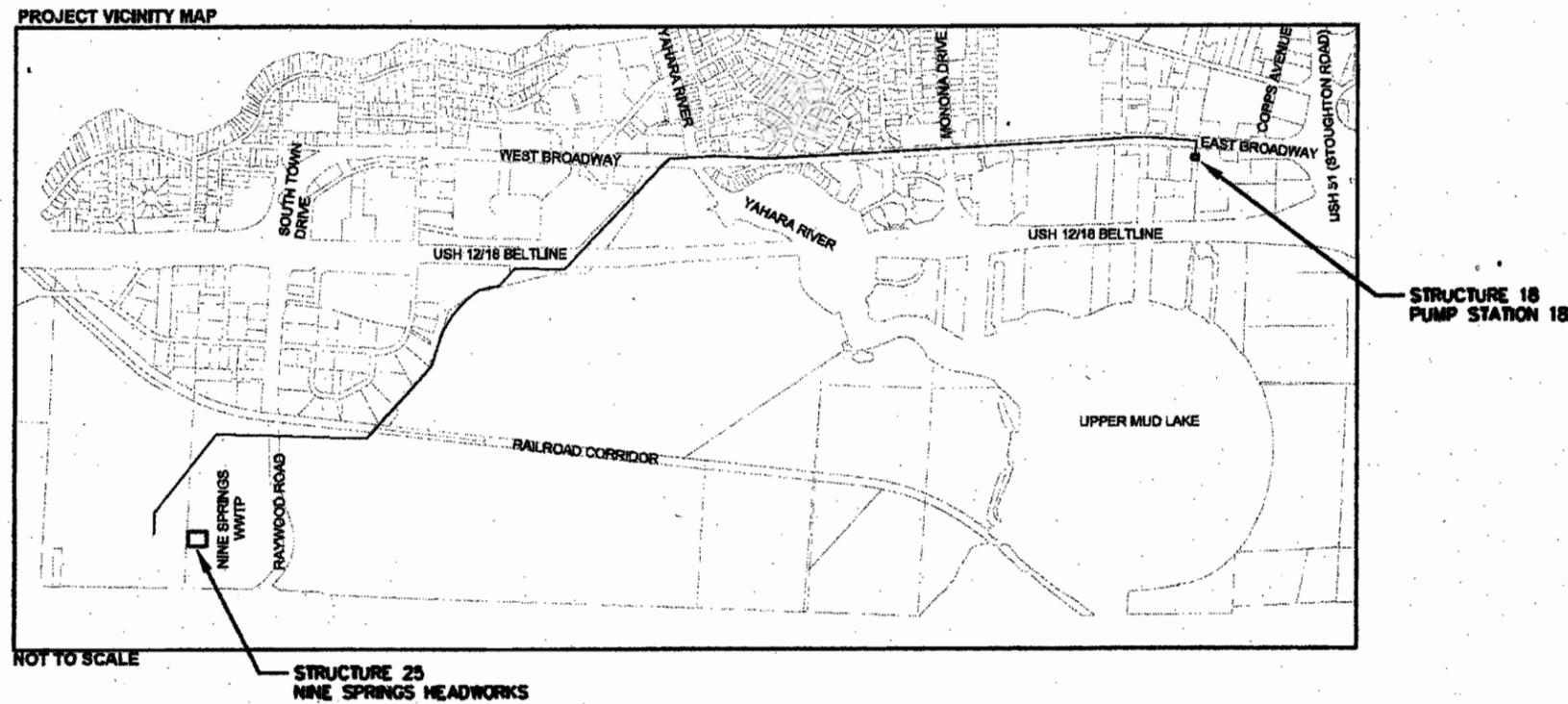


ANS/D 22/134
 Approved: _____
 Checked: TPU
 Designer: TPU
 Project Management Initials: _____
 Last revised by: WENZELER | Last Project: 2012-10-12
 Filename: L:\WORK\60214925\000_CADD\FORSEMAN\PS18\PM_COVER.DWG

PUMP STATION 18

PUMP STATION 18 TO NINE SPRINGS WWTP

MADISON METROPOLITAN SEWERAGE DISTRICT DANE COUNTY, WI DECEMBER 12, 2012 IN PROGRESS REVIEW



INDEX OF DRAWINGS

DRAWING NO.	ITEM DESCRIPTION	DRAWING NO.	ITEM DESCRIPTION
	TITLE SHEET	C-6	CURB & BOLLARD STAKING DATA
A-1a	ELEVATIONS AND PERSPECTIVES (REVISED)	C-7	PLAN & PROFILE
A-2a	ELEVATIONS AND PERSPECTIVES (REVISED)	C-8	LANDSCAPING PLAN (REVISED)
A-3	ROOF PLAN	C-9	EROSION CONTROL PLAN
M-2	UPPER MECHANICAL PLAN	99-C-01	EROSION CONTROL DETAILS (REVISED)
C-1	PROPERTY OVERVIEW	C-11	EROSION CONTROL DETAILS
C-2	OVERALL GRADING PLAN	C-12	CONSTRUCTION DETAILS
C-3	SANITARY PIPE CONNECTION PLAN	C-13	CONSTRUCTION DETAILS
C-4	GAS SERVICE PLAN	E1	PARTIAL EXTERIOR PLAN
C-5	ELECTRICAL CONDUIT PLAN		

REVISED 3/25/13

PREPARED FOR

MADISON METROPOLITAN SEWERAGE DISTRICT
 1610 MOORLAND ROAD
 MADISON, WISCONSIN 53713
 608-222-1201 tel
 www.mmsd.org

PREPARED BY

AECOM
 AECOM
 1350 DEMING WAY SUITE 100
 MIDDLETON, WI 53562
 608-836-6800 tel 608-836-8767 fax
 www.aecom.com

