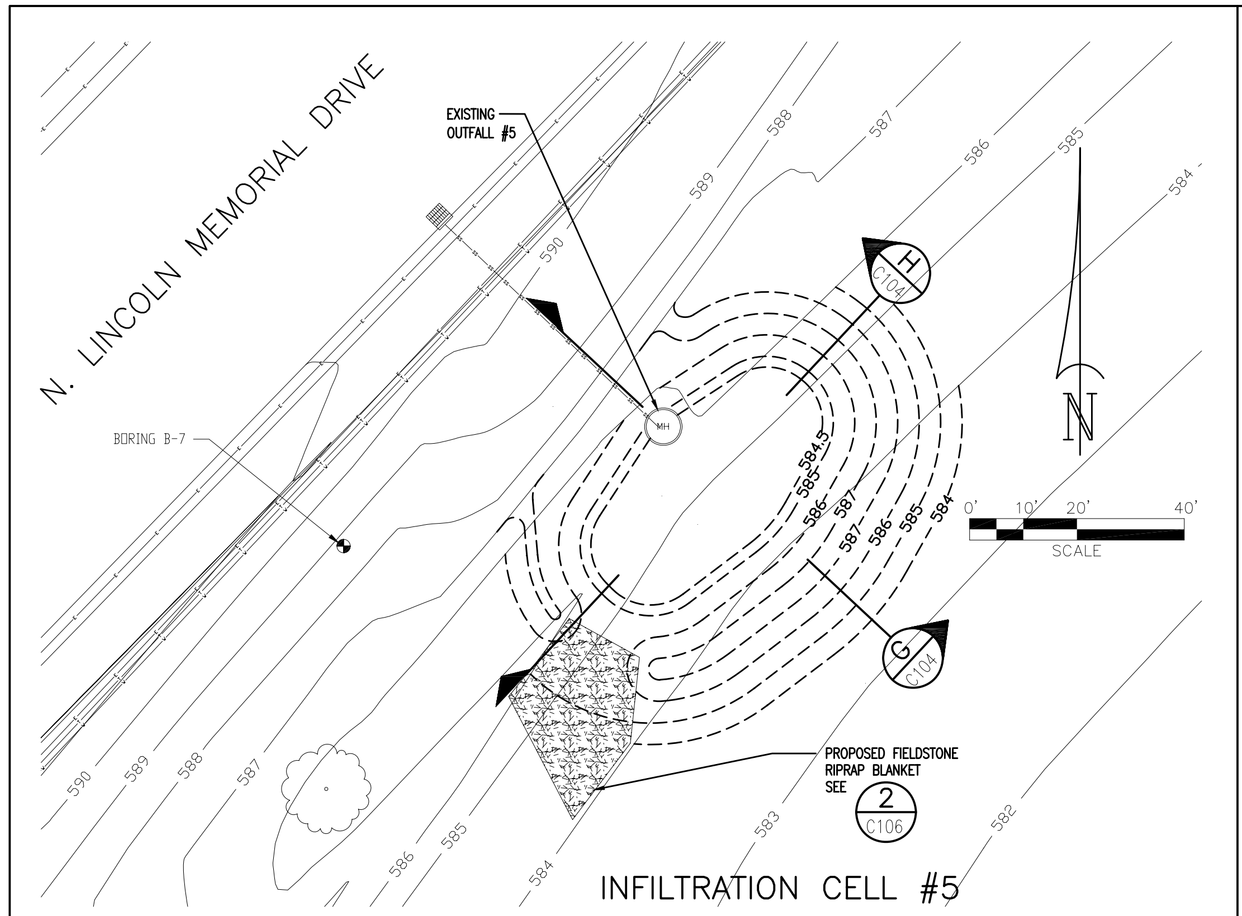
SECTION D
SCALE: HOR: 1"=10' VER: 1"=2' C103



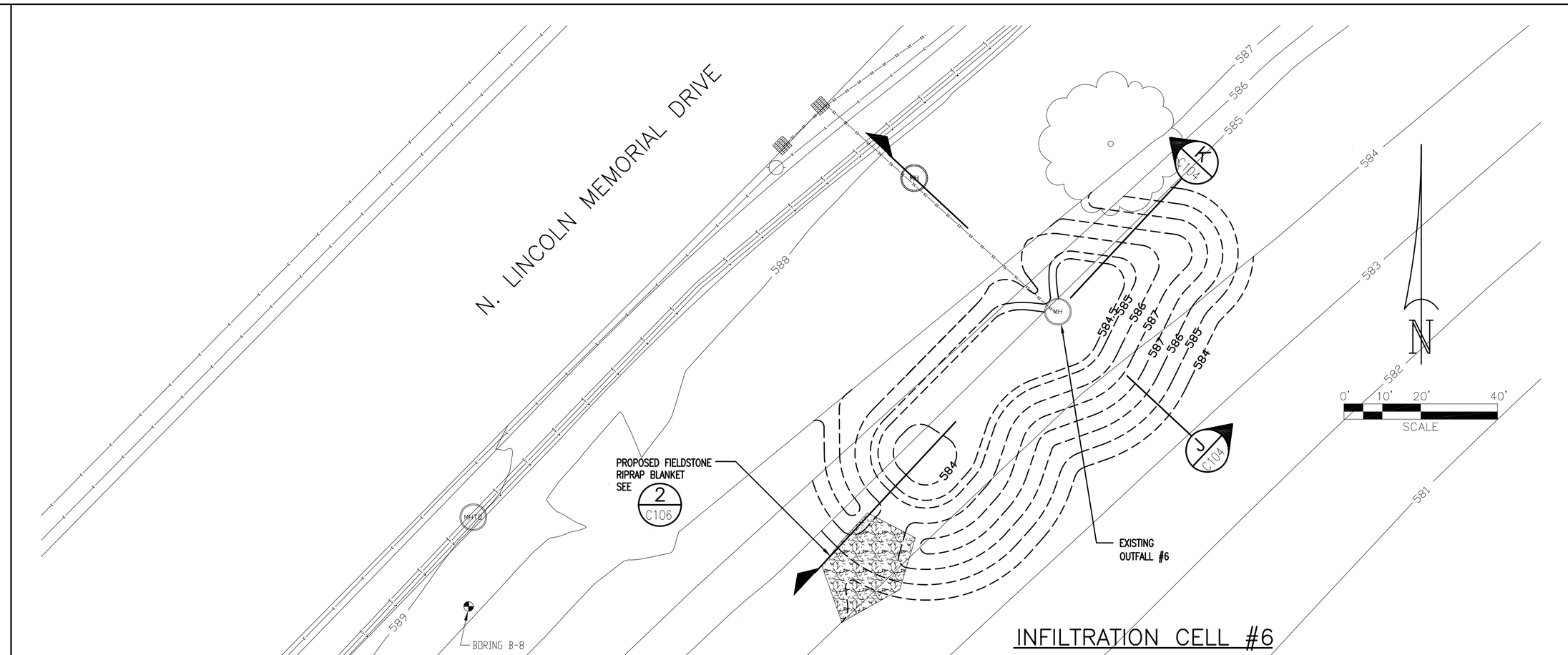
SECTION F
SCALE: HOR: 1"=10' VER: 1"=2' C103

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

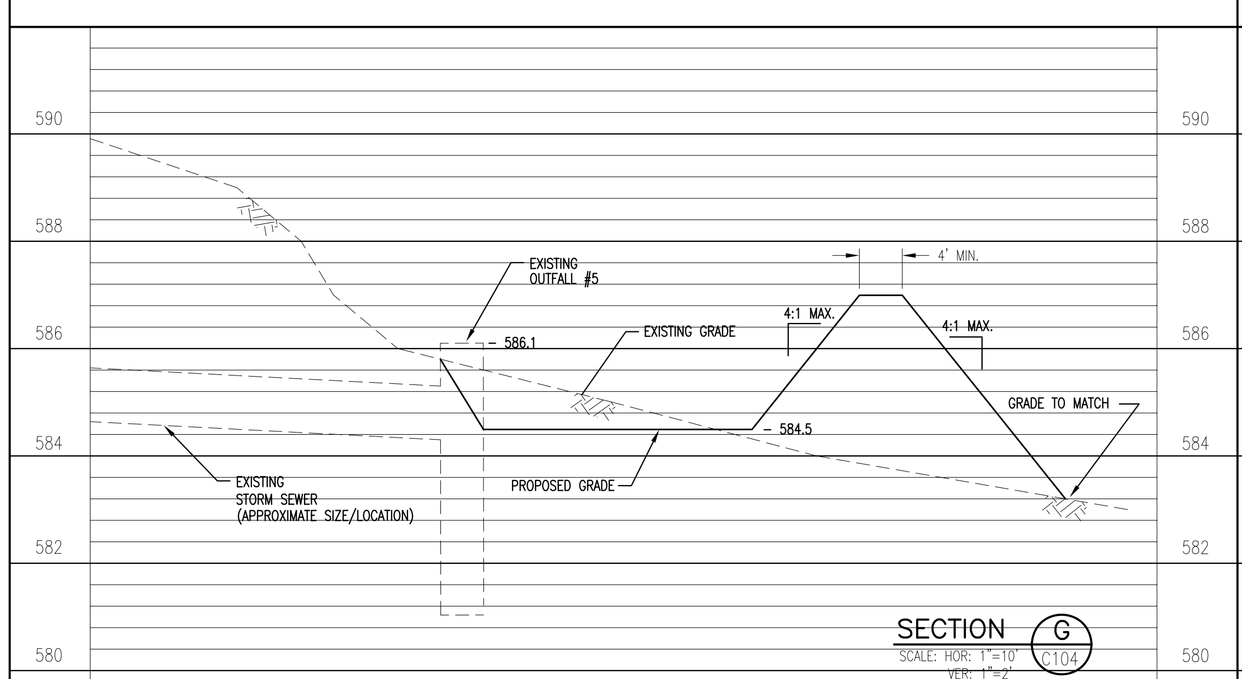
DRAWN BY: LMJ
CHECKED BY: JJH
SCALE: 1"= 20'
DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: GRADING PLAN INFILTRATION CELLS 3 AND 4
PROJECT NO. JDWD6613
REVISIONS:
SHEET NO. C103 4 OF 9
FILE NO.



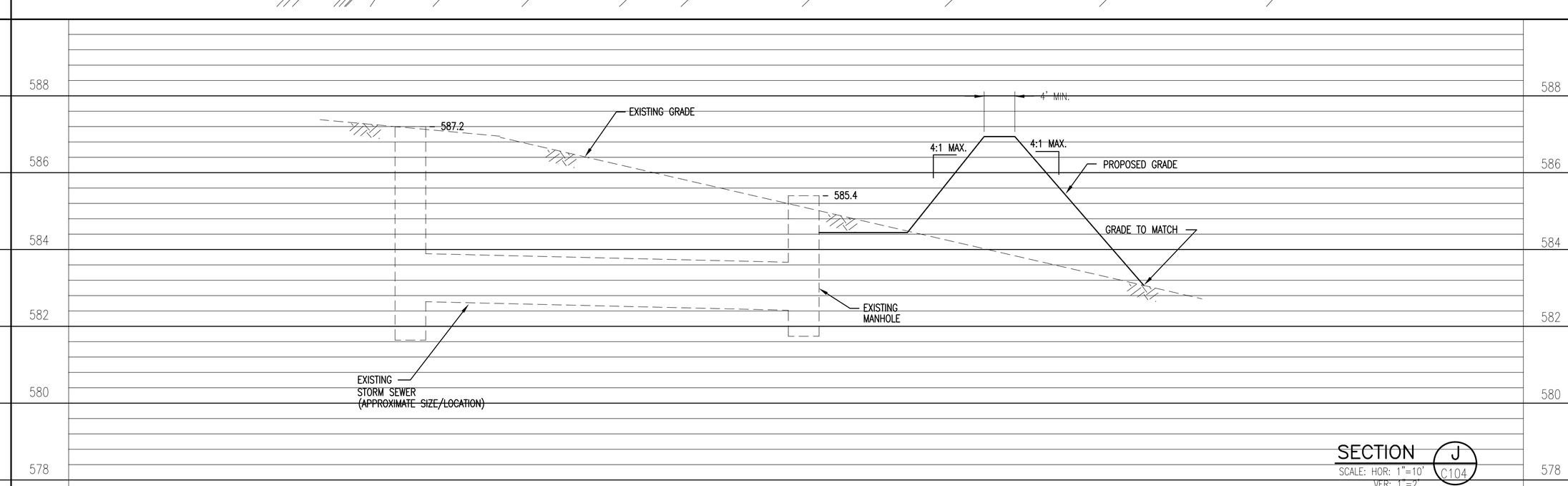
INFILTRATION CELL #5



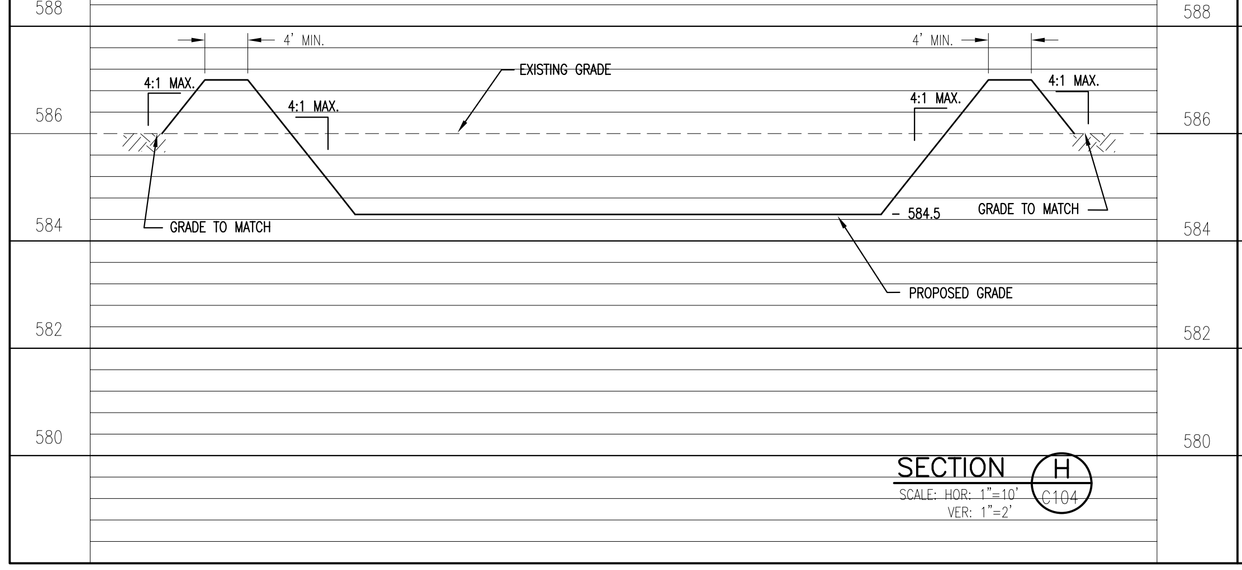
INFILTRATION CELL #6



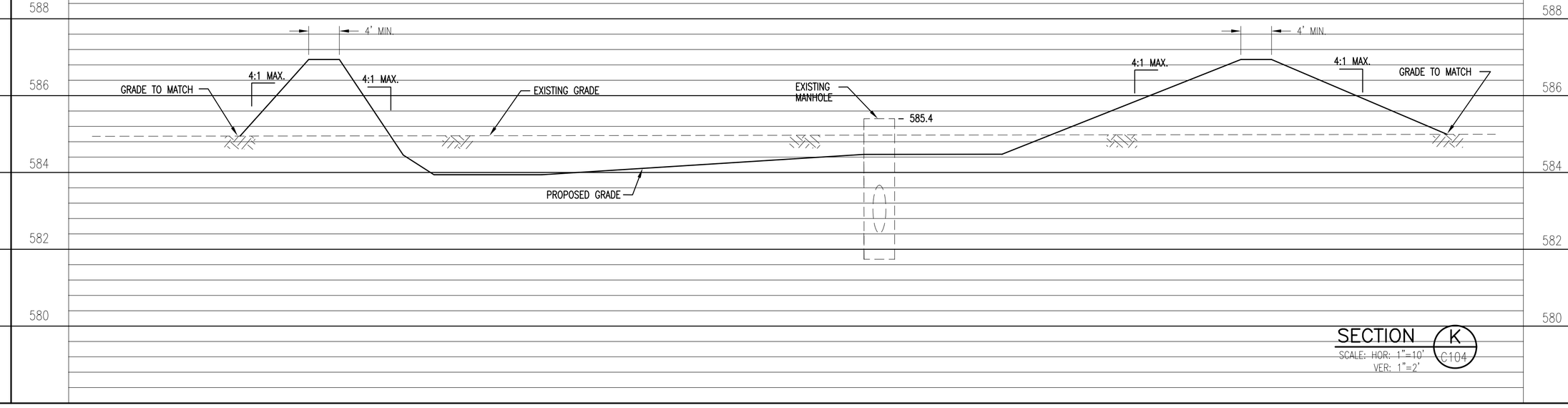
SECTION G C104
SCALE: HOR: 1"=10' VER: 1"=2'



SECTION J C104
SCALE: HOR: 1"=10' VER: 1"=2'



SECTION H C104
SCALE: HOR: 1"=10' VER: 1"=2'



SECTION K C104
SCALE: HOR: 1"=10' VER: 1"=2'

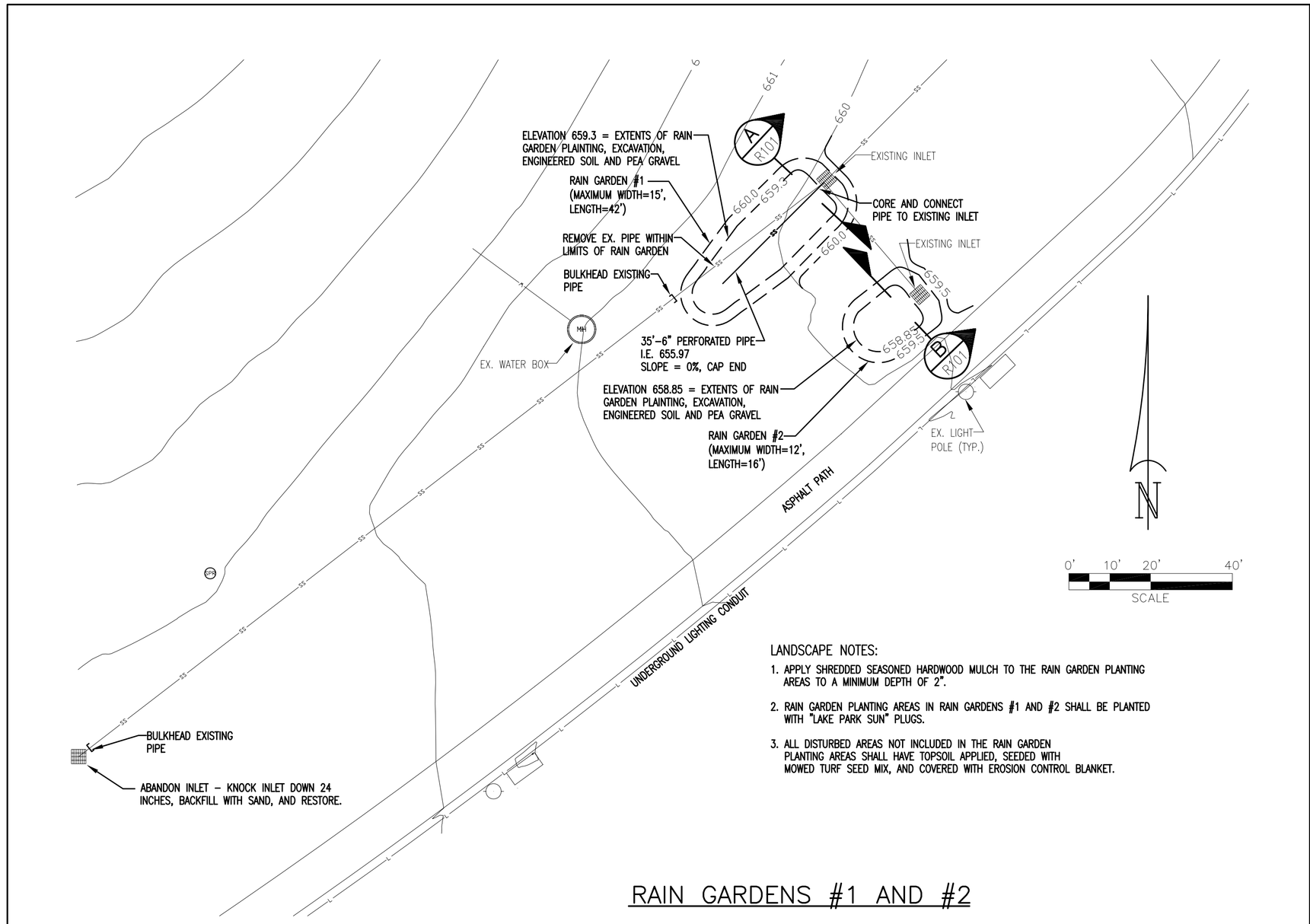
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: JJH
SCALE: 1"= 20'
DATE: 09/14/07

PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: GRADING PLAN INFILTRATION CELLS 5 AND 6

PROJECT NO. JDWD6613
REVISIONS:

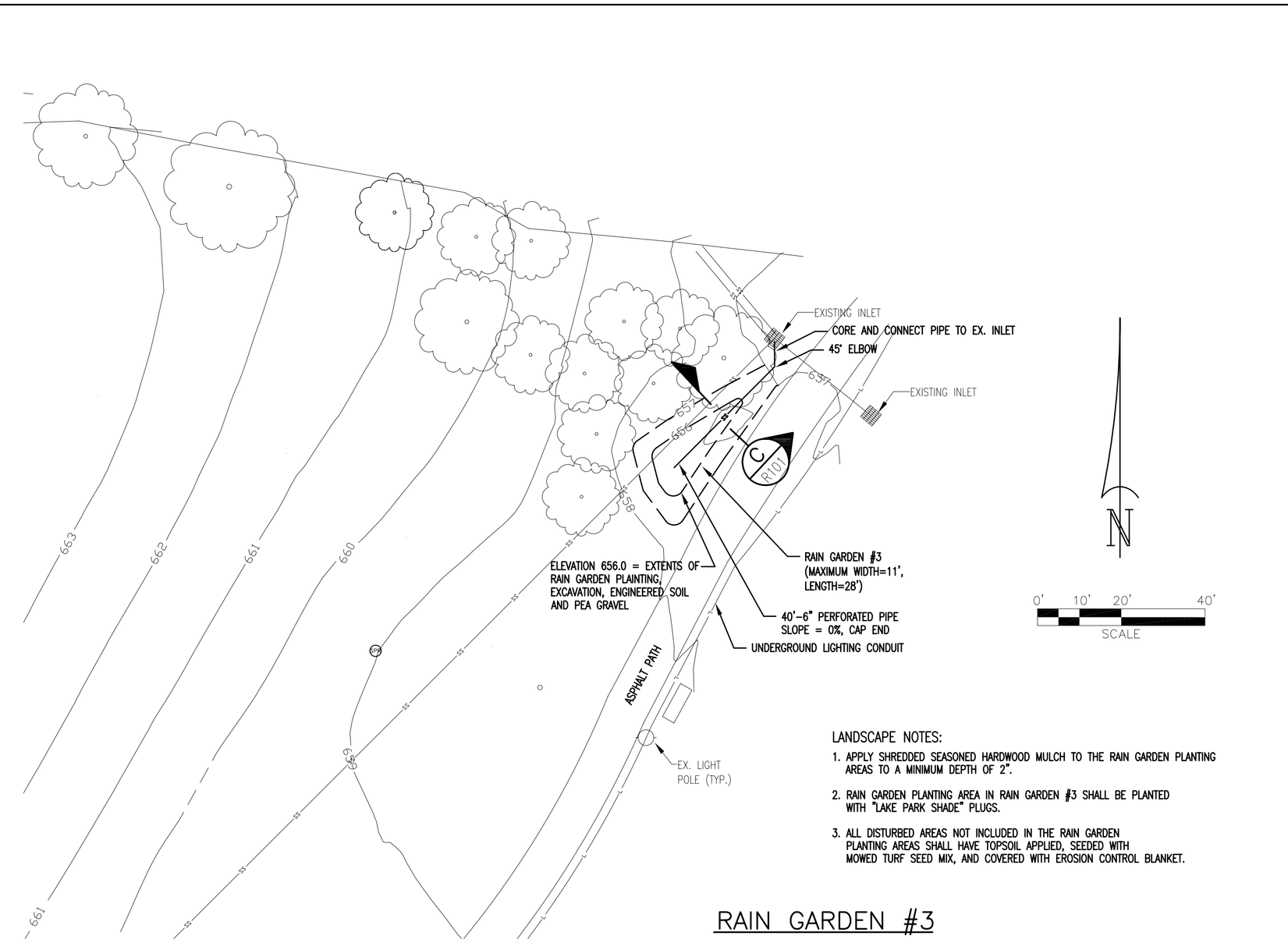
SHEET NO. C104 5 OF 9
FILE NO.



LANDSCAPE NOTES:

1. APPLY SHREDDED SEASONED HARDWOOD MULCH TO THE RAIN GARDEN PLANTING AREAS TO A MINIMUM DEPTH OF 2".
2. RAIN GARDEN PLANTING AREAS IN RAIN GARDENS #1 AND #2 SHALL BE PLANTED WITH "LAKE PARK SUN" PLUGS.
3. ALL DISTURBED AREAS NOT INCLUDED IN THE RAIN GARDEN PLANTING AREAS SHALL HAVE TOPSOIL APPLIED, SEEDED WITH MOWED TURF SEED MIX, AND COVERED WITH EROSION CONTROL BLANKET.

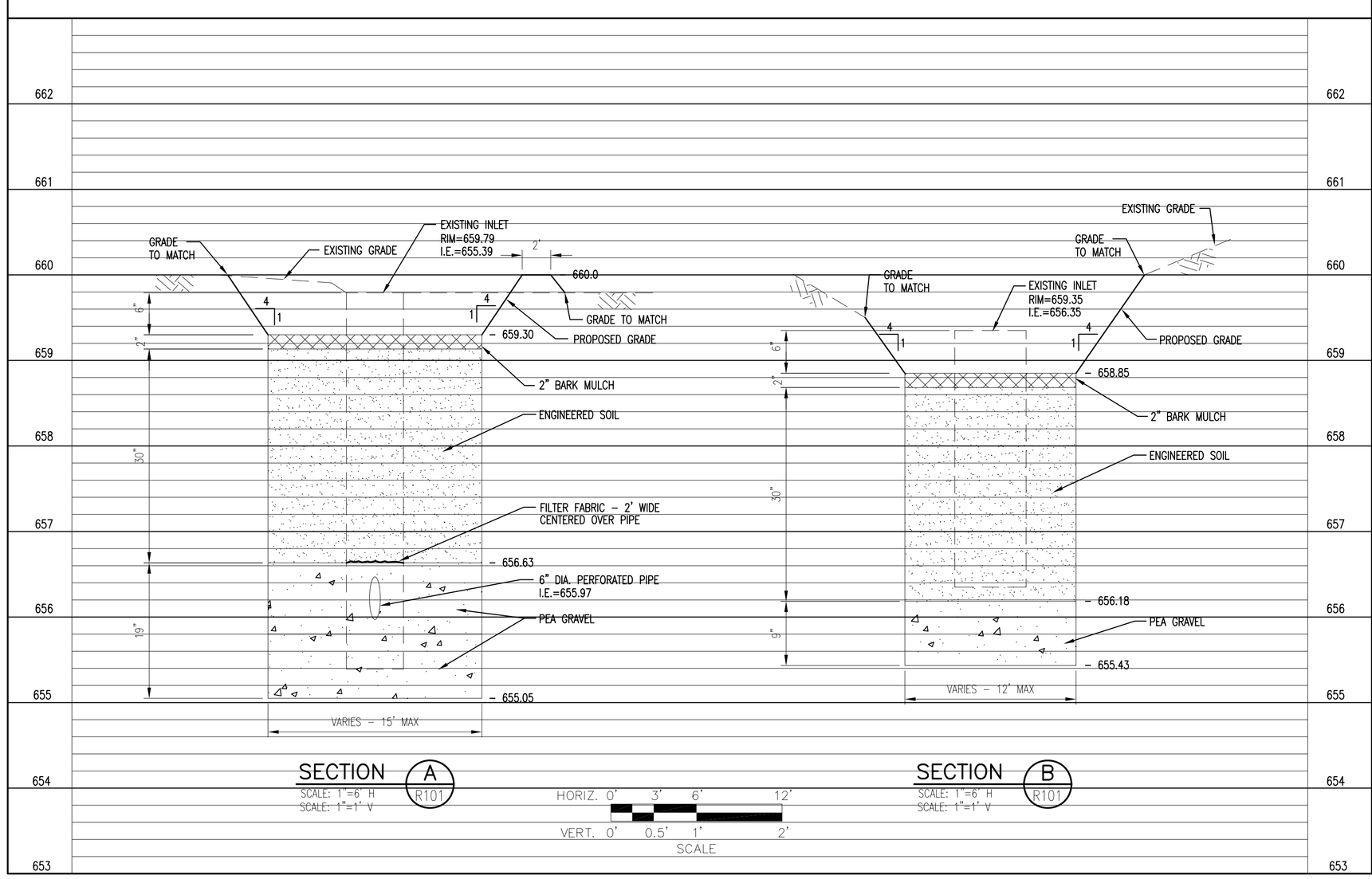
RAIN GARDENS #1 AND #2

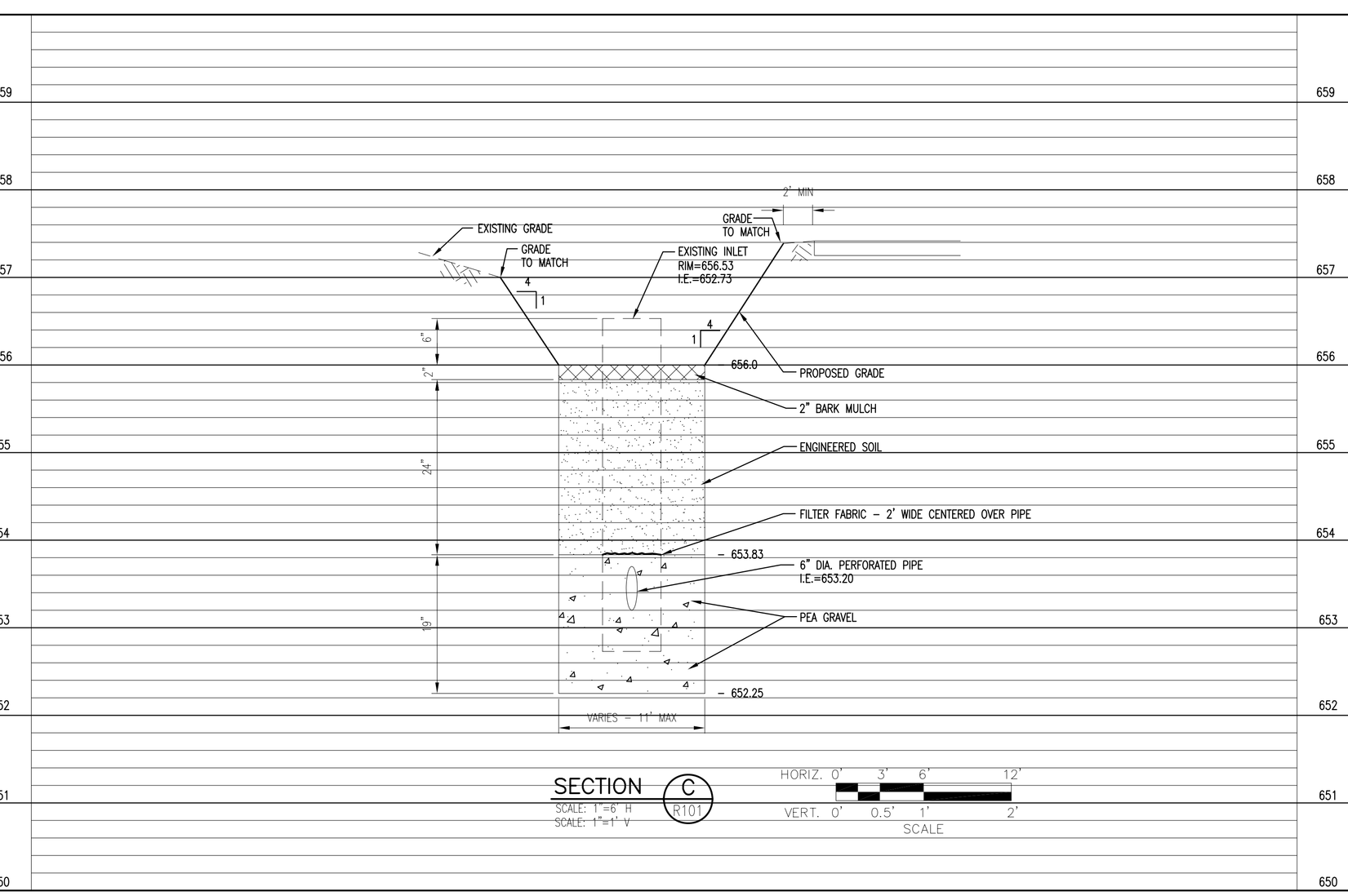


LANDSCAPE NOTES:

1. APPLY SHREDDED SEASONED HARDWOOD MULCH TO THE RAIN GARDEN PLANTING AREAS TO A MINIMUM DEPTH OF 2".
2. RAIN GARDEN PLANTING AREA IN RAIN GARDEN #3 SHALL BE PLANTED WITH "LAKE PARK SHADE" PLUGS.
3. ALL DISTURBED AREAS NOT INCLUDED IN THE RAIN GARDEN PLANTING AREAS SHALL HAVE TOPSOIL APPLIED, SEEDED WITH MOWED TURF SEED MIX, AND COVERED WITH EROSION CONTROL BLANKET.

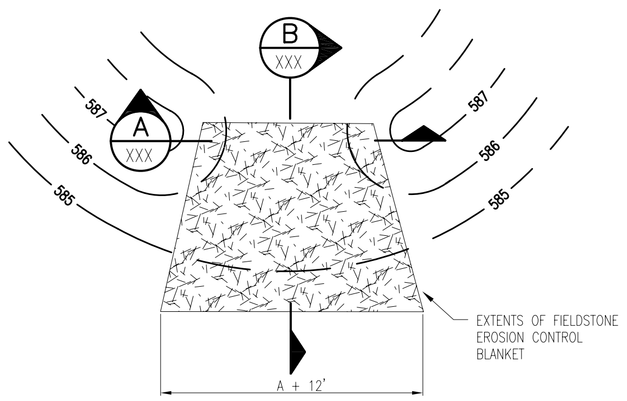
RAIN GARDEN #3





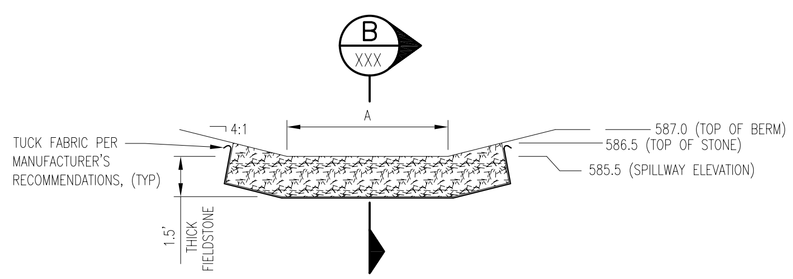
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1" = 20'
DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: RAIN GARDENS GRADING AND LANDSCAPE PLAN
PROJECT NO. JDWD6613
REVISIONS:
SHEET NO. C105 6 OF 9
FILE NO.

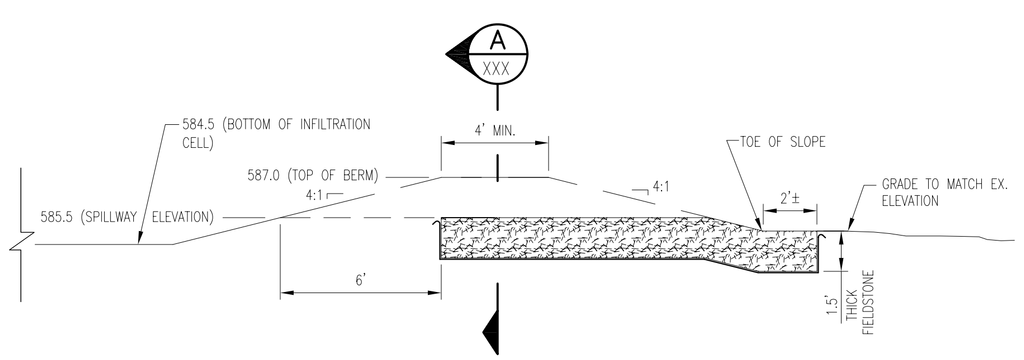


PLAN VIEW
SCALE: 1"=10'

SPILLWAY WIDTH TABLE SPILLWAY AT OUTFALL #	DIMENSION A
3	6'
4	8'
5	7'
6	5'



SECTION A
NTS

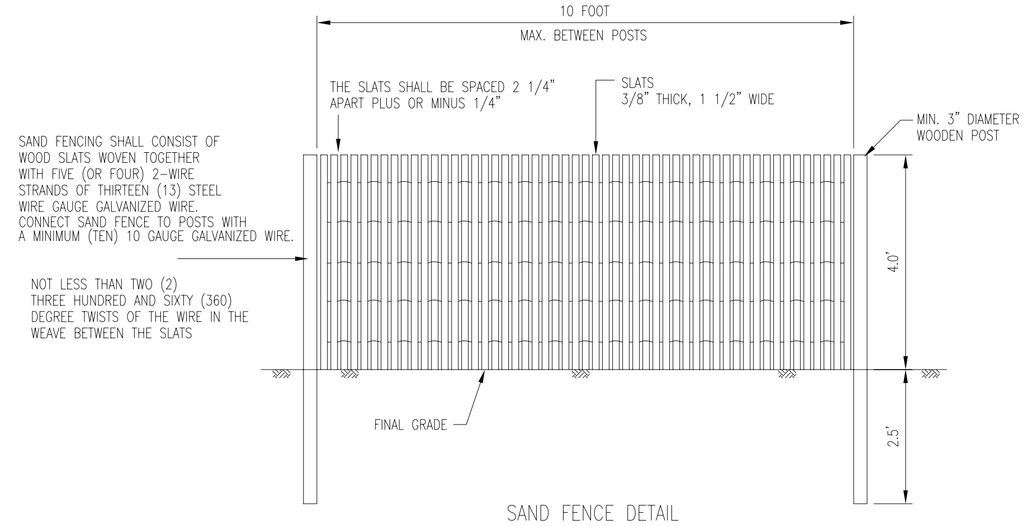


SECTION B
NTS

SPILLWAY DETAIL

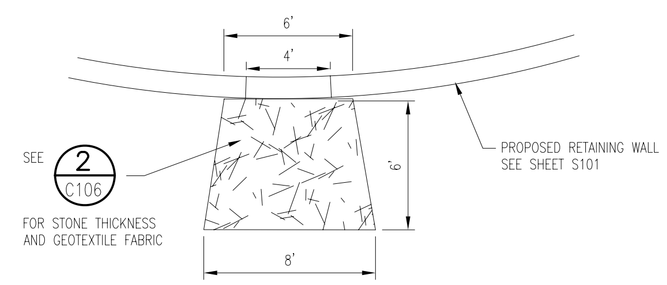
DETAIL 2
SCALE: 1"=4' C102, C103, C104

SLATS SHALL BE MADE OF NO. 1 ASPEN OR SPRUCE MEASURING 3/8" THICK, 1 1/2" WIDE AND 48" HIGH

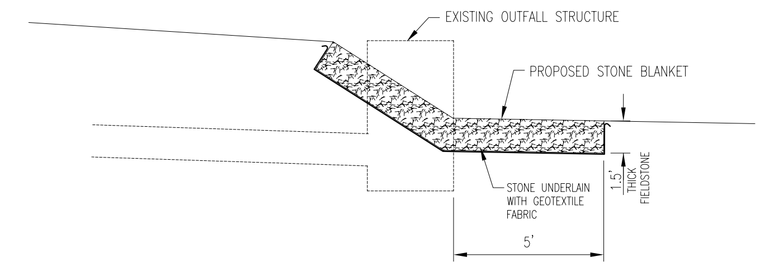


SAND FENCE DETAIL

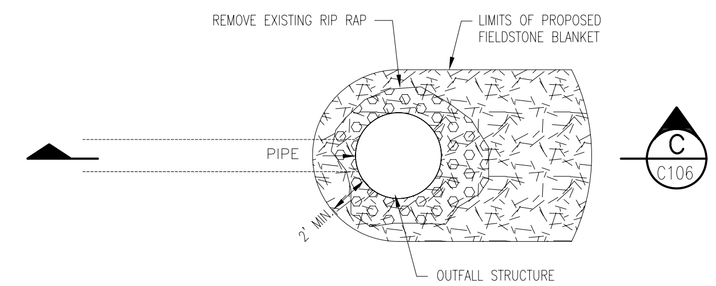
DETAIL 4
SCALE: 1"=2' L101



DETAIL 1
SCALE: 1"=5' C102

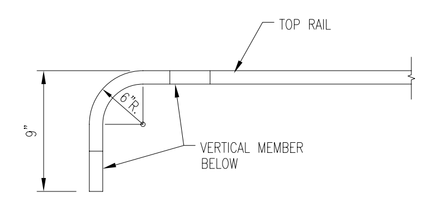


SECTION C
NTS C106



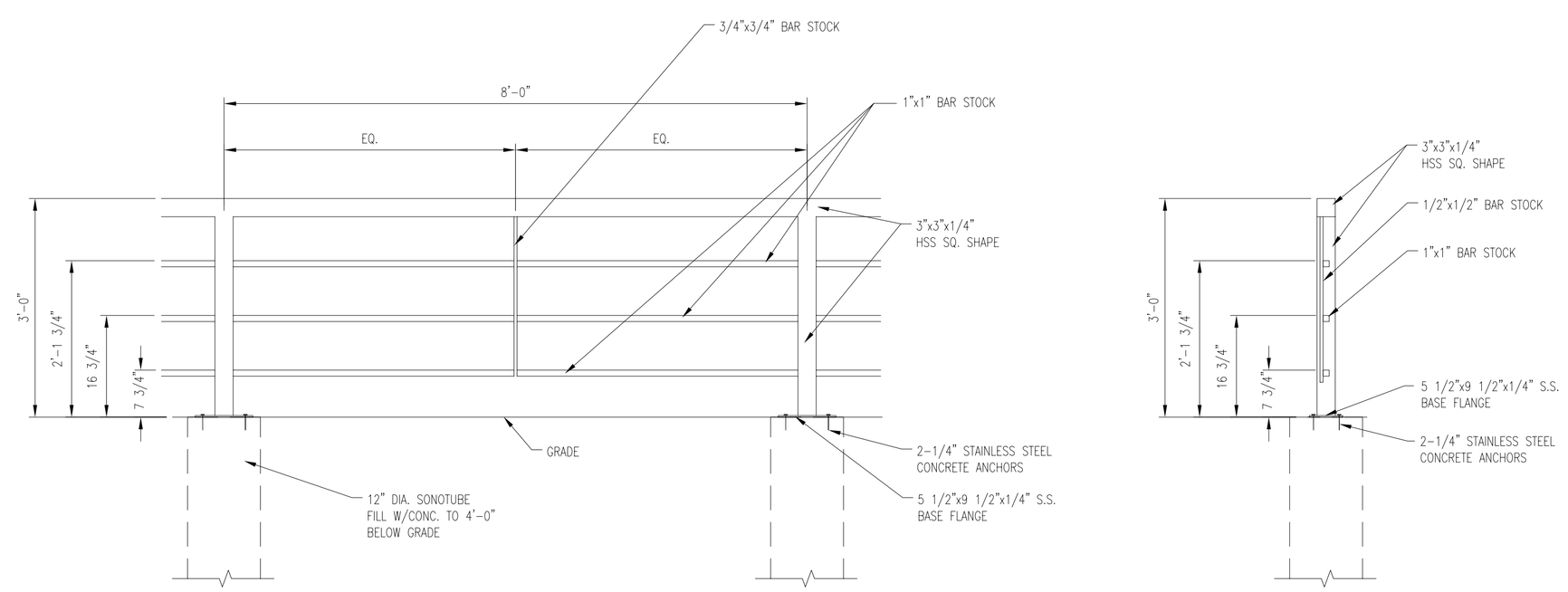
OUTFALL FIELDSTONE DETAIL

DETAIL 3
SCALE: 1"=5' C102, C103, C104



RAILING RETURN

DETAIL 6
SCALE: 1 1/2"=1'-0" C102



ELEVATION

SECTION

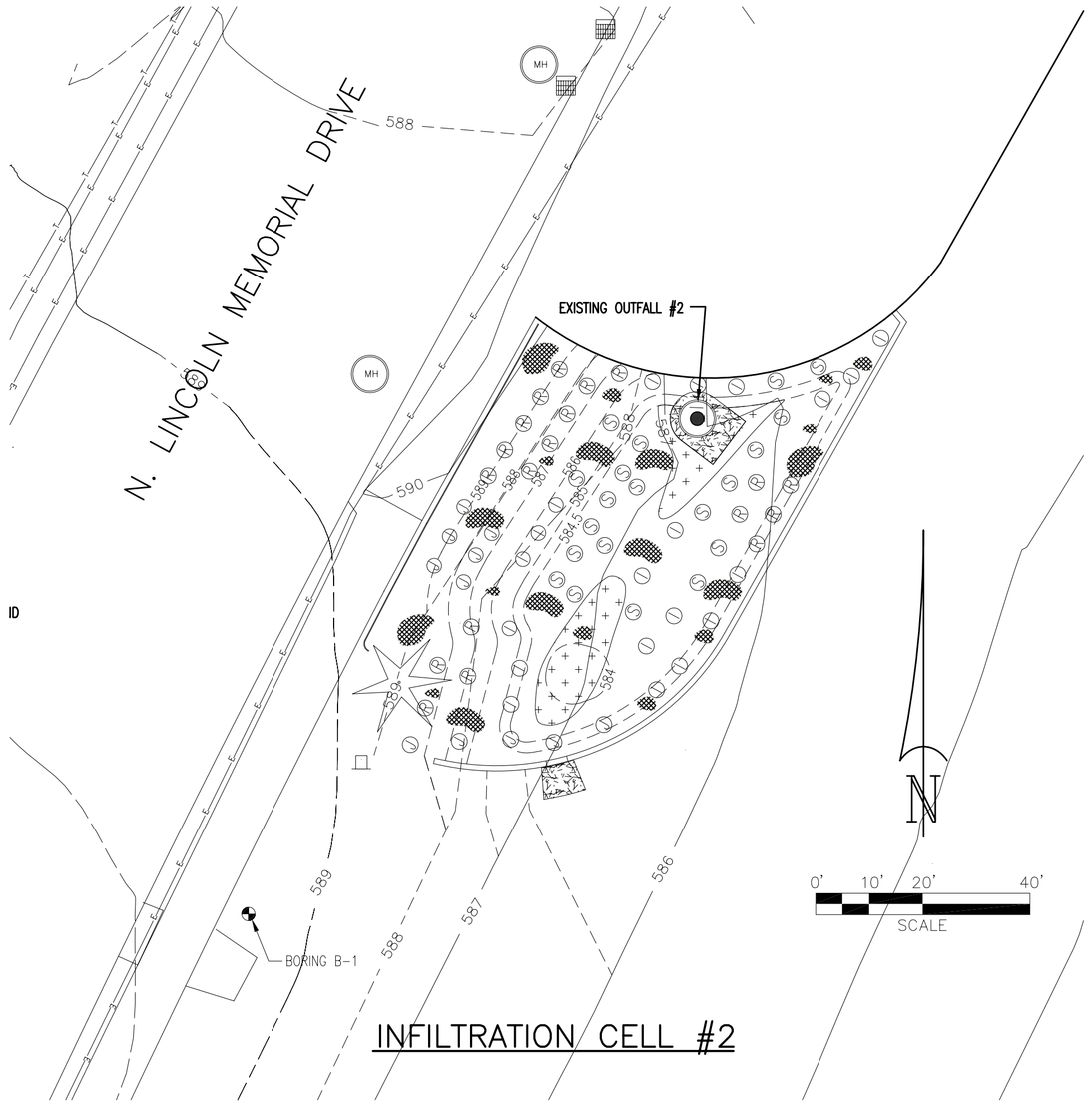
NOTE: WELD ALL JOINTS AND GRIND SMOOTH.