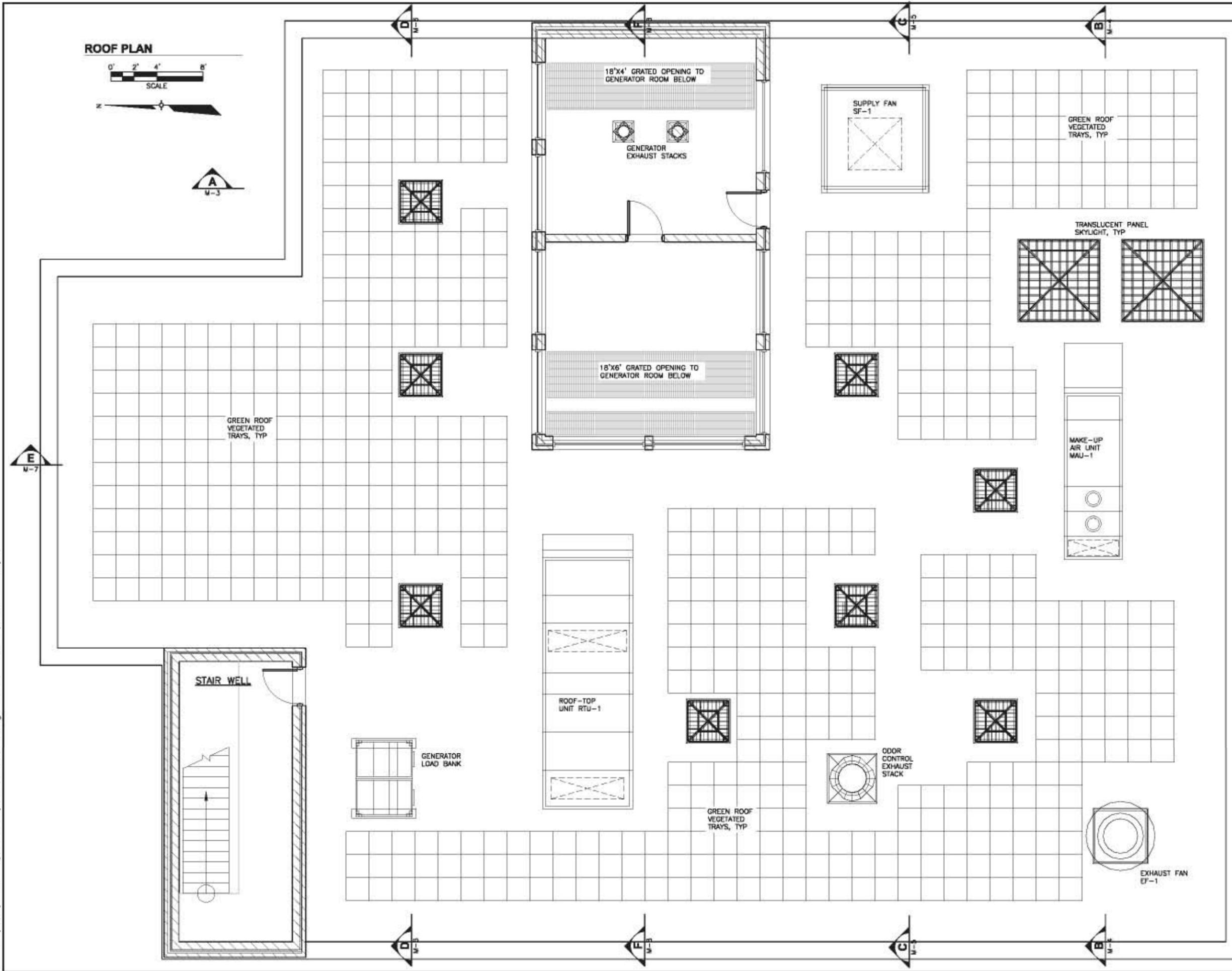
**MADISON METROPOLITAN SEWERAGE DISTRICT
 PUMP STATION 18
 PUMP STATION 18 TO NINE SPRINGS WWTP**

AECOM

DANE COUNTY, WI
 IN PROGRESS REVIEW

60214925

File: L:\work\60214925\000_CADD\PS18-M-ROF-01.dwg Time: Dec 11, 2012 - 4:32pm

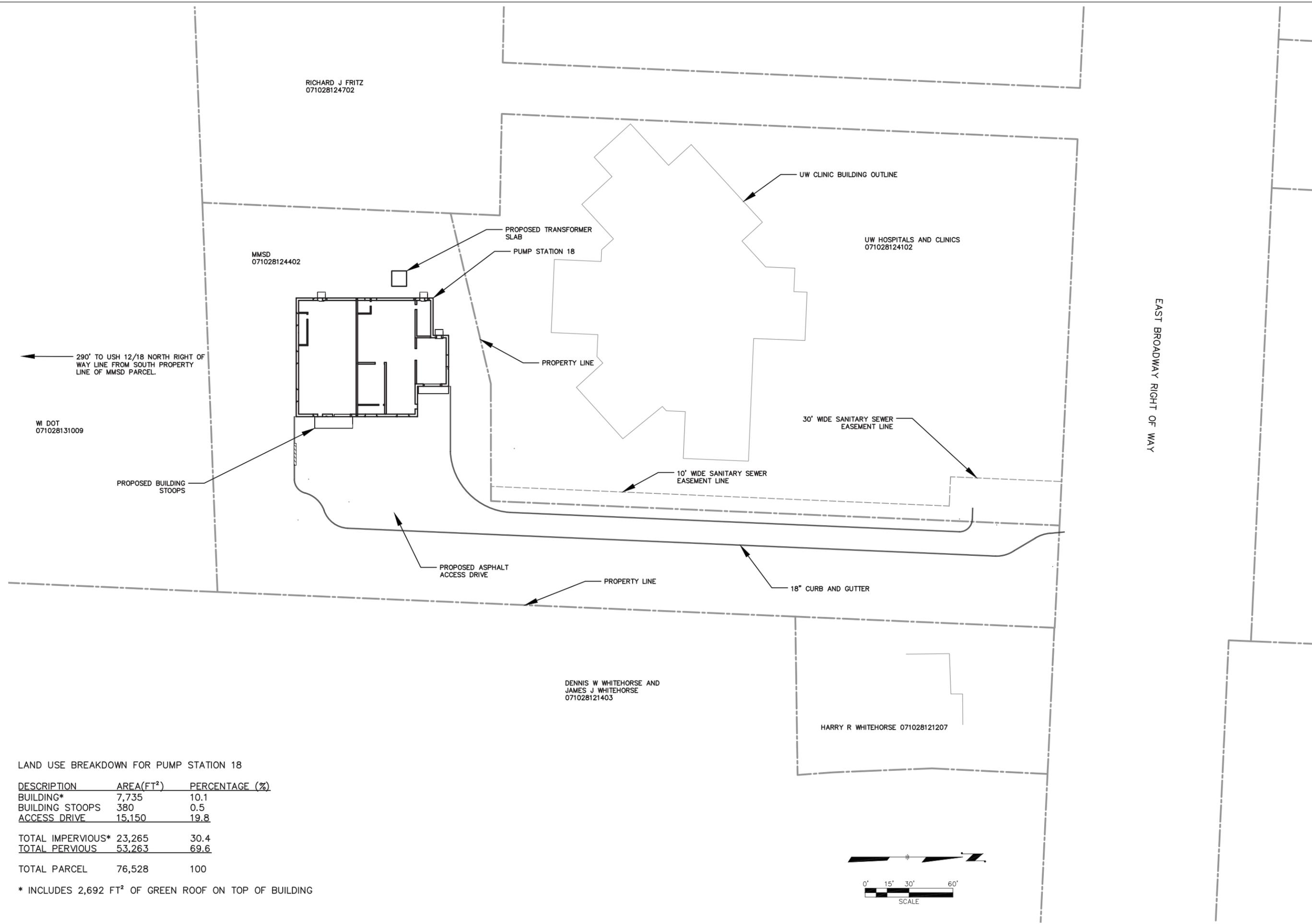


ROOF PLAN



<p>In Progress Review 12/12/2012</p>		NO	DRN/CHK	DATE
<p>SHEBOYGAN, WISCONSIN</p>		00-00-0000		
DRN JMK	DES ARB	00-00-0000		
CHK	APP	00-00-0000		
<p>PREPARED BY: AECOM</p>		<p>1550 DEMING WAY SUITE 100 MIDDLETON, WI 53602 T 608.835.8600 WWW.AECOM.COM</p>		
<p>MADISON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 1B MONONA, WISCONSIN</p>		<p>PUMP STATION ROOF PLAN</p>		
<p>DATE DECEMBER 2012</p>		<p>PROJECT NO 60214925</p>		
<p>FILE NO</p>		<p>SHEET NO</p>		
<p>DRAWING NO</p>		<p>A-3</p>		

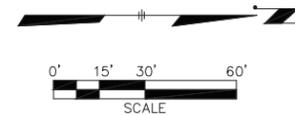
File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18\60214925_PS18_C01-EASEMENTS.dwg Time: Feb 07, 2013 - 1:02pm



LAND USE BREAKDOWN FOR PUMP STATION 18

DESCRIPTION	AREA(FT ²)	PERCENTAGE (%)
BUILDING*	7,735	10.1
BUILDING STOOPS	380	0.5
ACCESS DRIVE	15,150	19.8
TOTAL IMPERVIOUS*	23,265	30.4
TOTAL PERVIOUS	53,263	69.6
TOTAL PARCEL	76,528	100