RAILING DETAIL

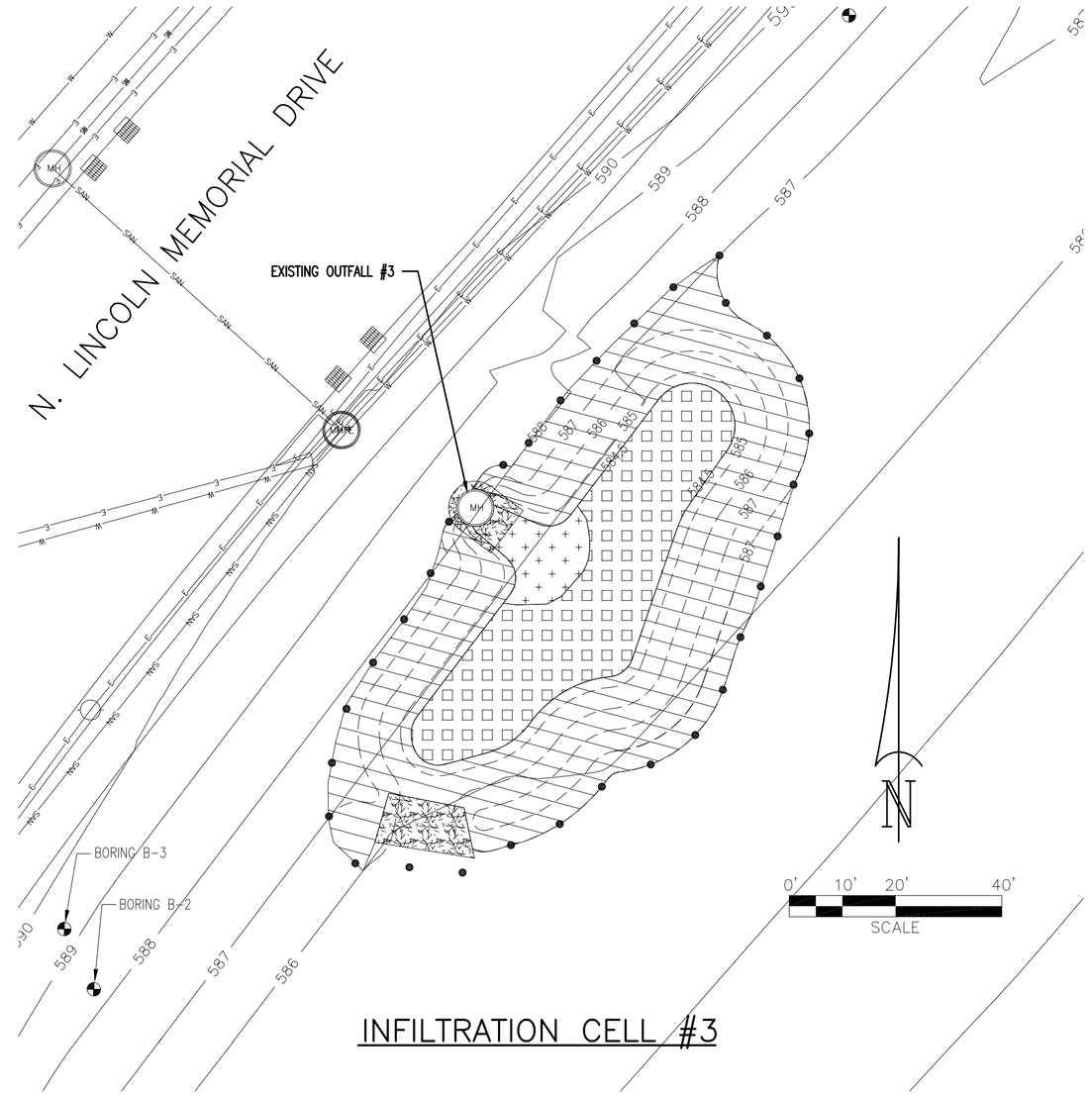
DETAIL 5
SCALE: 3/4"=1'-0" C102

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

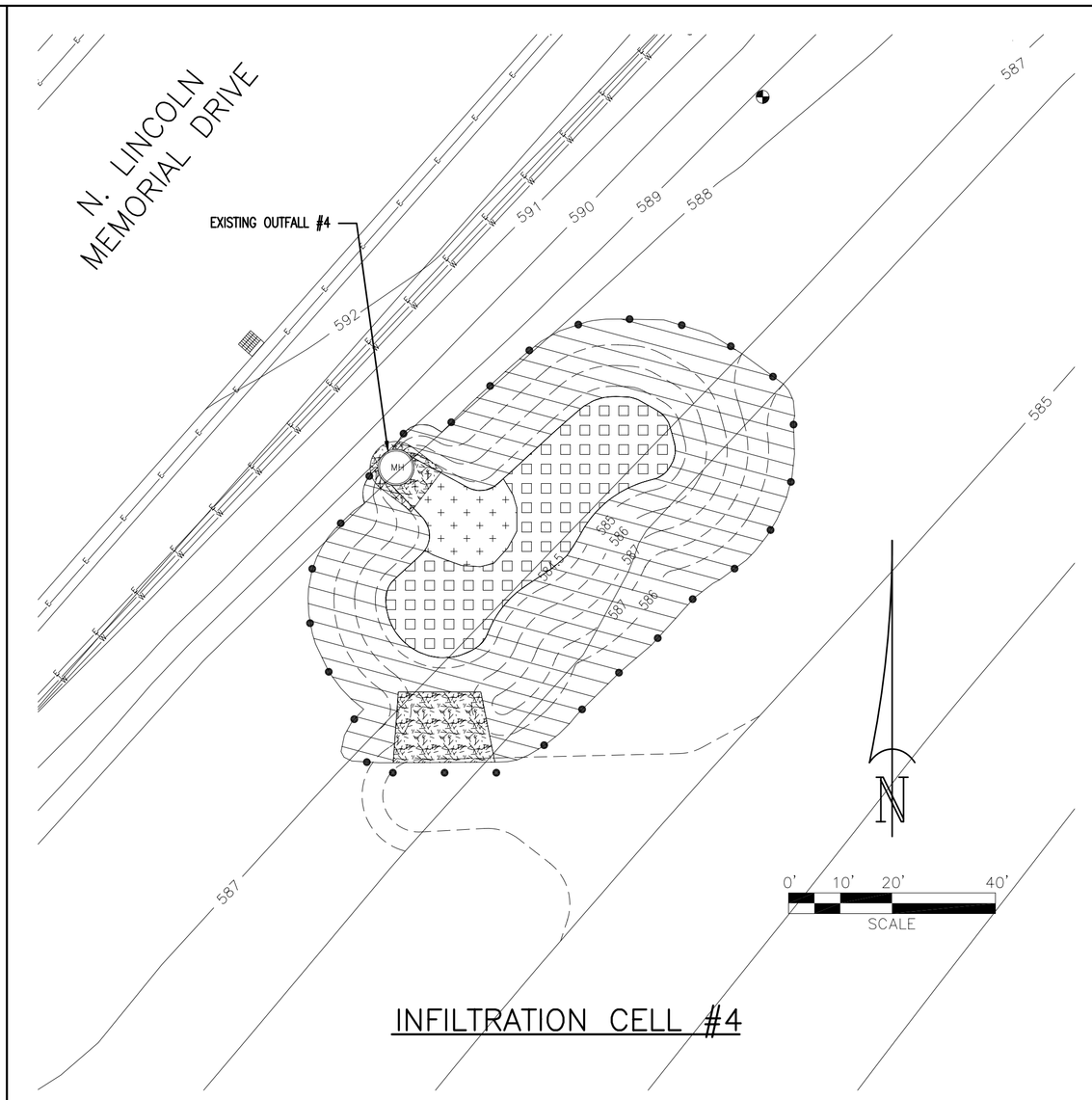
DRAWN BY: LMJ
CHECKED BY: JJH
SCALE: VARIES
DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: CONSTRUCTION DETAILS
PROJECT NO. JDWD6613
REVISIONS:
SHEET NO. C106 7 OF 9
FILE NO.



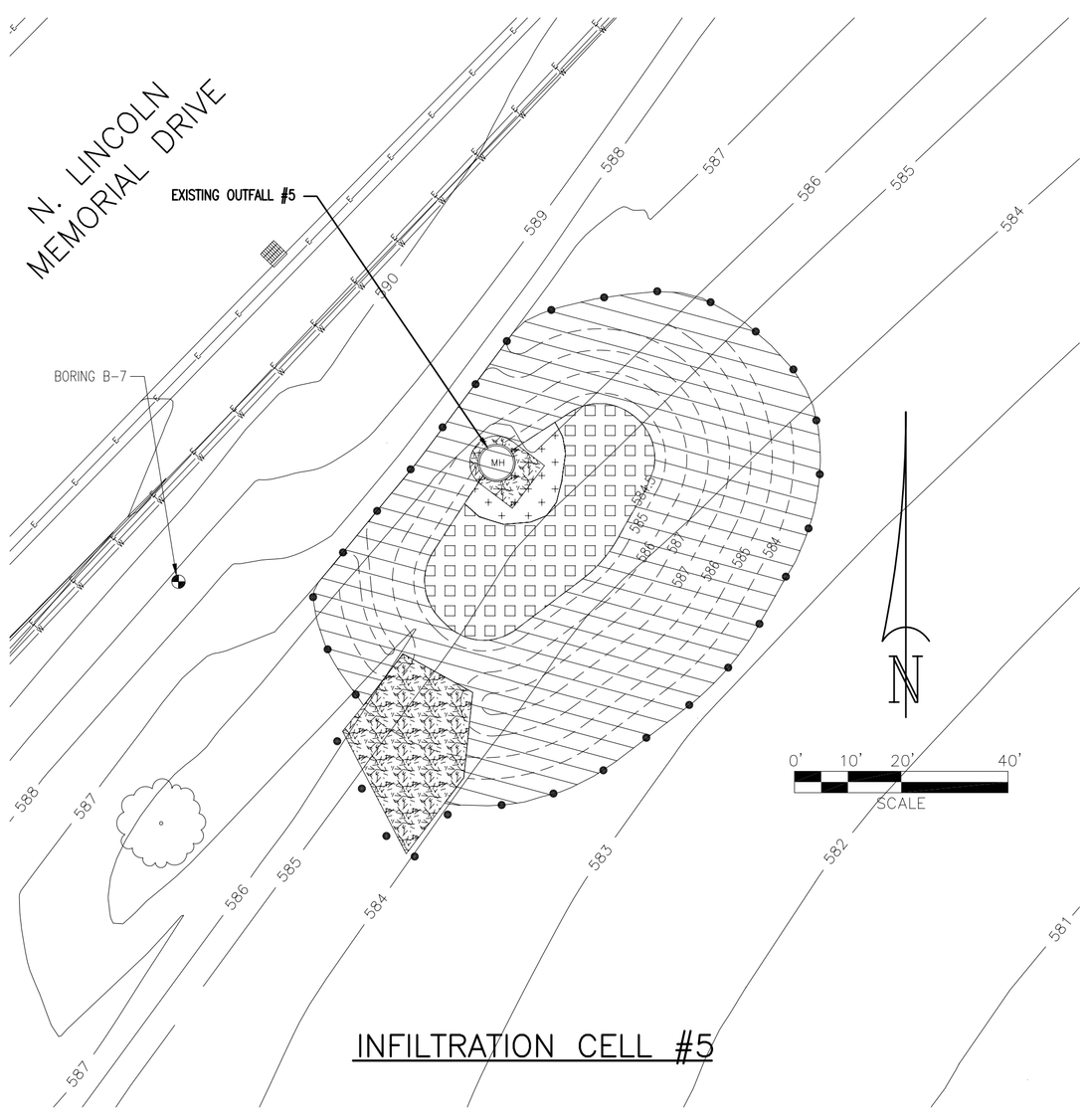
INFILTRATION CELL #2



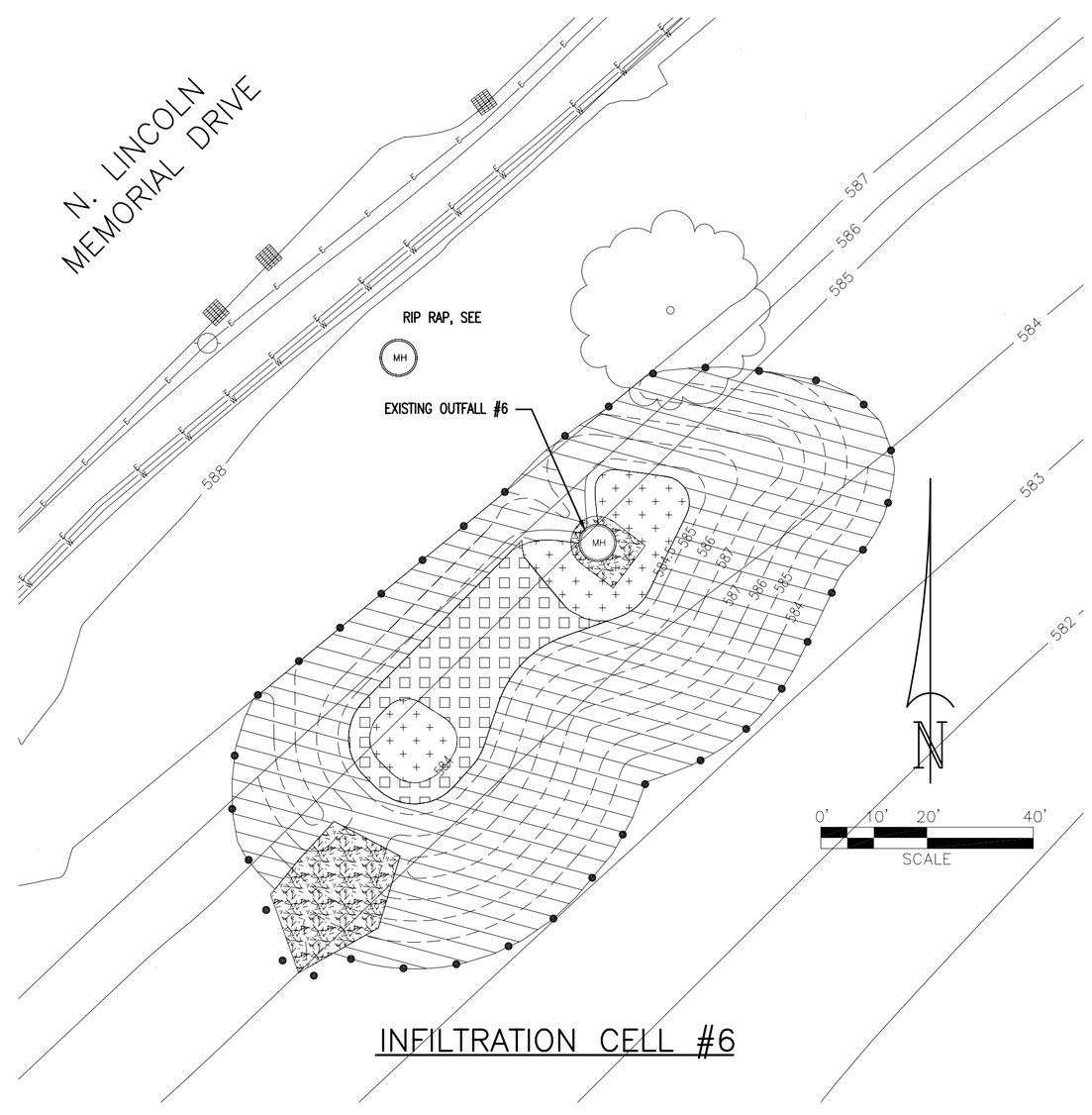
INFILTRATION CELL #3



INFILTRATION CELL #4



INFILTRATION CELL #5



INFILTRATION CELL #6

NOTES:

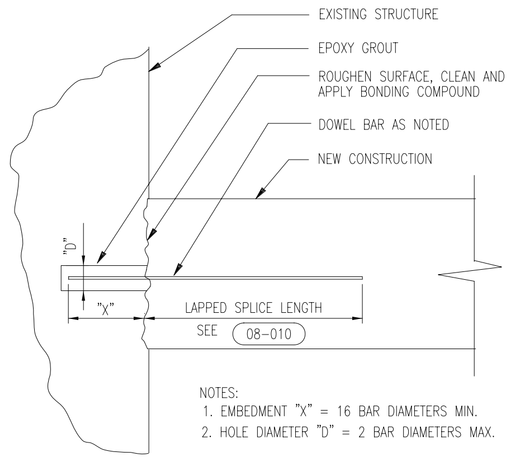
1. MESIC PRAIRIE, WET PRAIRIE AND SHRUB PLANTING BEDS SHALL RECEIVE A MINIMUM 3" THICK LAYER OF WDNR S100 COMPOST AND TILLED TO A DEPTH OF 6". FINAL GRADE SHALL MATCH THOSE ON THE PLANS.
2. APPLY SHREDDED SEASONED HARDWOOD MULCH TO THE MESIC PRAIRIE, WET PRAIRIE AND SHRUB PLANTING AREAS AFTER PLANTING TO A MINIMUM DEPTH OF 2".
3. INSTALL COCONUT FIBER MAT IN ALL DUNE PLANTING AREAS PRIOR TO PLANTING.
4. INSTALL SAND FENCE UPON COMPLETION OF ALL PLANTING.

LEGEND

- DUNE PLUGS
- MESIC PRAIRIE PLUGS
- WET PRAIRIE PLUGS
- FIELDSTONE RIP RAP BLANKET
- SAND FENCE
- (J) COMMON JUNIPER
- (R) VIRGINIA ROSE
- (I) INDIGO BUSH
- (S) ST. JOHN'S WORT
- ORNAMENTAL BOULDERS

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ	CHECKED BY: BJM
SCALE: 1"= 20'	DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT	SHEET DESCRIPTION: LANDSCAPE PLANS
PROJECT NO. JDWD6613	REVISIONS:
SHEET NO. L101 8 OF 9	FILE NO.



NOTES:
1. EMBEDMENT "X" = 16 BAR DIAMETERS MIN.
2. HOLE DIAMETER "D" = 2 BAR DIAMETERS MAX.

DRILLED IN DOWEL DETAIL (08-385)

NTS

PLAIN

(08-010)

MINIMUM REINFORCEMENT BAR SPLICE AND ANCHORAGE LENGTH (INCHES)

BAR SIZE IN-POUND	BAR SIZE METRIC mm	LAPPED SPLICE LENGTH		DEVELOPMENT LENGTH		STANDARD HOOK DEVELOPMENT LENGTH	COMPRESSION LAP LENGTH
		TOP BARS	OTHERS	TOP BARS	OTHERS		
3	10	21	16	16	12	6	12
4	13	21	16	16	12	7	15
5	16	29	23	23	17	9	19
6	19	40	31	31	24	10	23
7	22	48	37	37	29	12	27
8	25	61	47	47	36	14	30
9	29	74	57	57	44	15	34
10	32	89	68	68	53	17	38
11	36	104	80	80	62	19	42

NOTES:
1. TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
2. FOR BARS SPACED LESS THAN 6 BAR DIAMETERS OC INCREASE LENGTH BY 25%.
3. WHEN LAPPING TWO DIFFERENT SIZE BARS USE THE LAP LENGTH OF THE SMALLER BAR UNLESS NOTED OTHERWISE.
4. DEVELOPMENT LENGTH IS MINIMUM LENGTH OF EMBEDMENT FOR STRAIGHT DOWELS WHERE END HOOK IS NOT SHOWN, UNLESS OTHERWISE NOTED.
5. COMPRESSION LAP LENGTH FOR VERTICAL COLUMN BARS ONLY.
6. HOOKS SHALL BE ACI STANDARD UNLESS OTHERWISE NOTED.

GENERAL

1. THE GENERAL STRUCTURAL NOTES AND STANDARD STRUCTURAL DETAILS APPLY TO THE ENTIRE PROJECT UNLESS SPECIFICALLY STATED OTHERWISE.

DESIGN CRITERIA

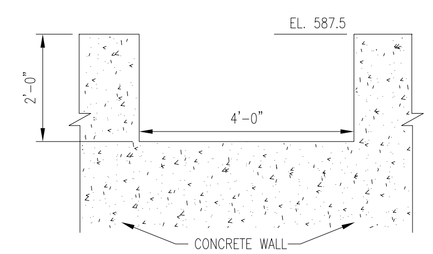
1. DESIGN AND CONSTRUCT IN CONFORMANCE WITH THE WISCONSIN ENROLLED COMMERCIAL BUILDING CODE, 2002 EDITION
2. SUPERIMPOSED DESIGN LOADS:
   A. RETAINING WALL SURCHARGE 0 PSF

FOUNDATIONS

1. NET SOIL BEARING CAPACITIES 2000 PSF ASSUMED
2. PLACE FOOTINGS ON NATURAL UNDISTURBED EARTH OR STRUCTURAL FILL.
3. PLACE FILL SIMULTANEOUSLY ON BOTH SIDES OF FREE-STANDING STRUCTURES.
4. TO MINIMIZE LATERAL FORCES AGAINST THE STRUCTURE DUE TO WEDGING ACTION OF THE SOIL, BEGIN COMPACTION OF EACH LAYER AT THE STRUCTURE WALL.

CONCRETE

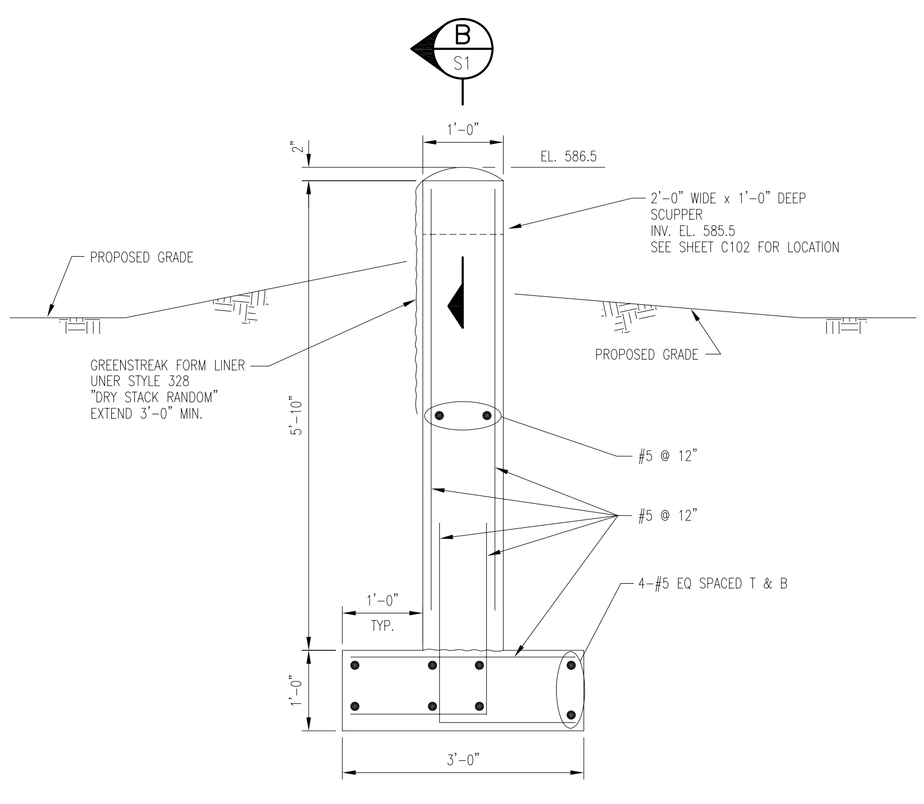
1. REINFORCING STEEL:
   A. DEFORMED BARS ASTM A615-GRADE 60
2. UNLESS OTHERWISE SHOWN PROVIDE COVER FOR REINFORCEMENT AS FOLLOWS:
   A. CAST AGAINST:
      1. EARTH 3 INCHES
   B. EXPOSED TO EARTH, WEATHER OR WATER:
      1. WALLS 2 INCHES
      2. FOOTINGS AND BASE SLAB:
         FORMED SURFACES 2 INCHES
         TOP OF FOOTINGS AND BASE SLABS 2 INCHES
3. PLACE DOWELS BEFORE PLACING CONCRETE.
4. DO NOT WELD OR FIELD BEND REINFORCING BARS, EXCEPT AS APPROVED BY ENGINEER.
5. CONCRETE:
   A. ALL LOCATIONS:
      CLASS A F'c=4500 PSI
   B. CONCRETE:
      COLOR DYE TAN
6. PROVIDE WATERSTOP IN CONSTRUCTION JOINTS IN:
   A. LOCATIONS SHOWN ON THE DRAWINGS.
7. UNLESS OTHERWISE NOTED, CONSTRUCTION JOINTS SHOWN ARE OPTIONAL. CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY ENGINEER.
8. LIMIT SIZE OF CONCRETE POURS. MAXIMUM LENGTH OF WALL AND SLAB POURS SHALL NOT EXCEED 60 FT.
9. BEFORE CONCRETE IS PLACED, CONSTRUCTION JOINTS SHALL BE CLEANED AND LAITANCE REMOVED AND SURFACE WETTED. STANDING WATER SHALL BE REMOVED.
10. VERTICAL CONSTRUCTION JOINTS IN WALLS SHALL BE LOCATED A MINIMUM OF ONE-HALF WALL HEIGHT FROM CORNERS OR OTHER INTERSECTING WALLS. HORIZONTAL JOINTS IN WALLS SHALL BE LOCATED WITHIN MIDDLE THIRD OF WALL HEIGHT.
11. CONSTRUCTION JOINTS SHALL HAVE KEYS OR ROUGHENED SURFACES. WHERE ROUGHENED SURFACE IS USED, THE SURFACE SHALL HAVE AN AMPLITUDE OF 1/4" MIN.
12. CHAMFER EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.



SCUPPER DETAIL

SECTION (B) S1, C102

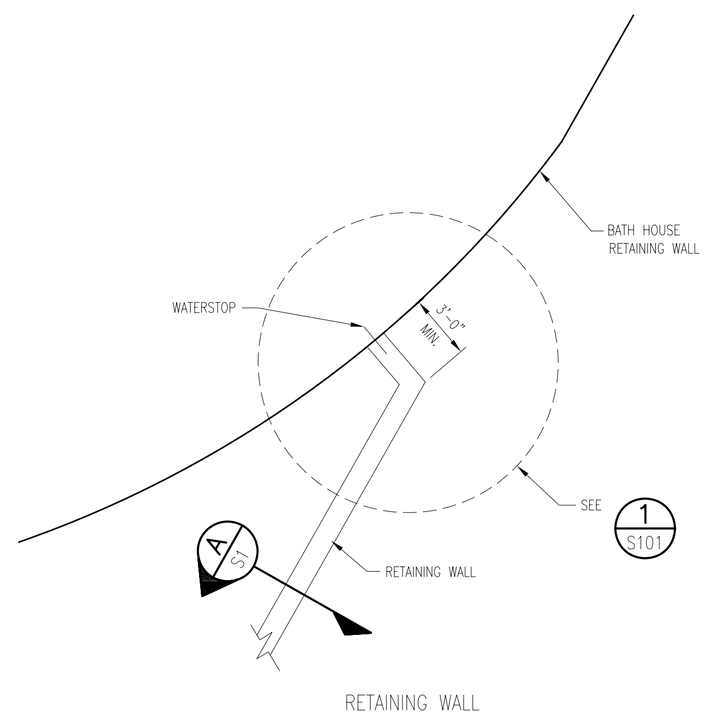
SCALE: 1"=2'



RETAINING WALL DETAIL

SECTION (A) S1

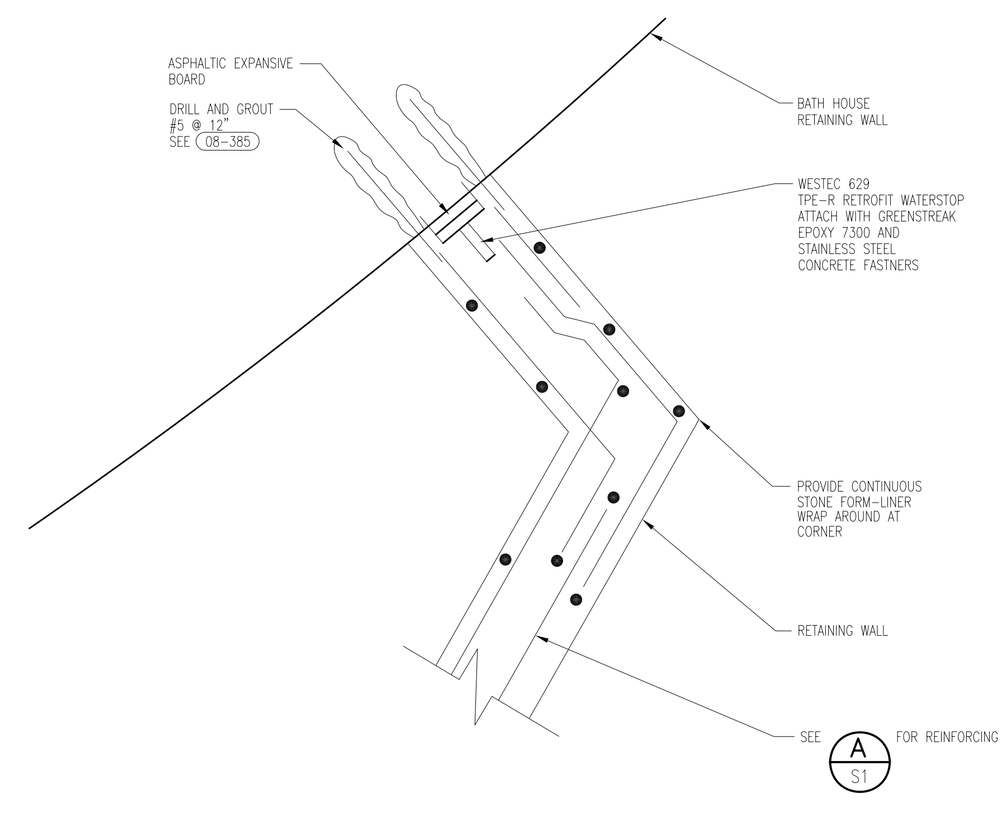
SCALE: 3/4"=1'-0"



RETAINING WALL

PLAN

SCALE: 1"=5'

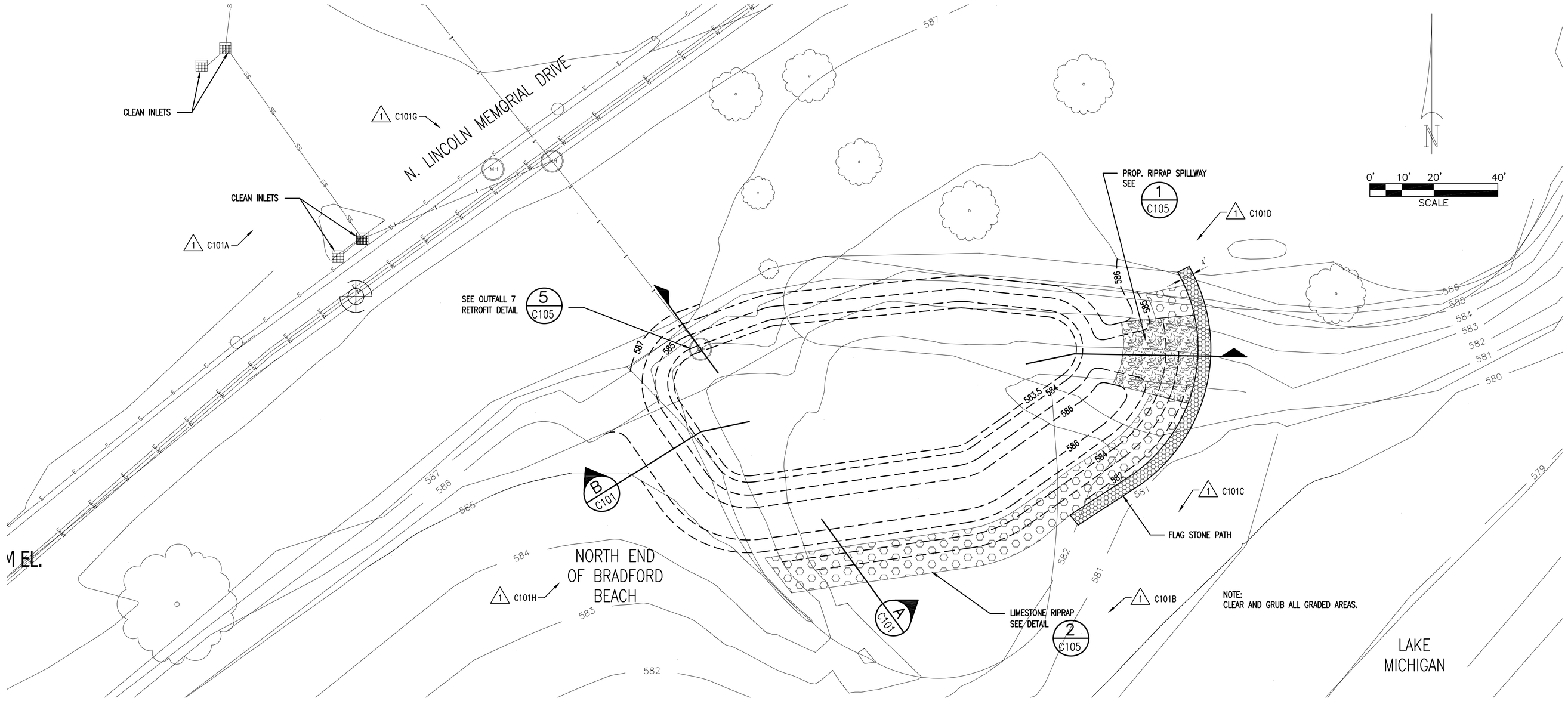


DETAIL (1) S1

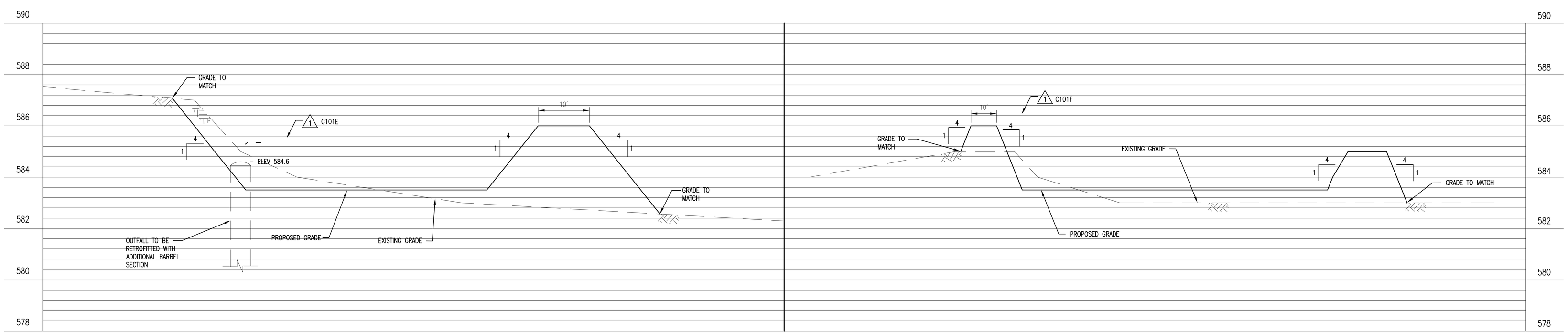
SCALE: 1"=1'

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION
& PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: WHM
SCALE: VARIES
DATE: 09/14/07
PROJECT TITLE: BRADFORD BEACH STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: STRUCTURAL DETAILS
PROJECT NO. JDWD6613
REVISIONS:
SHEET NO. S101 9 OF 9
FILE NO.