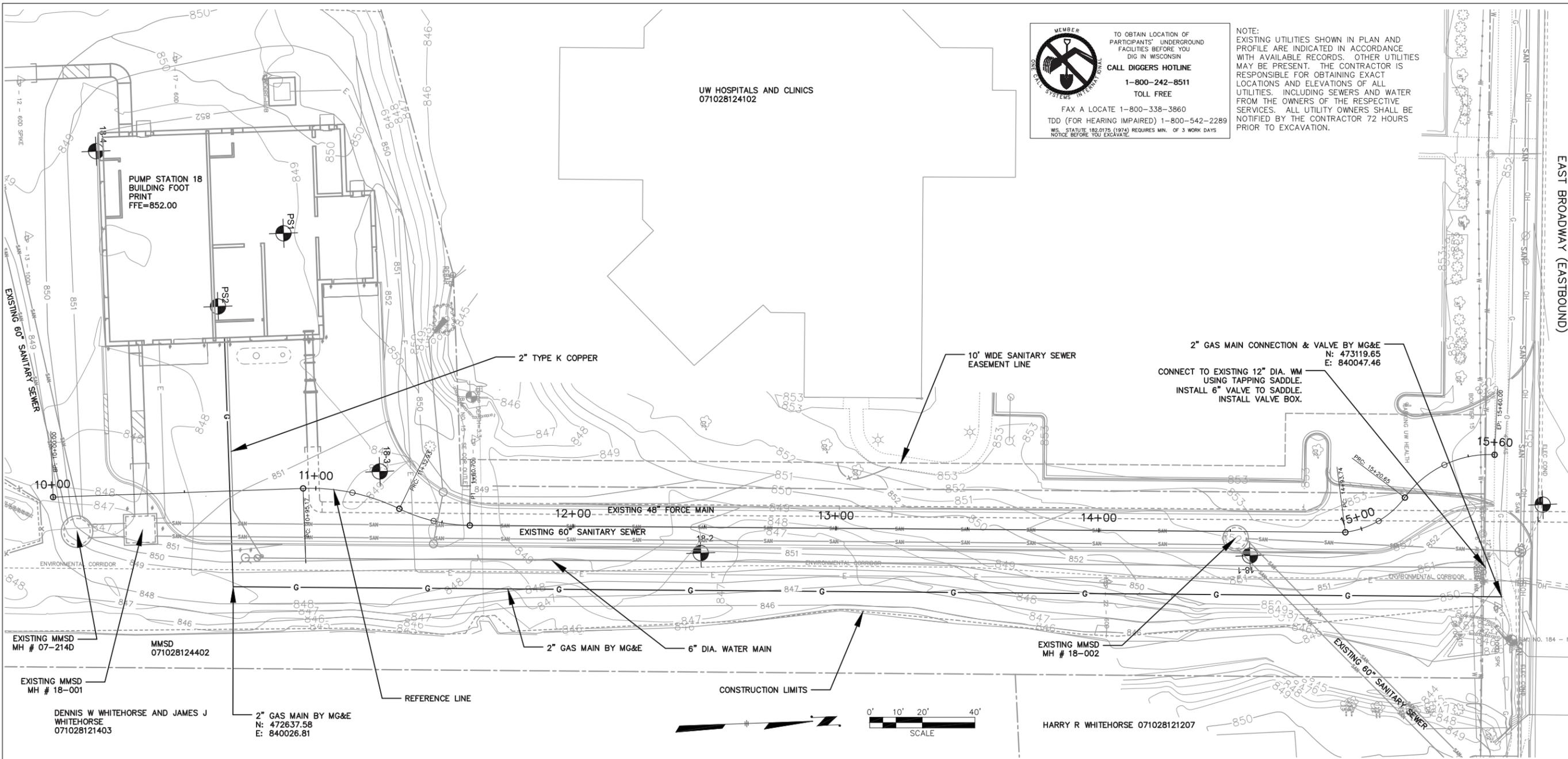
* INCLUDES 2,692 FT² OF GREEN ROOF ON TOP OF BUILDING



In Progress Review
01/21/2013

MIDDLETON, WISCONSIN	NO								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">DRN</td> <td style="width: 25%;">TPJ</td> <td style="width: 25%;">CHK</td> <td style="width: 25%;">APP</td> </tr> <tr> <td style="width: 25%;">DES</td> <td style="width: 25%;">TPJ</td> <td style="width: 25%;">CHK</td> <td style="width: 25%;">APP</td> </tr> </table>	DRN	TPJ	CHK	APP	DES	TPJ	CHK	APP	REVISIONS
DRN	TPJ	CHK	APP						
DES	TPJ	CHK	APP						
<p>PREPARED BY:</p> <p>1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562 T 608-836-9800 WWW.AECOM.COM</p>									
<p>MADISON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 18 MONONA, WISCONSIN</p>	<p>PUMP STATION PROPERTY OVERVIEW</p>								
DATE DECEMBER 2012									
PROJECT NO 60214925									
FILE									
FILE NO									
SHEET NO									
DRAWING NO									
C-1									

File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18\60214925_PS18_C04-GAS.dwg Time: Feb 06, 2013 - 3:58pm



UW HOSPITALS AND CLINICS
071028124102



 TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN
CALL DIGGERS HOTLINE
1-800-242-8511
 TOLL FREE
 FAX A LOCATE 1-800-338-3860
 TDD (FOR HEARING IMPAIRED) 1-800-542-2289
WIS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

NOTE:
EXISTING UTILITIES SHOWN IN PLAN AND PROFILE ARE INDICATED IN ACCORDANCE WITH AVAILABLE RECORDS. OTHER UTILITIES MAY BE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING EXACT LOCATIONS AND ELEVATIONS OF ALL UTILITIES, INCLUDING SEWERS AND WATER FROM THE OWNERS OF THE RESPECTIVE SERVICES. ALL UTILITY OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.

EAST BROADWAY (EASTBOUND)

MIDDLETON, WISCONSIN		NO	REVISIONS	DRN CHK	DATE
DRN	TPJ				
DES	TPJ				
CHK					
APP					

In Progress Review
01/21/2013

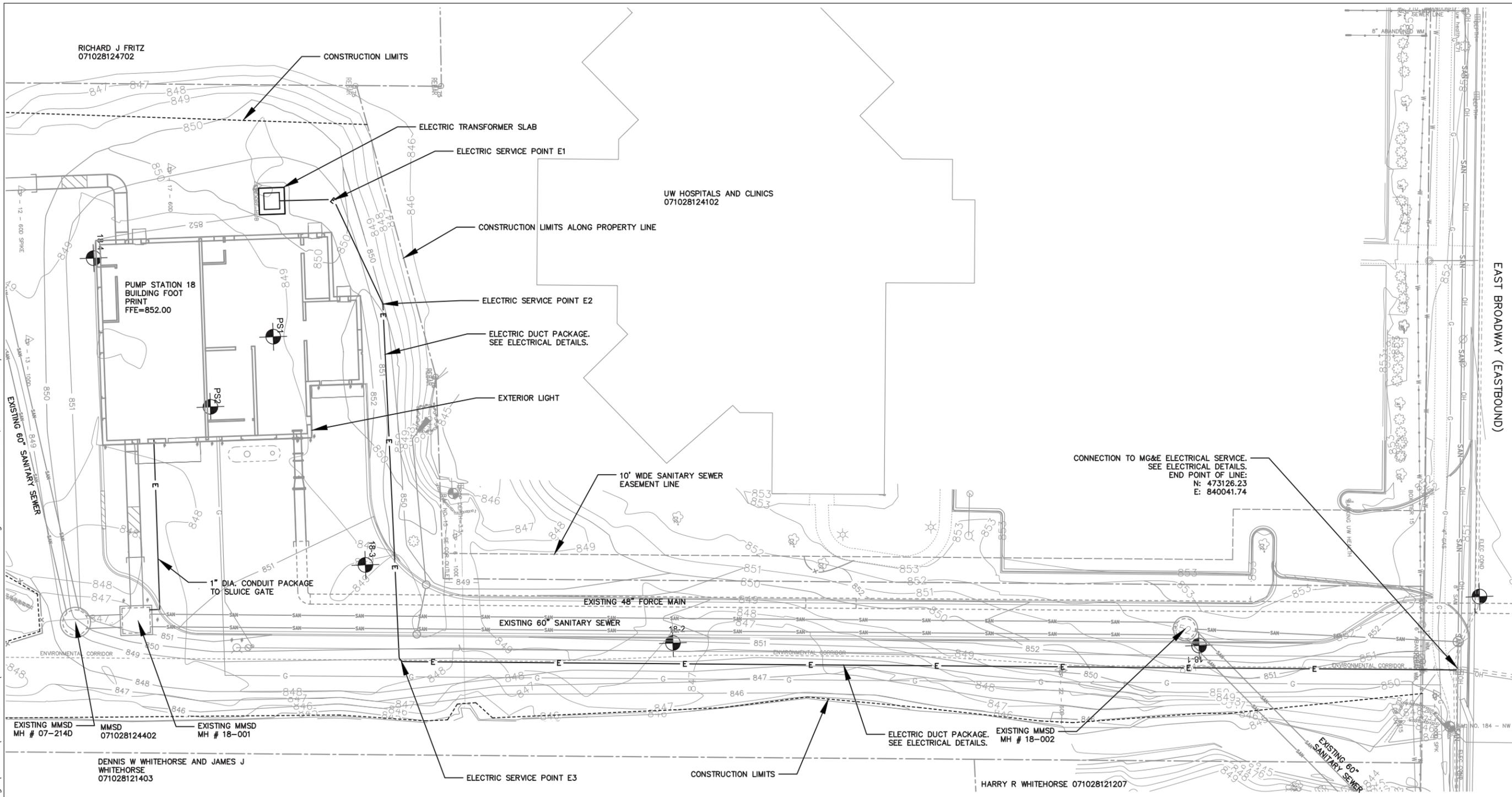
PREPARED BY:



1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
WWW.AECOM.COM
T 608-996-9800

MADISON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 18 MONONA, WISCONSIN	PUMP STATION GAS SERVICE PLAN
DATE	DECEMBER 2012
PROJECT NO	60214925
FILE	
FILE NO	
SHEET NO	
DRAWING NO	C4

File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18\60214925_PS18_C05-ELEC.dwg Time: Feb 06, 2013 - 3:59pm



EAST BROADWAY (EASTBOUND)



ELECTRICAL SERVICE (48" DIA. BEND RADIUS POINTS)

RADII POINT	NORTHING	EASTING	LOCATION	FINISHED GRADE
E1	472685.90	839841.87	WEST OF PS18	851.3
E2	472703.36	839882.31	NORTH OF PS18	850.0
E3	472708.92	840021.86	SE OF CB 18.2	848.9

TRANSFORMER STAKING DATA

CORNER	NORTHING	EASTING	LOCATION	FINISHED GRADE
1	472667.78	839834.40	NW	852.50
2	472657.61	839834.40	SW	852.50
3	472657.61	839844.90	SE	852.50
4	472667.78	839844.90	NE	852.50

MEMBER

 TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN
CALL DIGGERS HOTLINE
1-800-242-8511
 TOLL FREE
 FAX A LOCATE 1-800-338-3860
 TDD (FOR HEARING IMPAIRED) 1-800-542-2289
WS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

NOTE:
 EXISTING UTILITIES SHOWN IN PLAN AND PROFILE ARE INDICATED IN ACCORDANCE WITH AVAILABLE RECORDS. OTHER UTILITIES MAY BE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING EXACT LOCATIONS AND ELEVATIONS OF ALL UTILITIES, INCLUDING SEWERS AND WATER FROM THE OWNERS OF THE RESPECTIVE SERVICES. ALL UTILITY OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.