OUTFALL 7 INFILTRATION CELL



SECTION A C101
SCALE: HOR: 1"=10' VER: 1"=2'

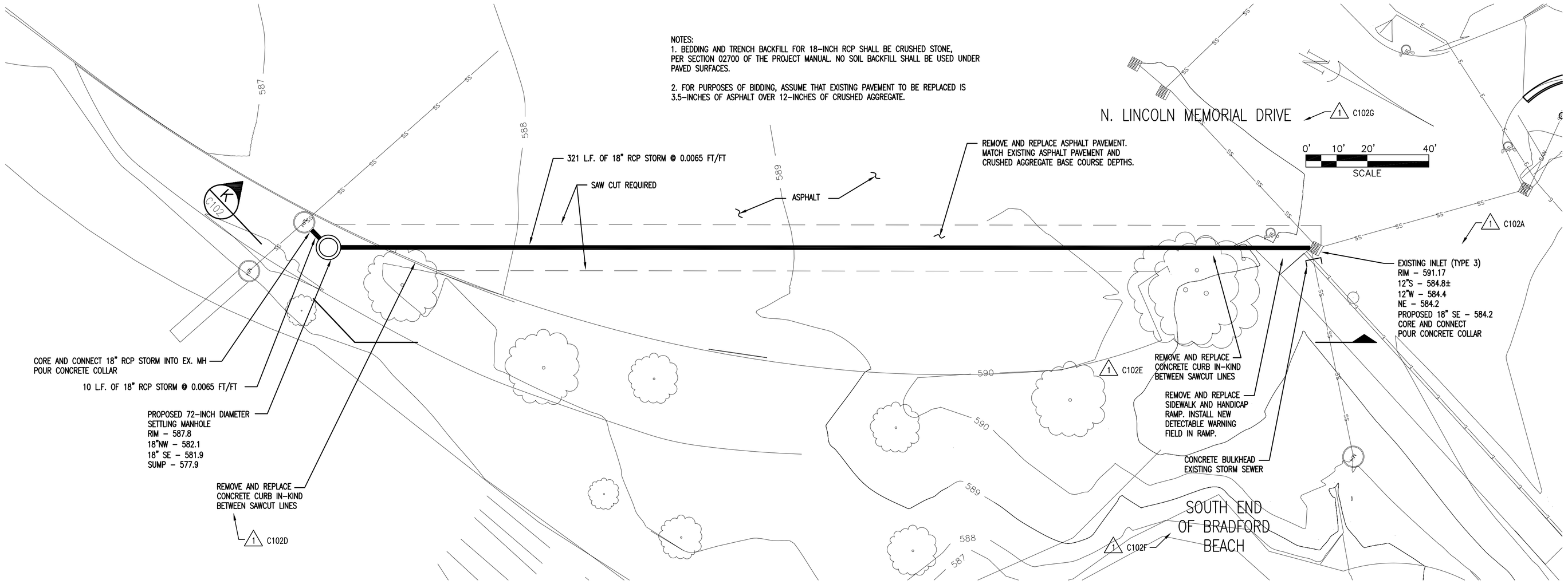
SECTION B C101
SCALE: HOR: 1"=20' VER: 1"=2'

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

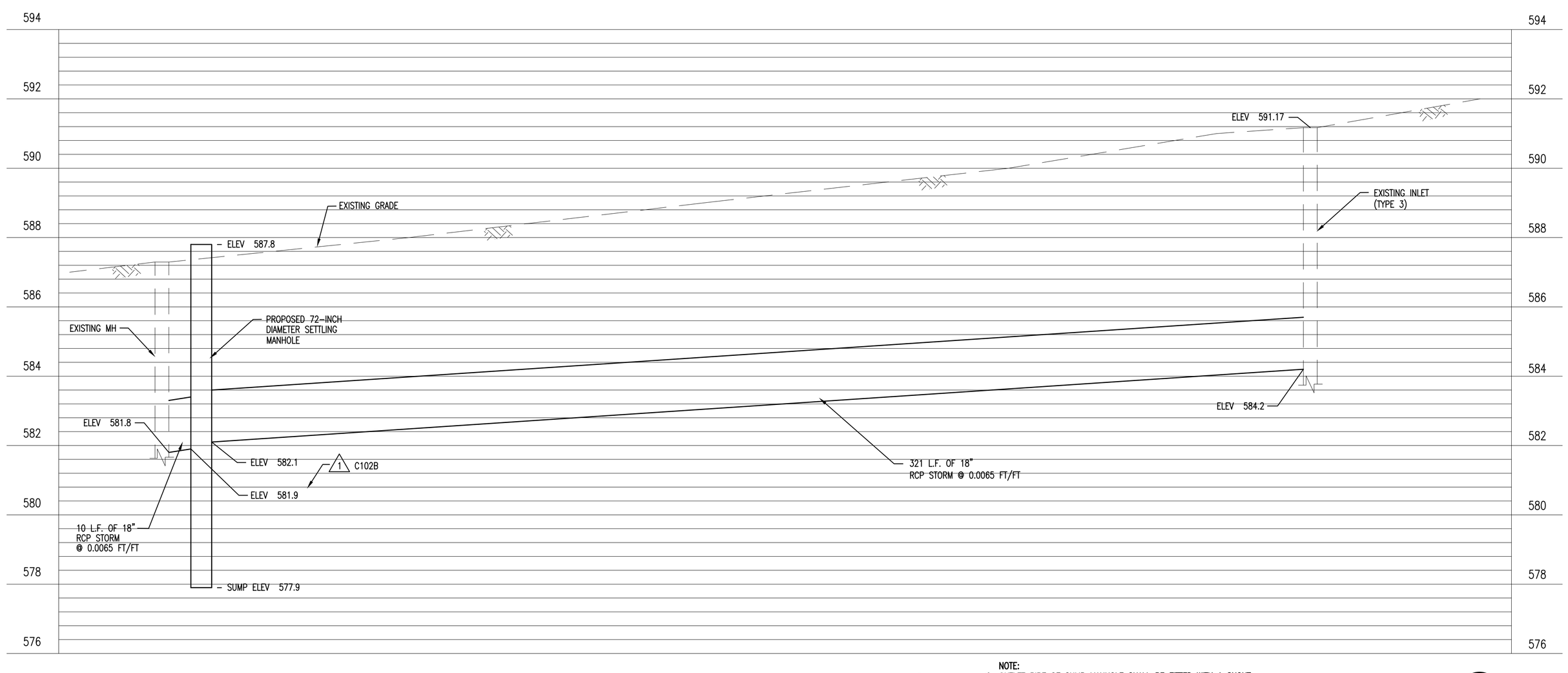
DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1"= 20'
DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: OUTFALL 7 INFILTRATION CELL GRADING PLAN
PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07
SHEET NO. C101 2 OF 11
FILE NO.

NOTES:
1. BEDDING AND TRENCH BACKFILL FOR 18-INCH RCP SHALL BE CRUSHED STONE, PER SECTION 02700 OF THE PROJECT MANUAL. NO SOIL BACKFILL SHALL BE USED UNDER PAVED SURFACES.

2. FOR PURPOSES OF BIDDING, ASSUME THAT EXISTING PAVEMENT TO BE REPLACED IS 3.5-INCHES OF ASPHALT OVER 12-INCHES OF CRUSHED AGGREGATE.



OUTFALL O STORMWATER RELAY



1 C102C

NOTE:
OUTLET PIPE OF SUMP MANHOLE SHALL BE FITTED WITH A SNOUT OIL-WATER DEBRIS SEPARATION DEVICE (MODEL 30R) WITH BIO-SKIRT TM AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC, 53 MT. ARCHER RD., LYME, CT. 06371.

SECTION K C102
SCALE: HOR: 1"=20' VER: 1"=2'

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

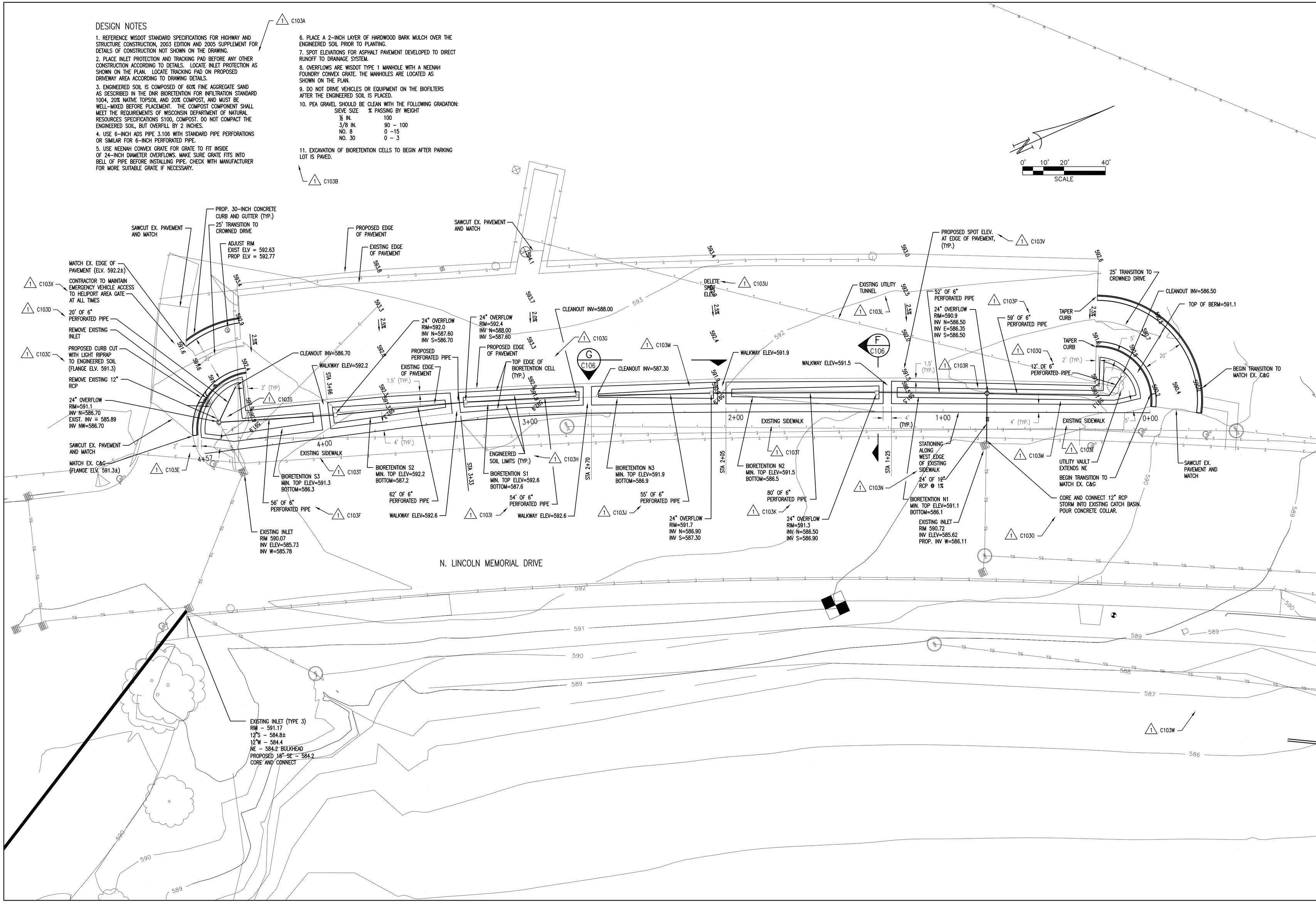
DRAWN BY: LMJ	CHECKED BY: BJM
SCALE: 1"= 20'	DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT	SHEET DESCRIPTION: OUTFALL O STORMWATER RELAY
PROJECT NO. V011-06613-02	REVISIONS: 1 12/11/07
SHEET NO. C102 3 OF 11	FILE NO.

DESIGN NOTES

1. REFERENCE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2003 EDITION AND 2005 SUPPLEMENT FOR DETAILS OF CONSTRUCTION NOT SHOWN ON THE DRAWING.
2. PLACE INLET PROTECTION AND TRACKING PAD BEFORE ANY OTHER CONSTRUCTION ACCORDING TO DETAILS. LOCATE INLET PROTECTION AS SHOWN ON THE PLAN. LOCATE TRACKING PAD ON PROPOSED DRIVEWAY AREA ACCORDING TO DRAWING DETAILS.
3. ENGINEERED SOIL IS COMPOSED OF 60% FINE AGGREGATE SAND AS DESCRIBED IN THE DNR BIORETENTION FOR INFILTRATION STANDARD 1004, 20% NATIVE TOPSOIL AND 20% COMPOST, AND MUST BE WELL-MIXED BEFORE PLACEMENT. THE COMPOST COMPONENT SHALL MEET THE REQUIREMENTS OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS S100, COMPOST. DO NOT COMPACT THE ENGINEERED SOIL, BUT OVERFILL BY 2 INCHES.
4. USE 6-INCH ADS PIPE 3.106 WITH STANDARD PIPE PERFORATIONS OR SIMILAR FOR 6-INCH PERFORATED PIPE.
5. USE NEENAH CONVEX GRATE FOR GRATE TO FIT INSIDE OF 24-INCH DIAMETER OVERFLOWS. MAKE SURE GRATE FITS INTO BELL OF PIPE BEFORE INSTALLING PIPE. CHECK WITH MANUFACTURER FOR MORE SUITABLE GRATE IF NECESSARY.
6. PLACE A 2-INCH LAYER OF HARDWOOD BARK MULCH OVER THE ENGINEERED SOIL PRIOR TO PLANTING.
7. SPOT ELEVATIONS FOR ASPHALT PAVEMENT DEVELOPED TO DIRECT RUNOFF TO DRAINAGE SYSTEM.
8. OVERFLOWS ARE WISDOT TYPE 1 MANHOLE WITH A NEENAH FOUNDRY CONVEX GRATE. THE MANHOLES ARE LOCATED AS SHOWN ON THE PLAN.
9. DO NOT DRIVE VEHICLES OR EQUIPMENT ON THE BIOFILTERS AFTER THE ENGINEERED SOIL IS PLACED.
10. PEA GRAVEL SHOULD BE CLEAN WITH THE FOLLOWING GRADATION:

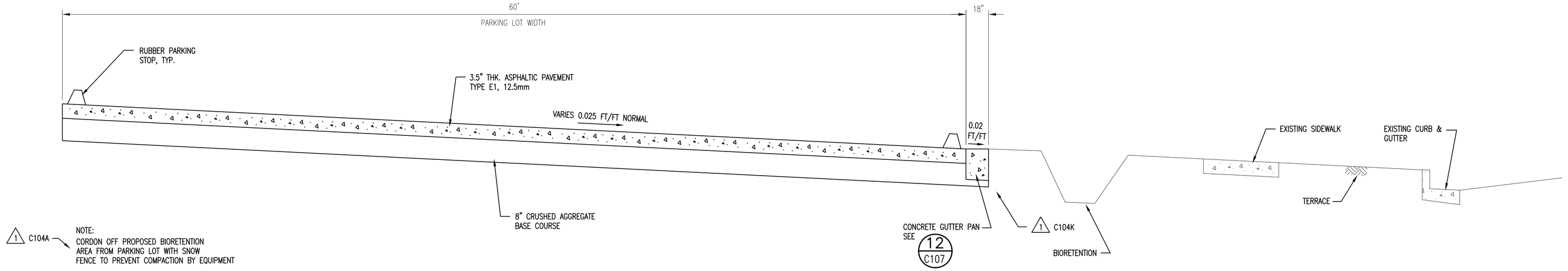
SIEVE SIZE	% PASSING BY WEIGHT
½ IN.	100
3/8 IN.	90 – 100
NO. 8	0 –15
NO. 30	0 – 3

11. EXCAVATION OF BIORETENTION CELLS TO BEGIN AFTER PARKING LOT IS PAVED.



MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

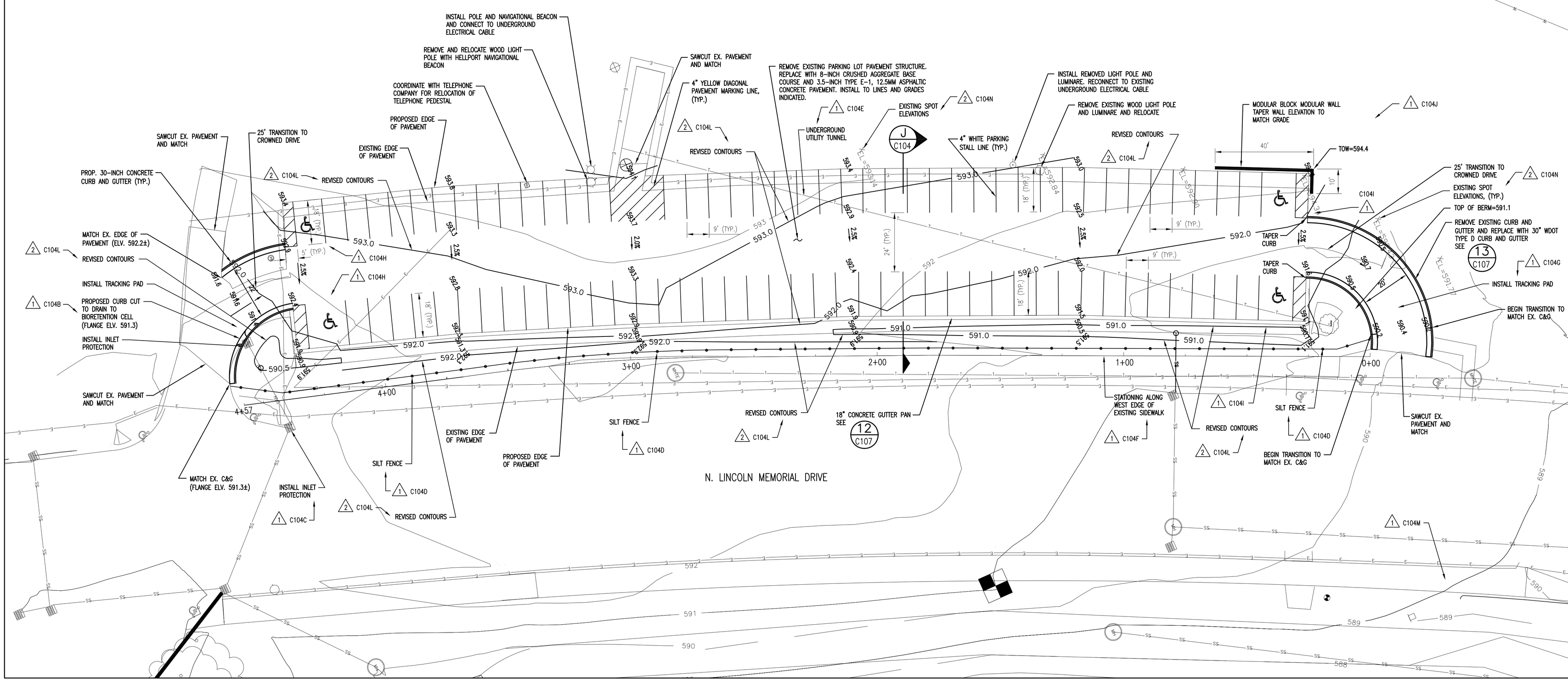
DRAWN BY: LMJ	CHECKED BY: BJM
SCALE: 1" = 20'	DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT	SHEET DESCRIPTION: STORMWATER SITE PLAN PARKING LOT
PROJECT NO. V011-06613-02	REVISIONS: 1 12/11/07
SHEET NO. C103 4 OF 11	FILE NO.



TYPICAL SECTION

SECTION J C104

SCALE: NTS

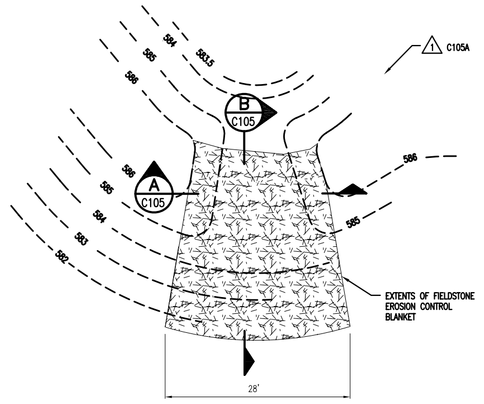


MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS

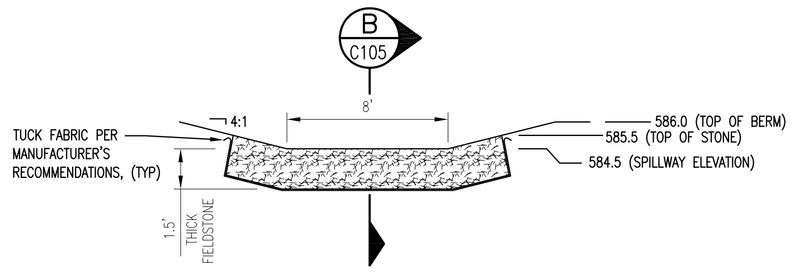
Architecture, Engineering & Environmental Services

CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

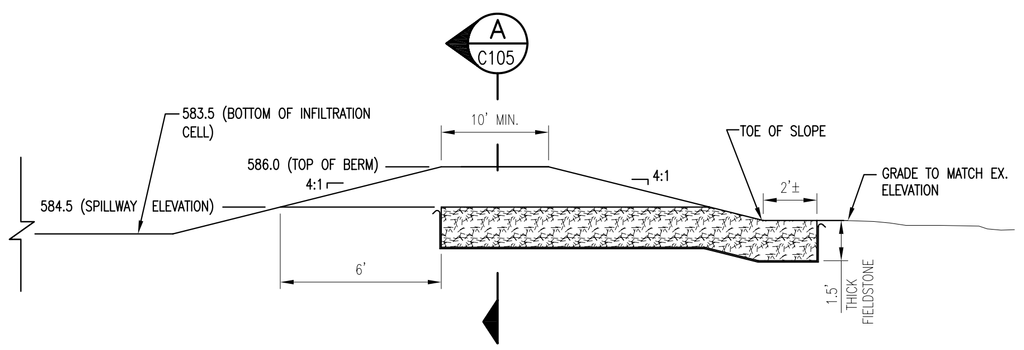
DRAWN BY: LMJ	CHECKED BY: BJM
SCALE: 1" = 20'	DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT	SHEET DESCRIPTION: PAVEMENT LAYOUT – PARKING LOT
PROJECT NO. V011-06613-02	REVISIONS: 1 2 12/11/07
SHEET NO. C104 5 OF 11	FILE NO.



PLAN VIEW
NTS



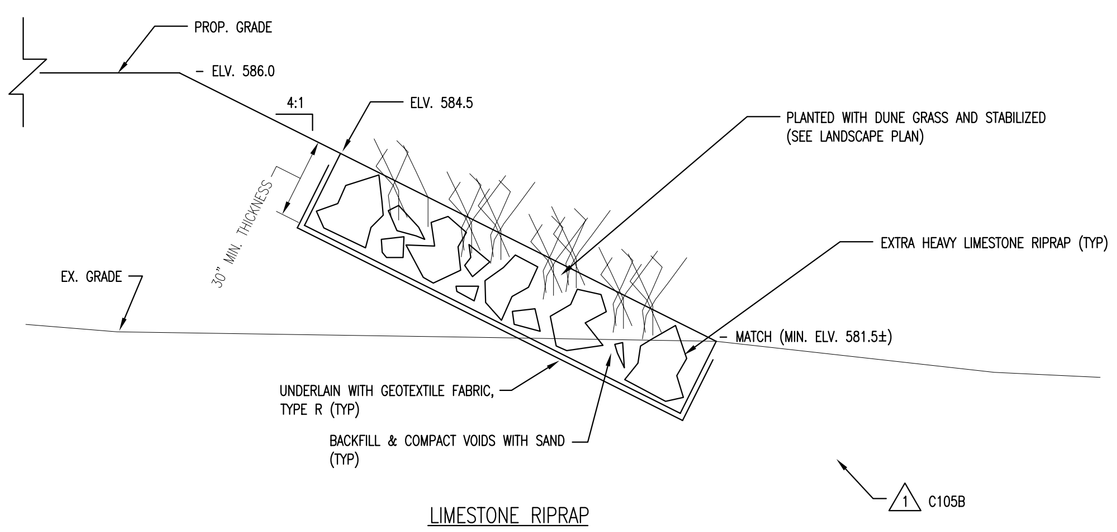
SECTION A C105
NTS



SECTION B C105
NTS

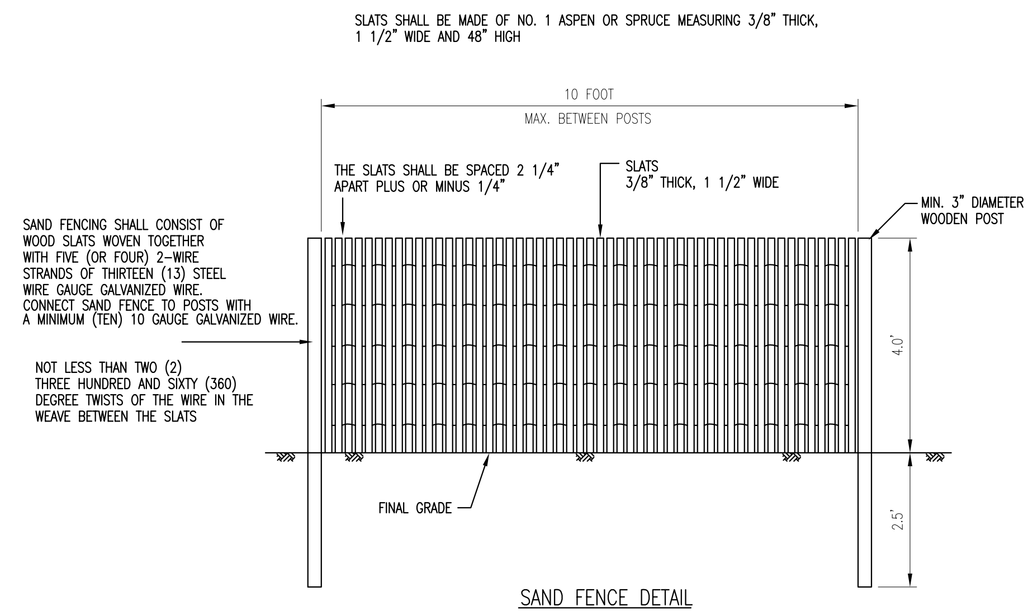
SPILLWAY DETAIL

DETAIL 1 C101
SCALE: 1"=4'



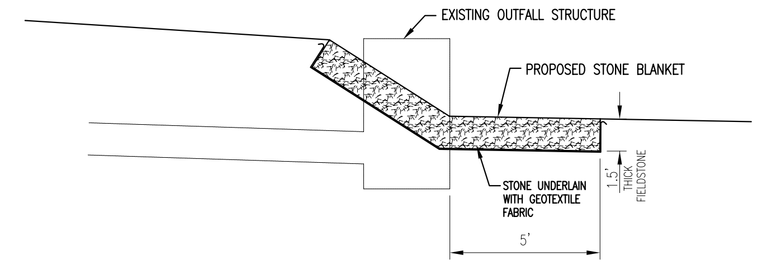
LIMESTONE RIPRAP

DETAIL 2 C101
NTS

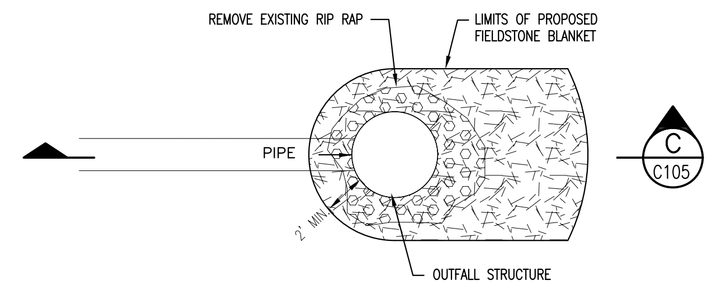


SAND FENCE DETAIL

DETAIL 3 L101
SCALE: 1"=2'

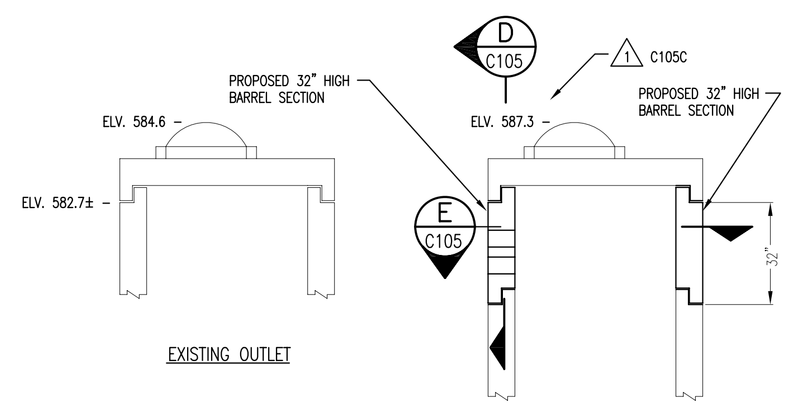


SECTION C C105
NTS



OUTFALL FIELDSTONE DETAIL

DETAIL 4 L101
SCALE: 1"=5'



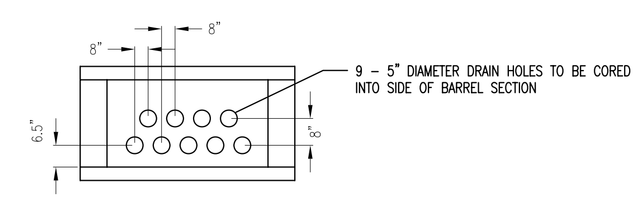
EXISTING OUTLET

PROPOSED OUTLET

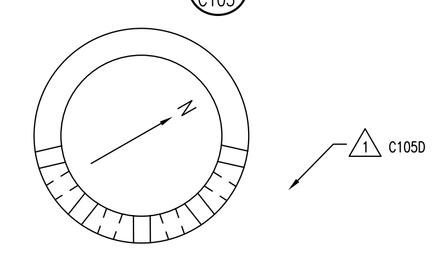
CATCH BASIN RETROFIT SHALL CONFORM TO WISCONSIN D.O.T. STANDARD DETAIL DRAWING 8 A 6-4

OUTLET 7 RETROFIT

DETAIL 5 C101
NTS



SECTION D C105



SECTION E C105

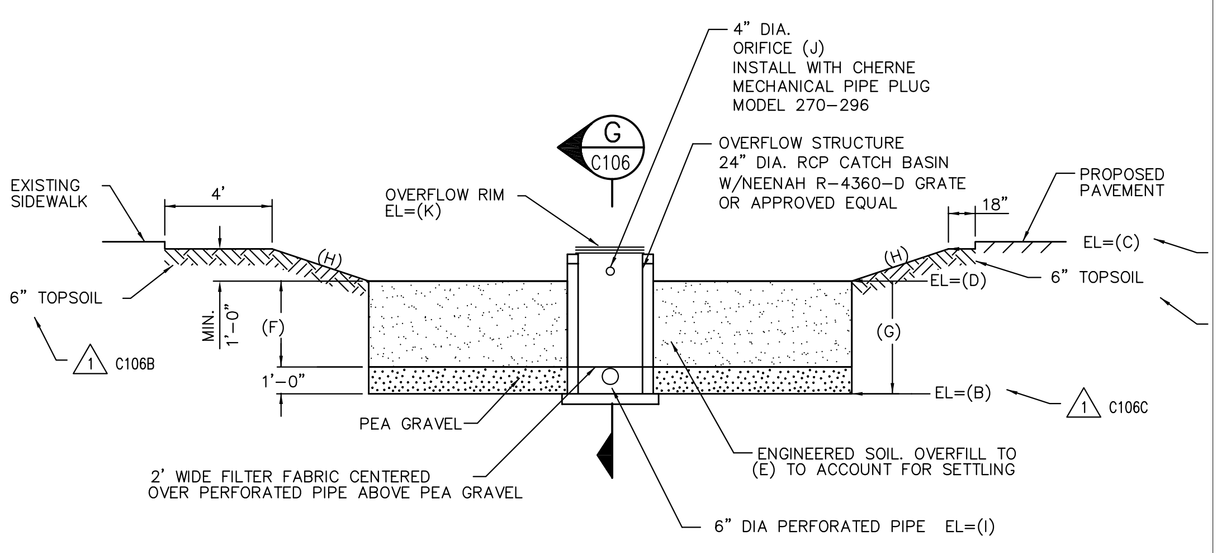
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ	CHECKED BY: BJM
SCALE: VARIES	DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT	SHEET DESCRIPTION: CONSTRUCTION DETAILS
PROJECT NO. V011-06613-02	REVISIONS: 1 12/11/07
SHEET NO. C105 6 OF 11	FILE NO.

BIORETENTION CELL ELEVATIONS

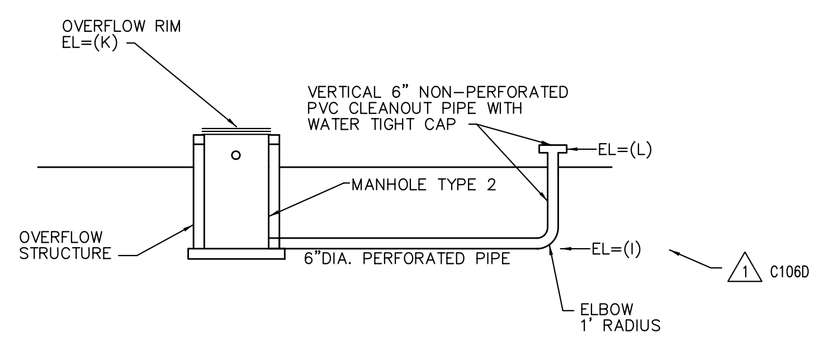
(A) BIORETENTION	(B) BOTTOM ELEV.	(C) MIN. TOP ELEV.	(D) TOP OF ENGINEERED SOIL	(E) ENGINEERED SOIL OVERFILL ELEV.	(F) ENGINEERED SOIL DEPTH FEET	(G) TOTAL FILTER MEDIA DEPTH FEET	(H) SIDE SLOPES	(I) UNDERDRAIN INVERT ELEV.	(J) ORIFICE INVERT ELEV.	(K) RIM ELEV.	(L) CLEANOUT TOP ELEV.
N1	586.10	591.10	590.10	590.30	3.00	4.00	2:1	586.50	590.10	590.90	591.10
N2	586.50	591.50	590.50	590.70	3.00	4.00	2:1	586.90	590.50	591.30	591.50
N3	586.90	591.90	590.90	591.10	3.00	4.00	2:1	587.30	590.90	591.70	591.90
S1	587.60	592.60	591.60	591.80	3.00	4.00	2:1	588.00	591.60	592.40	592.60
S2	587.20	592.20	591.20	591.40	3.00	4.00	2:1	587.60	591.20	592.00	592.20
S3	586.30	591.30	590.30	590.50	3.00	4.00	2:1	586.70	590.30	591.10	591.30

1 C106A



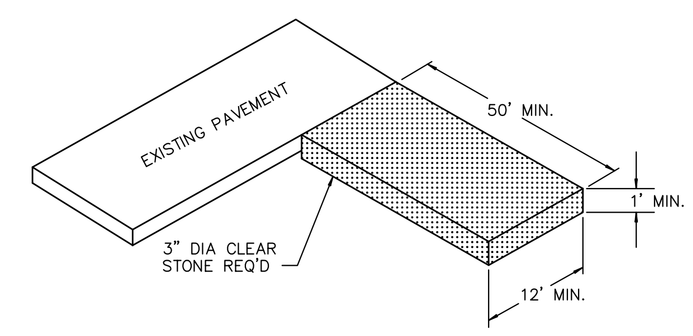
BIORETENTION CROSS SECTION

SECTION F C103
NTS



UNDERDRAIN CLEANOUT DETAIL

SECTION G C103
NTS



STONE TRACKING PAD

DETAIL 6 C103
NTS

1. PLACE GEOTEXTILE FABRIC UNDER THE ROCK.

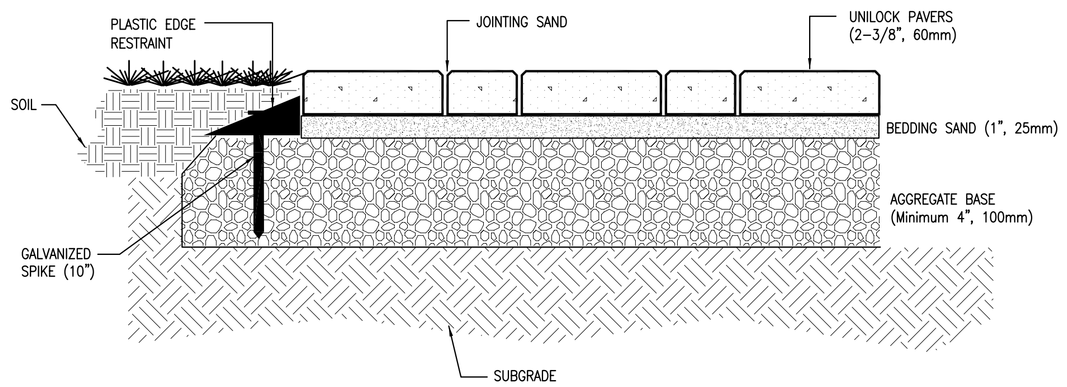
2. REMOVE MUD AND DEBRIS FROM TIRES AND VEHICLE UNDERCARAGE PRIOR TO LEAVING SITE.

3. REMOVE AND REPLACE STONE IF IT BECOMES FILLED WITH MUD AND DEBRIS.

4. STONE TRACKING PAD TO BE LOCATED IN THE FIELD BY ENGINEER.

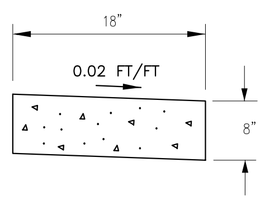
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1" = 20'
DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: CONSTRUCTION DETAILS
PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07
SHEET NO. C106 7 OF 11
FILE NO.



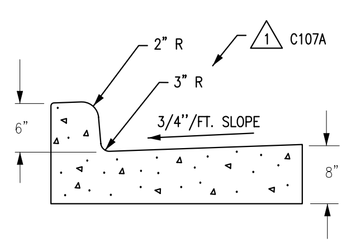
BRICK PATH DETAIL CROSS SECTION

DETAIL 10 L102, L103
NTS



CONCRETE GUTTER PAN

DETAIL 12 C104
NTS

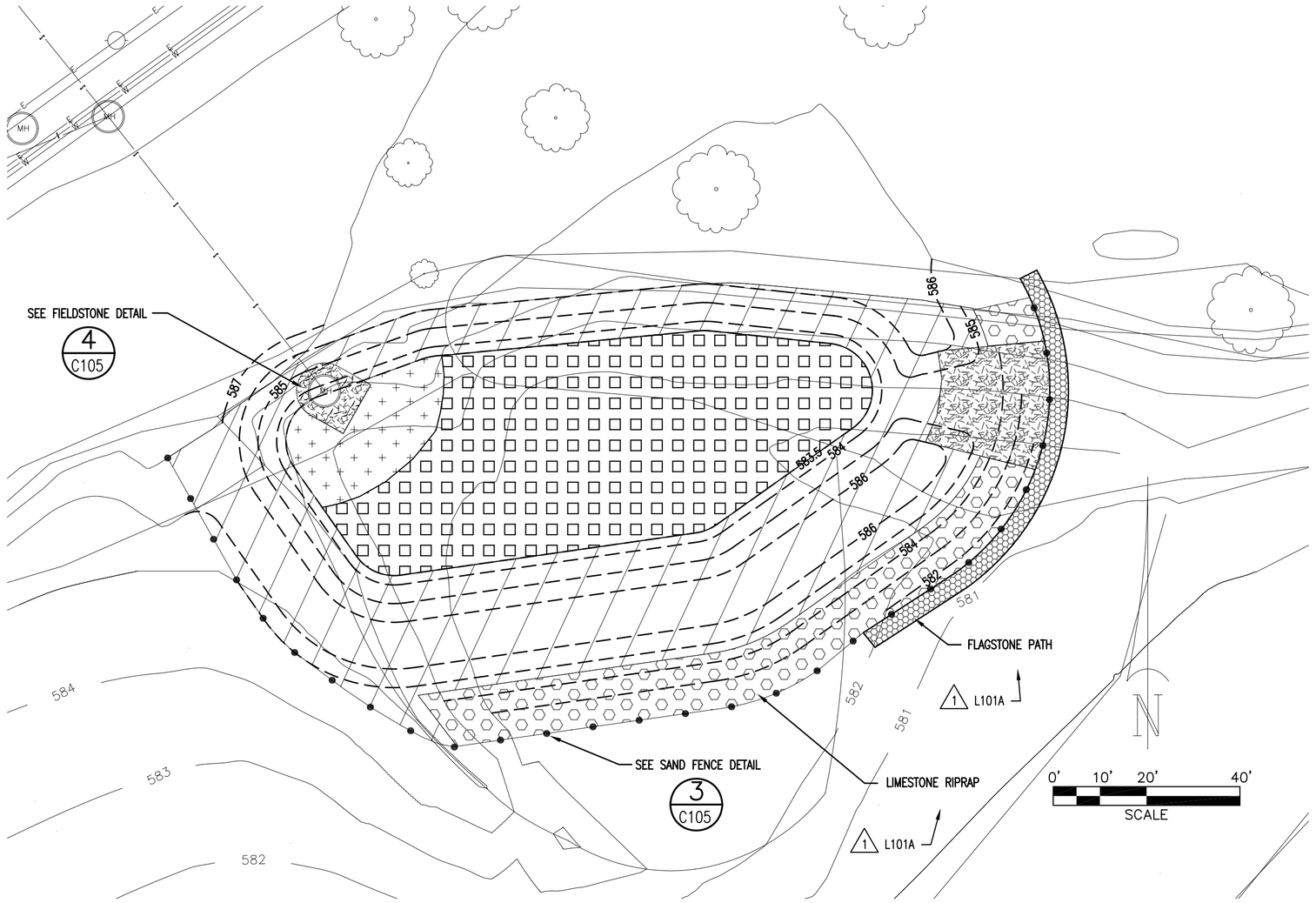


CONCRETE CURB & GUTTER 30"

DETAIL 13 C104
NTS

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1" = 40'
DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: CONSTRUCTION DETAILS
PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07
SHEET NO. C107 8 OF 11
FILE NO.



OUTFALL 7 LANDSCAPING PLAN

NOTES:

1. MESIC PRAIRIE AND WET PRAIRIE PLANTING BEDS SHALL RECEIVE A MINIMUM 3" THICK LAYER OF WDNR S100 COMPOST AND TILLED TO A DEPTH OF 6". FINAL GRADE SHALL MATCH THOSE ON THE PLANS.
2. APPLY SHREDDED HARDWOOD BARK MULCH TO THE MESIC PRAIRIE AND WET PRAIRIE PLANTING AREAS TO A MINIMUM DEPTH OF 2".
3. INSTALL COCONUT FIBER MAT IN DUNE PLANTING AREAS (EXCLUDING RIP RAP AREAS) PRIOR TO PLANTING.
4. INSTALL SAND FENCE UPON COMPLETION OF ALL PLANTING.
5. PLANT DUNE PLUGS IN LIMESTONE RIPRAP PER SPECIFICATIONS.

1 L101B

LEGEND

- DUNE PLUGS
- MESIC PRAIRIE PLUGS
- WET PRAIRIE PLUGS
- FIELDSTONE RIP RAP BLANKET
- SAND FENCE

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

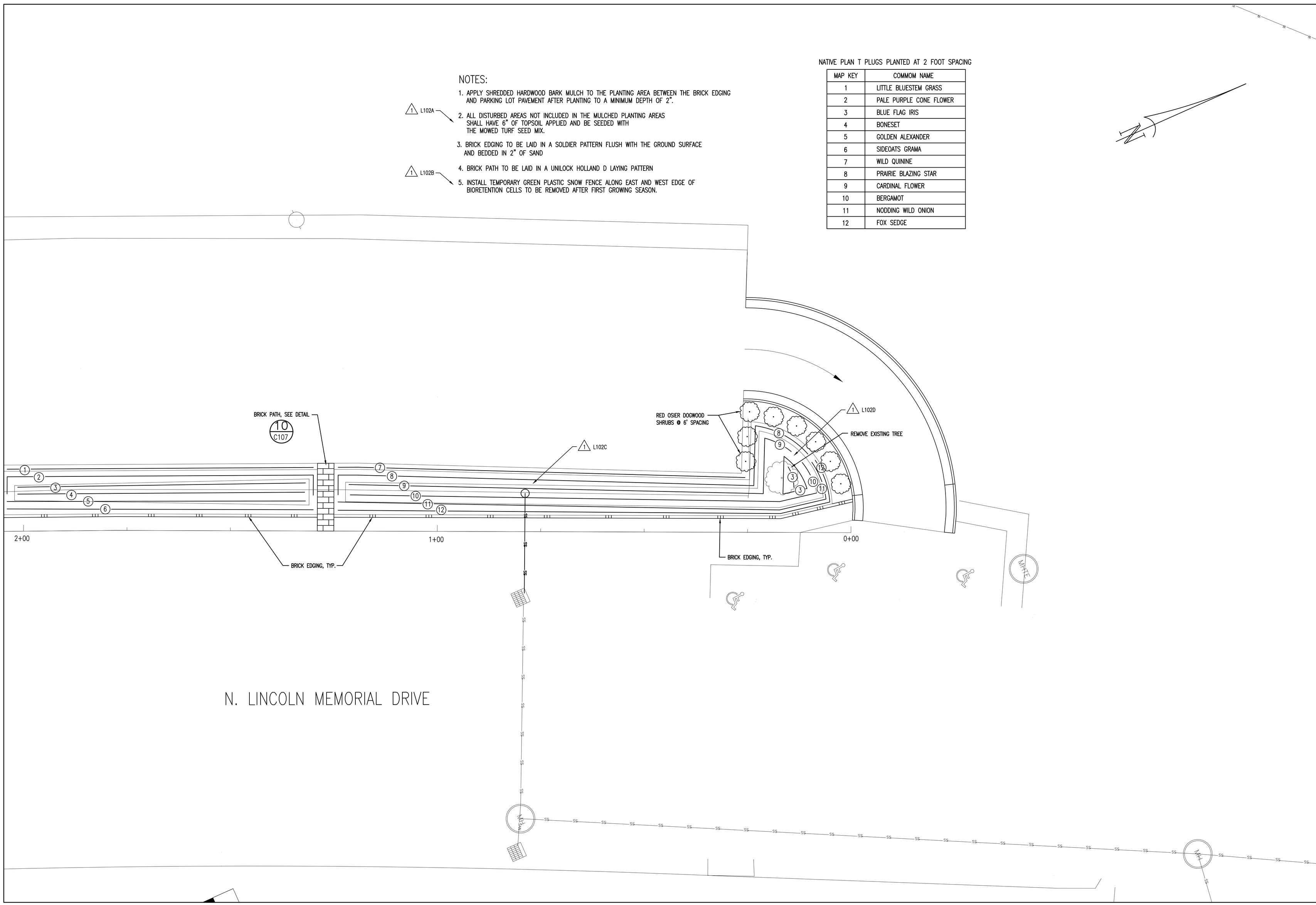
DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1" = 20'
DATE: 12/3/07
PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: OUTFALL 7 LANDSCAPING PLAN
PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07
SHEET NO. L101 9 OF 11
FILE NO.

NOTES:

1. APPLY SHREDDED HARDWOOD BARK MULCH TO THE PLANTING AREA BETWEEN THE BRICK EDGING AND PARKING LOT PAVEMENT AFTER PLANTING TO A MINIMUM DEPTH OF 2".
2. ALL DISTURBED AREAS NOT INCLUDED IN THE MULCHED PLANTING AREAS SHALL HAVE 6" OF TOPSOIL APPLIED AND BE SEEDED WITH THE MOWED TURF SEED MIX. (1 L102A)
3. BRICK EDGING TO BE LAID IN A SOLDIER PATTERN FLUSH WITH THE GROUND SURFACE AND BEDDED IN 2" OF SAND
4. BRICK PATH TO BE LAID IN A UNILOCK HOLLAND D LAYING PATTERN (1 L102B)
5. INSTALL TEMPORARY GREEN PLASTIC SNOW FENCE ALONG EAST AND WEST EDGE OF BIORETENTION CELLS TO BE REMOVED AFTER FIRST GROWING SEASON.

NATIVE PLAN T PLUGS PLANTED AT 2 FOOT SPACING

MAP KEY	COMMOM NAME
1	LITTLE BLUESTEM GRASS
2	PALE PURPLE CONE FLOWER
3	BLUE FLAG IRIS
4	BONESET
5	GOLDEN ALEXANDER
6	SIDEOATS GRAMA
7	WILD QUININE
8	PRAIRIE BLAZING STAR
9	CARDINAL FLOWER
10	BERGAMOT
11	NODDING WILD ONION
12	FOX SEDGE



MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1"= 10'
DATE: 12/3/07

PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: PARKING LOT LANDSCAPING PLAN NORTH END

PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07

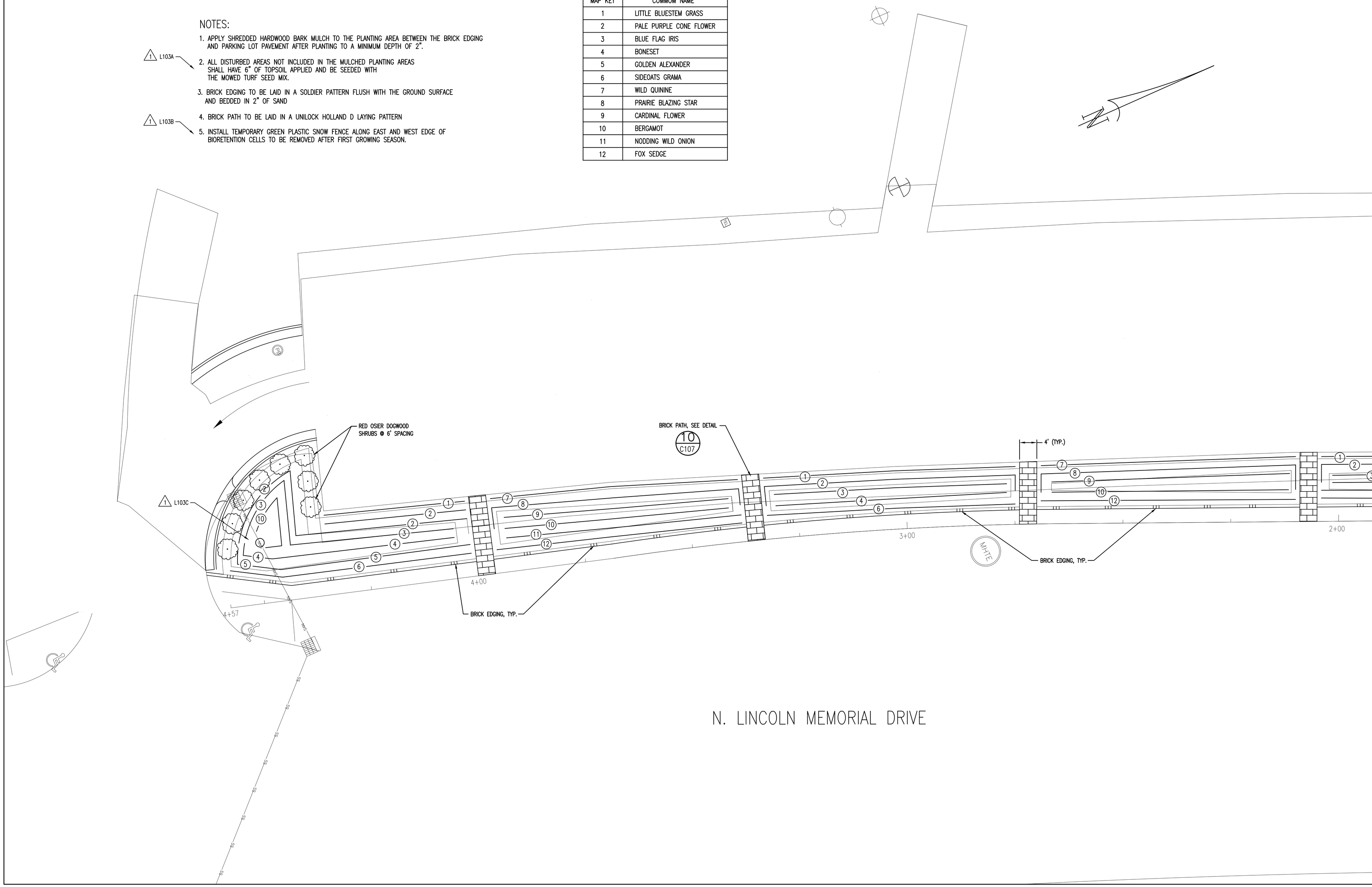
SHEET NO. L102
10 OF 11
FILE NO.

NOTES:

1. APPLY SHREDDED HARDWOOD BARK MULCH TO THE PLANTING AREA BETWEEN THE BRICK EDGING AND PARKING LOT PAVEMENT AFTER PLANTING TO A MINIMUM DEPTH OF 2".
2. ALL DISTURBED AREAS NOT INCLUDED IN THE MULCHED PLANTING AREAS SHALL HAVE 6" OF TOPSOIL APPLIED AND BE SEEDED WITH THE MOWED TURF SEED MIX. (1 L103A)
3. BRICK EDGING TO BE LAID IN A SOLDIER PATTERN FLUSH WITH THE GROUND SURFACE AND BEDDED IN 2" OF SAND
4. BRICK PATH TO BE LAID IN A UNILOCK HOLLAND D LAYING PATTERN (1 L103B)
5. INSTALL TEMPORARY GREEN PLASTIC SNOW FENCE ALONG EAST AND WEST EDGE OF BIORETENTION CELLS TO BE REMOVED AFTER FIRST GROWING SEASON.

NATIVE PLAN T PLUGS PLANTED AT 2 FOOT SPACING

MAP KEY	COMMOM NAME
1	LITTLE BLUESTEM GRASS
2	PALE PURPLE CONE FLOWER
3	BLUE FLAG IRIS
4	BONESET
5	GOLDEN ALEXANDER
6	SIDEOATS GRAMA
7	WILD QUININE
8	PRAIRIE BLAZING STAR
9	CARDINAL FLOWER
10	BERGAMOT
11	NODDING WILD ONION
12	FOX SEDGE



MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

DRAWN BY: LMJ
CHECKED BY: BJM
SCALE: 1"= 10'
DATE: 12/3/07

PROJECT TITLE: BRADFORD BEACH PHASE II STORMWATER IMPROVEMENT PROJECT
SHEET DESCRIPTION: PARKING LOT LANDSCAPING PLAN SOUTH END

PROJECT NO. V011-06613-02
REVISIONS: 1 12/11/07

SHEET NO. L103 11 OF 11
FILE NO.

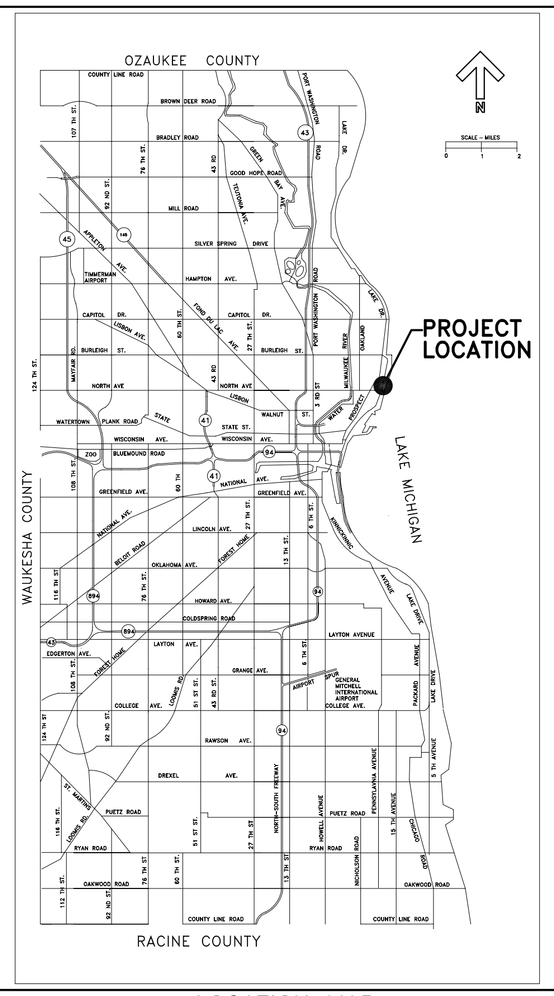
BRADFORD BEACH PARK

2500 N. LINCOLN MEMORIAL DRIVE

STORMWATER IMPROVEMENT PROJECT–PHASE II

PROJECT #V011–06613–02

DECEMBER, 2007



LOCATION MAP

LEGEND:

- EXISTING GAS METER
- EXISTING TELEPHONE BOX
- EXISTING TRANSFORMER
- EXISTING MANHOLE
- EXISTING LIGHT POLE
- EXISTING CATCH BASIN OR INLET
- EXISTING FENCE
- EXISTING PAVEMENT
- EXISTING CURBFACE
- EXISTING TREE/BUSH LINE
- EXISTING CONTOURS
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING STORM SEWER
- EXISTING WATER LINE
- EXISTING ELECTRIC (BURIED)
- EXISTING LIGHTING (BURIED)
- EXISTING PROFILE
- IRON PIPE (PROPERTY CORNER)
- SURVEY CONTROL POINT
- BUTT JOINT
- SOD AREA
- PROPOSED LIGHT POLE
- PROPOSED CATCH BASIN
- PROPOSED FENCE
- PROPOSED PAVEMENT
- PROPOSED CURBFACE
- PROPOSED TREE/BUSH LINE
- PROPOSED CONTOURS
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- PROPOSED ELECTRIC (BURIED)
- PROPOSED LIGHTING (BURIED)
- PROPOSED PROFILE

ABBREVIATIONS:

ASP	ASPHALT	MH	MANHOLE
CABC	CRUSHED AGGREGATE BASE COURSE	N	NORTHING
CB	CATCH BASIN	O.C.	ON CENTER
C.I.	CAST IRON	PAVT	PAVEMENT
CL	CENTERLINE	PKG	PARKING
CMP	CORUGATED METAL PIPE	PKWY	PARKWAY
CONC	CONCRETE	PROP	PROPOSED
COND	CONDUIT	PVC	POLYVINYL CHLORIDE
DIA.	DIAMETER	R	RADIUS
ELEC	ELECTRICAL	RT	RIGHT
EL	ELEVATION	RCP	REINFORCED CONRETE PIPE
EXST	EXISTING	RD	ROAD
E	EASTING	SAN	SANITARY SEWER
F TO F	FACE TO FACE	SS	STORM SEWER
G	GAS	ST	STREET
G.W.I.	GALVANIZED WROUGHT IRON	STA	STATION
HOR	HORIZONTAL	T	TELEPHONE
HP	HIGH POINT	TYP	TYPICAL
I.E.	INVERT ELEVATION	UD	UNDER DRAIN
LT	LEFT	VERT	VERTICAL
L	LIGHTING CABLE/CONDUIT	W	WATER
MAX	MAXIMUM	WEPCO	WI ELECTRICAL POWER CO
MIN	MINIMUM	X	EXTRA

CONSTRUCTION SITE EROSION CONTROL

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSPECTED AT LEAST EVERY 7 DAYS OR WITHIN 24 HOURS OF A 0.5–INCH RAINFALL. CONTROL PRACTICES FOUND IN NEED OF REPAIR SHALL BE REPAIRED WITHIN 24 HOURS OF INSPECTION. SEDIMENT CONTROL PRACTICES ARE TO BE IN WORKING CONDITION AT THE END OF EACH DAY.

2. TRACKING PADS AND INLET PROTECTION SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF EXCAVATION.

3. BEFORE ANY SITE WORK COMMENCES, INSTALL SILT FENCE, THE CONSTRUCTION BARRIER FENCE, INLET PROTECTION AND TRACKING PADS.

2 T101B 4. INSPECT DAILY AND IF NECESSARY CLEAN NEARBY PRIVATE AND LOCAL STREETS OF ANY DEPOSITED SEDIMENT.

5. ALL EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES EROSION AND SEDIMENT CONTROL "TECHNICAL STANDARDS."

6. STORM DRAIN INLET PROTECTION SHALL BE PROVIDED FOR ALL CATCH BASINS, MANHOLES, AND CURB INLETS THAT MAY POTENTIALLY ALLOW SEDIMENT TO ENTER THE STORM SEWER SYSTEM. SELECT TYPE A, B OR C INLET PROTECTION AS APPROPRIATE. INLET PROTECTION SHALL BE IN CONFORMANCE WITH THE WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD EROSION CONTROL DETAILS.

7. IF DEWATERING IS REQUIRED FOR ANY EXCAVATION THE DEWATERING SYSTEM SHALL CONFORM TO THE WISCONSIN CONSERVATION PRACTICE STANDARD NO. 1061–DEWATERING. ASSUME THAT FINE TO VERY FINE TEXTURED SOILS ARE BEING EXCAVATED WHEN SELECTING THE DEWATERING SYSTEM.

8. THE USE, STORAGE, AND DISPOSAL OF CHEMICALS, CEMENT, AND OTHER COMPOUNDS AND MATERIALS USED ON SITE SHALL BE MANAGED DURING THE CONSTRUCTION PERIOD TO PREVENT THEIR TRANSPORT BY RUNOFF TO WATERS OF THE STATE.

9. ALL EROSION CONTROL PRACTICES SHOULD BE ADJUSTED TO MEET FIELD CONDITIONS DURING CONSTRUCTION.

10. UNLESS NOTED ON PLANS, ALL AREAS WHERE THE EXISTING VEGETATIVE COVER IS REMOVED SHALL BE REPLACED WITH 6" OF TOP SOIL AND SEEDED PER THE REQUIREMENTS OF SECTION 630 OF THE WISDOT STANDARD SPECIFICATIONS. USE WISDOT SEED MIXTURE 10 IN ALL AREAS WHERE SEEDING OCCURS.

2 T101A 11. UNLESS NOTED ON PLANS, PLACE MULCH PER SECTION 627 OF THE WISDOT STANDARD SPECIFICATIONS OVER ALL SEEDED AREAS AT 1.5 TONS PER ACRE.

GENERAL NOTES

1. APPLICATION SPECIFICATIONS – STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2003 EDITION, WITH AMMENDMENTS TO DATE, AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.

2. CONTRACTOR SHALL CALL DIGGERS HOTLINE ((414) 259–1181) AND PARKS MAINTENANCE DIVISION AT (414) 258–2322 FOR UTILITIES LOCATION PRIOR TO START OF CONSTRUCTION.

3. ALL INFORMATION SHOWN ON EXISTING CONDITIONS IS BASED ON RECORDS AVAILABLE TO MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS AS OF JANUARY 2004, ALTHOUGH THE COUNTY IN NO WAY GUARANTEES THE INFORMATION AS BEING ENTIRELY ACCURATE IN THE EVENT PERSONS PERFORMING WORK FOR MILWAUKEE COUNTY SHOULD ENCOUNTER ERRORS OR OMISSIONS IN THESE DRAWINGS DURING CONSTRUCTION OF THIS PROJECT, IT SHALL BE THEIR RESPONSIBILITY TO INFORM THE COUNTY AS SOON AS POSSIBLE.

4. ALL DIMENSIONS AND RADII SHOWN ARE TO EDGE OF PAVEMENT OR FRONT FACE OF CURB.

5. CONCRETE CURB AND GUTTER GRADES ARE TO THE GUTTER, UNLESS OTHERWISE NOTED.

6. SAWCUT LIMITS OF REMOVAL OF EXISTING PAVEMENT.

7. ALL ELEVATIONS ON THESE DRAWINGS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM. (CITY OF MILWAUKEE DATUM)

8. SET CATCH BASIN CASTINGS 1/2–INCH BELOW FINISHED GRADE WITH SMOOTH TROWELED EDGES.

9. EXISTING SIGNS AFFECTED BY CONSTRUCTION SHALL BE PROTECTED OR RELOCATED AS DIRECTED BY THE ENGINEER.

10. CONTRACTOR SHALL PROTECT ALL TREES NOT SHOWN FOR REMOVAL.

11. CURB FLARES FOR DEPRESSED CURB OPENINGS WHERE SHOWN ON PLAN SHALL BE AT A 6:1 SLOPE.

12. CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS.

12. UNLESS NOTED ON PLANS, PLACE FERTILIZER TYPE A PER SECTION 629 OF THE WISDOT STANDARD SPECIFICATIONS OVER ALL SEEDED AREAS AT A RATE OF 7 POUNDS PER 1000 SQ. FT.

2 T101B 13. ALL SLOPES GREATER THAN 2.5:1 REQUIRE WISDOT EROSION CONTROL FABRIC CLASS I TYPE B. THERE SHALL BE NO SLOPES GREATER THAN 2:1.

14. THE CONSTRUCTION BARRIER FENCE POSTS SHALL BE NOTCHED CONVENTIONAL METAL "T" OR "U" SHAPED FENCE POSTS.

15. THE CONSTRUCTION BARRIER FENCE FABRIC SHALL BE INTERNATIONAL ORANGE (UV STABILIZED) HIGH DENSITY POLYETHYLENE DIAMOND MESH. THE HEIGHT SHALL BE A MINIMUM OF 3.75 FEET.

16. COMPLY WITH ALL LOCAL AND STATE EROSION CONTROL ORDINANCES

DRAWING INDEX:

T101	TITLE SHEET	1 OF 13
C101	OUTFALL 7 INFILTRATION CELL GRADING PLAN	2 OF 13
C102	OUTFALL 0 STORMSEWER RELAY	3 OF 13
C103	PARKING LOT STORMSEWER SITE PLAN	4 OF 13
C104	PARKING LOT PAVEMENT LAYOUT	5 OF 13
C105	CONSTRUCTION DETAILS	6 OF 13
C106	CONSTRUCTION DETAILS	7 OF 13
C107	CONSTRUCTION DETAILS	8 OF 13
L101	OUTFALL 7 LANDSCAPING PLAN	9 OF 13
L102	PARKING LOT LANDSCAPING PLAN NORTH END	10 OF 13
L103	PARKING LOT LANDSCAPING PLAN SOUTH END	11 OF 13
CR1	RAVINE IMPROVEMENT PLAN	12 OF 13
CR2	RAVINE IMPROVEMENT DETAILS	13 OF 13

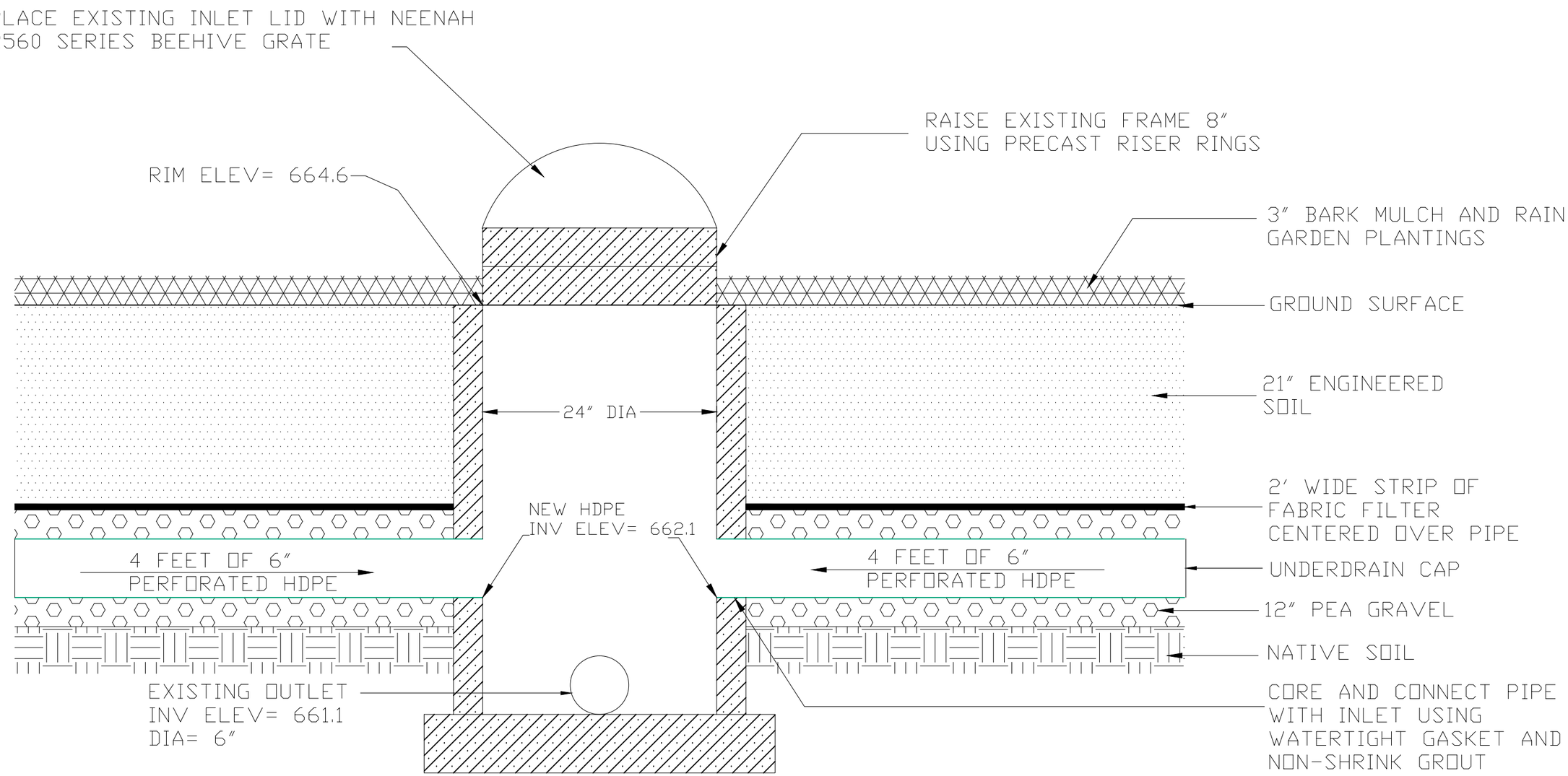
MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION & PUBLIC WORKS
Architecture, Engineering & Environmental Services Section
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

RECOMMENED FOR APPROVAL BY
DATE
PROJECT APPROVAL BY
DIRECTOR–DTPW
DATE
PROJECT MANAGER REVIEW BY:
DATE:

REVISIONS:
2 12/11/07

BUILDING NO. XXXXX
SITE NO. XXXXX
PROJECT NO. V011–06613–02
SHEET NO. T101
FILE NO.

XXXXX



NOTES:

1)SLOPE HDPE PIPE TO AREA DRAIN AT 0.5% GRADE

RAIN GARDEN INLET MODIFICATIONS

SCALE: NTS

PROJECT TITLE:
BRADFORD BEACH
STORMWATER IMPROVEMENT PROJECT
RAIN GARDEN DETAILS

MILWAUKEE COUNTY DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS:
1) 5/7/2008 RAIN GARDEN
BY: RF

DESIGN FIRM:
MILWAUKEE COUNTY

DRAWN BY: RF

SCALE: NTS

DATE
MAY 7, 2008

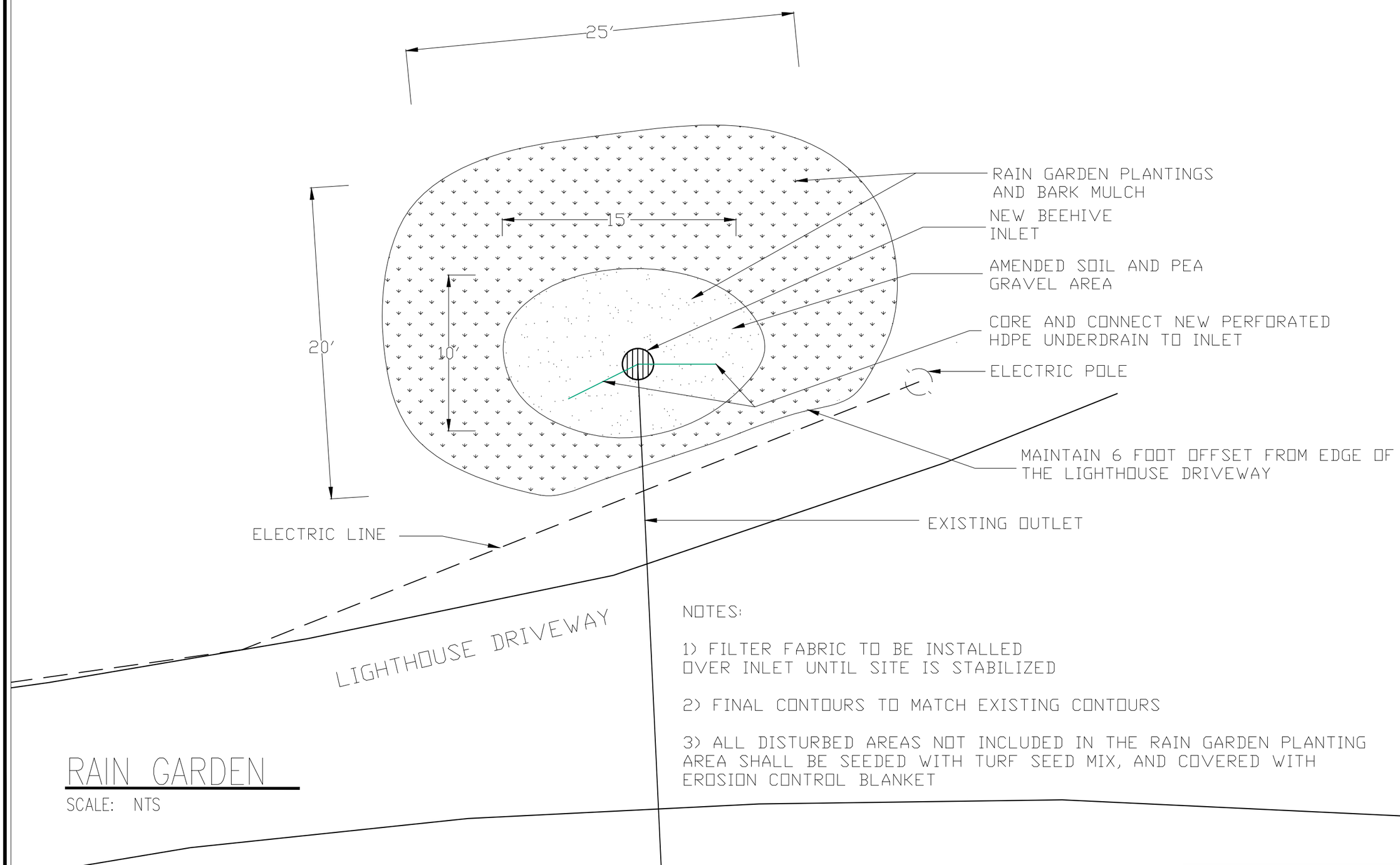
PROJECT
V011-06613-2

SITE NO:

BUILDING NO:
-

SHEET DESCRITION:
RAIN GARDEN DETAILS

SHEET NO.
C2



NOTES:

1) FILTER FABRIC TO BE INSTALLED
OVER INLET UNTIL SITE IS STABILIZED

2) FINAL CONTOURS TO MATCH EXISTING CONTOURS

3) ALL DISTURBED AREAS NOT INCLUDED IN THE RAIN GARDEN PLANTING
AREA SHALL BE SEEDED WITH TURF SEED MIX, AND COVERED WITH
EROSION CONTROL BLANKET

RAIN GARDEN

SCALE: NTS

PROJECT TITLE:
BRADFORD BEACH
STORMWATER IMPROVEMENT PROJECT
RAIN GARDEN DETAILS

MILWAUKEE COUNTY DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS
CITY CAMPUS 2711 W. WELLS ST. SECOND FLOOR MILWAUKEE, WI 53208

REVISIONS:
1) 5/7/2008 RAIN GARDEN
BY: RF

DESIGN FIRM:
MILWAUKEE COUNTY

DRAWN BY: RF

SCALE: NTS

DATE
MAY 7, 2008

PROJECT
V011-06613-2

SITE NO:

BUILDING NO:
-

SHEET DESCRITION:
RAIN GARDEN DETAILS

SHEET NO.
C1

C-5

SPILLWAY PRIOR TO BEING SANDED IN (2008)

SPILLWAY BEGINING
TO SAND IN (2009)

SPILLWAY COMPLETELY SANDED
IN (2012)

Appendix D

County Grounds Pond #2

Appendix D-1: Site Map

Appendix D-2: Inspection and Maintenance Logs

Appendix D-3: O&M Manual

Appendix D-4: Design Plans

D-1

Milwaukee County Grounds Basin 2
Stormwater Structure
Stormwater Sewer
Stormwater Ditchline
Project Limits
N
Inlet
Outfall
Assumed OF 2-3, i3
Assumed OF 2-3, i4
Outfall 2-3, i2
Pond 2-3 Outlet
Outfall 2-2, i1
Outfall 2-3, i1
Pond 2-2 Outlet
Outfall 2-1, i2
Outfall 2-1, i1
Pond 2-1 Outlet

D-2

County Ground Stormwater Pond Inspection

Inspected By: _____ Date: _____

Embankments

	Yes	No
Slumping	_____	_____
Seepage	_____	_____
Animal Holes	_____	_____
Weeds	_____	_____
Erosion	_____	_____
Other Damage	_____	

Outlet Structure & Pipe

	Yes	No
Clogging	_____	_____
Erosion	_____	_____
Tampering	_____	_____

Structural Integrity

Excellent _____ Good _____

Fair _____ Poor _____

Spillway Integrity

Excellent _____ Good _____

Fair Poor

Other Damage _____

Inlets

	Clogging		Erosion		Tampering		Structural Integrity
	Yes	No	Yes	No	Yes	No	(Excellent / Good / Fair / Poor)
Outfall 2-1, i1							
Outfall 2-1, i2							
Outfall 2-2, i1							
Outfall 2-3, i1							
Outfall 2-3, i2							
Outfall 2-3, i3*							
Outfall 2-3, i4*							
Pond 2-1 Outlet							
Pond 2-2 Outlet							
Pond 2-3 Outlet							

* Indicates that this outfall is assumed

Inspection Comments: _____

_____

_____

_____

County Ground Stormwater Pond Maintenance

Maintenance

After 1 Inch Rain Event	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

June	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____
Measure Sediment Depths	_____	_____

Sediment Depth

Sediment levels in the ponds should be marked at the approximate location on the pond site plan. The depth is from the water surface to the bottom. Three different locations in each of the three ponds should be measured.

Pond No.	Location No.	Depth (ft)	Elevation
1	_____	_____	_____
1	_____	_____	_____
1	_____	_____	_____
2	_____	_____	_____
2	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
3	_____	_____	_____
3	_____	_____	_____

October	Yes	No
Trash & Debris Removed	_____	_____
Clogs Repaired	_____	_____

November	Yes	No
Native Species Mowed to Six Inches	_____	_____

As Needed	Methods Used	Species Targeted
Invasive Species Control	_____	_____

Maintenance Comments: _____

_____

_____

D-3

Final Report

Maintenance and Inspection Plan for Basin No. 2

at Milwaukee County Grounds

Milwaukee County, Wisconsin
Project Number: V378-00620

Prepared for

Prepared by:

Earth Tech, Inc.
1020 N. Broadway, Suite 400
Milwaukee, WI 53202

June 2001

TABLE OF CONTENTS

Page

1. INTRODUCTION 1
2. FUNCTION OF POND 1
3. INSPECTIONS 2
4. VEGETATION MANAGEMENT 2
   - 4.1 Woody Plant Control 2
   - 4.2 Noxious Weed Control 2
5. EROSION CONTROL 3
6. STRUCTURAL MAINTENANCE 3
7. DEBRIS AND LITTER REMOVAL 3
8. SEDIMENT REMOVAL 3

LIST OF APPENDICES

Appendix

A Maintenance And Inspection Form

1. INTRODUCTION

This "Annual Maintenance and Inspection Plan" provides information on regular maintenance and inspection tasks required to keep this facility operating efficiently and maintaining an attractive appearance. Maintenance aspects of operating a typical wet detention facility include plant maintenance and control, addressing potential erosion problems, removal of debris from water quality outlet structure, debris and litter removal from pond site, and sediment removal from pond bottom. Comprehensive semi-annual facility investigations should take place in the spring and fall

Milwaukee County DPW – Facilities management is responsible for all aspects of maintenance and inspection of this pond.

2. FUNCTION OF POND

Basin No. 2 is composed of three ponds and approximately 1,000 feet of channel upstream, downstream, and interlinking the ponds. Weirs have been constructed between the ponds to control the water elevation in the individual ponds. The downstream pond is controlled by an outlet structure.

The wet retention pond system is designed to detain, treat, and release stormwater runoff from upland areas. Stormwater runoff enters the west end of the ponds through a swale running along the north side of Wisconsin Avenue. Basin No. 2 drainage area is bounded by, approximately, W. Connell Avenue on the north, Windsor Court on the east, W. Bluemound Road on the south, and N. 94th Street on the west. Approximately 94 acres drain into Basin No. 2.

Pollutants removed by wet retention ponds include sediment, nutrients, heavy metals, oxygen demanding compounds (BOD), hydrocarbons, and bacteria. Pollutant removal in wet retention ponds is primarily due to the settling of particulate pollutants and sediment due to gravity. Better than an 80 percent reduction in total suspended solids (TSS) is expected.

The water quality outlet is designed for the following parameters:

- 2-year storm event discharges entirely through the orifice (8-inch pipe under water) in the water quality structure which are set at elevation 701.4.
- 5-year storm event discharge entirely through the 29-inch orifice in the center weir of the water quality structure, which is set at elevation 701.4.
- 10-year storm event discharges entirely through the 42-inch outlet pipe, which also controls the water level in the pond, which is set at elevation 705.9.
- Storm events greater than the 100-year will discharge through the water quality structure and the pond overflow spillway, which is set at elevation 711.0.

3. INSPECTIONS

The ponds, channels, embankments and vegetation, inlet pipes, wiers, and outlet structure should be inspected twice annually, in the spring and fall. An inspection form is included in the Appendix. The ponds should be checked for excessive sedimentation levels. The depth of the ponds should be checked at several locations. When the pond's bottom is within three feet of the pond surface, bottom sediments should be removed. The pond embankment should be checked for slumping, seepage, animal holes, woody plants, and any other damage. The pond inlets should be checked for clogging, erosion, and any other damage. The pond outlet should be checked for clogging, erosion, spillway integrity and any other damage.

The Grounds Facilities Management Office shall use the information to budget annual maintenance costs for all ponds and keep the completed inspection forms on file.

4. VEGETATION MANAGEMENT

The facility has been restored and seeded with an ecology seed mix.

This wet detention pond can be mowed with equipment currently used by Facilities Management. The facility should be mowed every year in order to avoid the growth of woody plant material (trees and shrubs) adjacent to the pond. Grass shall be mowed to a height of 6 inches. The growth of woody plant material too close to the water edge can block sunlight and inhibit the growth of the prairie plants and emergent plants that benefit the water quality and pollutant removal processes in the pond. This mowing should occur in mid-spring. Fine cutting/trimming around outlet structures and control devices should take place at the same time as the annual mowing. no special equipment is required. Care should be taken not to cut grass down so short as to expose bare ground that can cause erosion in these hydraulically sensitive areas.

4.1 Woody Plant Control

Trees and shrubs may begin to invade the prairie plants around the perimeter of the pond. Nature controlled the invasion of woody plants into prairies with periodic wildfires. For safety reasons, this may not be desirable, even if the fire is controlled. Mowing the site once a year, in mid-spring will prevent woody plants from establishing themselves and control the spread of noxious weeds such as pigweed, queen ann's lace, and giant ragweed. Undesirable larger trees and shrubs will need to be cut down. Additionally, a herbicide application to the cut stumps may be used to prevent regrowth.

4.2 Noxious Weed Control

Invader (non-native) species of plants may colonize recently disturbed ground and potentially dominate at some locations. Some of the more notable undesirable plants include purple loosestrife, *Lythrum salicaria;* reed canary grass, *Phalaris arundinacea;* and Canada thistle, *Cirsium arvense* because of their aggressiveness to form monotypic stands. Using a herbicide that breaks down in water (Rodeo) and selectively spraying individual, unwanted plants can control these plants. Spraying should be done on a calm day. Cardboard may be used behind the plant to not inadvertently spray desirable plants. These plants can also be controlled by pulling them out if the stand is not large and may be preferable before using a herbicide.

5. EROSION CONTROL

Two main types of erosion can occur, rutting of slopes from stormwater runoff and scouring at inlet and outlet areas. All side slopes have been designed generally with a maximum slope of 4:1 horizontal to vertical, except in some areas where 3:1 slopes were designed. All exposed areas were seeded at construction. Once vegetation is established, side slope erosion is not expected to occur. If erosion does occur, a determination must be made as to the cause. A common cause of erosion is a concentrated flow coming from overland areas discharging down side slopes. If the cause of erosion is bare soil, the area should be reseeded and mulched with the specified ecology seed mix. If concentrated flow is determined to be the cause, a slight re-grading to spread the flow over a wider area and restoration with seed and mulch will likely mitigate this problem. It may be necessary to use erosion control matting or other erosion control devices to protect exposed soil until vegetation is established.

Erosion can also occur in the spillway, near the inlet pipes, and near the outlet structure. This type of erosion will likely require replacing displaced riprap with appropriately sized material or adding new riprap.

General observations for erosion should be made during normal grass cutting periods. Inlet and outlet areas should be checked for erosion during spring and fall inspections and after storm events. More frequent inspection (after smaller storms) is recommended during the first year of operation.

6. STRUCTURAL MAINTENANCE

Periodically, the outlet structure may clog with debris. The most likely materials include woody vegetation, paper, plastics, and other light debris. The outlet structure should be checked for debris accumulation during normal grass cutting after large storm events, and during spring and fall annual inspections. During the semi-annual inspections, the outlet structure should be checked for evidence of tampering, structural degradation, structural integrity (rusting, cracking, etc.) and sediment accumulation. In addition, the drain valves for the ponds should be operated and reseated to avoid seizure of the valves.

7. DEBRIS AND LITTER REMOVAL

During routing mowing operations and after each major storm, debris and litter should be removed from the site, especially from the outlet structure and water surface.

8. SEDIMENT REMOVAL

The ponds should be checked during the spring and fall inspections for excessive sediment buildup. if the semi-annual inspections of the ponds reveal that the bottom elevations are within three feet of the water surface, bottom sediment should be removed. Sediment should be removed from the pond and forebay to a depth of five feet below the water surface.

We recommend dredging be done during the winter months for two reasons. The ground will be frozen in winter and the plants will be dormant which will reduce damage to the pond. The pond should be drawn down in fall by opening the valves located northeast of the ponds. This will allow time for the safety shelf to dry out. Once the frost has set,

the safety shelf may then be used as a roadway and platform to perform the dredging operations. The upstream pond is small enough to be excavated with a backhoe and dump truck.

Appropriate agency review and permitting will be required as part of the dewatering and dredging of the pond. This will require testing and proper disposal of the sediments. It is expected that the uppermost pond will require cleaning every 5-15 years and the two downstream ponds less frequently

APPENDIX A

MAINTENANCE AND INSPECTION FORM

WET DETENTION POND
SEMI-ANNUAL INSPECTION FORM

Pond No.: _____ Location: _____

Pond Inspected by: _____ Date: _____

Pond

Sediment Levels in the Pond (mark approximate location on pond site plan). Depth is from water surface to bottom

Location No.	Depth (feet)

When the pond bottom is within three feet of the pond surface, bottom sediments should be removed.