In Progress Review
01/21/2013

MIDDLETON, WISCONSIN

DRN	TPJ	DES	TPJ	CHK	APP

NO REVISIONS

DRN CHK DATE

PREPARED BY: **AECOM**

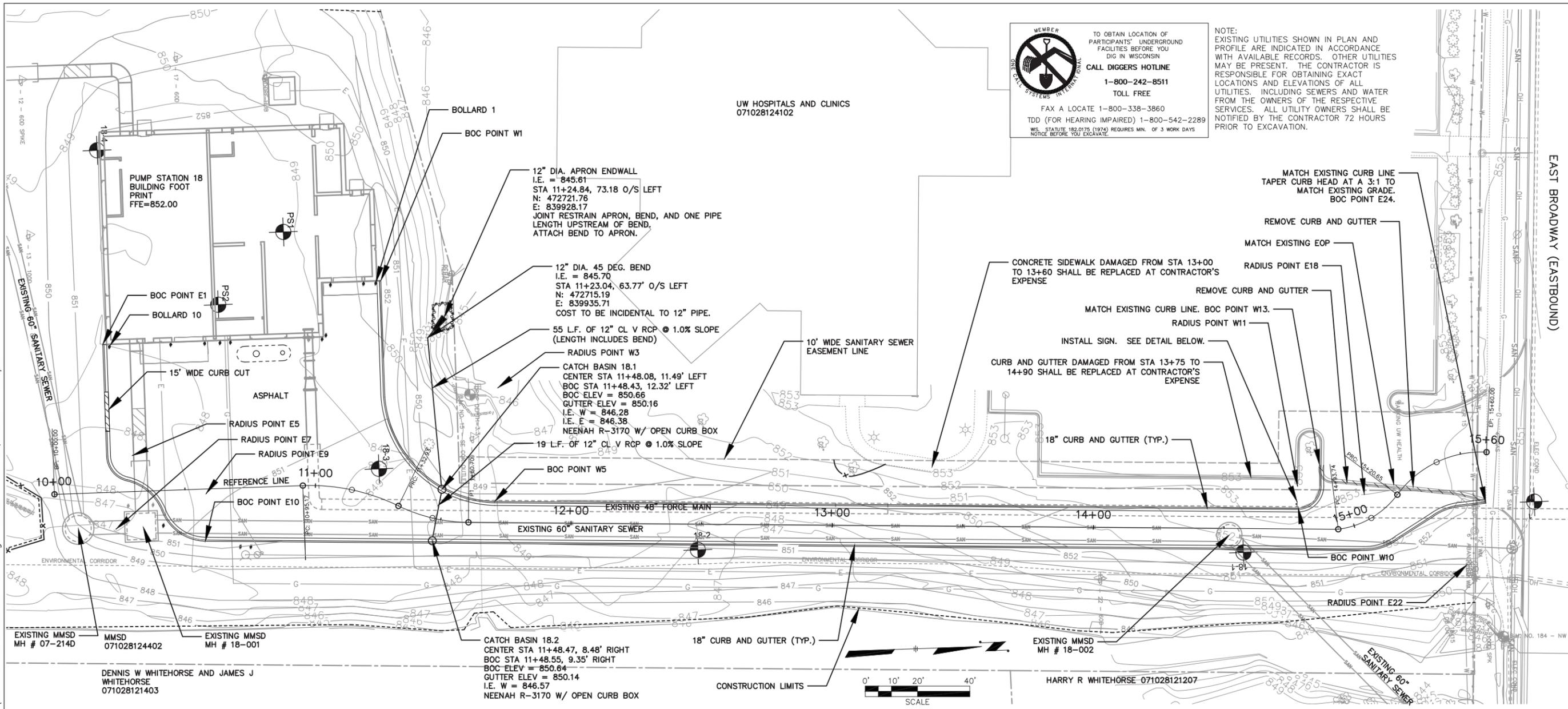
1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
 T 608-936-9800 WWW.AECOM.COM

MADISON METROPOLITAN SEWERAGE DISTRICT
 PUMP STATION 18
 MONONA, WISCONSIN

PUMP STATION ELECTRICAL CONDUIT PLAN

DATE DECEMBER 2012
 PROJECT NO 60214925
 FILE NO
 SHEET NO
 DRAWING NO **C-5**

File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18_C06-CURB.dwg Time: Feb 06, 2013 - 4:00pm



MEMBER

 TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN
CALL DIGGERS HOTLINE
 1-800-242-8511
 TOLL FREE
 FAX A LOCATE 1-800-338-3860
 TDD (FOR HEARING IMPAIRED) 1-800-542-2289
 WIS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

NOTE:
 EXISTING UTILITIES SHOWN IN PLAN AND PROFILE ARE INDICATED IN ACCORDANCE WITH AVAILABLE RECORDS. OTHER UTILITIES MAY BE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING EXACT LOCATIONS AND ELEVATIONS OF ALL UTILITIES, INCLUDING SEWERS AND WATER FROM THE OWNERS OF THE RESPECTIVE SERVICES. ALL UTILITY OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.

EAST BROADWAY (EASTBOUND)
 MIDDLETON, WISCONSIN
 PREPARED BY:

 1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
 WWW.AECOM.COM
 T 608-936-9800

EAST CURB LINE STAKING DATA (BOC STAKING POINTS)

POINT	STA	OFFSET	DIRECTION	NORTHING	EASTING	ELEVATION	DESCRIPTION
E1	10+20.47	56.54	LEFT	472590.78	839933.90	852.50	BOC
E2	10+20.47	38.32	LEFT	472590.78	839952.13	852.22	CURB CUT
E3	10+20.47	23.32	LEFT	472590.78	839967.13	852.00	CURB CUT
E4	10+20.47	13.81	LEFT	472590.78	839976.63	851.85	PC
E5	10+30.47	13.81	LEFT	472600.78	839976.63	0.00	10.0' RADIUS POINT
E6	10+27.95	4.14	LEFT	472598.25	839986.31	851.75	PT - PC
E7	10+23.22	14.01	RIGHT	472593.52	840004.45	0.00	18.75' RADIUS POINT
E8	10+40.85	7.64	RIGHT	472611.15	839998.08	851.61	PT - PC
E9	10+58.10	1.69	RIGHT	472628.41	839992.13	0.00	18.25' RADIUS POINT
E10	10+57.10	19.92	RIGHT	472627.40	840010.36	851.44	PT
E11	11+48.55	9.35	RIGHT	472714.13	840014.07	850.64	CATCH BASIN
E12	12+00.00	8.00	RIGHT	472767.26	840016.35	850.99	BOC
E13	13+00.00	8.00	RIGHT	472867.17	840020.63	851.80	BOC
E14	14+00.00	8.00	RIGHT	472967.07	840024.91	852.61	BOC
E15	14+75.00	8.00	RIGHT	473042.01	840028.12	853.25	BOC - VPC
E16	14+87.17	8.00	RIGHT	473054.16	840028.64	853.27	HP-VC
E17	14+99.66	9.78	RIGHT	473069.48	840029.30	853.00	PC
E18	15.10.33	9.18	LEFT	473071.51	840007.86	0.00	21.5' RADIUS POINT
E19	15+10.51	12.38	RIGHT	473083.62	840025.63	852.70	PT
E20	15+23.69	16.1	RIGHT	473097.94	840017.14	852.41	PC
E21	15+25.00	16.32	RIGHT	473098.64	840016.73	852.39	BOC - VPT
E22	15+18.03	37.61	RIGHT	473109.83	840036.25	0.00	22.5' RADIUS POINT
E23	15+42.29	19.11	RIGHT	473108.14	840013.81	852.21	PT
E24			RIGHT	473117.80	840012.91	851.52	MATCH EX GUTTER

WEST CURB LINE STAKING DATA (BOC STAKING POINTS)