Channel

	Yes	No
Slumping	☐	☐
Seepage	☐	☐
Animal Holes	☐	☐
Woody Plants	☐	☐
Weeds	☐	☐
Erosion	☐	☐
Other Damage	_____	

Additional Comments

_____

_____

_____

_____

Embankments

	Yes	No
Slumping	☐	☐
Seepage	☐	☐
Animal Holes	☐	☐
Woody Plants	☐	☐
Weeds	☐	☐
Erosion	☐	☐
Other Damage	_____	

Inlet Pipes

	Yes	No
Clogging	☐	☐
Erosion	☐	☐

Structural Integrity

Excellent ☐ Good ☐

Fair ☐ Poor ☐

Other Damage _____

Outlet Structure, Weirs, & Pipe

	Yes	No
Clogging	☐	☐
Erosion	☐	☐
Tampering	☐	☐

Structural Integrity

Excellent ☐ Good ☐

Fair ☐ Poor ☐

Spillway Integrity

Excellent ☐ Good ☐

Fair ☐ Poor ☐

Other Damage _____

Additional Comments

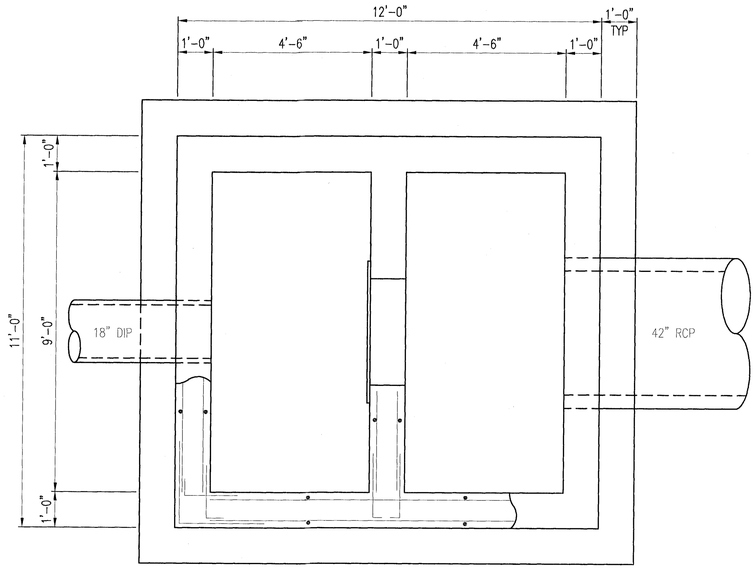
_____

_____

_____

_____

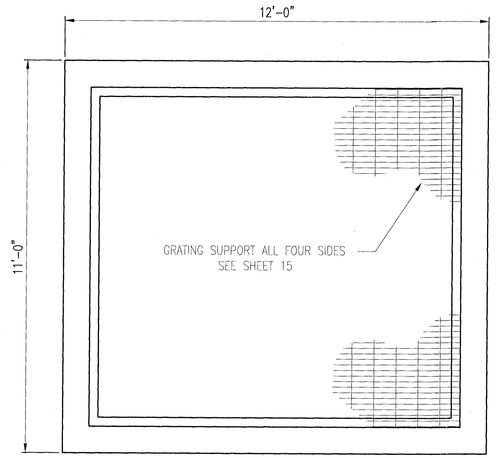
D-4



NOTE: REINF SHOWN #5@12" EW EF

LOWER PLAN

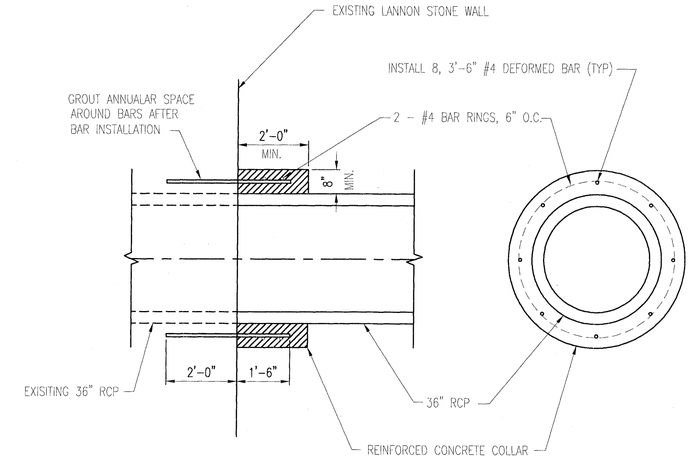
1" = 2'-0"



NOTE: GRATE SHALL HAVE MINIMUM 2 FASTENER DEVICES TO GRATING SUPPORTS PER GRATE SECTION.

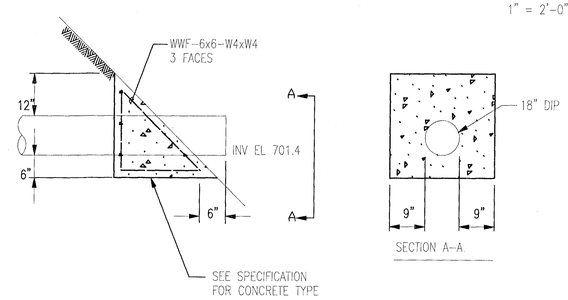
UPPER PLAN

1" = 2'-0"



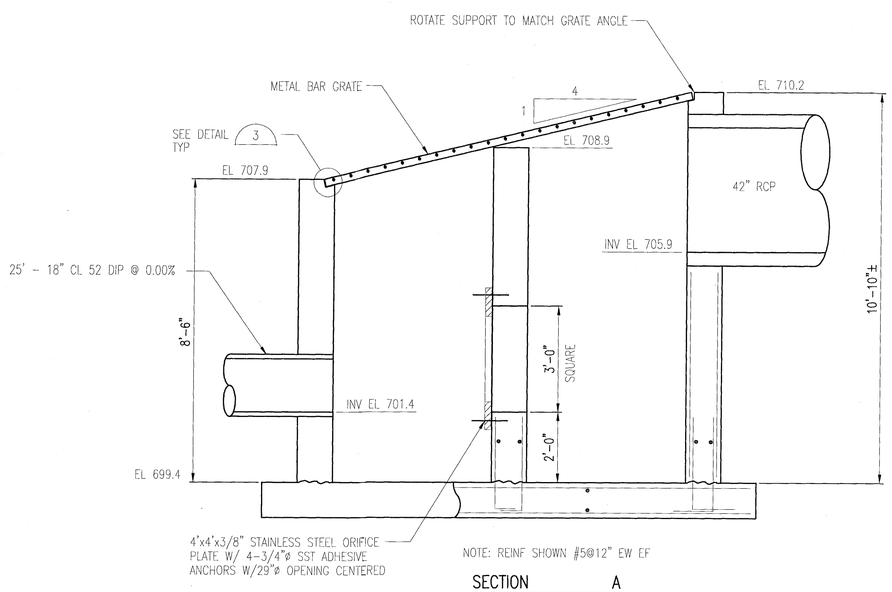
CONCRETE COLLAR CONNECTION DETAIL

1" = 2'-0"



CONCRETE PIPE ANCHOR DETAIL

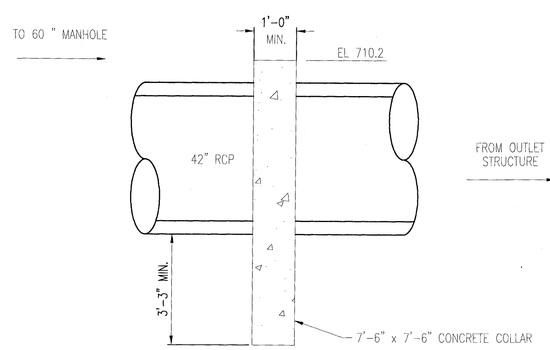
NTS



NOTE: REINF SHOWN #5@12" EW EF

SECTION A

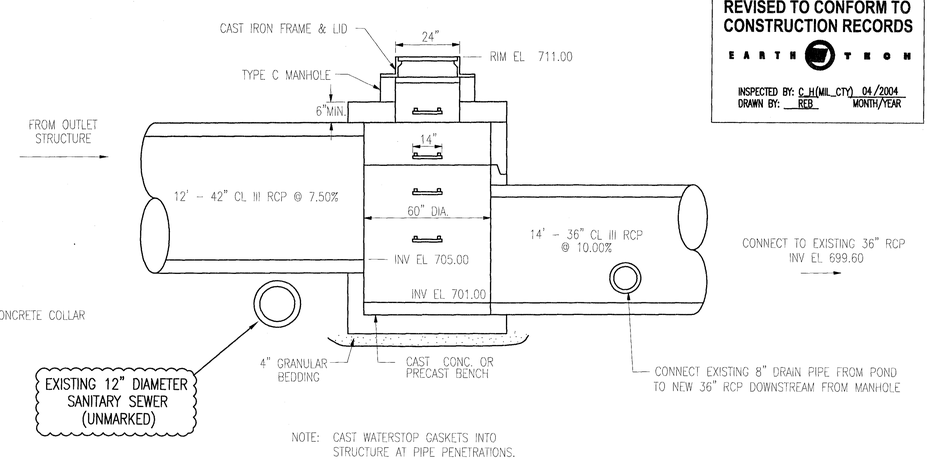
1" = 2'-0"



NOTE: INSTALL COLLAR BETWEEN OUTLET STRUCTURE AND MANHOLE.

ANTI-SEEP COLLAR

NTS



NOTE: CAST WATERSTOP GASKETS INTO STRUCTURE AT PIPE PENETRATIONS.

MANHOLE TYPE C DETAIL

NTS

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

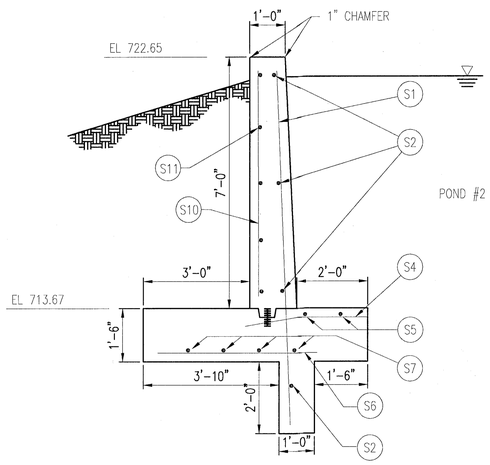
REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

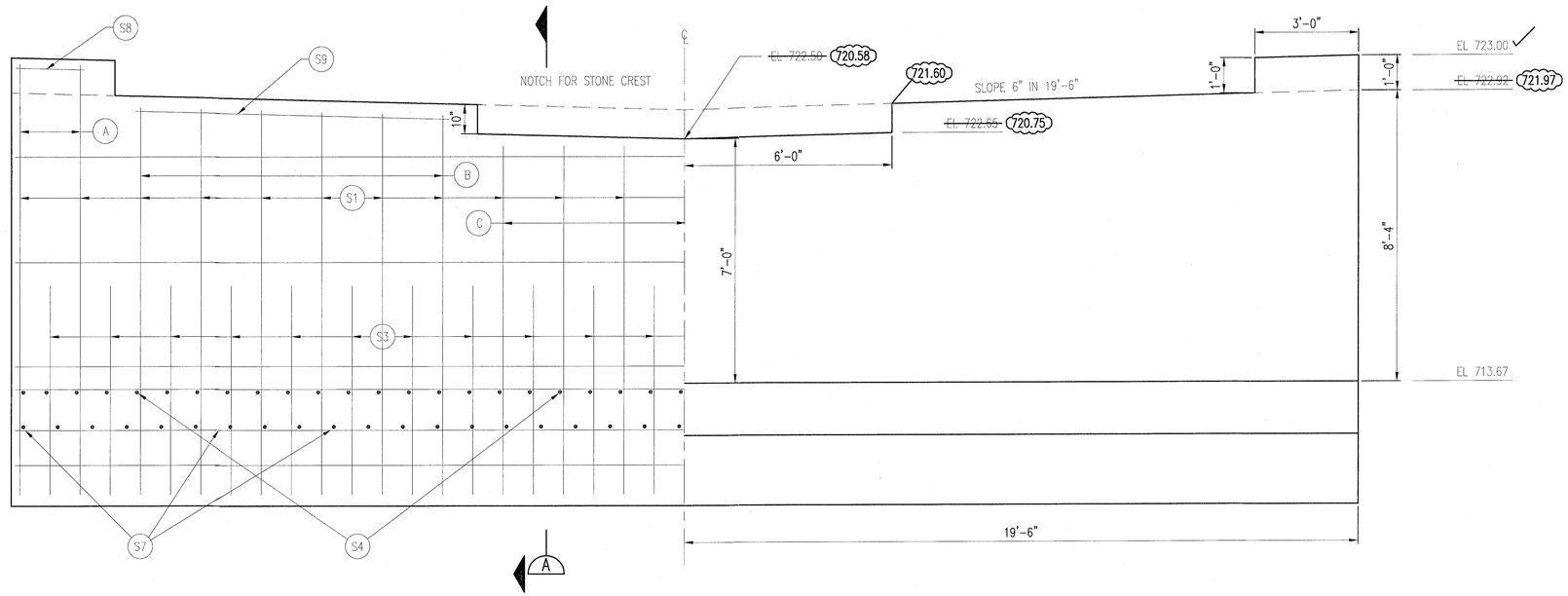
PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: **OUTLET STRUCTURE**

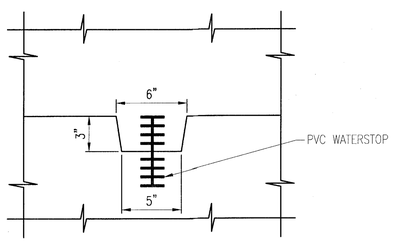
PROJECT NO. V378-00620



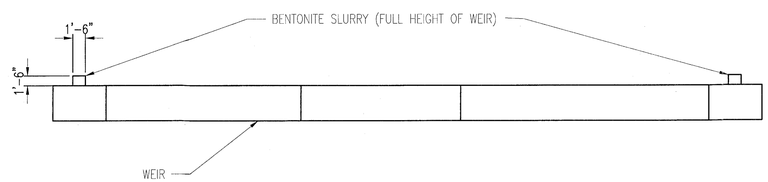
SECTION A
1" = 2'-0"



FRONT ELEVATION (LOOKING UPSTREAM)
1" = 2'-0"



CONSTRUCTION JOINT DETAIL
NTS



PLAN VIEW
NTS

BILL OF BARS

NO.	MARK	SIZE	LENGTH	SPACING	LOCATION & DETAIL
4	S1A	#5	12'-5"	21" C to C	VERTICAL IN STEM
12	S1B	#5	11'-2"	21" C to C	VERTICAL IN STEM
7	S1C	#5	10'-2"	21" C to C	VERTICAL IN STEM
8	S2	#4	21'-0"	3" C to C	LONGITUDINAL IN STEM
22	S3	#5	6'-0"	21" C to C	VERTICAL IN STEM
45	S4	#4	3'-0"	10½" Cs	TRANS IN FOOT TOP OF HEEL
4	S5	#4	21'-0"	12" APART	LONG IN FOOT TOP OF HEEL
39	S6	#5	4'-6"	12" C to C	TRANS IN FOOT BOTTOM OF TOE
8	S7	#4	21'-0"	12" APART	LONG IN FOOT BOTTOM OF TOE
2	S8	#4	2'-0"	-------	LONGITUDINAL IN STEM
2	S9	#4	9'-0"	-------	LONGITUDINAL IN STEM
40	S10	#4	6'-8"	12" C to C	TEMPERATURE STEEL
10	S11	#4	21'-0"	12" C to C	TEMPERATURE STEEL

REVISED TO CONFORM TO CONSTRUCTION RECORDS
EARTH TECH
INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

WEIR STRUCTURE

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: WEIR STRUCTURE

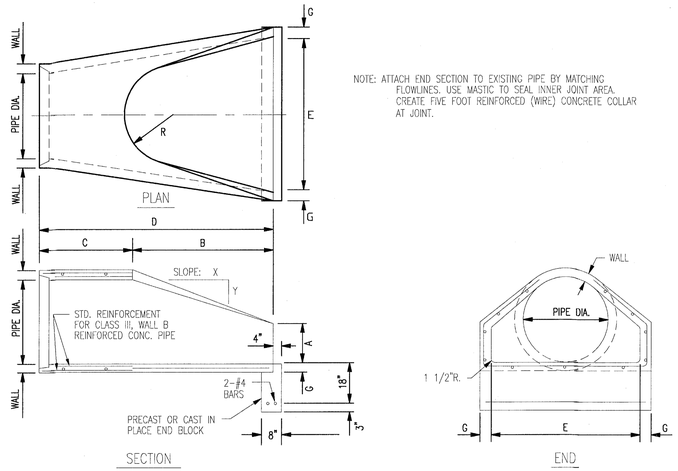
PROJECT NO. V378-00620

SHEET NO. 13 OF 15

FILE NO.

81250 101-B-098

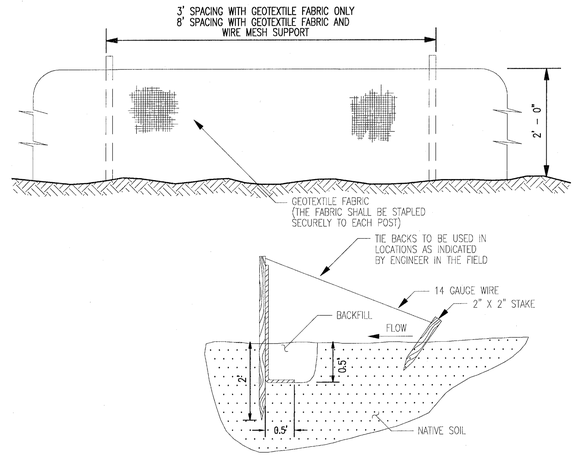
PIPE DIA.	WT. (lbs.)	WALL	A	B	C	D	E	G	R	SLOPE
30"	2190	3"	12"	54"	19"	73"	60"	3"	15"	3:1



NOTE: ATTACH END SECTION TO EXISTING PIPE BY MATCHING FLOWLINES. USE MASTIC TO SEAL INNER JOINT AREA. CREATE FIVE FOOT REINFORCED (WIRE) CONCRETE COLLAR AT JOINT.

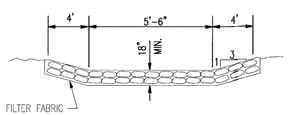
PRECAST REINFORCED CONCRETE FLARED END SECTION DETAIL (9)

NTS 11|12

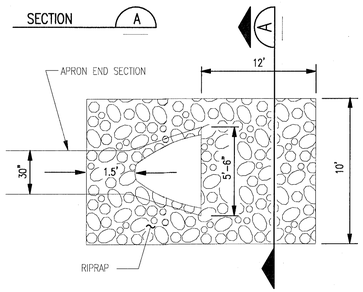


FILTER FABRIC (SILT) FENCE DETAIL (10)

NTS 3|12

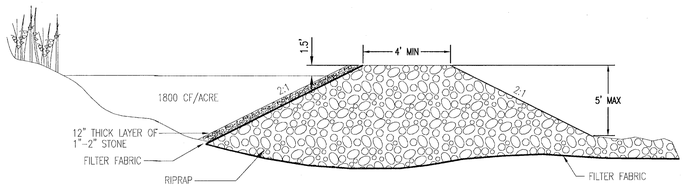


SECTION (A)

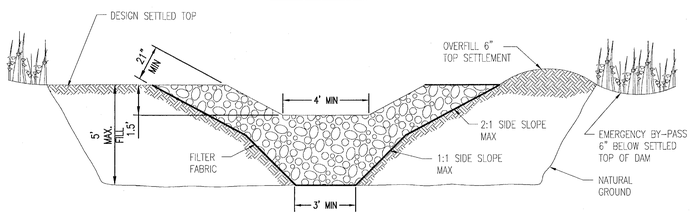


RIPRAP AT 30" END SECTION DETAIL (11)

NTS 4|12



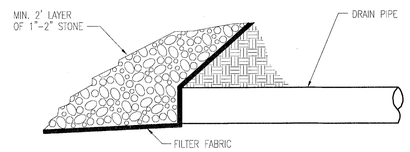
CROSS SECTION



SECTION

TEMPORARY SEDIMENT TRAP DETAIL (12)

NTS 3|12



TEMPORARY DRAIN SEDIMENT TRAP DETAIL (13)

NTS 3|12

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

MISCELLANEOUS DETAILS

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

SCALE: AS NOTED
DRAWN BY: RB
DATE: 05-25-01
CHECKED BY: MEH

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

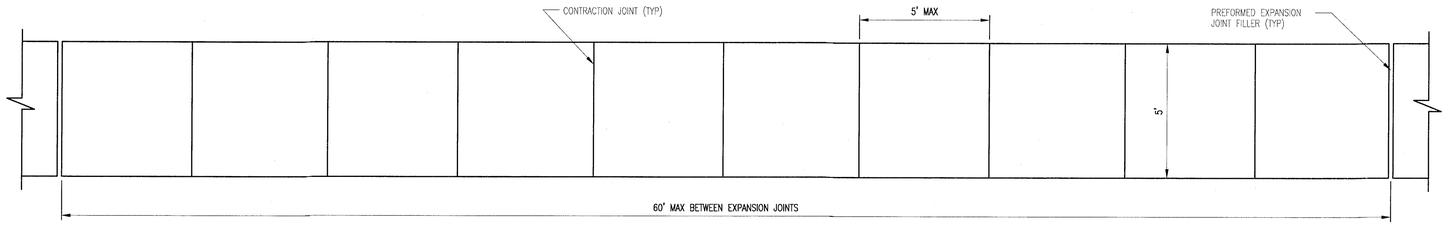
SHEET DESCRIPTION: MISCELLANEOUS DETAILS

PROJECT NO. V378-00620

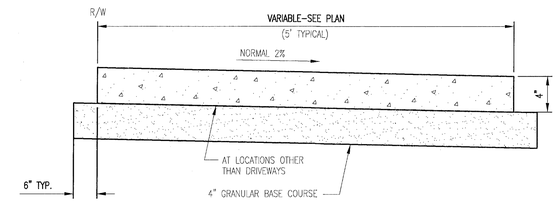
SHEET NO. 12 OF 15

FILE NO.

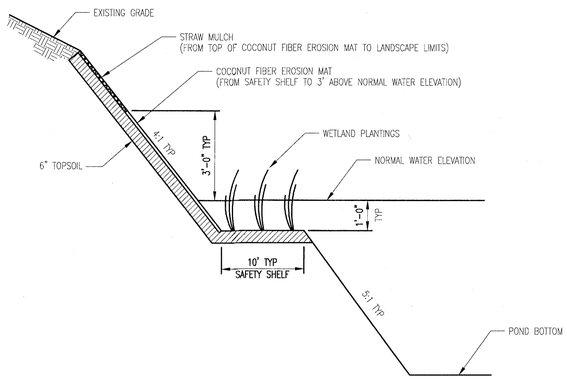
81251 101-5-029



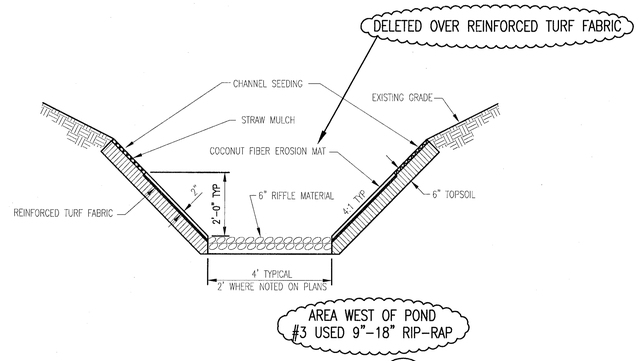
CONCRETE SIDEWALK DETAIL 1
NTS 10 | 11



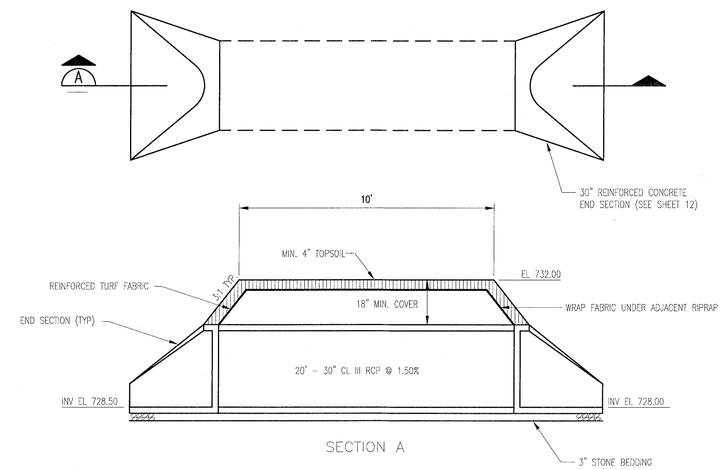
CONCRETE SIDEWALK SECTION 2
NTS 10 | 11



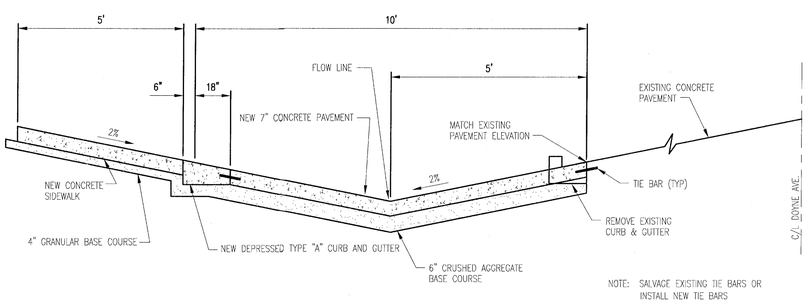
TYPICAL POND CROSS SECTION 3
NTS 4 | 11



TYPICAL CHANNEL CROSS SECTION 4
NTS 4 | 11

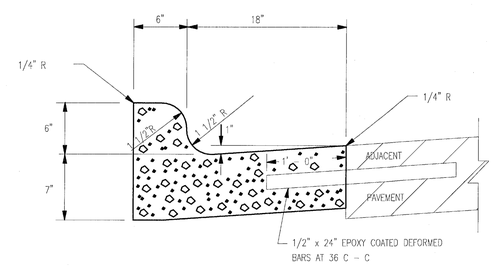


CULVERT CROSSING DETAIL 5
NTS 4 | 11



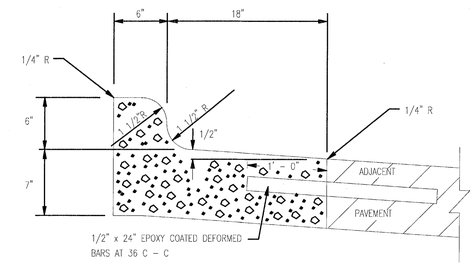
NOTE: SALVAGE EXISTING TIE BARS OR INSTALL NEW TIE BARS

DISABLED LOADING/UNLOADING ZONE DETAIL 6
NTS 10 | 11
ALTERNATIVE BID #1



TYPE "A" (INCLUDING TIE BARS)

STANDARD 24" CURB & GUTTER 7
NTS 10 | 11
ALTERNATIVE BID #1



TYPE "A" (INCLUDING TIE BARS)

REVERSE-PITCH 24" CURB & GUTTER 8
NTS 10 | 11
ALTERNATIVE BID #1

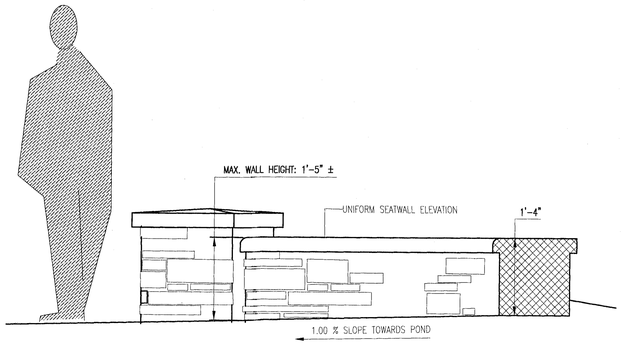
REVISED TO CONFORM TO CONSTRUCTION RECORDS
EARTH TECH
INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

MISCELLANEOUS DETAILS

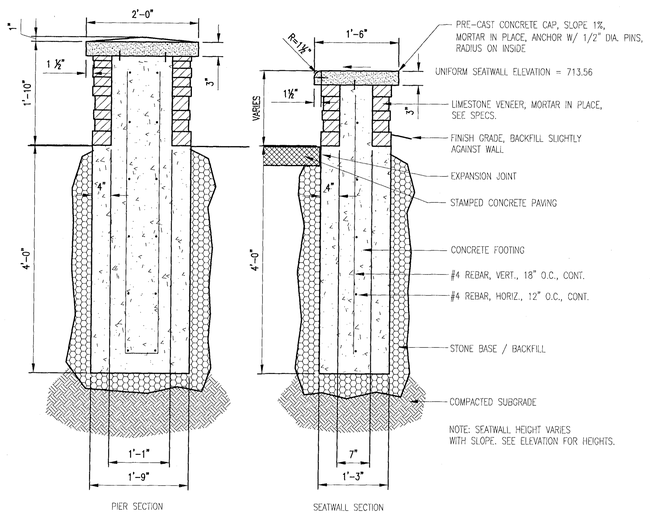
MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE,WISCONSIN 53233

REVISIONS:
DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01
PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS
SHEET DESCRIPTION: MISCELLANEOUS DETAILS
PROJECT NO. V378-00620
SHEET NO. 11 OF 15
FILE NO.

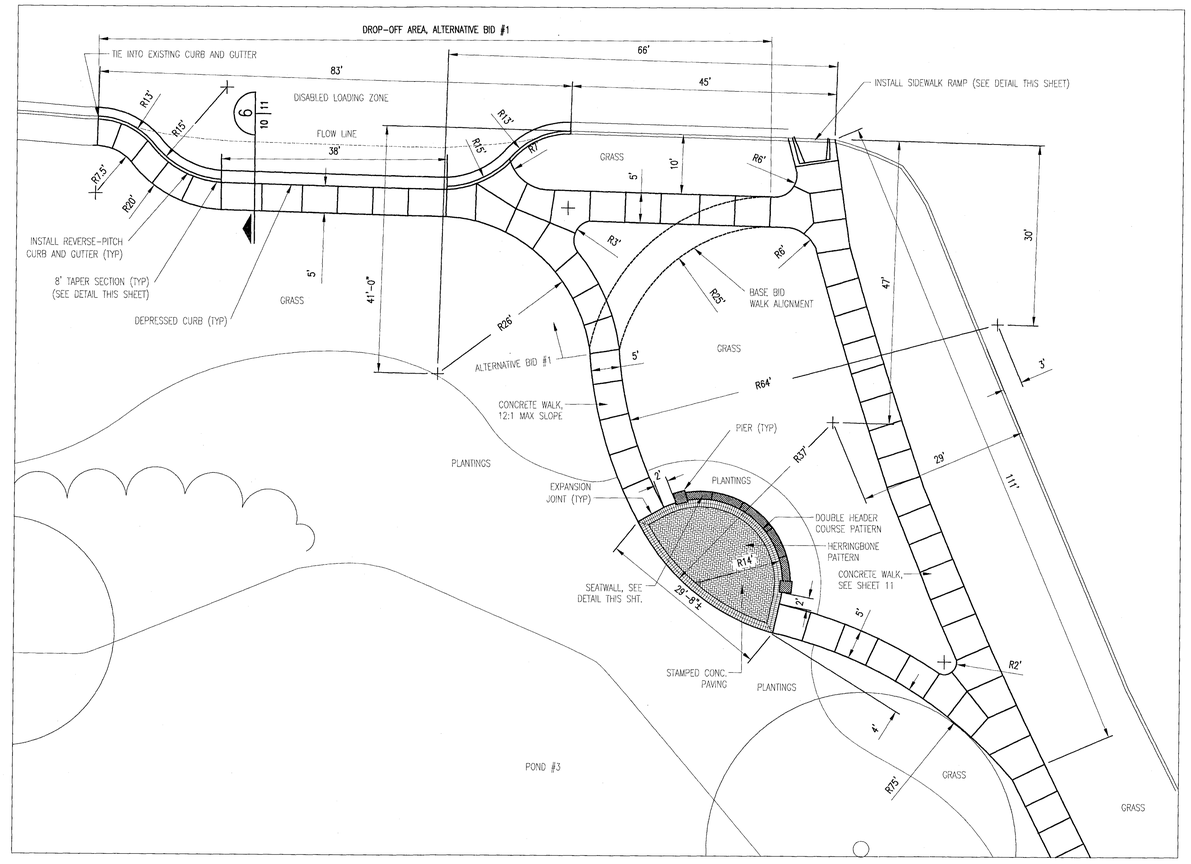
81252 101-G-030



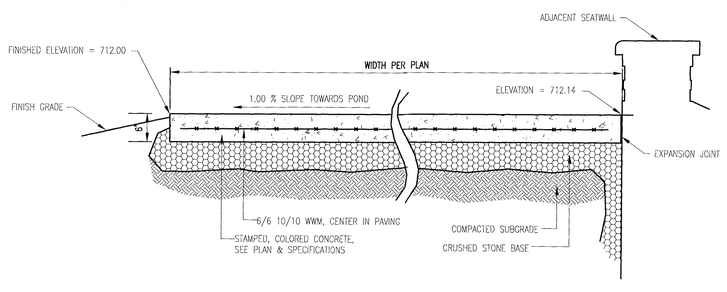
SEATWALL & PIER ELEVATION
NTS



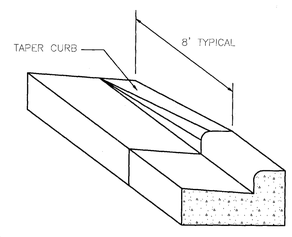
SEATWALL & PIER SECTIONS
NTS



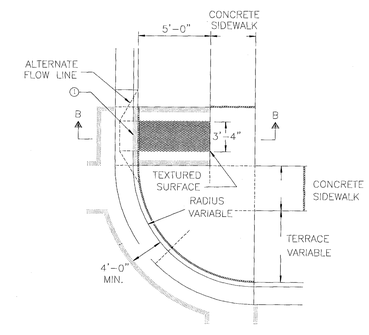
OVERLOOK AND DROP-OFF LAYOUT PLAN
NTS



STAMPED, COLORED CONCRETE SECTION
NTS

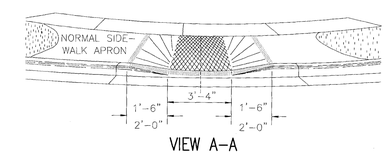


CURB TAPER DETAIL
NTS

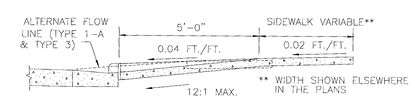


PLAN VIEW

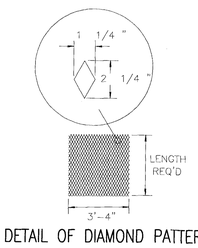
SIDEWALK (TYPE 3) RAMP
(OUTSIDE OF CROSSWALK AREA)



VIEW A-A



SECTION B-B



DETAIL OF DIAMOND PATTERN

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

OVERLOOK DETAILS

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

COURTHOUSE ANNEX

REVISIONS:

SCALE: AS NOTED
DATE: 05-25-01
DRAWN BY: RB
CHECKED BY: MEH

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: OVERLOOK DETAILS

PROJECT NO. V378-00620

SHEET NO. 10 OF 15

FILE NO.

81253 101-G-031

NOTES:

1. SEE SHEET 8 FOR PLANT SCHEDULE.

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004
DRAWN BY: RED MONTH/YEAR

LANDSCAPE PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

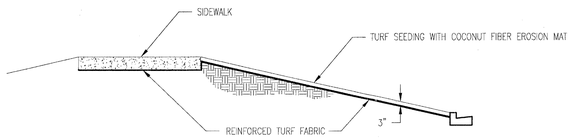
SHEET DESCRIPTION: **LANDSCAPE PLAN**

PROJECT NO. V378-00620

SHEET NO. 9 OF 15

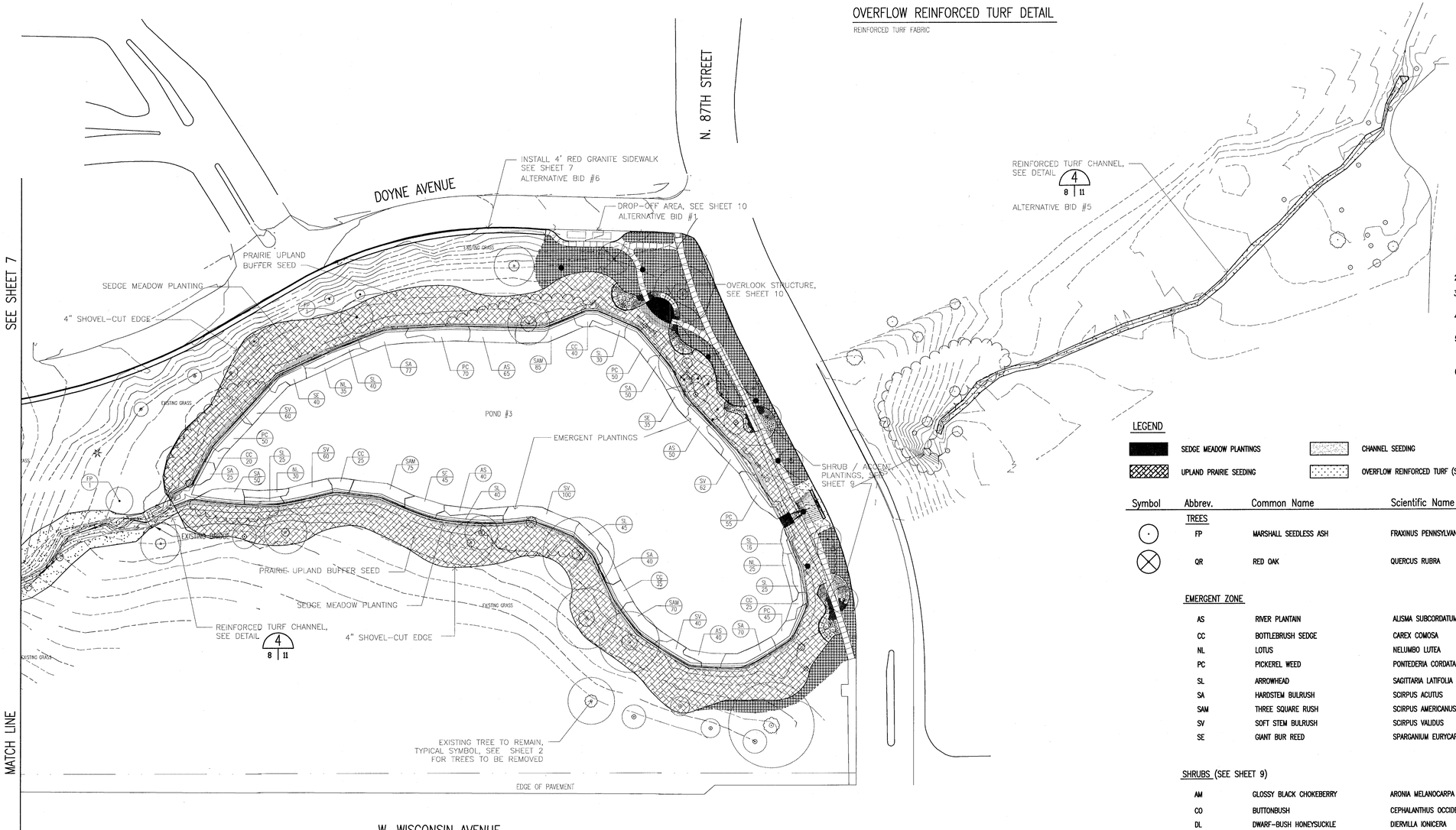
FILE NO.

81254 101-G-032



OVERFLOW REINFORCED TURF DETAIL

REINFORCED TURF FABRIC



REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: RBB MONTH/YEAR

NOTES:

1. WETLAND PLANTS ARE SHOWN IN THEIR FINAL LOCATIONS. ADJUST LOCATIONS AS NECESSARY TO PREVENT SUBMERSION OF PLANT LEAVES.
2. SEE SPECIFICATIONS FOR DETAILED PLANTING INSTRUCTIONS.
3. EXISTING TREES OUTSIDE LIMITS OF EXCAVATION TO REMAIN. (SEE SHEET 2 FOR REMOVAL PLAN)
4. COVER ALL SEEDED AREAS WITH COCONUT FIBER EROSION CONTROL MAT. AFTER SEEDING.
5. DECOMPOSED RED GRANITE SIDEWALK SHALL BE 4' WIDE. INSTALL TYPAR FABRIC (WEED BARRIER FABRIC MODEL # 3201) UNDER GRANITE SIDEWALK. SEE DETAIL SHEET 7.
6. AVERAGE WIDTH OF SEDGE MEADOW PALNTING IS 6 FEET. MIN. 2 PLANTS PER ROW.

LEGEND

- SEDGE MEADOW PLANTINGS
- CHANNEL SEEDING
- TURF RESTORATION (INCLUDE TOPSOIL, SEED, FERTILIZER, AND MULCH)
- UPLAND PRAIRIE SEEDING
- OVERFLOW REINFORCED TURF (SEE DETAIL THIS SHEET)

Symbol	Abbrev.	Common Name	Scientific Name	Qty. This Sheet	Size	Cond.	Spacing
	TREES						
⊙	FP	MARSHALL SEEDLESS ASH	FRAXINUS PENNSYLVANIA IAN. "MARSHALL"	5	3" CAL.	B/B	As shown
⊗	QR	RED OAK	QUERCUS RUBRA	1	4" CAL.	B/B	As shown
	EMERGENT ZONE						
	AS	RIVER PLANTAIN	ALISMA SUBCORDATUM	195	1 GAL.	CONT.	36" O.C.
	CC	BOTTLEBRUSH SEDGE	CAREX COMOSA	145	1 GAL.	CONT.	36" O.C.
	NL	LOTUS	NELUMBO LUTEA	420	1 GAL.	CONT.	36" O.C.
	PC	PICKEREL WEED	PONTEDERIA CORDATA	270	1 GAL.	CONT.	36" O.C.
	SL	ARROWHEAD	SAGITTARIA LATIFOLIA	221	1 GAL.	CONT.	36" O.C.
	SA	HARDSTEM BULRUSH	SCIRPUS ACUTUS	312	1 GAL.	CONT.	36" O.C.
	SAM	THREE SQUARE RUSH	SCIRPUS AMERICANUS	230	1 GAL.	CONT.	36" O.C.
	SV	SOFT STEM BULRUSH	SCIRPUS VALIDUS	322	1 GAL.	CONT.	36" O.C.
	SE	GIANT BUR REED	SPARGANIUM EURYCAPUM	120	1 GAL.	CONT.	36" O.C.
	SHRUBS (SEE SHEET 9)						
	AM	GLOSSY BLACK CHOKEBERRY	ARONIA MELANOCARPA VAR. ELATA	26	36" HT.	B/B	48" O.C.
	CO	BUTTONBUSH	CEPHALANTHUS OCCIDENTALIS	20	1 GAL.	CONT.	As shown
	DL	DWARF-BUSH HONEYSUCKLE	DIERVILLA IONICERA	25	2 GAL.	CONT.	54" O.C.
	HR	HAPPY RETURNS DAYLILY	HEMEROCALLIS 'HAPPY RETURNS'	114	1 GAL.	CONT.	18" O.C.
	IS	SIBERIAN IRIS	IRIS SIBERICA x 'SUPER EGO'	20	1 GAL.	CONT.	24" O.C.
	RA	GRO-LOW FRAGRANT SUMAC	RHUS AROMATICA 'GRO-LOW'	41	2 GAL.	CONT.	48" O.C.
	SF	FROEBEL'S SPIREA	SPIREA x BUMALDA 'FROEBELII'	81	2 GAL.	CONT.	42" O.C.
	VD	JUDD VIBURNUM	VIBURNUM x JUDDI	4	36" HT.	B/B	As Shown

LANDSCAPE PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: LANDSCAPE PLAN

PROJECT NO. V378-00620

SHEET NO. 8 OF 15

FILE NO.

81255 101-G-033

LEGEND

SEDGE MEADOW PLANTINGS

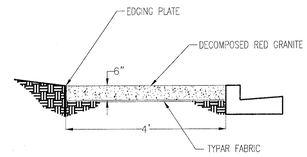
UPLAND PRAIRIE SEEDING

CHANNEL SEEDING

Symbol	Abbrev.	Common Name	Scientific Name	Qty. This Sheet	Size	Cond.	Spacing
	TREES						
⊙	FP	MARSHALL SEEDLESS ASH	FRAXINUS PENNSYLVANIA IAN. "MARSHALL"	4	3" CAL.	B/B	As shown
	EMERGENT ZONE						
	AS	RIVER PLANTAIN	ALISMA SUBCORDATUM	54	1 GAL.	CONT.	36" O.C.
	CC	BOTTLEBRUSH SEDGE	CAREX COMOSA	215	1 GAL.	CONT.	36" O.C.
	NL	LOTUS	NELUMBO LUTEA	131	1 GAL.	CONT.	36" O.C.
	PC	PICKEREL WEED	PONTEDERIA CORDATA	251	1 GAL.	CONT.	36" O.C.
	SL	ARROWHEAD	SAGITTARIA LATIFOLIA	231	1 GAL.	CONT.	36" O.C.
	SA	HARDSTEM BULRUSH	SCIRPUS ACUTUS	355	1 GAL.	CONT.	36" O.C.
	SAM	THREE SQUARE RUSH	SCIRPUS AMERICANUS	239	1 GAL.	CONT.	36" O.C.
	SV	SOFT STEM BULRUSH	SCIRPUS VALIDUS	316	1 GAL.	CONT.	36" O.C.
	SE	GIANT BUR REED	SPARGANIUM EURYCAPUM	180	1 GAL.	CONT.	36" O.C.

NOTES:

1. WETLAND PLANTS ARE SHOWN IN THEIR FINAL LOCATIONS. ADJUST LOCATIONS AS NECESSARY TO PREVENT SUBMERSION OF PLANT LEAVES.
2. SEE SPECIFICATIONS FOR DETAILED PLANTING INSTRUCTIONS.
3. EXISTING TREES OUTSIDE LIMITS OF EXCAVATION TO REMAIN. (SEE SHEET 2 FOR REMOVAL PLAN)
4. COVER ALL SEEDED AREAS, WITH COCONUT FIBER EROSION CONTROL MAT AFTER SEEDING.
5. DECOMPOSED RED GRANITE SIDEWALK SHALL BE 4' WIDE. INSTALL TYPAR FABRIC (WEED BARRIER FABRIC MODEL # 3201) UNDER GRANITE SIDEWALK. (SEE DETAIL THIS SHEET)
6. AVERAGE WIDTH OF SEDGE MEADOW PLANTING IS 6 FEET. MIN. 2 PLANTS PER ROW.



RED GRANITE SIDEWALK DETAIL

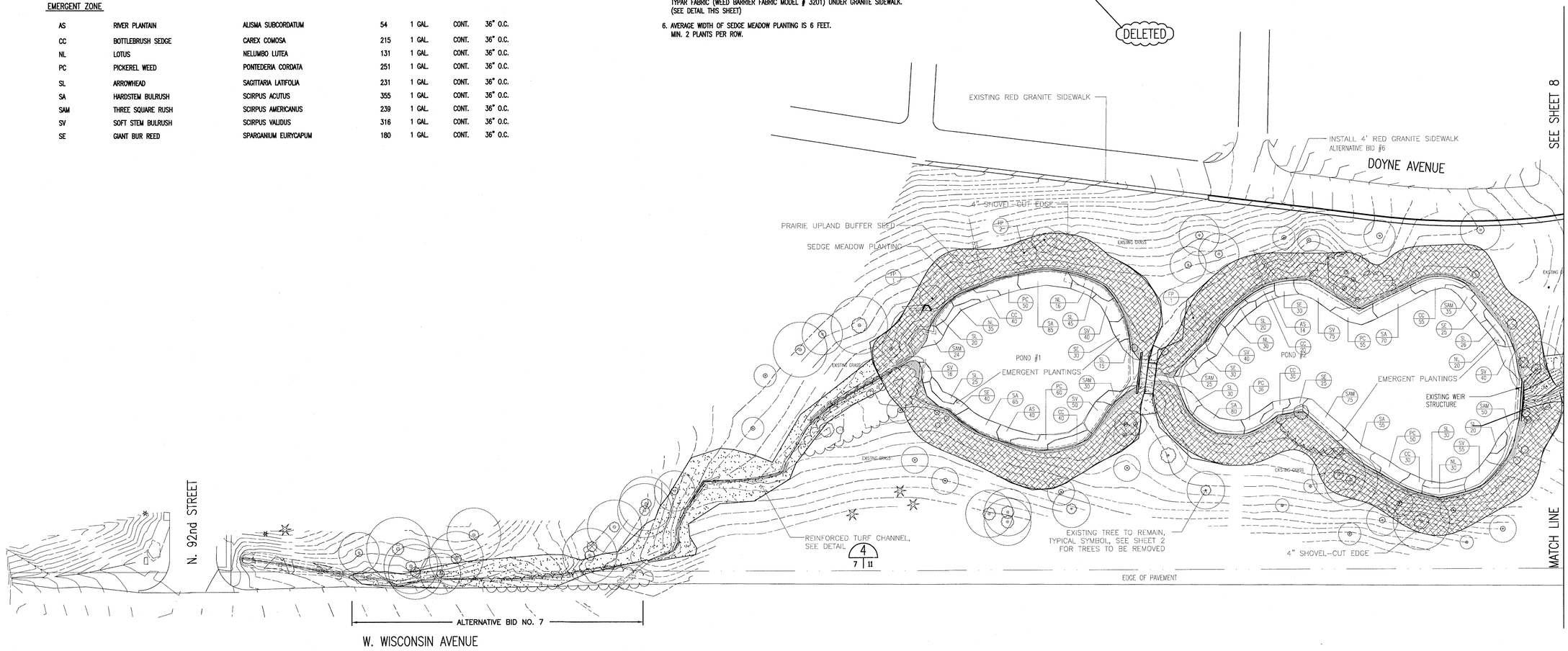
NTS

ALTERNATIVE BID #6

DELETED

N

SCALE 50' 100'



REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004

DRAWN BY: REB MONTH/YEAR

LANDSCAPE PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

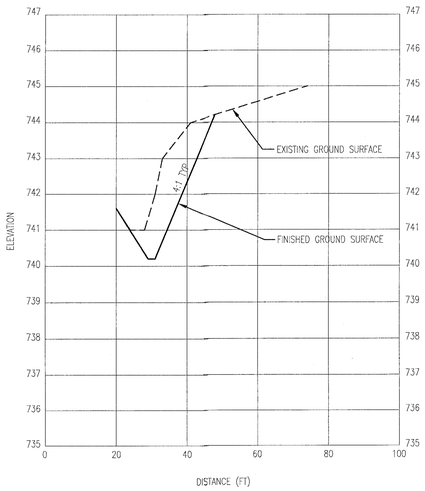
SHEET DESCRIPTION: LANDSCAPE PLAN

PROJECT NO. V378-00620

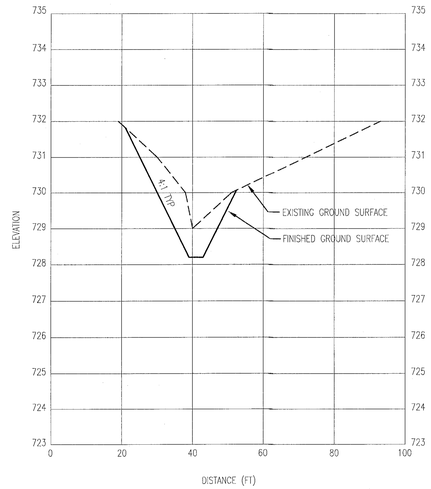
SHEET NO. 7 OF 15

FILE NO.

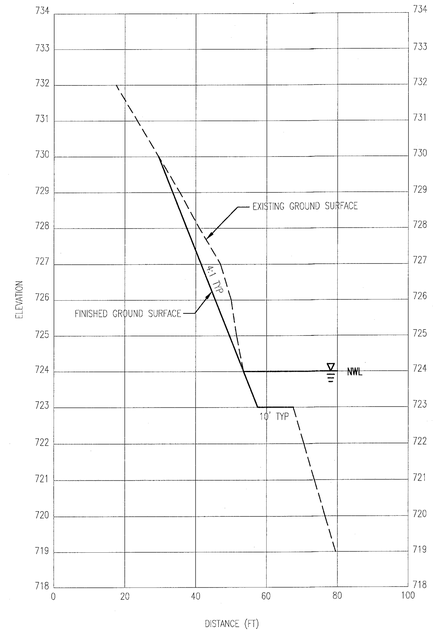
81256 101-6-034



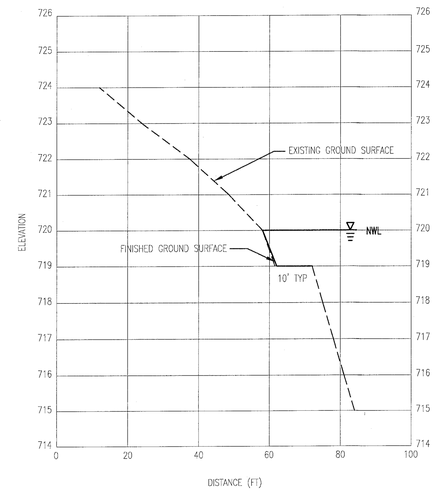
SECTION A
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 4



SECTION B
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 4

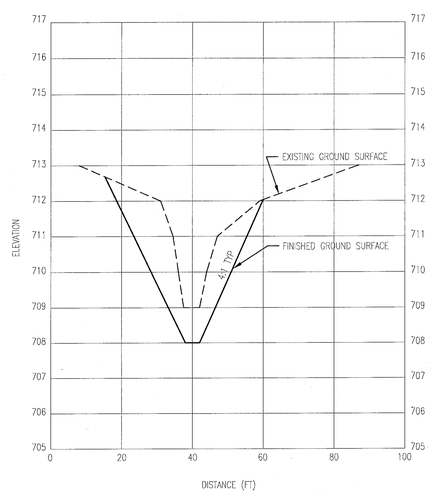


SECTION C
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 4

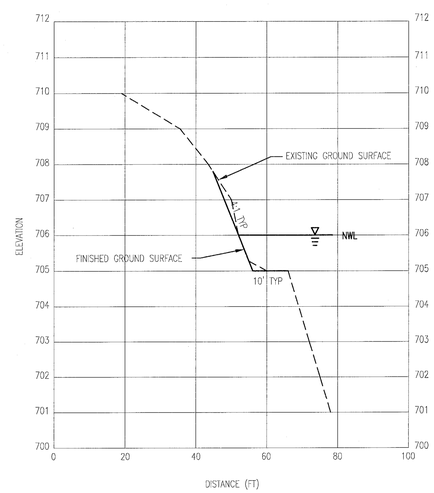


SECTION D
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 4

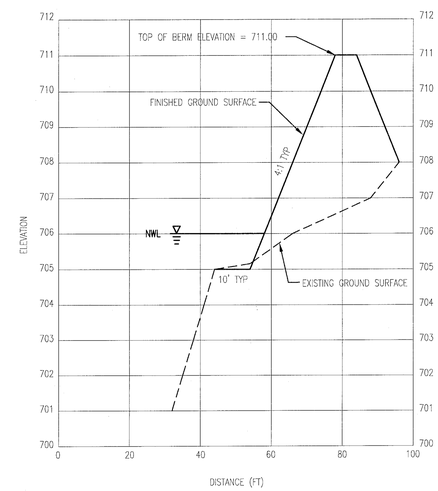
ALTERNATIVE BID NO. 7



SECTION E
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 5



SECTION F
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 5



SECTION G
SCALE: HOR.-1"=20' VER.-1"=2'
6 | 5

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

CROSS SECTIONS

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

SCALE: AS NOTED
DATE: 05-25-01
DRAWN BY: RB
CHECKED BY: MEH

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: CROSS SECTIONS

PROJECT NO. V378-00620

SHEET NO. 6 OF 15

FILE NO.

81257 101-G-035

GENERAL NOTES:

1. SEE DETAIL 4/5|11 FOR TYPICAL CHANNEL CROSS SECTION.
2. SEE DETAIL 3/5|11 FOR TYPICAL POND CROSS SECTION.
3. CONTRACTOR MAY ADJUST SLOPES ON PROPOSED GRADING TO SAVE TREES NOT MARKED FOR REMOVAL IN THE REMOVALS PLAN; SLOPE ADJUSTMENTS SHALL BE NO STEEPER THAN 3:1.
4. EXISTING VALVE VAULTS LOCATED ON SITE ALLOW WATER LEVELS TO BE DRAWN DOWN IN THE PONDS DURING CONSTRUCTION. CONTRACTOR SHALL CONFIRM THE LOCATION OF THE VALVE VAULTS AND SHALL HAVE OWNER OPERATE.
5. POND DREDGING LIMITS ARE DETAILED IN APPENDIX A OF THE SPECIFICATIONS AND IN THE "ENGINEERING FEASIBILITY STUDY ON STORMWATER MANAGEMENT ACTIVITIES AT THE MILWAUKEE COUNTY GROUNDS" PREPARED BY HEY AND ASSOCIATES, INC.
6. ALL PROPOSED GRADES ABOVE SAFETY SHELF ARE 4:1 UNLESS OTHERWISE INDICATED. ALL PROPOSED GRADES BELOW THE SAFETY SHELF ARE 5:1 UNLESS OTHERWISE INDICATED.
7. REMOVE STONE BEDDING AND SEDIMENT TRAP PRIOR TO FILLING HOLE. FILL HOLE WITH CLAY MATERIAL PRIOR TO INSTALLING PIPE. PIPE IS TO BE INSTALLED WITH CLAY BEDDING AND BACKFILL. PROVIDE ANTI-SEEP COLLAR AFTER INSTALLATION OF CONCRETE PIPE.

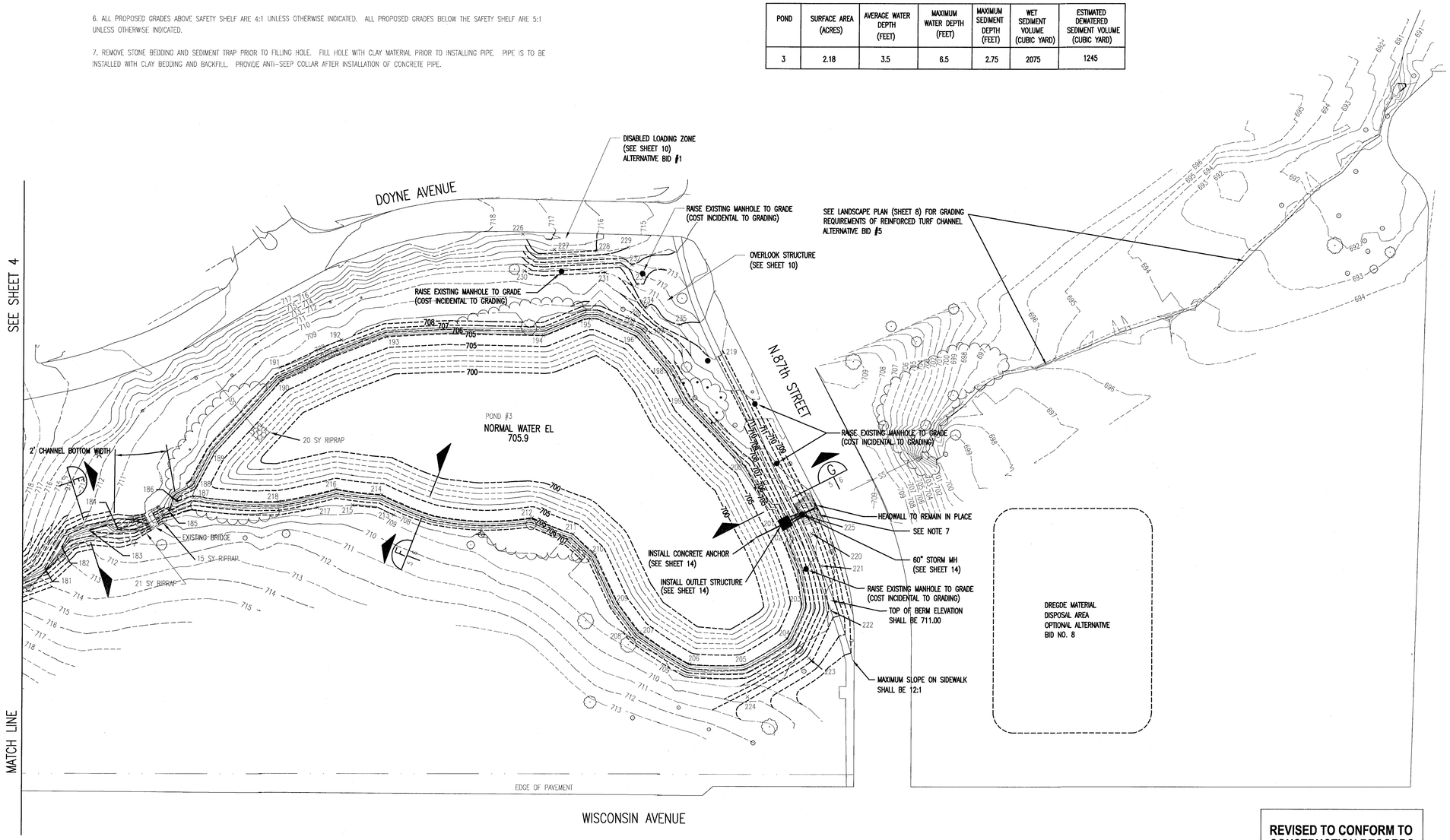
DREDGE MATERIAL DISPOSAL AREA

NOTES:
1. PLACE SILT FENCE PRIOR TO STRIPPING TOPSOIL.
2. PLACE DREDGE DISPOSAL MATERIAL TO 85% COMPACTION.
3. CAP COMPACTED DREDGE MATERIAL WITH MINIMUM 1' OF CLAY MATERIAL. COMPACT CLAY CAP TO 85% COMPACTION.
4. REPLACE TOPSOIL TO MINIMUM 4" THICKNESS, PREPARE SEED BED, FERTILIZE, SEED AND MULCH AREA.
5. SEE APPENDIX IN PROJECT MANUAL FOR DREDGE DISPOSAL GRADING PLAN.

POND	SURFACE AREA (ACRES)	AVERAGE WATER DEPTH (FEET)	MAXIMUM WATER DEPTH (FEET)	MAXIMUM SEDIMENT DEPTH (FEET)	WET SEDIMENT VOLUME (CUBIC YARD)	ESTIMATED DEWATERED SEDIMENT VOLUME (CUBIC YARD)
3	2.18	3.5	6.5	2.75	2075	1245

N

SCALE 50' 100'



GRADING PLAN CONTROL POINTS

CONTROL POINT	"X" EASTING	"Y" NORTHING	ELEVATION
181	2528733.7577	385065.1833	710.00
182	2528749.2621	385084.5430	709.00
183	2528774.6823	385100.5262	708.00
184	2528800.4807	385102.3708	707.00
185	2528847.6103	385118.7402	706.00
186	2528855.2748	385127.0469	705.00
187	2528871.4931	385131.5631	705.00
188	2528872.8857	385139.2689	705.00
189	2528890.1745	385171.9335	705.00
190	2528951.0823	385237.9150	705.00
191	2528950.3300	385250.7275	708.00
192	2529007.0371	385276.3644	708.00
193	2529049.0272	385279.5218	705.00
194	2529194.4424	385280.8923	705.00
195	2529238.0240	385296.1806	705.00
196	2529280.6210	385279.6678	705.00
197	2529293.4969	385283.4616	708.00
198	2529308.3037	385247.6166	705.00
199	2529324.8839	385217.4470	705.00
200	2529381.9853	385159.9407	705.00
201	2529412.6794	385110.3551	SEE OUTLET STR.
202	2529417.4810	385101.5833	SEE OUTLET STR.
203	2529434.8365	385034.3953	705.00
204	2529421.4614	385002.9858	705.00
205	2529380.6969	384978.3451	705.00
206	2529331.3594	384679.1501	705.00
207	2529284.9627	385008.1154	705.00
208	2529269.5301	385008.0791	708.00
209	2529264.7624	385034.2330	705.00
210	2529243.2852	385079.0556	705.00
211	2529222.7273	385097.6177	705.00
212	2529184.4826	385112.4346	705.00
213	2529056.4851	385114.7201	708.00
214	2529045.1173	385133.1944	705.00
215	2529018.2913	385123.5348	708.00
216	2529002.6438	385138.0810	705.00
217	2528985.7404	385121.4607	708.00
218	2528949.8106	385126.7761	705.00
219	2529359.4068	385263.2626	711.00
220	2529443.6438	385098.7850	711.00
221	2529452.8406	385069.1200	711.00
222	2529462.3375	385028.6387	711.00
223	2529442.0270	384985.0384	711.00
224	2529385.0520	384948.9259	711.00
225	2529434.7778	385115.9555	711.00
226	2529174.8236	385373.3259	717.00
227	2529204.1508	385359.2834	717.00
228	2529243.3331	385358.2310	716.00
229	2529272.6072	385361.2713	715.00
230	2529176.4755	385340.0226	711.00
231	2529251.6580	385338.6462	711.00
232	2529276.0230	385345.5617	714.00
233	2529280.7153	385328.1106	713.00
234	2529288.3332	385306.5453	712.00
235	2529321.0202	385291.2521	712.00

REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

GRADING PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE,WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: **GRADING PLAN**

PROJECT NO. V378-00620

SHEET NO. 5 OF 15

FILE NO.

81258 101-G-036

GRADING PLAN CONTROL POINTS

CONTROL POINT	"X" EASTING	"Y" NORTHING	ELEVATION	CONTROL POINT	"X" EASTING	"Y" NORTHING	ELEVATION
101	2527526.6565	384873.6062	746.00	141	2528145.9297	385148.4275	723.00
102	2527539.7341	384871.7103	745.00	142	2528146.1437	385179.1179	730.00
103	2527576.7864	384865.4936	744.00	143	2528238.5988	385186.0033	730.00
104	2527614.0680	384869.9285	743.00	144	2528258.6654	385148.1964	723.00
105	2527642.9616	384869.5746	742.00	145	2528282.7387	385060.9661	723.00
106	2527646.0553	384887.0782	746.00	146	2528265.6397	385039.3358	723.00
107	2527669.1118	384869.8076	741.00	147	2528246.2643	385011.6201	723.00
108	2527713.1296	384872.2980	740.00	148	2528195.9632	384981.3318	727.00
109	2527718.7615	384892.7128	744.00	149	2528107.6107	385029.9779	727.00
110	2527753.1183	384877.5993	739.00	150	2528121.5809	385040.3111	723.00
111	2527772.5060	384880.4102	738.00	151	2528088.4491	385064.0375	723.00
112	2527801.0231	384886.1688	737.00	152	2528319.3685	385112.2027	726.00
113	2527809.5736	384888.3479	736.00	153	2528310.2814	385086.9071	725.00
114	2527821.9897	384891.4304	735.00	154	2528305.5415	385047.3659	725.00
115	2527829.3474	384897.4697	734.00	155	2528301.4114	385026.3418	726.00
116	2527838.6399	384905.0972	733.00	156	2528336.8065	385061.4758	719.00
117	2527845.9283	384917.0013	732.00	157	2528365.8935	385094.3425	719.00
118	2527851.2082	384929.9969	731.00	158	2528363.7044	385126.5313	724.00
119	2527858.0411	384942.9252	730.00	159	2528417.4002	385167.3118	724.00
120	2527868.0778	384958.4659	729.00	160	2528461.5364	385152.9289	719.00
121	2527906.4703	384965.6780	732.00	161	2528512.1692	385123.6924	719.00
122	2527862.9184	384892.5197	736.00	162	2528519.2799	385139.4835	722.00
123	2527864.2714	384898.4906	735.00	163	2528573.9343	385152.7024	719.00
124	2527857.2794	384910.0876	734.00	164	2528599.5993	385169.2218	722.00
125	2527856.0886	384922.4409	733.00	165	2528616.1401	385147.7681	719.00
126	2527916.4534	384966.2579	732.00	166	2528655.5890	385099.7649	719.00
127	2527921.1275	384989.2605	730.00	167	2528663.7224	385070.0570	719.00
128	2527957.2231	384991.0713	730.00	168	2528671.9193	385059.1983	SEE WEIR STR.
129	2527920.5209	384944.5985	732.00	169	2528668.9564	385020.3977	SEE WEIR STR.
130	2527955.1206	384965.8741	730.00	170	2528658.8206	385005.8676	719.00
131	2527961.2947	384981.2678	729.00	171	2528650.7225	384984.4632	719.00
132	2527987.0519	385030.6019	726.00	172	2528627.1878	384959.3788	719.00
133	2527966.7969	385028.9690	729.00	173	2528459.0502	385034.1277	719.00
134	2528029.2244	385057.4078	725.00	174	2528430.2009	385030.0643	719.00
135	2527992.3628	385021.7978	728.00	175	2528356.9189	385008.9598	722.00
136	2528071.6358	385067.0494	727.00	176	2528349.6716	385031.6635	719.00
137	2528075.9146	385084.5944	724.00	177	2528674.7133	385040.4665	714.00
138	2528093.5880	385103.0013	723.00	178	2528682.7469	385040.8104	713.00
139	2528070.9336	385138.1706	729.00	179	2528691.7157	385043.2962	712.00
140	2528106.9153	385153.1930	728.00	180	2528707.5874	385051.5833	711.00

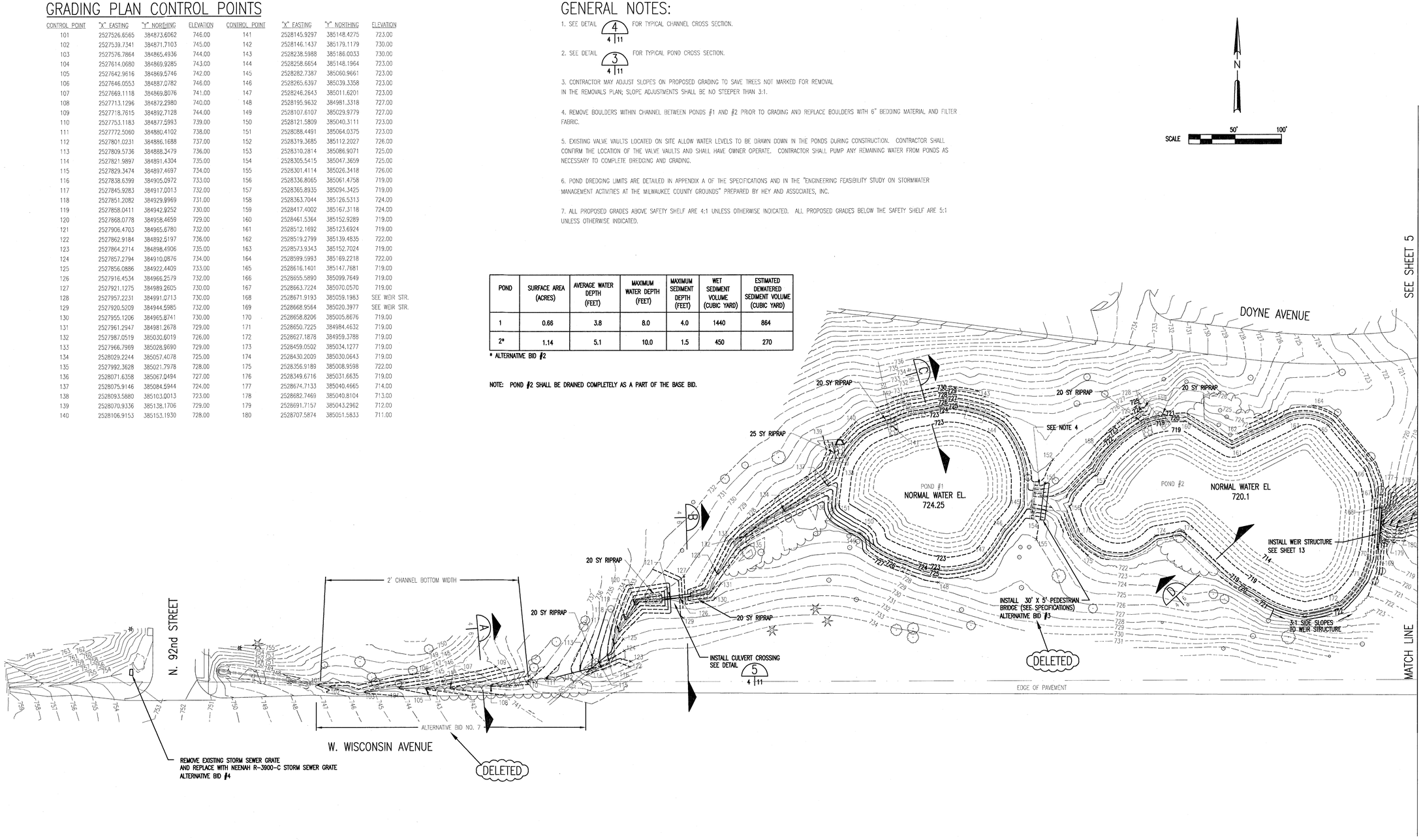
GENERAL NOTES:

1. SEE DETAIL 4/4|11 FOR TYPICAL CHANNEL CROSS SECTION.
2. SEE DETAIL 3/4|11 FOR TYPICAL POND CROSS SECTION.
3. CONTRACTOR MAY ADJUST SLOPES ON PROPOSED GRADING TO SAVE TREES NOT MARKED FOR REMOVAL IN THE REMOVALS PLAN; SLOPE ADJUSTMENTS SHALL BE NO STEEPER THAN 3:1.
4. REMOVE BOULDERS WITHIN CHANNEL BETWEEN PONDS #1 AND #2 PRIOR TO GRADING AND REPLACE BOULDERS WITH 6" BEDDING MATERIAL AND FILTER FABRIC.
5. EXISTING VALVE VAULTS LOCATED ON SITE ALLOW WATER LEVELS TO BE DRAWN DOWN IN THE PONDS DURING CONSTRUCTION. CONTRACTOR SHALL CONFIRM THE LOCATION OF THE VALVE VAULTS AND SHALL HAVE OWNER OPERATE. CONTRACTOR SHALL PUMP ANY REMAINING WATER FROM PONDS AS NECESSARY TO COMPLETE DREDGING AND GRADING.
6. POND DREDGING LIMITS ARE DETAILED IN APPENDIX A OF THE SPECIFICATIONS AND IN THE "ENGINEERING FEASIBILITY STUDY ON STORMWATER MANAGEMENT ACTIVITIES AT THE MILWAUKEE COUNTY GROUNDS" PREPARED BY HEY AND ASSOCIATES, INC.
7. ALL PROPOSED GRADES ABOVE SAFETY SHELF ARE 4:1 UNLESS OTHERWISE INDICATED. ALL PROPOSED GRADES BELOW THE SAFETY SHELF ARE 5:1 UNLESS OTHERWISE INDICATED.

POND	SURFACE AREA (ACRES)	AVERAGE WATER DEPTH (FEET)	MAXIMUM WATER DEPTH (FEET)	MAXIMUM SEDIMENT DEPTH (FEET)	WET SEDIMENT VOLUME (CUBIC YARD)	ESTIMATED DEWATERED SEDIMENT VOLUME (CUBIC YARD)
1	0.66	3.8	8.0	4.0	1440	864
2*	1.14	5.1	10.0	1.5	450	270

* ALTERNATIVE BID #2

NOTE: POND #2 SHALL BE DRAINED COMPLETELY AS A PART OF THE BASE BID.



REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C.H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

GRADING PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

PROJECT TITLE:
SHEET DESCRIPTION: GRADING PLAN
PROJECT NO. V378-00620
SHEET NO. 4 OF 15
FILE NO.

81259 101-G-037

EROSION CONTROL NOTES:

1. GENERAL

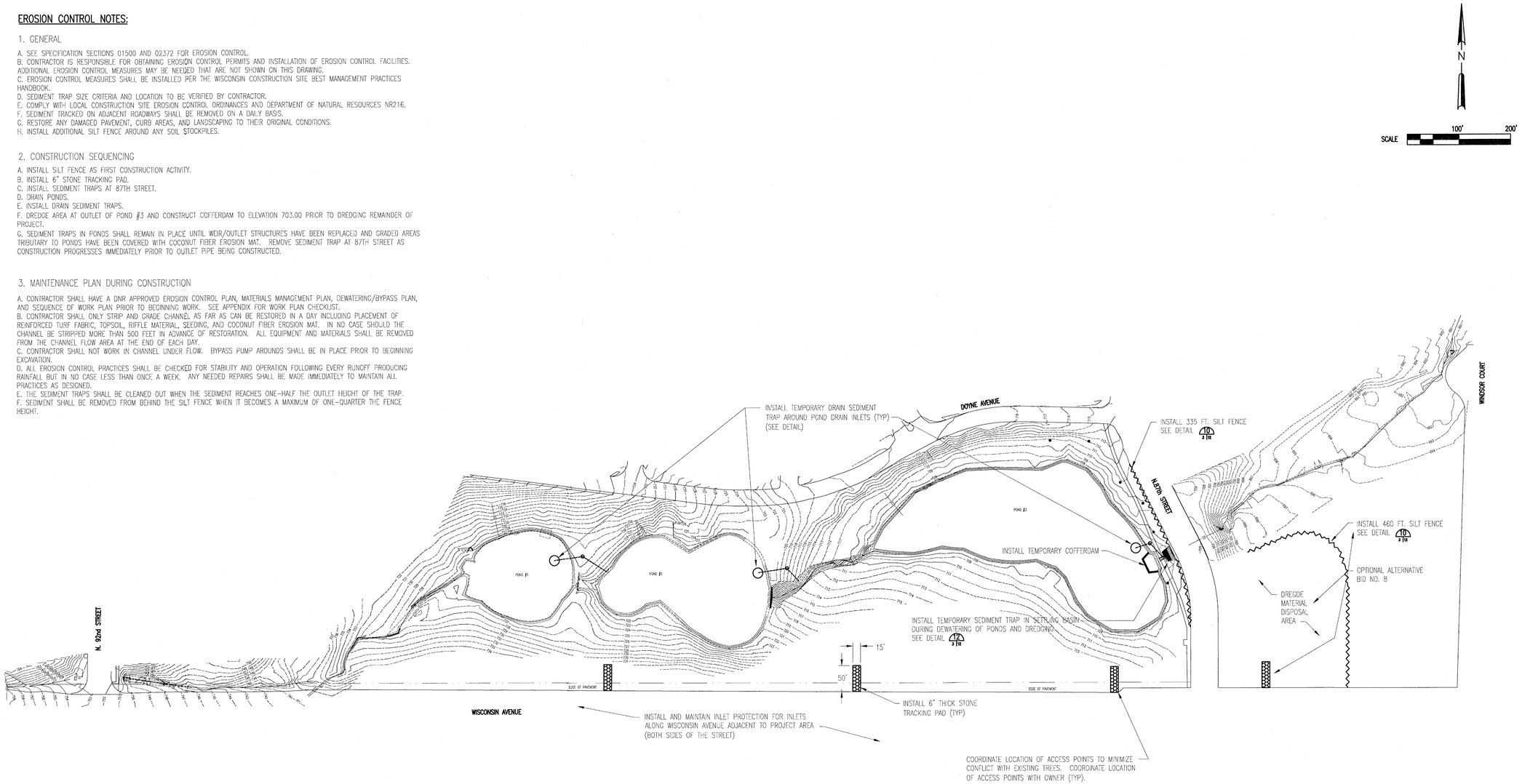
A. SEE SPECIFICATION SECTIONS 01500 AND 02372 FOR EROSION CONTROL.
B. CONTRACTOR IS RESPONSIBLE FOR OBTAINING EROSION CONTROL PERMITS AND INSTALLATION OF EROSION CONTROL FACILITIES. ADDITIONAL EROSION CONTROL MEASURES MAY BE NEEDED THAT ARE NOT SHOWN ON THIS DRAWING.
C. EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK.
D. SEDIMENT TRAP SIZE CRITERIA AND LOCATION TO BE VERIFIED BY CONTRACTOR.
E. COMPLY WITH LOCAL CONSTRUCTION SITE EROSION CONTROL ORDINANCES AND DEPARTMENT OF NATURAL RESOURCES NR216.
F. SEDIMENT TRACKED ON ADJACENT ROADWAYS SHALL BE REMOVED ON A DAILY BASIS.
G. RESTORE ANY DAMAGED PAVEMENT, CURB AREAS, AND LANDSCAPING TO THEIR ORIGINAL CONDITIONS.
H. INSTALL ADDITIONAL SILT FENCE AROUND ANY SOIL STOCKPILES.

2. CONSTRUCTION SEQUENCING

A. INSTALL SILT FENCE AS FIRST CONSTRUCTION ACTIVITY.
B. INSTALL 6" STONE TRACKING PAD.
C. INSTALL SEDIMENT TRAPS AT 87TH STREET.
D. DRAIN PONDS.
E. INSTALL DRAIN SEDIMENT TRAPS.
F. DREDGE AREA AT OUTLET OF POND #3 AND CONSTRUCT COFFERDAM TO ELEVATION 703.00 PRIOR TO DREDGING REMAINDER OF PROJECT.
G. SEDIMENT TRAPS IN PONDS SHALL REMAIN IN PLACE UNTIL WEIR/OUTLET STRUCTURES HAVE BEEN REPLACED AND GRADED AREAS TRIBUTARY TO PONDS HAVE BEEN COVERED WITH COCONUT FIBER EROSION MAT. REMOVE SEDIMENT TRAP AT 87TH STREET AS CONSTRUCTION PROGRESSES IMMEDIATELY PRIOR TO OUTLET PIPE BEING CONSTRUCTED.

3. MAINTENANCE PLAN DURING CONSTRUCTION

A. CONTRACTOR SHALL HAVE A DNR APPROVED EROSION CONTROL PLAN, MATERIALS MANAGEMENT PLAN, DEWATERING/BYPASS PLAN, AND SEQUENCE OF WORK PLAN PRIOR TO BEGINNING WORK. SEE APPENDIX FOR WORK PLAN CHECKLIST.
B. CONTRACTOR SHALL ONLY STRIP AND GRADE CHANNEL AS FAR AS CAN BE RESTORED IN A DAY INCLUDING PLACEMENT OF REINFORCED TURF FABRIC, TOPSOIL, RIFFLE MATERIAL, SEEDING, AND COCONUT FIBER EROSION MAT. IN NO CASE SHOULD THE CHANNEL BE STRIPPED MORE THAN 500 FEET IN ADVANCE OF RESTORATION. ALL EQUIPMENT AND MATERIALS SHALL BE REMOVED FROM THE CHANNEL FLOW AREA AT THE END OF EACH DAY.
C. CONTRACTOR SHALL NOT WORK IN CHANNEL UNDER FLOW. BYPASS PUMP AROUNDS SHALL BE IN PLACE PRIOR TO BEGINNING EXCAVATION.
D. ALL EROSION CONTROL PRACTICES SHALL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF PRODUCING RAINFALL BUT IN NO CASE LESS THAN ONCE A WEEK. ANY NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.
E. THE SEDIMENT TRAPS SHALL BE CLEANED OUT WHEN THE SEDIMENT REACHES ONE-HALF THE OUTLET HEIGHT OF THE TRAP.
F. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT BECOMES A MAXIMUM OF ONE-QUARTER THE FENCE HEIGHT.



REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

RECOMMENDED EROSION CONTROL PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 9107 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MEH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: SUGGESTED EROSION CONTROL PLAN

PROJECT NO. V378-00620

SHEET NO. 3 OF 15

FILE NO.

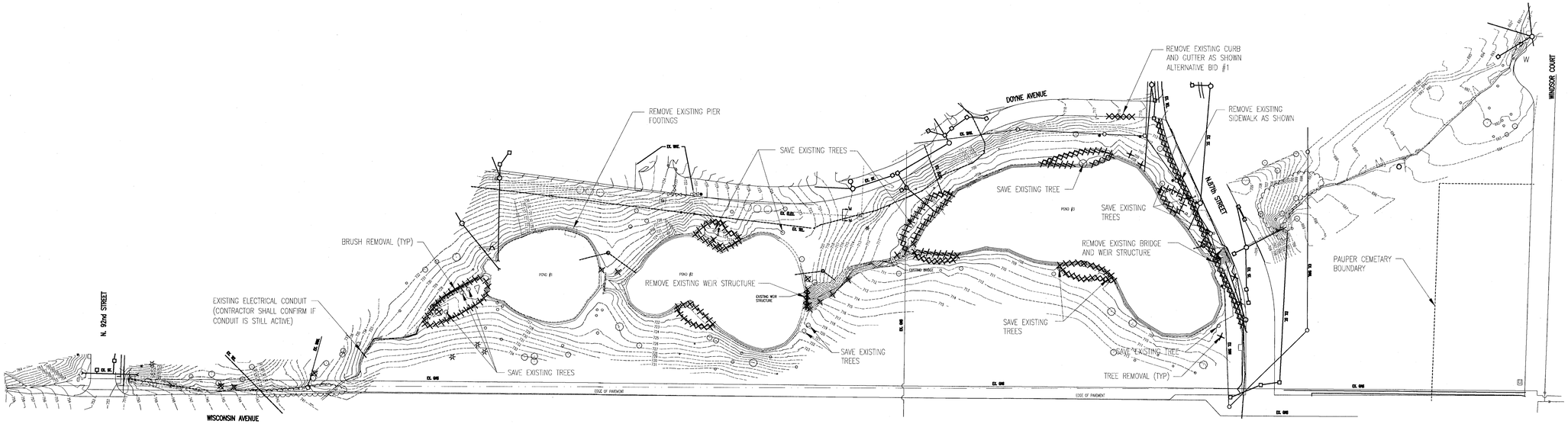
812260 101-6-038

EXISTING CONDITIONS / REMOVALS NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE EXACT LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES. ALL UTILITY OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.
2. BRUSH REMOVALS INCLUDE AREA BETWEEN "X" AND WATERS EDGE.
3. REMOVE AND DISPOSE OF EXISTING WETLAND VEGETATION SURROUNDING THE PONDS.
4. VERIFY TREES SHOWN TO REMAIN WILL BE SALVAGABLE WITH MAXIMUM 3:1 SLOPE.

N

SCALE 100' 200'



REVISED TO CONFORM TO CONSTRUCTION RECORDS

EARTH TECH

INSPECTED BY: C_H(MIL_CTY) 04/2004
DRAWN BY: REB MONTH/YEAR

EXISTING CONDITIONS / REMOVALS PLAN

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WISCONSIN 53233

REVISIONS:

DRAWN BY: RB
CHECKED BY: MCH
SCALE: AS NOTED
DATE: 05-25-01

PROJECT TITLE: MILWAUKEE COUNTY BASIN NO. 2 REHAB
MILWAUKEE COUNTY GROUNDS

SHEET DESCRIPTION: EXISTING CONDITIONS / REMOVALS PLAN

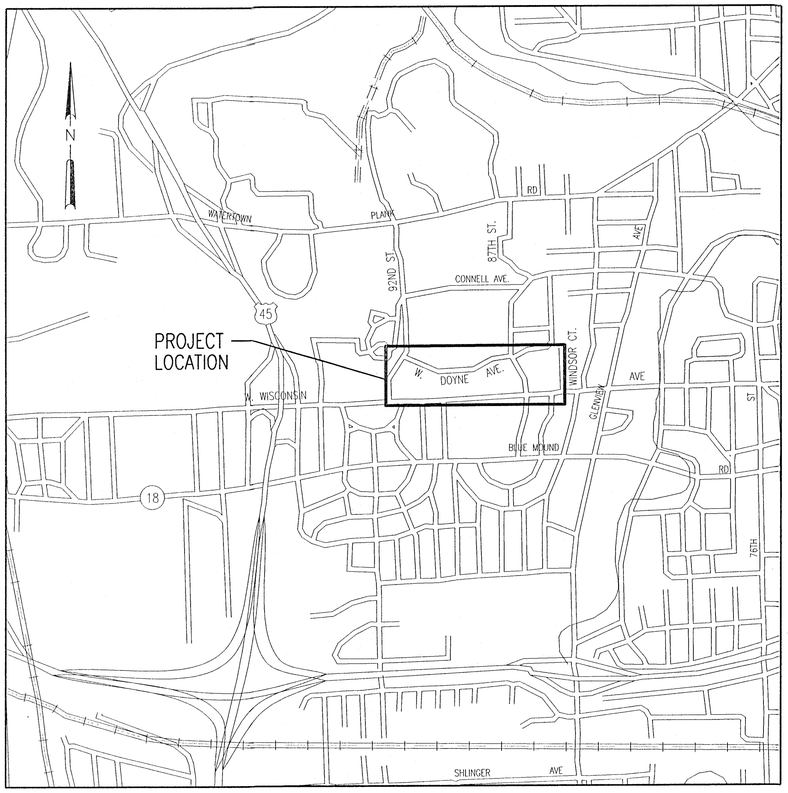
PROJECT NO. V378-00620

SHEET NO. 2 OF 15

FILE NO.

81261 101-G-039

SECOND BIDDING
BASIN NO. 2 REHABILITATION
AT
MILWAUKEE COUNTY GROUNDS
COUNTY PROJECT NO.:
V378-00620



PROJECT LOCATION MAP
W. WISCONSIN AVENUE BETWEEN WINDSOR COURT AND N. 92nd STREET
AT MILWAUKEE COUNTY GROUNDS
MILWAUKEE COUNTY – WISCONSIN

LEGEND

- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE REMOVAL
- EXISTING TREE LINE
- EXISTING BUSH
- ELECTRICAL MANHOLE
- EXISTING STRUCTURE
- 722 — EXISTING CONTOURS
- 733 — PROPOSED CONTOURS
- LIMITS OF EXCAVATION
- SILT FENCE
- REMOVAL WORK

WISCONSIN MARK J. DUMMANN S-21993 Grafton WI. PROFESSIONAL ENGINEER
May 25, 2001

UTILITY CONTACTS

AMERITECH
7721 W. FOND DU LAC AVE.
MILWAUKEE, WI 53218
ATTN: MIKE WARD (414) 535-7406

WISCONSIN ELECTRIC POWER CO.
7301 W. CALUMET
MILWAUKEE, WI 53223
ATTN: RANDY KLUMB (414) 259-6127

WISCONSIN GAS CO.
5400 N. GREEN BAY AVE.
MILWAUKEE, WI 53209
ATTN: ART COVI (414) 540-5763

GENERAL NOTES

1. APPLICABLE SPECIFICATIONS – STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, EDITION OF 1996, WITH AMENDMENTS TO DATE, AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
2. CALL DIGGERS HOTLINE. (414-259-1181), FOR UTILITIES LOCATION PRIOR TO START OF CONSTRUCTION.
3. ALL ELEVATIONS ON THESE DRAWINGS ARE BASED ON NATIONAL VERTICAL GEODETIC DATUM (1929).
4. EXISTING SIGNS AFFECTED BY THE CONSTRUCTION SHALL BE PROTECTED OR RELOCATED AS INDICATED BY THE ENGINEER.
5. WHERE THE WORD "PROPOSED" IS USED IT SHALL MEAN "INSTALL".

BENCHMARKS

BMK 3. N385244.80, E2529367.03 EL 710.44, CROSS IN WALK

BMK 6. N385251.10, E2528275.85 EL 739.30, CROSS IN TOP OF CURB

DRAWING INDEX:

COVER SHEET	1 OF 15
EXISTING CONDITIONS / REMOVALS PLAN	2 OF 15
EROSION CONTROL PLAN	3 OF 15
GRADING PLAN	4 OF 15
GRADING PLAN	5 OF 15
CROSS SECTIONS	6 OF 15
LANDSCAPE PLAN	7 OF 15
LANDSCAPE PLAN	8 OF 15
LANDSCAPE PLAN	9 OF 15
OVERLOOK DETAILS	10 OF 15
MISCELLANEOUS DETAILS	11 OF 15
MISCELLANEOUS DETAILS	12 OF 15
WEIR STRUCTURE	13 OF 15
OUTLET STRUCTURE	14 OF 15
STRUCTURE DETAILS	15 OF 15

ABBREVIATIONS:

AC	ACRE	NTS	NOT TO SCALE
ASP	ASPHALT	O.C.	ON CENTER
BMK	SURVEY BENCHMARK	OFA	OBJECT FREE AREA
BMP	BEST MANAGEMENT PRACTICE	OH	OVERHEAD
C	CENTER	PVC	POLYVINYL CHLORIDE PIPE
CB	CATCH BASIN	PSF	POUNDS PER SQUARE FOOT
C.I.	CAST IRON	PSI	POUNDS PER SQUARE INCH
CL	CENTERLINE	R	RADIUS
CF	CUBIC FEET	RCP	REINFORCED CONCRETE PIPE
CONC	CONCRETE	REIN	REINFORCEMENT
COND	CONDUIT	REP.	REPRESENTATIVE
DIA.	DIAMETER	ROW	RIGHT OF WAY
DIP	DUCTILE IRON PIPE	RT	RIGHT
E	ELECTRIC	SAN	SANITARY SEWER
EF	EACH FACE	SIM	SIMILAR
EL	ELEVATION	SF	SQUARE FEET
EXST	EXISTING	STA	STATION
FF	FACE OF CURB TO FACE OF CURB	SS	STORM SEWER
FT	FEET	T	TELEPHONE
HP	HIGH POINT	TB	TEST BORING
HOR	HORIZONTAL	TYP	TYPICAL
I.E.	INVERT ELEVATION	UNO	UNLESS NOTED OTHERWISE
INV	INVERT	VERT	VERTICAL
L	LENGTH	W	WIDTH
LT	LEFT	WEPCO	WISCONSIN ELECTRIC POWER COMPANY
MH	MANHOLE		
MW	MONITORING WELL		
MIN	MINIMUM		

MILWAUKEE COUNTY DEPARTMENT OF PUBLIC WORKS
ARCHITECTURE AND ENGINEERING DIVISION
COURTHOUSE ANNEX 907 NORTH 10TH STREET MILWAUKEE, WI 53233

RECOMMENDED FOR APPROVAL BY: Thomas Bell, Director
DATE 5/29/01

PROJECT APPROVAL BY: Douglas Nordne, DIRECTOR-DEPARTMENT OF PUBLIC WORKS
DATE 5/30/01

PROJECT MANAGER REVIEW BY: Rod Sitz
DATE: 5/29/01

REVISIONS:

PROJECT NO. #V378-00620

SHEET NO. 1 OF 15

FILE NO.

101-G-040

Appendix E

Milwaukee County Parks

Invasive Species Quick Reference Guide

QUICK REFERENCE GUIDE

PHENOLOGY AND CONTROL OF COMMON INVASIVE PLANT SPECIES FOUND IN SOUTHEASTERN WISCONSIN

MILWAUKEE COUNTY PARKS
N·A·T·I·O·N·A·L
GOLD MEDAL WINNER

UW Extension
Cooperative Extension

Sources:

Milwaukee County Department of Parks, Recreation & Culture field staff experience

Wisconsin Department of Natural Resources

University of Wisconsin Stevens Point Freckmann Herbarium

Czarapata, Elizabeth. Invasive Plants of the Upper Midwest: An Illustrated Guide to Their Identification and Control

Renz Lab, University of Wisconsin Madison

Publication developed by:

Mary McQuiggin, Natural Areas Stewardship Assistant, Milwaukee County Department of Parks, Recreation & Culture

Allison Hager, Natural Areas Intern, Milwaukee County Department of Parks, Recreation & Culture

Brian Russart, Natural Areas Coordinator, Milwaukee County Department of Parks, Recreation & Culture & University of Wisconsin—Extension

Lasted updated January 2014

Table of Contents

Invasive Trees, Shrubs and Vines of Southeastern Wisconsin……..3-10

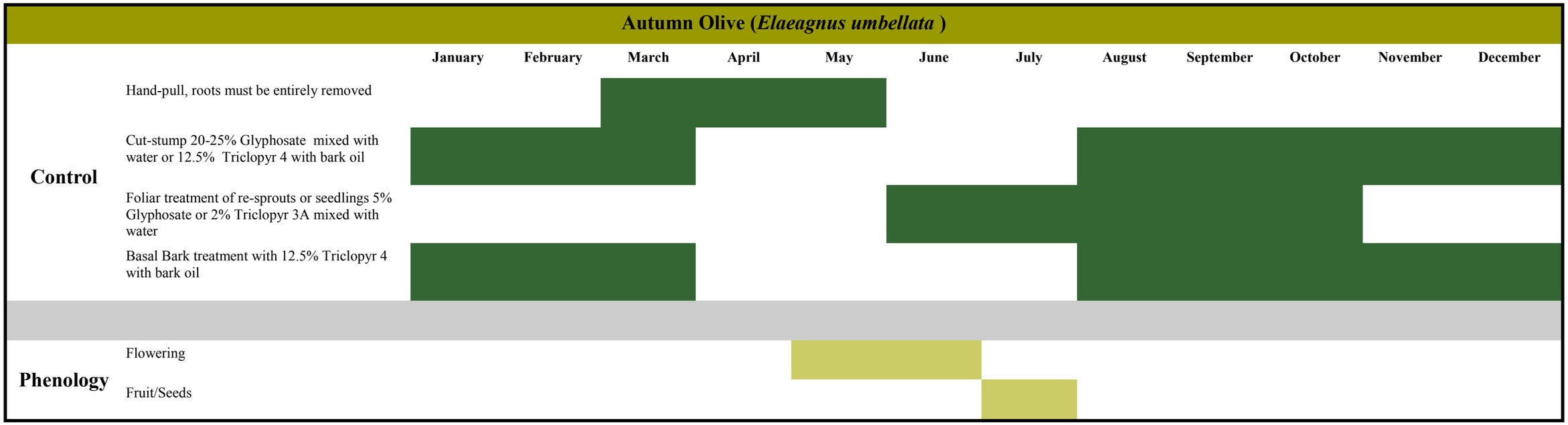
Invasive Forbs of Southeastern Wisconsin…….11-18

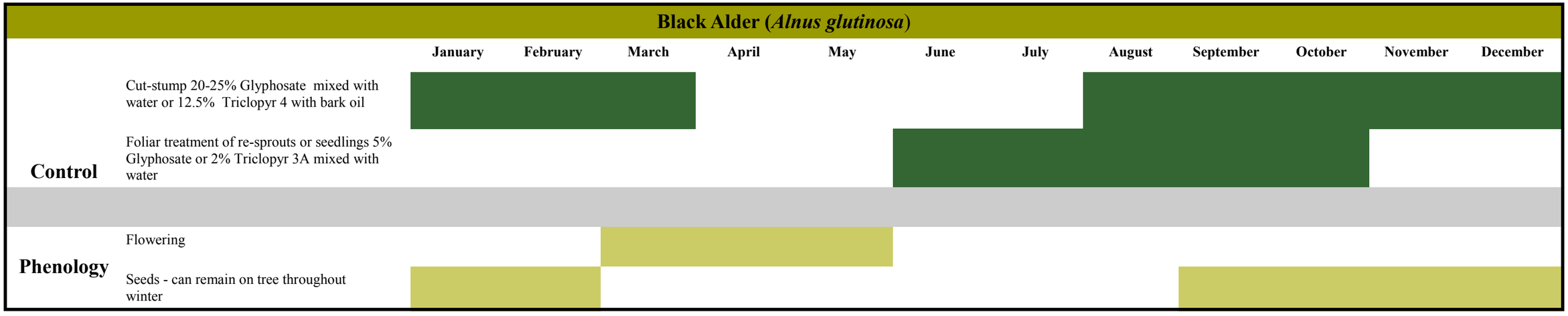
Invasive Grasses of Southeastern Wisconsin……..19-20

Herbicide Application Methods……21

Chemical Mixing Table……..22

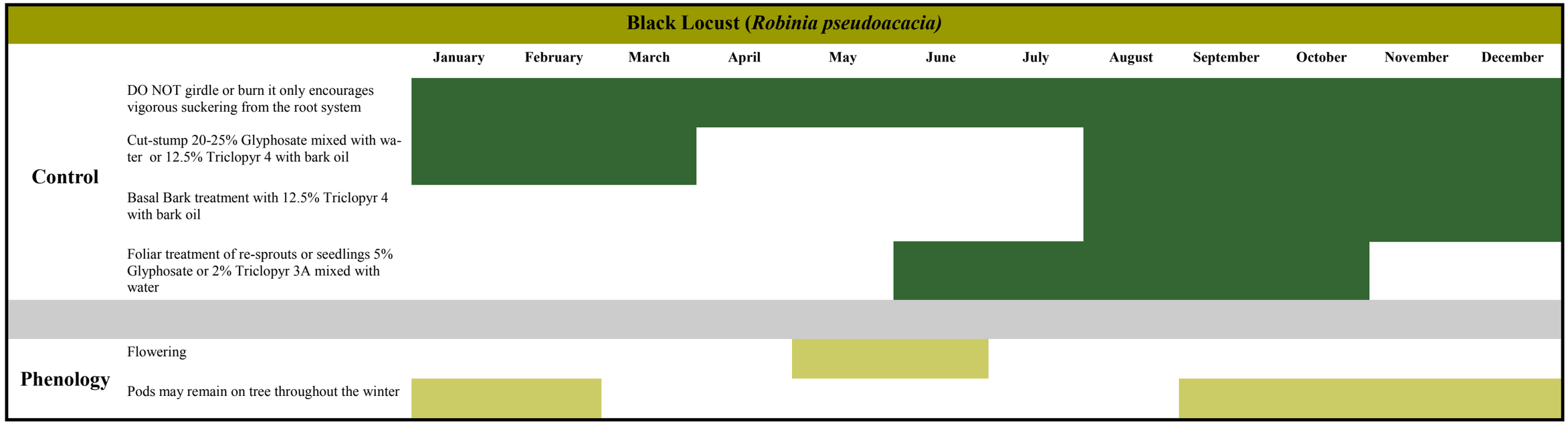
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

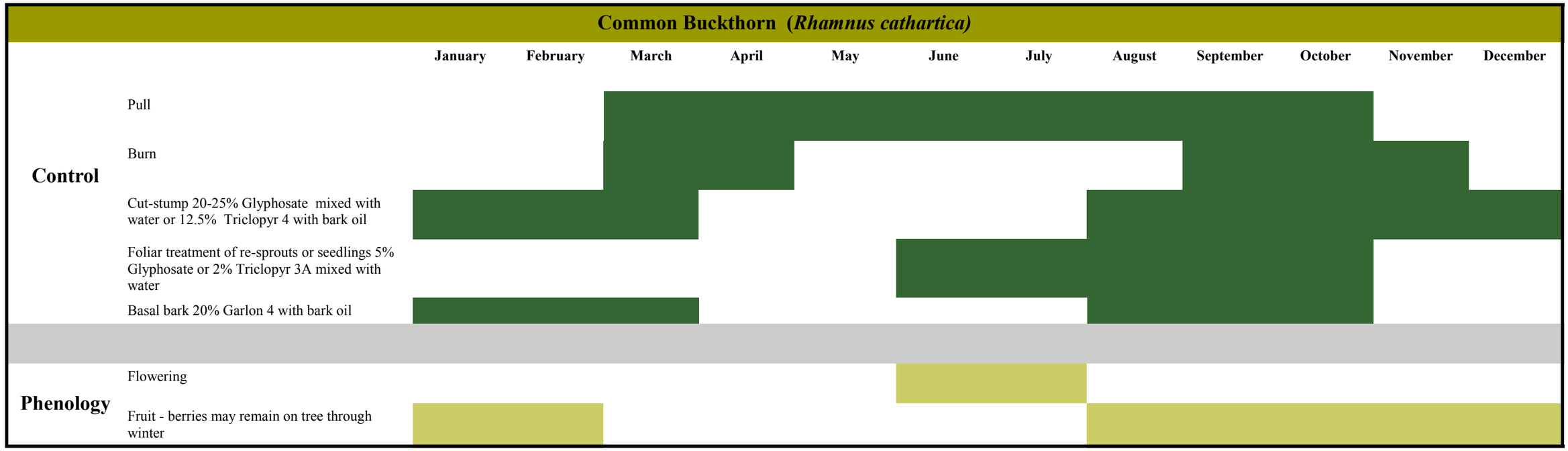




Notes:

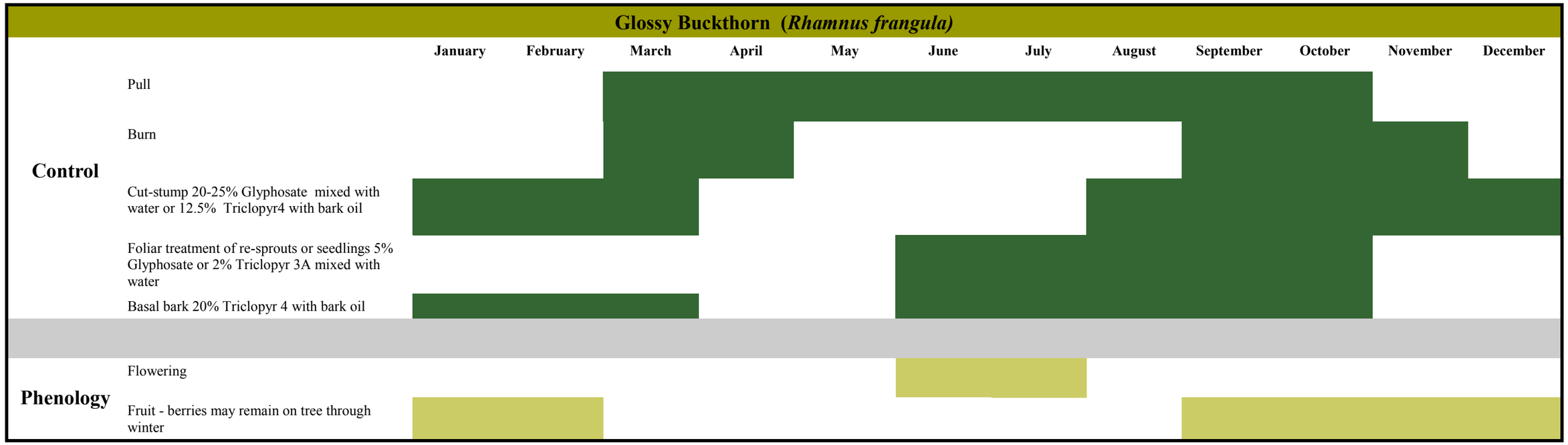
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

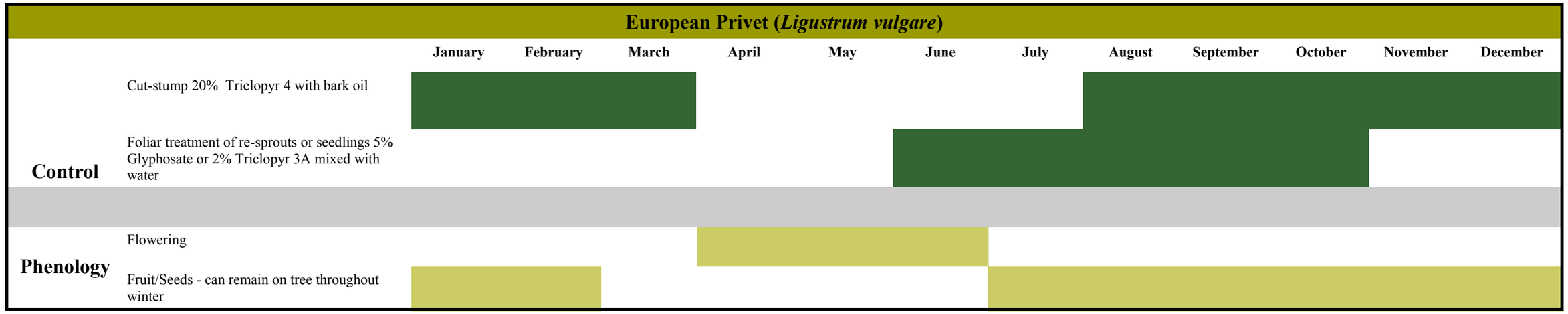




Notes: ***When controlling either species of buckthorn, priority should be given to removing mature female trees***

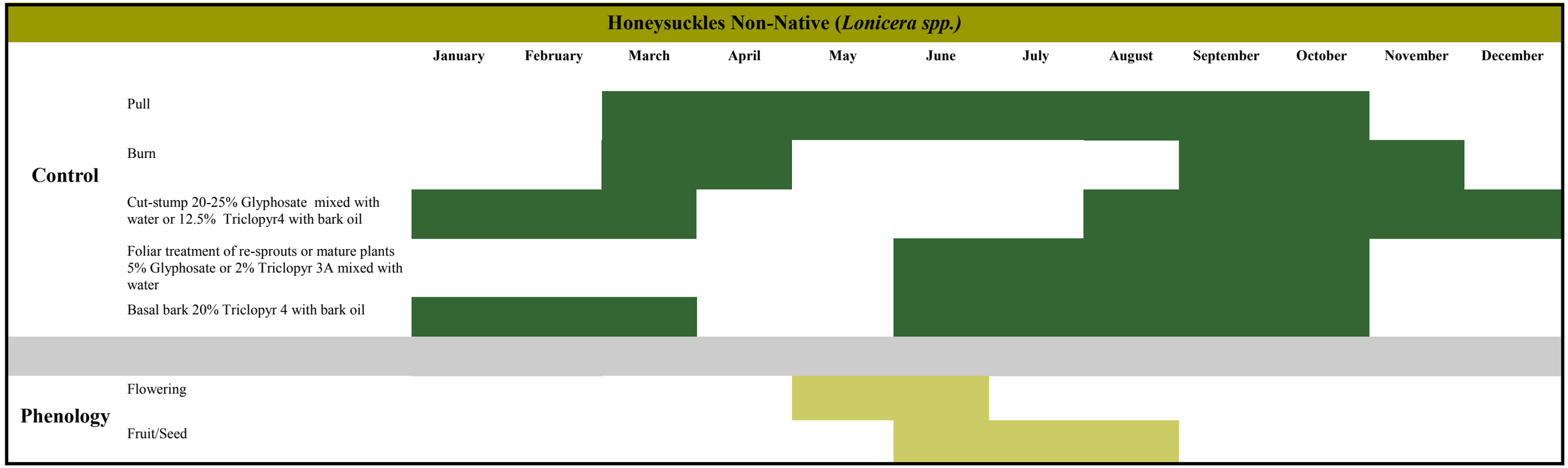
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

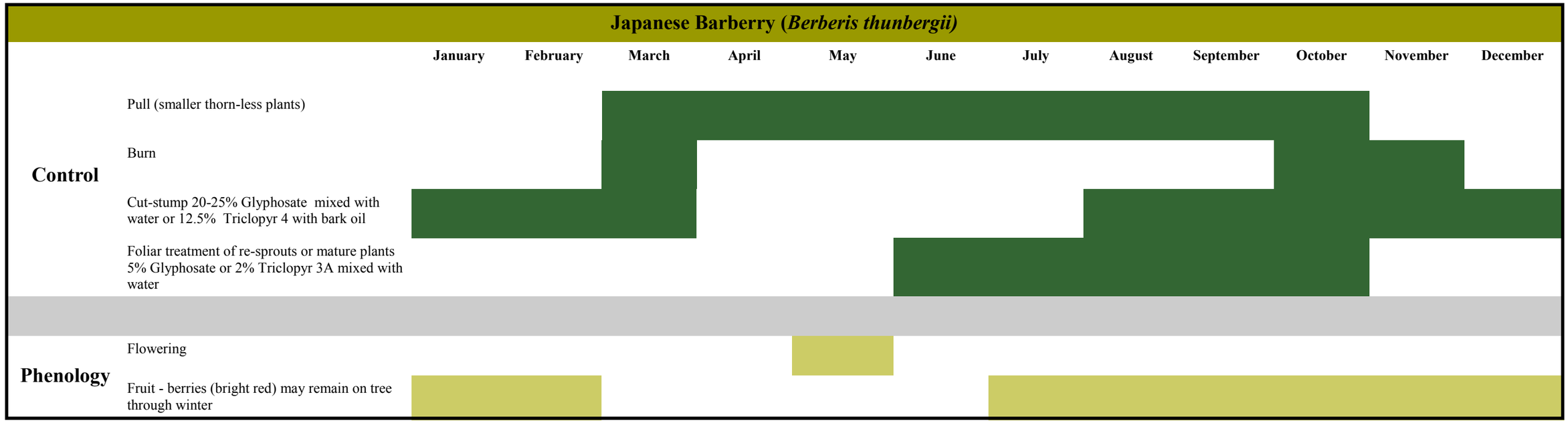




Notes:

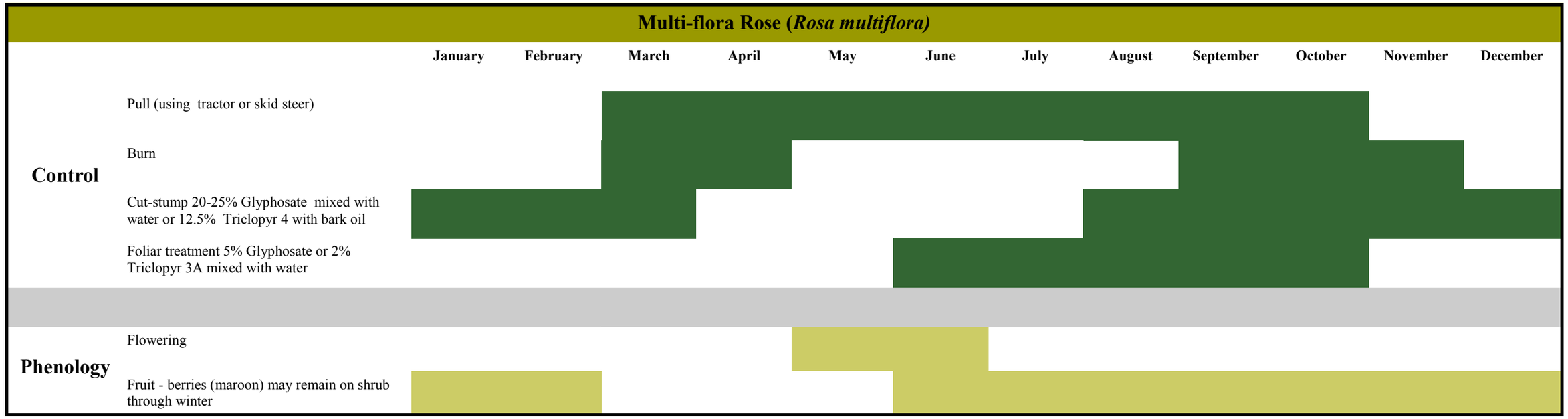
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

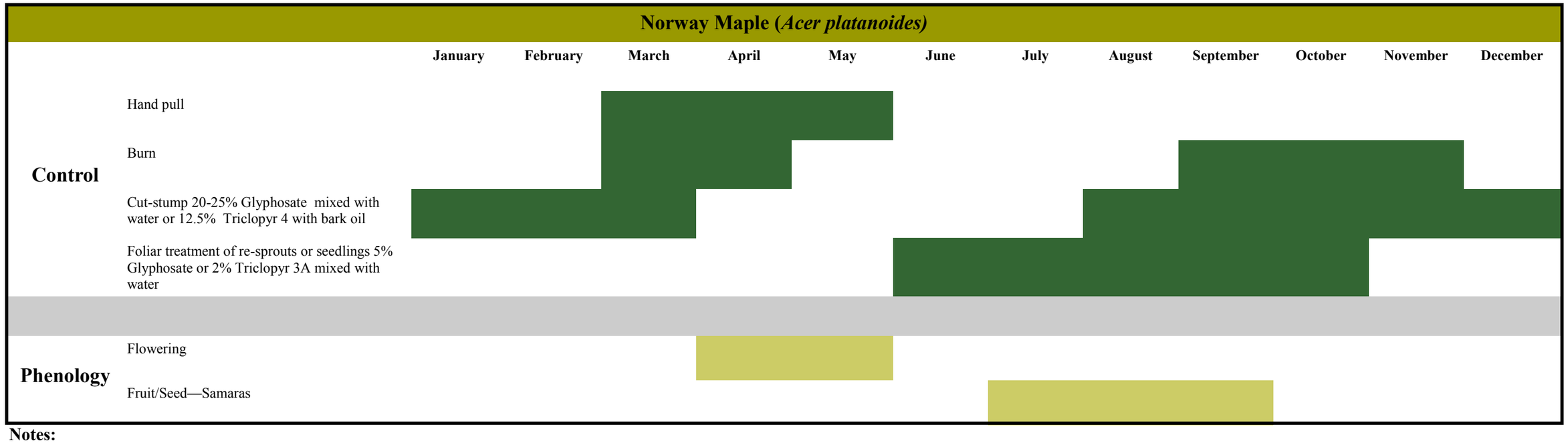




Notes:

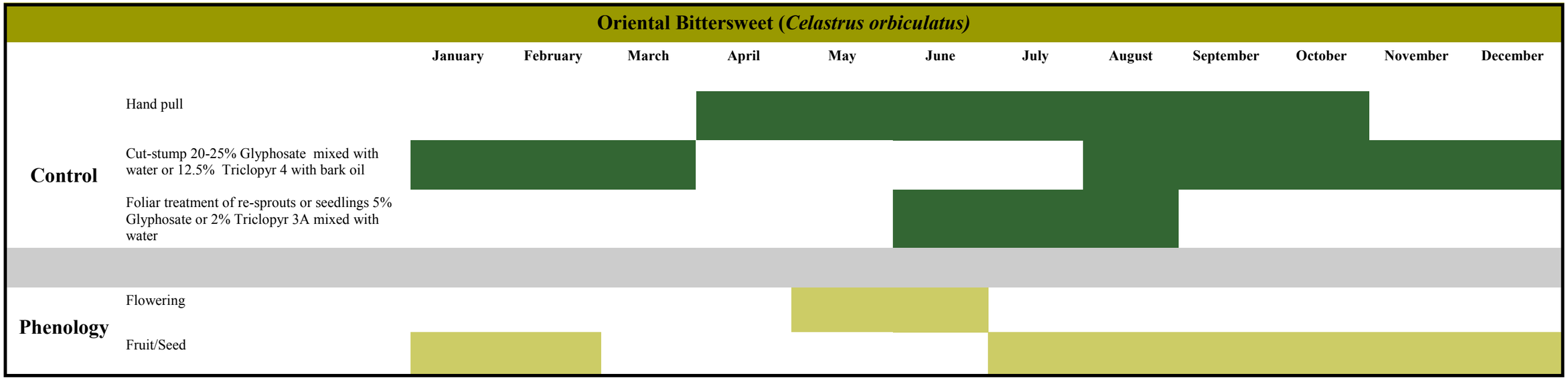
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

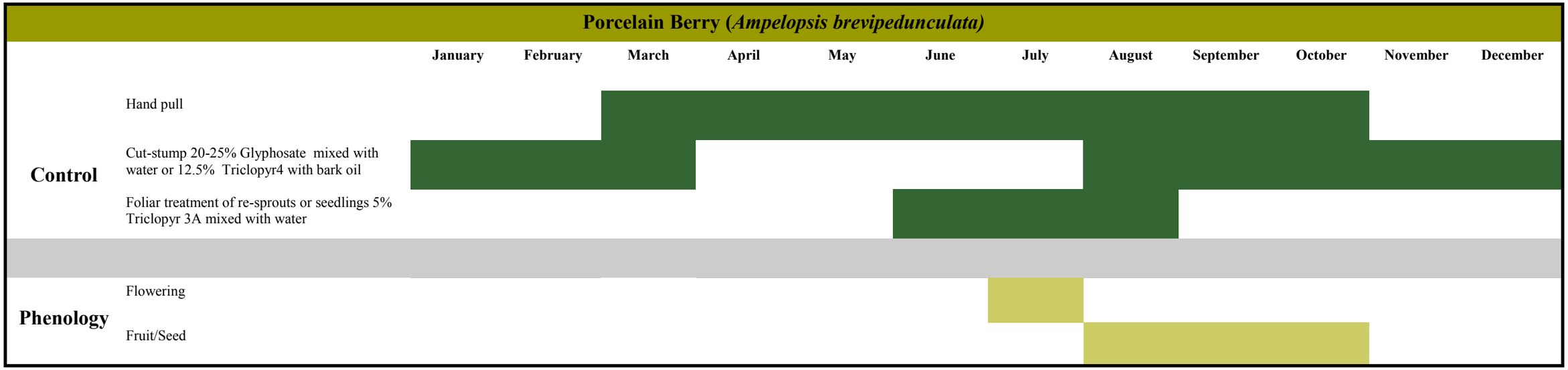




Notes:

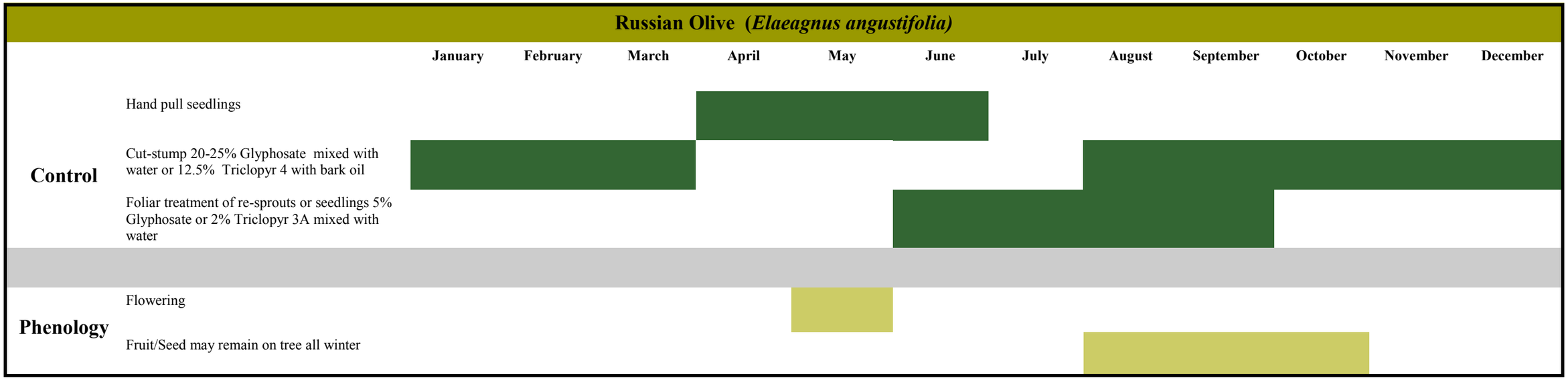
Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

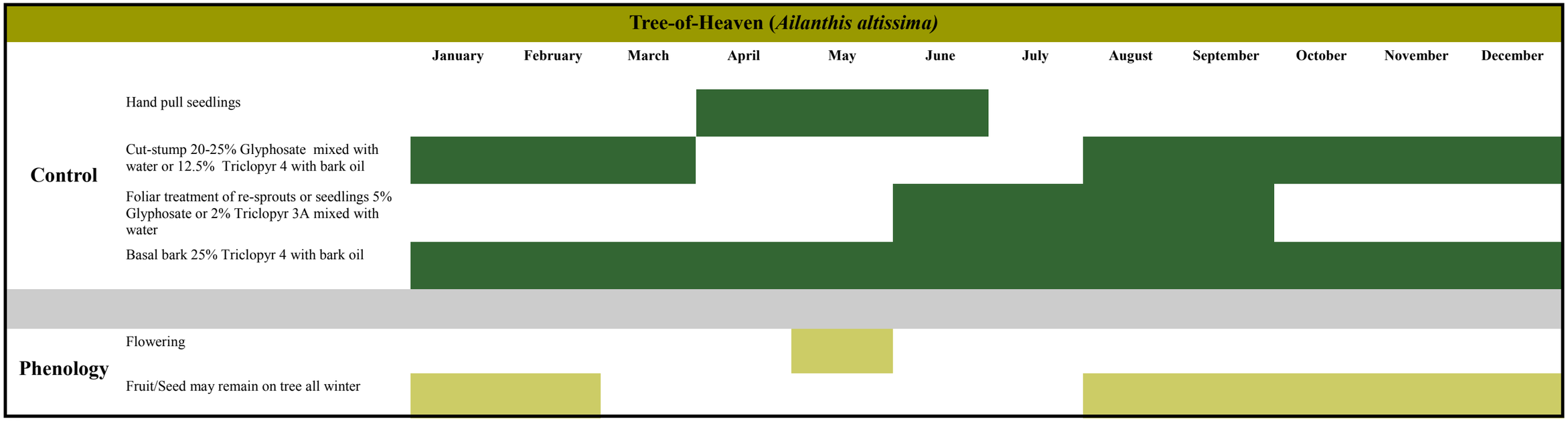




Notes:

Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

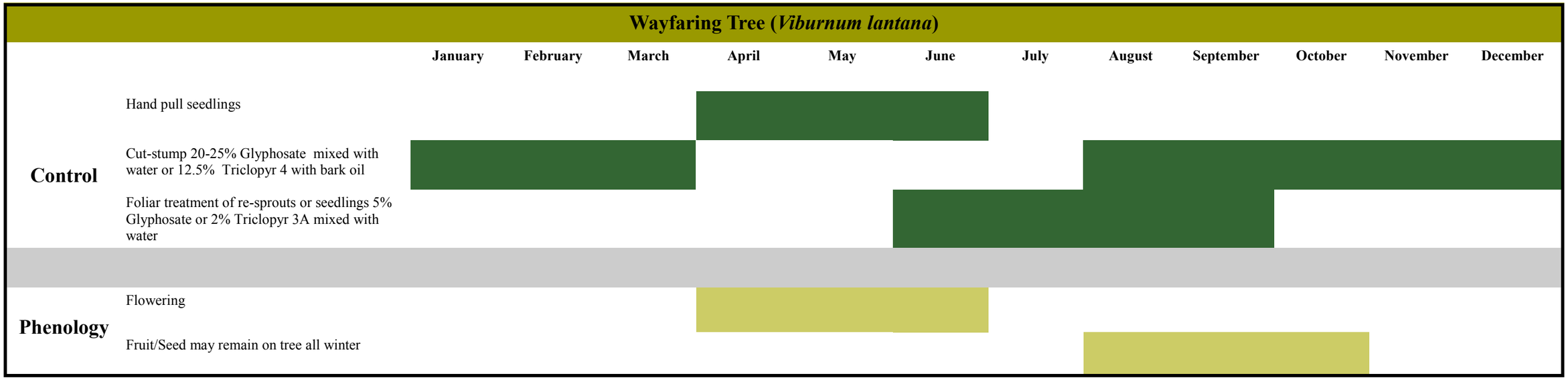




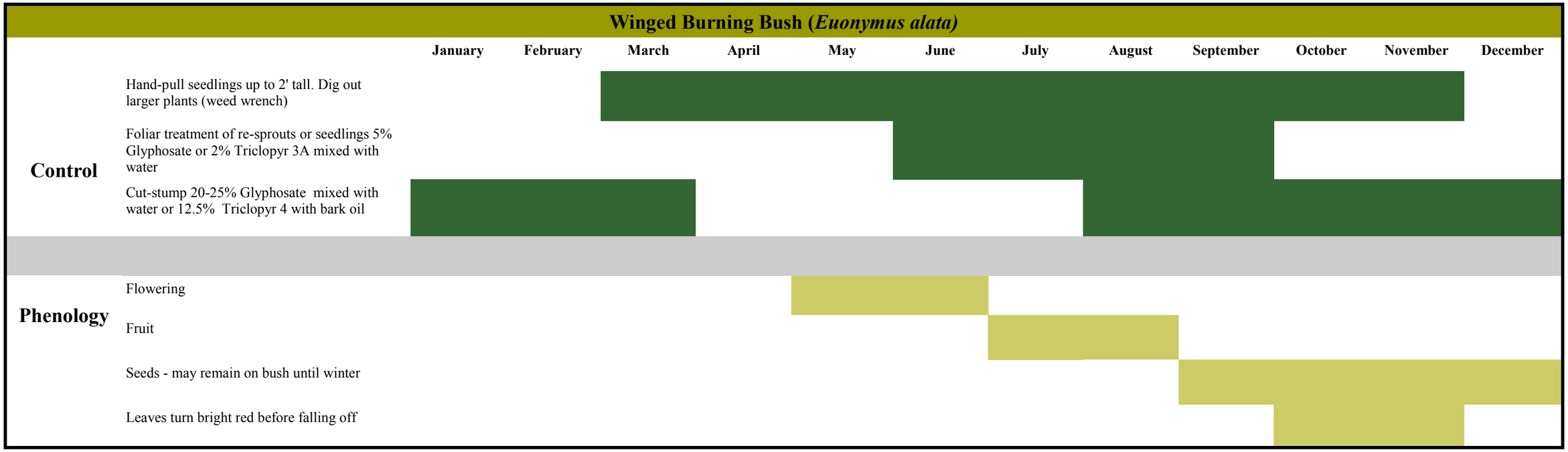
Notes:

Invasive Trees, Shrubs, and Vines of Southeastern Wisconsin

Wayfaring Tree (*Viburnum lantana*)

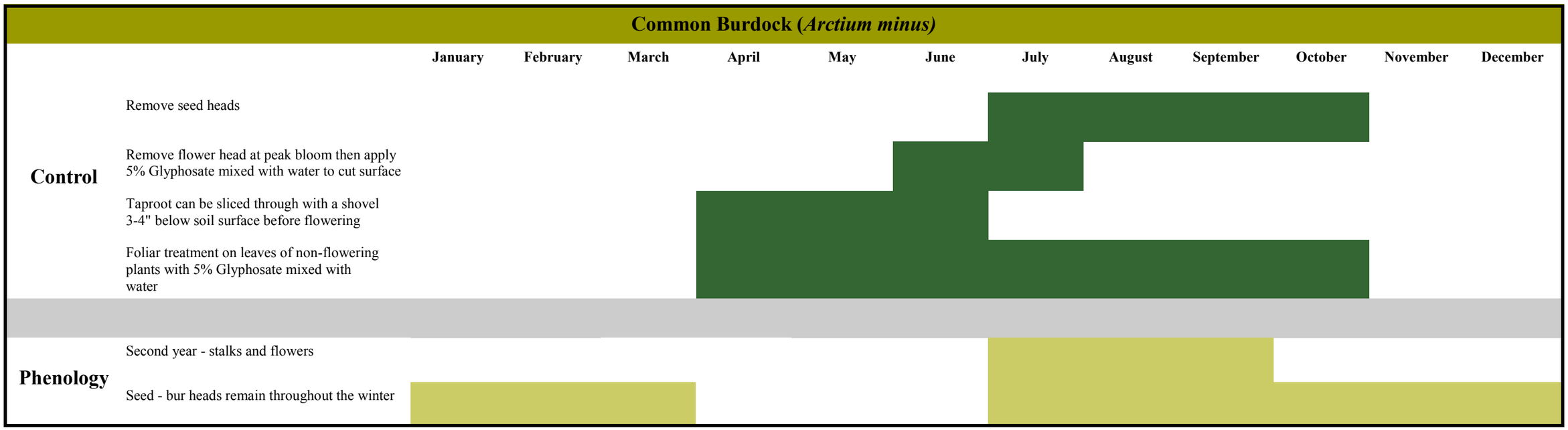


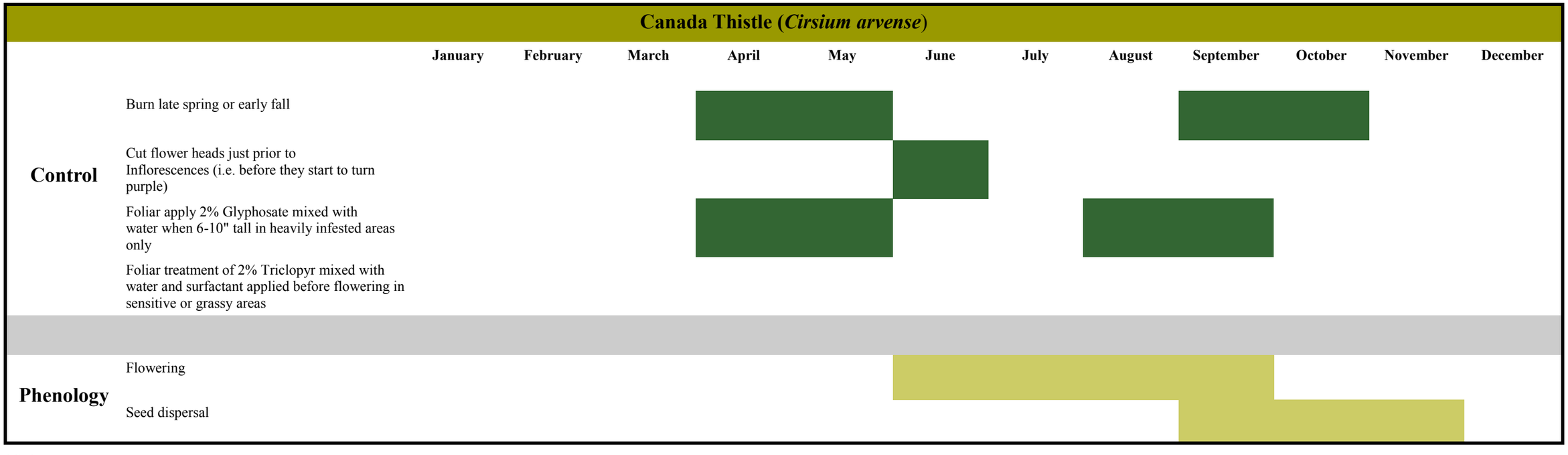
Winged Burning Bush (*Euonymus alata*)



Notes:

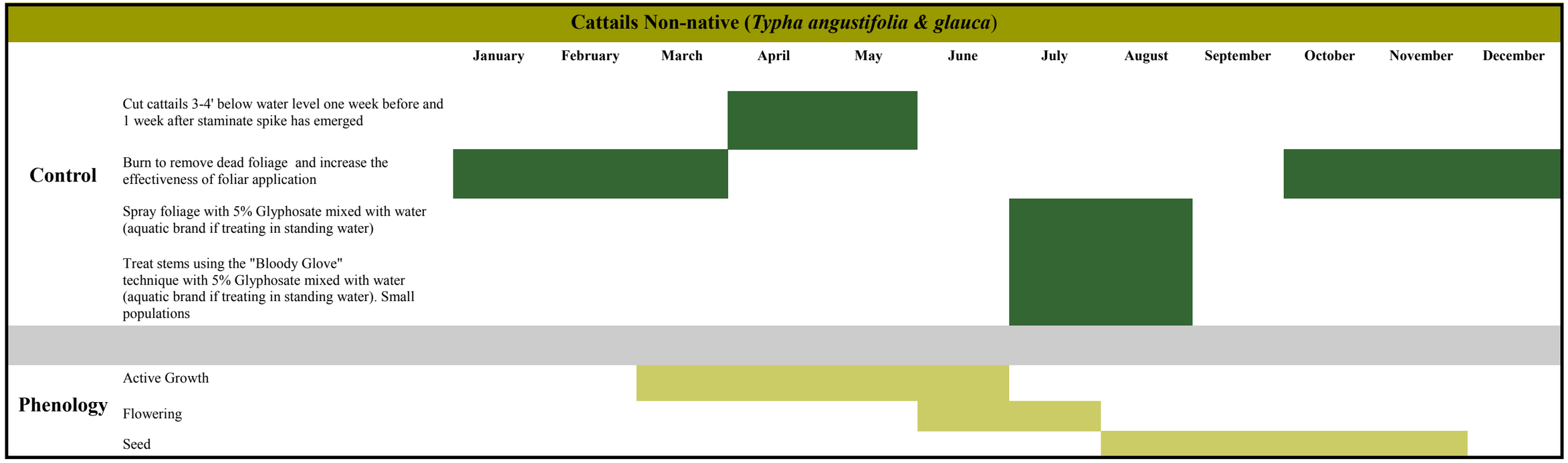
Invasive Forbs of Southeastern Wisconsin

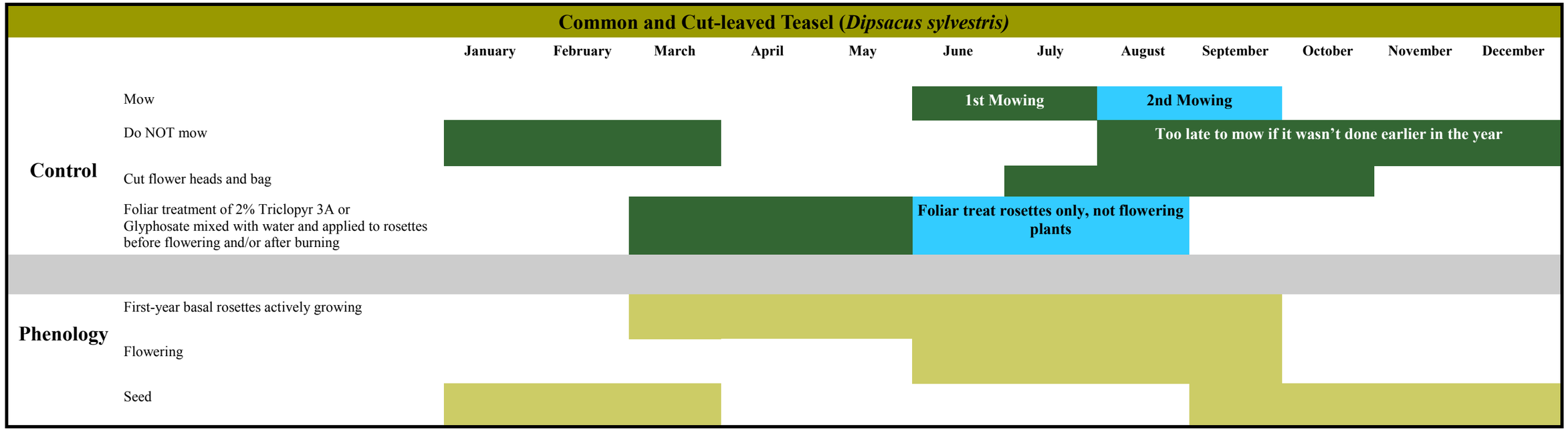




Notes:

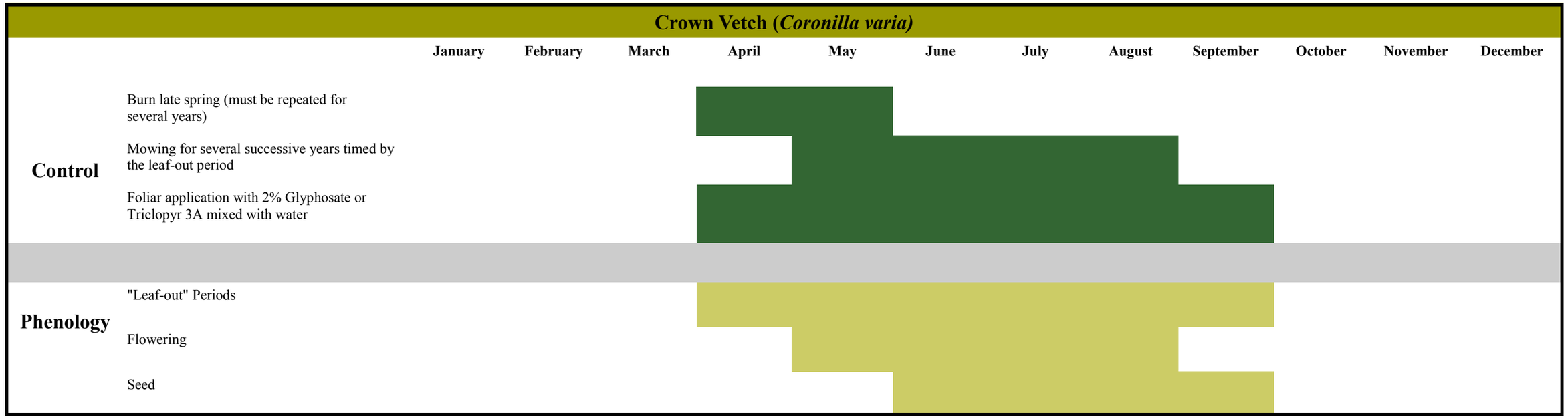
Invasive Forbs of Southeastern Wisconsin

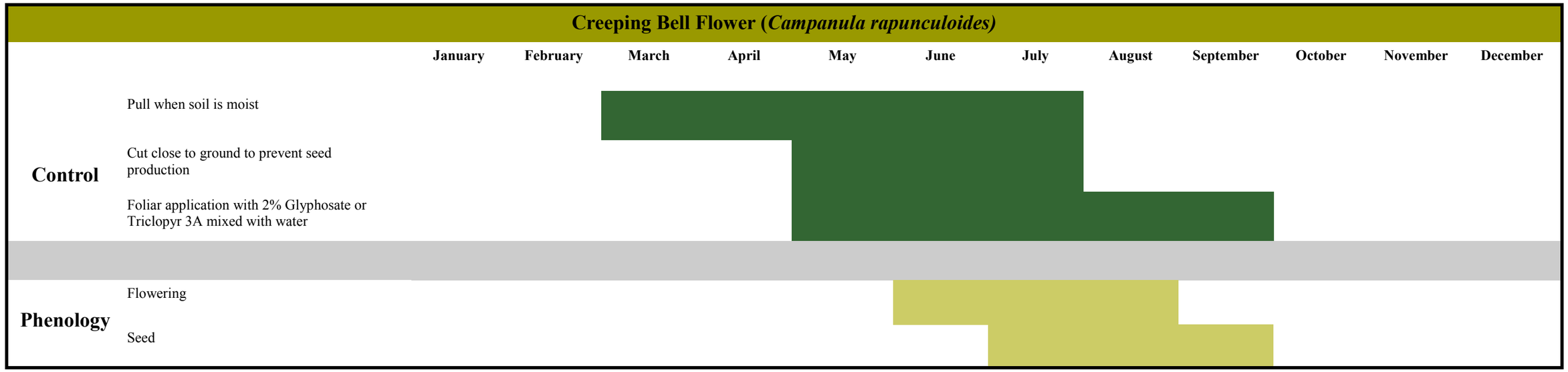




Notes:

Invasive Forbs of Southeastern Wisconsin

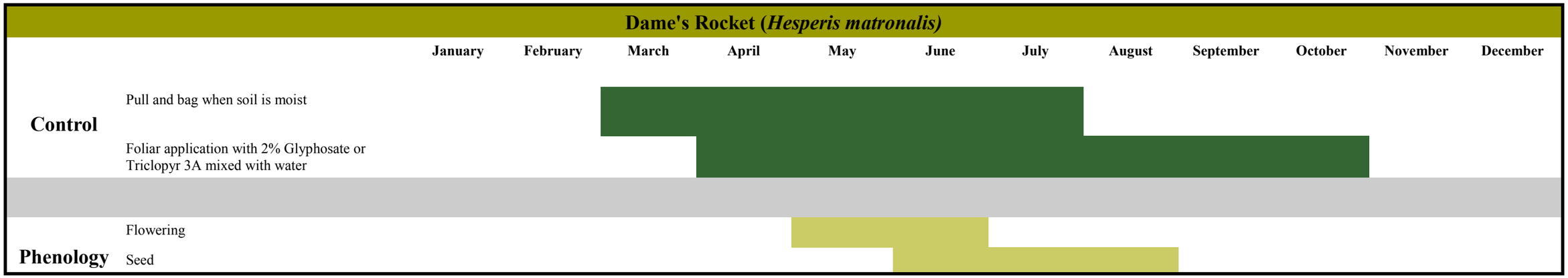




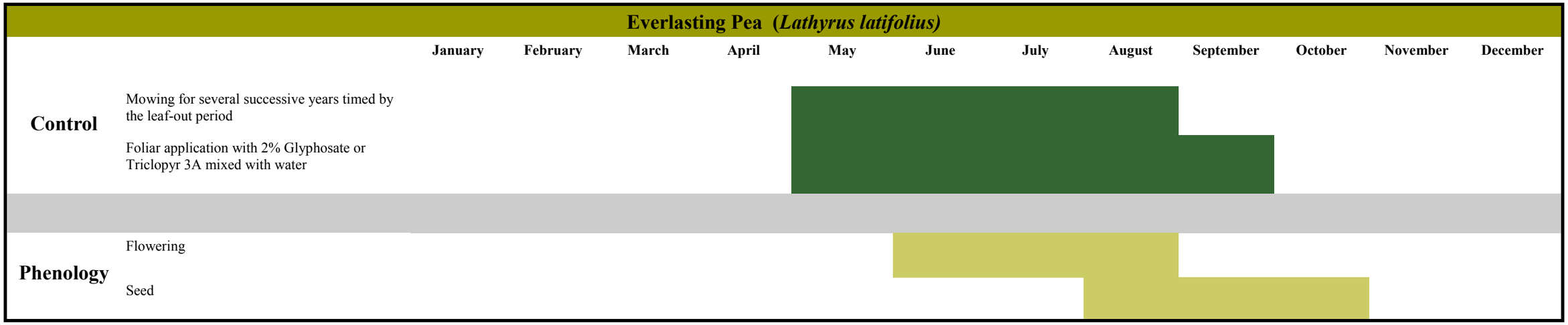
Notes:

Invasive Forbs of Southeastern Wisconsin

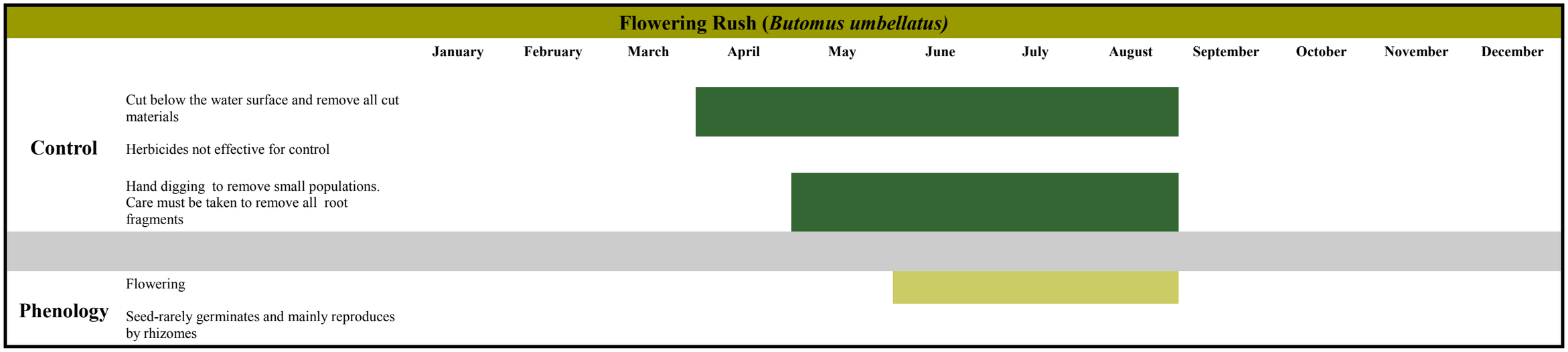
Dame's Rocket (*Hesperis matronalis*)



Everlasting Pea (*Lathyrus latifolius*)



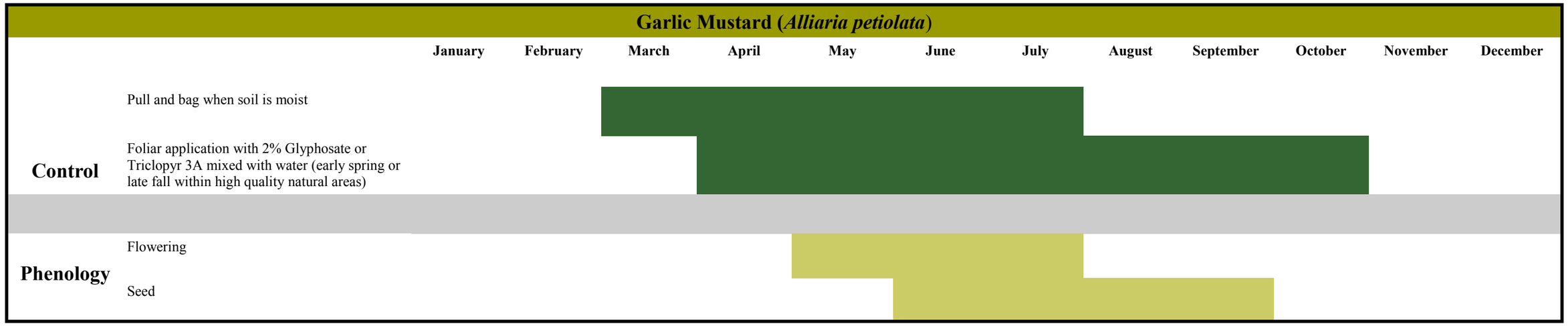
Flowering Rush (*Butomus umbellatus*)



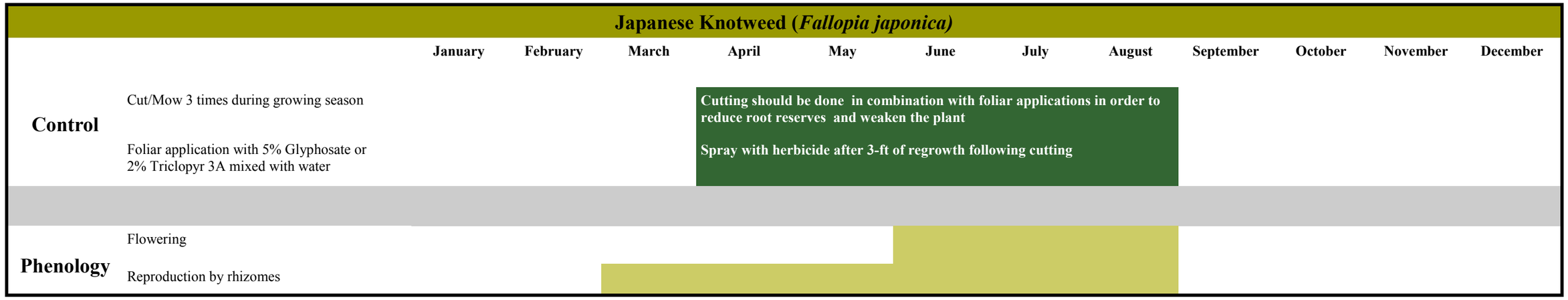
Notes:

Invasive Forbs of Southeastern Wisconsin

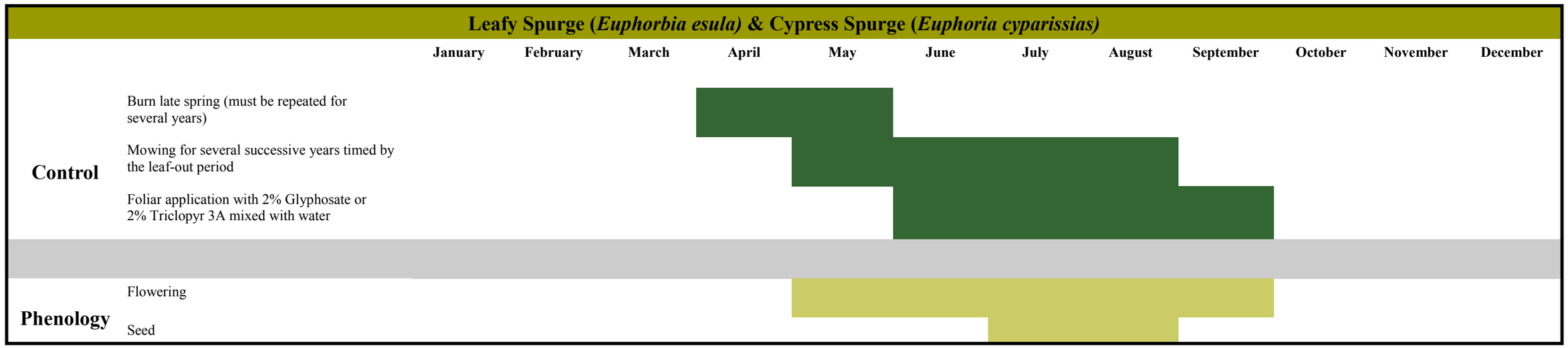
Garlic Mustard (*Alliaria petiolata*)



Japanese Knotweed (*Fallopia japonica)*



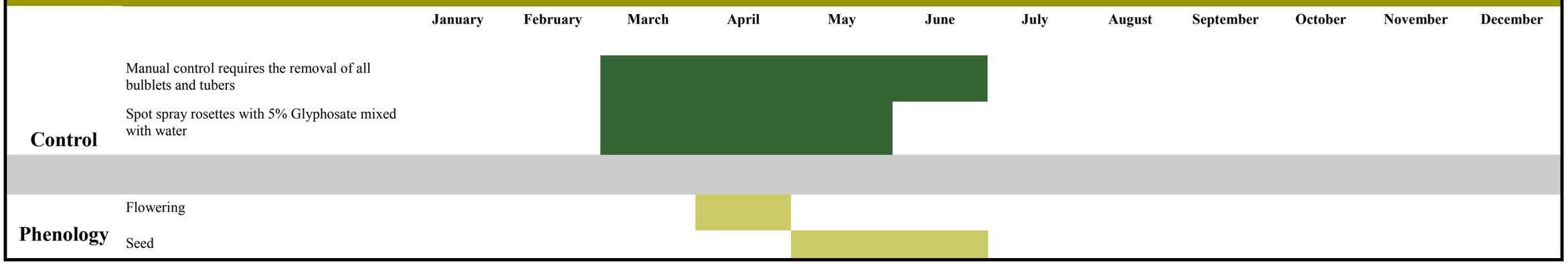
Leafy Spurge (*Euphorbia esula)* & Cypress Spurge (*Euphoria cyparissias)*



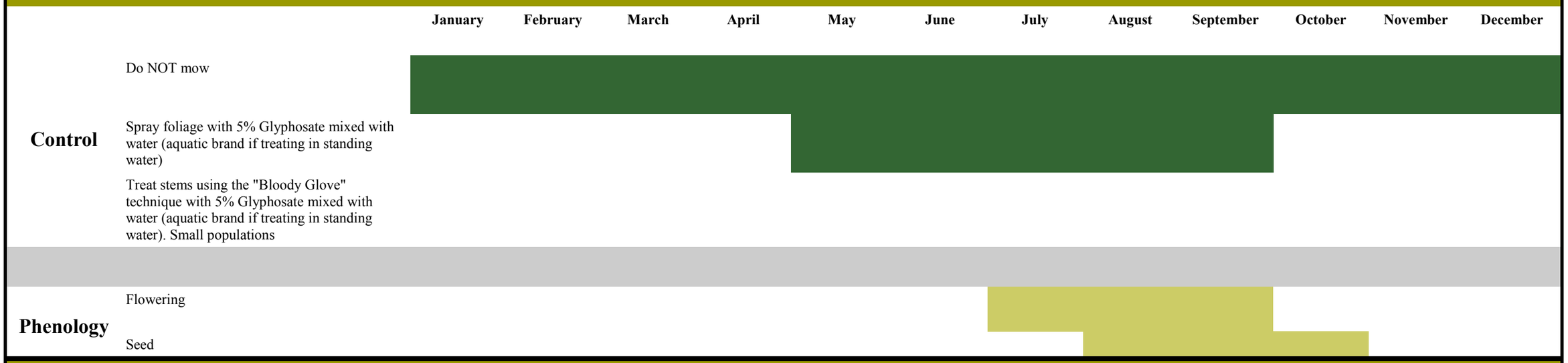
Notes:

Invasive Forbs of Southeastern Wisconsin

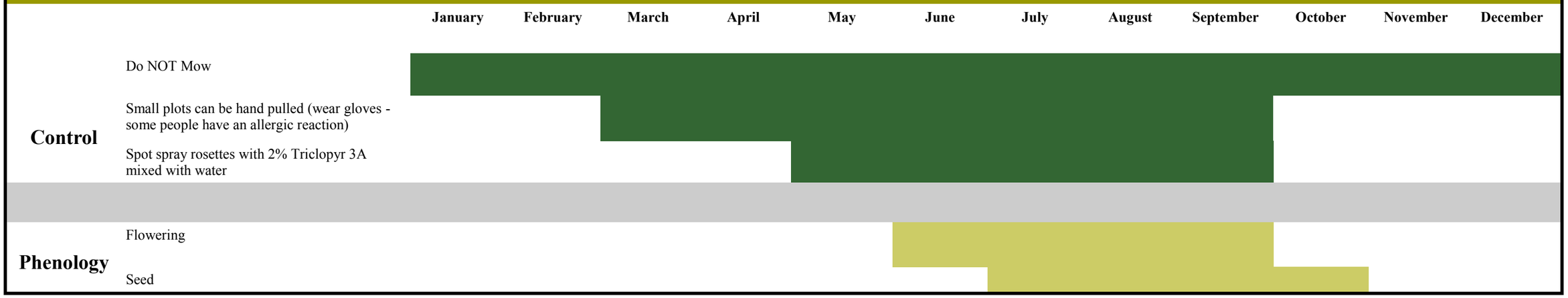
Lesser Celandine (*Ranunculus fiscaria)*



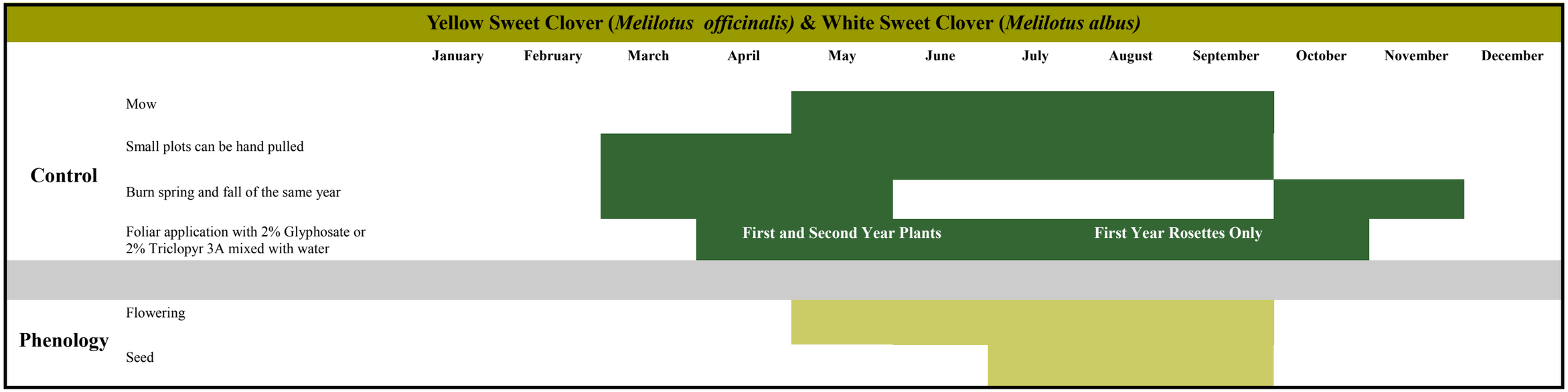
Purple Loosestrife *(Lythrum salicaria)*

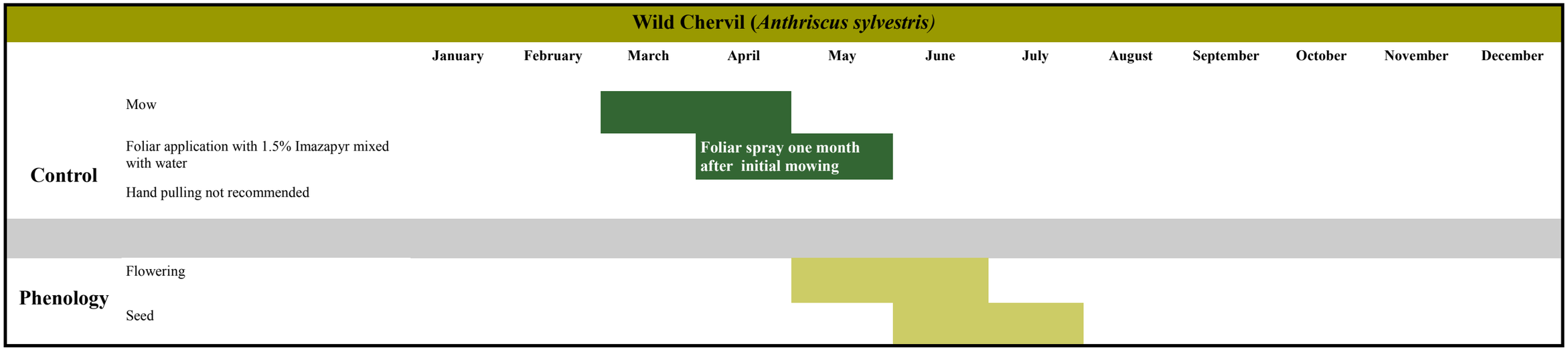


Spotted Knapweed (*Centurea maculosa)*



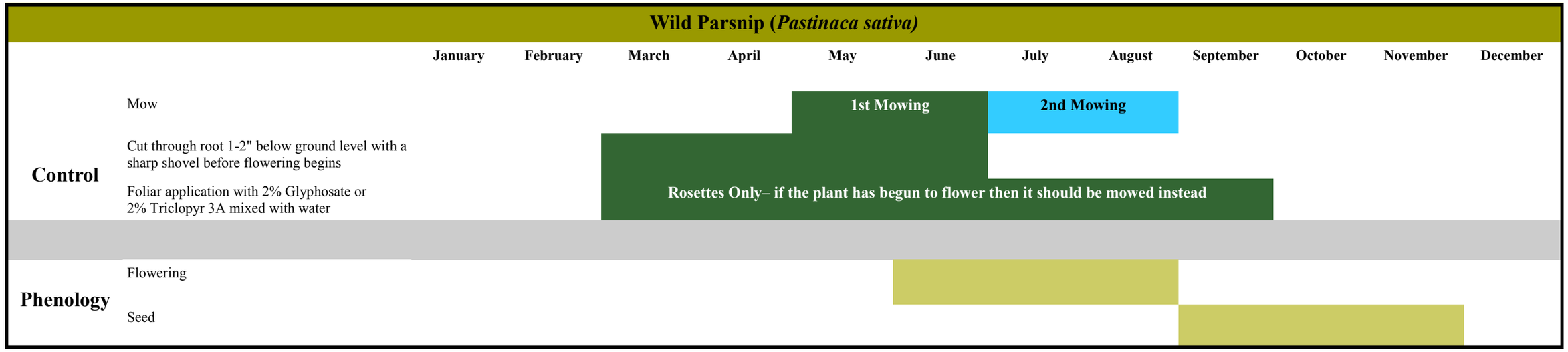
Invasive Forbs of Southeastern Wisconsin





Notes:

Invasive Forbs of Southeastern Wisconsin



Notes: **********Always cover skin completely when working with this plant. Contact with sap can cause painful burns or boils**********

Invasive Grasses of Southeastern Wisconsin

Common Reed Grass (*Phragmites australis)*

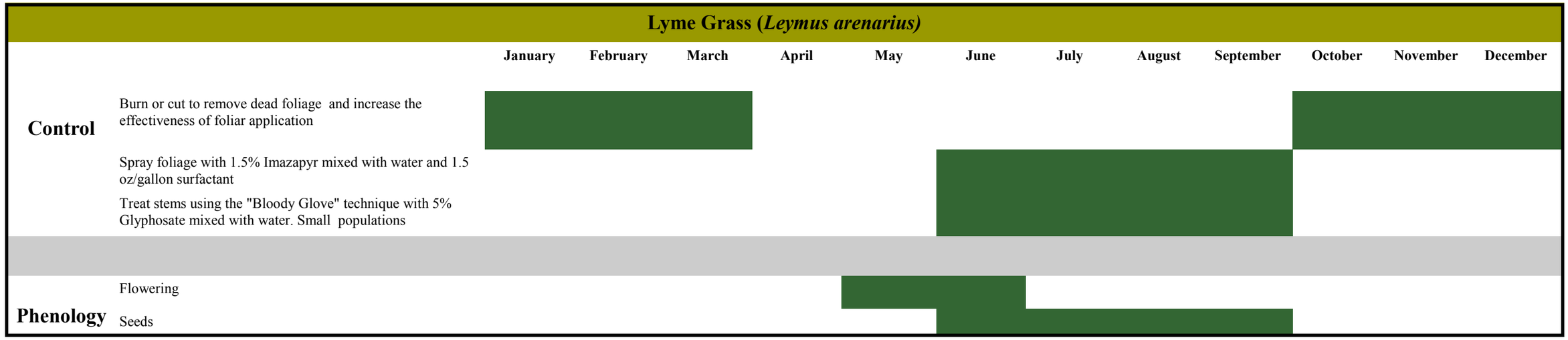
		January	February	March	April	May	June	July	August	September	October	November	December
Control	Burn or cut to remove dead foliage and increase the effectiveness of foliar application												
	Spray foliage with 1.5% Imazapyr mixed with water and 1.5 oz/gallon surfactant												
	Treat stems using the "Bloody Glove" technique with 5% Glyphosate mixed with water (aquatic brand if treating in standing water). Small populations												
	Do not mow												
	Readily reproduces vegetatively after mowing. Equipment should be used to spot mow stands and immediately cleaned on site.					Mow at flowering and prior to herbicide treatment							
Phenology	Flowering												
	Seeds can stay on plant through winter												

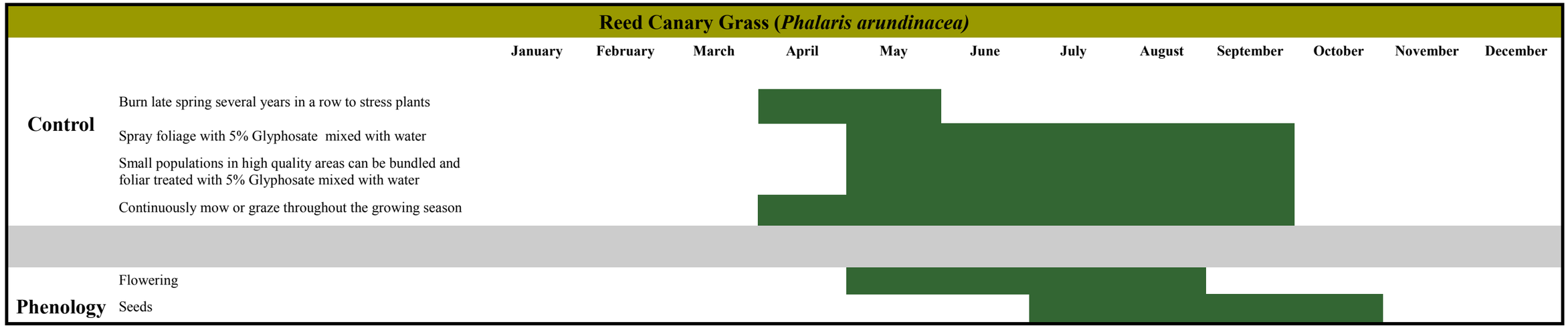
Japanese Plume Grass (*Miscanthus sinensis)*

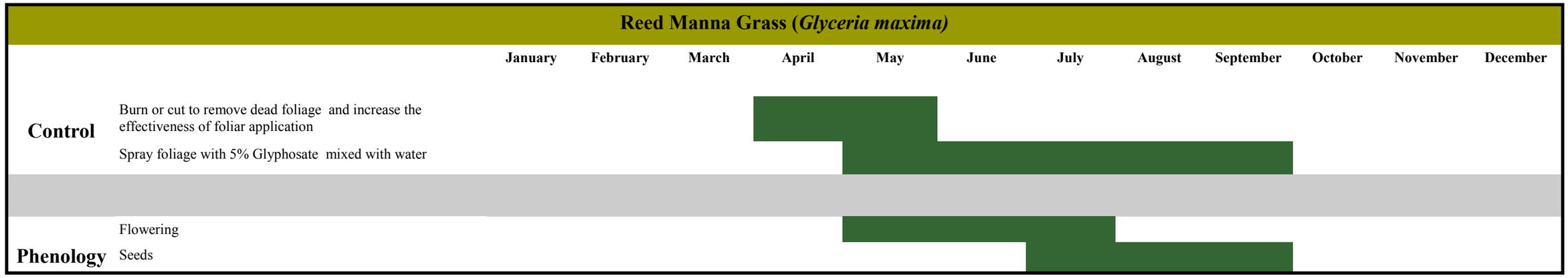
		January	February	March	April	May	June	July	August	September	October	November	December
Control	Burn or cut to remove dead foliage and increase the effectiveness of foliar application												
	Spray foliage with 5% Glyphosate mixed with water												
	Treat stems using the "Bloody Glove" technique with 5% Glyphosate mixed with water. Small populations												
	Do not mow												
Phenology	Flowering												
	Seeds can stay on plant through winter												

Notes:

Invasive Grasses of Southeastern Wisconsin







Notes:

Common Herbicide Application Methods

Cut-stump treatment:

Applying herbicide to freshly cut stump's cambium layer. Garlon 4 should be mixed with a penetrating bark oil (year round) and Glyphosate can be mixed with just water (growing season). Glyphosate with bark only needs to be applied to the cambium layer; Garlon 4 should be applied to the cambium layer and down the sides of the cut-stump to the root crown.

Basal Bark Treatment:

Applying a mixture of Garlon 4 and bark oil in a 6-15" band around the entire trunk of a tree or the stems at the base of a shrub.

Foliar Treatment:

Apply to the green leaves of an invasive plant with a sprayer or wick applicator. Leaves should be thoroughly covered, but not have chemical dripping off of them. When foliage is either waxy or fuzzy the herbicide should be mixed with a surfactant to improve penetration. Recommended application times are early spring and late fall within high quality sites because most native plants are dormant. In ecologically degraded sites, application can occur throughout the growing season. For foliage with a waxy coating it is recommended that the solution be mixed with .5% of a surfactant such as bark oil. "Bloody Glove" technique refers to soaking a cloth glove in a chemical solution, wearing it over your rubber herbicide application gloves and wiping the glove along the blades of grass or other vegetation. This method is particularly useful in high quality sites where a broad spraying application would be ecologically degrading.

Girdling Treatment:

Girdling is cutting and removing a band (1-2" wide on smaller trees, 6-8" on larger trees) of bark around the entire trunk of the tree to interrupt the flow of sap between the roots and the crown of the tree. Cuts should be treated with herbicide prior to spring sap flow.

FAQ	**Glyphosate (Round-up, Rodeo, Razor) & Triclopyr (Garlon 3A)**	**Triclopyr (Garlon 4)**
What is it mixed with?	Water or water with surfactant (waxy or fuzzy foliage)	Penetrating Bark Oil (Cut-stump)
Where is it applied?	Cambium layer, just inside bark on cut stump, foliage	Cambium layer and down the side of cut stump to root crown
What time of year should it be applied?	Cut-stump: early fall Foliar: During growing season in heavily infested areas; early spring/late fall in sensitive areas	Cut-stump: Can be applied anytime, most effective in the fall
What are the temperature or other restrictions?	>32°F Foliar > 50 °F	< 80°F Should not be applied when snow prevents coverage to the ground line
How soon after cutting should it be applied?	As soon as possible or within 30 minutes	Anytime, shortly after cutting is recommended
What plants will be affected?	Glyphosate is non-selective and will kill anything. Triclopyr is broadleaf specific	Broadleaf specific
What percentage is used?	Cut-stump or girdling: 12.5% - 25% AI. Foliar: 2% - 5% depending on species	Cut-stump or girdling: 12.5% a..i.
Restricted Entry Interval	Keep people and pets off of sprayed area until solution has dried typically < 1 day	12 hours

Total Mix	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL	% Concentration (Quantity of Herbicide needed) mL
Quantity (L)	**1.5**	**2**	**3**	**4**	**5**	**12.5**	**20**
1	15	20	30	40	50	125	200
3	45	60	90	120	150	375	600
5	75	100	150	200	250	625	1000
6	90	120	180	240	300	750	1200
9	135	180	270	360	450	1125	1800
10	150	200	300	400	500	1250	2000
12	180	240	360	480	600	1500	2400
15	225	300	450	600	750	1875	3000
20	300	400	600	800	1000	2500	4000
40	600	800	1200	1600	2000	5000	8000
50	750	1000	1500	2000	2500	6250	10000

*** For .5% surfactant: add 5 mL of oil / 1 L of mixture***
For cut stump mixtures: substitute penetrating bark oil for water