POINT	STA	OFFSET	DIRECTION	NORTHING	EASTING	ELEVATION	DESCRIPTION
W1	11+11.24	80.59	LEFT	472698.03	839913.24	852.50	BOC
W2	11+17.42	37.44	LEFT	472698.03	839957.71	851.70	PC
W3	11+71.65	51.53	LEFT	472741.48	839955.66	0.00	43.50' RADIUS POINT
W4	11+48.43	12.32	LEFT	472719.13	839992.98	850.66	CATCH BASIN
W5	11+70.70	8.04	LEFT	472738.67	839999.07	850.76	PT
W6	12+00.00	8.03	LEFT	472767.95	840000.33	850.99	BOC
W7	13+00.00	8.02	LEFT	472867.85	840004.62	851.80	BOC
W8	14+00.00	8.00	LEFT	472967.76	840008.92	852.61	BOC
W9	14+75.00	8.00	LEFT	473042.69	840012.13	853.25	BOC - VPC
W10	14+78.37	8.00	LEFT	473046.00	840012.28	853.23	PC
W11	14+78.02	16.49	LEFT	473046.08	840003.78	0.00	8.50' RADIUS POINT
W12	14+86.52	16.52	LEFT	473054.57	840004.11	853.20	PT
W13	14+86.37	24.89	LEFT	473054.76	839996.15	853.17	MATCH EX BOC

BOC = BACK OF CURB

BOLLARD STAKING DATA (CENTER POINT)

BOLLARD	NORTHING	EASTING	STATION	OFFSET	DIRECTION	FINISHED GRADE
1	472696.03	839914.24	11+10.37	79.21	LEFT	852.00
2	472691.36	839914.24	11+08.10	78.37	LEFT	852.00
3	472678.69	839914.24	11+01.82	76.77	LEFT	852.00
4	472676.28	839933.40	11+01.38	57.47	LEFT	852.00
5	472674.78	839934.90	11+00.58	55.86	LEFT	852.00
8	472629.78	839934.90	10+59.47	55.54	LEFT	852.00
9	472616.78	839934.90	10+46.47	55.54	LEFT	852.00
10	472593.28	839934.90	10+22.97	55.54	LEFT	852.00
11	472611.57	840003.83	10+41.27	13.39	RIGHT	851.40
12	472640.77	840012.93	10+70.47	22.49	RIGHT	851.00
13	472644.77	840013.10	10+74.46	22.66	RIGHT	851.00

INSTALL SIGN AT:
 STA 14+77.67, 9.50' O/S LEFT
 N: 473045.42
 E: 840010.74

CUSTOM SIGN TO BE INSTALLED ON POST:



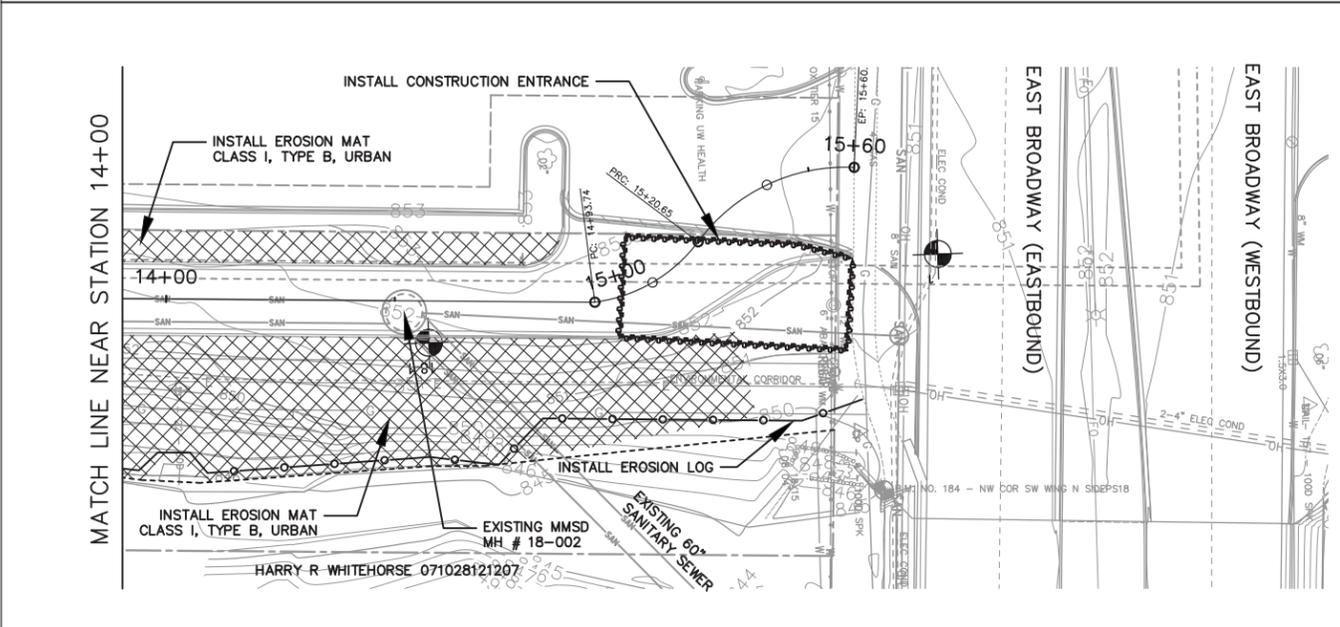
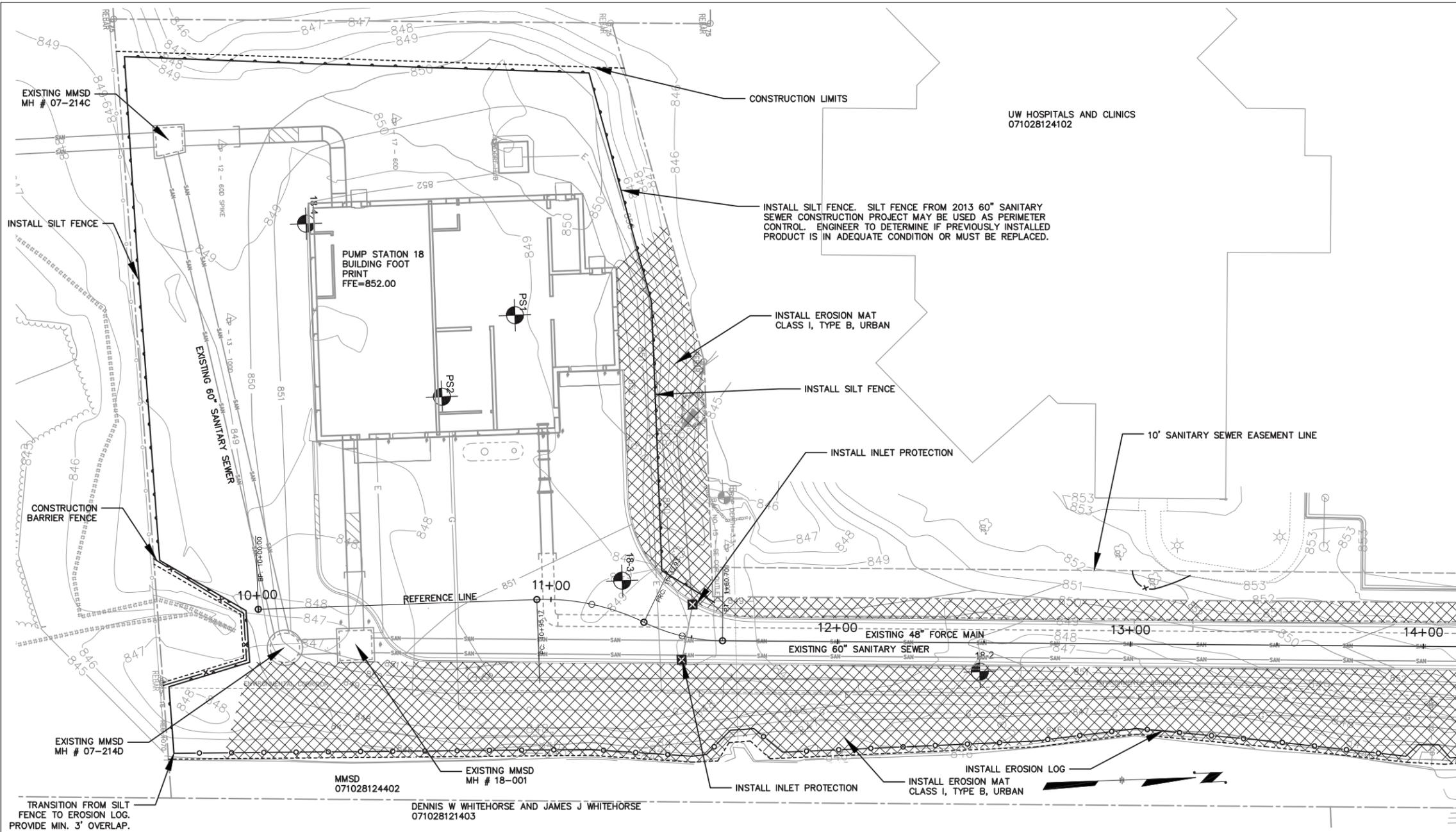
5" BLACK LETTERS ON WHITE BACKGROUND WITH BLACK BORDER.
 ALUMINUM SHEET - 24" (W) X 30" (H) X 0.100 (MIN.) INCH NOMINAL THICKNESS.
 POST - TUBULAR STEEL SIGN POST.
 SIGN SHEET TO MEET REQUIREMENTS OF WISDOT SECTION 637 OF STANDARD SPECIFICATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.
 SIGN POST TO MEET REQUIREMENTS OF WISDOT SECTION 634 OF STANDARD SPECIFICATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.

MADISON METROPOLITAN SEWERAGE DISTRICT
 PUMP STATION 18
 MONONA, WISCONSIN
 PUMP STATION
 CURB & BOLLARD STAKING DATA
 DATE DECEMBER 2012
 PROJECT NO 60214925
 FILE NO
 SHEET NO
 DRAWING NO
 C-6

In Progress Review
01/21/2013
 REVISIONS
 NO
 DRN
 DES
 CHK
 APP
 MIDDLETON, WISCONSIN
 PREPARED BY:

 1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
 WWW.AECOM.COM
 T 608-936-9800

File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18\60214925_PS18_C09-EC.dwg Time: Feb 06, 2013 - 4:05pm



LEGEND

- CONSTRUCTION ENTRANCE, STONE TRACKING PAD
- EROSION LOGS
- SILT FENCE
- INLET PROTECTION WISDOT TYPE D
- EROSION MAT CLASS I TYPE B URBAN
- EXISTING WETLAND BOUNDARY

MEMBER
TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN
CALL DIGGERS HOTLINE
1-800-242-8511
TOLL FREE
 FAX A LOCATE 1-800-338-3860
 TDD (FOR HEARING IMPAIRED) 1-800-542-2289
WS. STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

NOTE:
 EXISTING UTILITIES SHOWN IN PLAN AND PROFILE ARE INDICATED IN ACCORDANCE WITH AVAILABLE RECORDS. OTHER UTILITIES MAY BE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING EXACT LOCATIONS AND ELEVATIONS OF ALL UTILITIES, INCLUDING SEWERS AND WATER FROM THE OWNERS OF THE RESPECTIVE SERVICES. ALL UTILITY OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.

**MADISON METROPOLITAN SEWERAGE DISTRICT
 PUMP STATION 18
 MONONA, WISCONSIN**

**PUMP STATION
 EROSION CONTROL PLAN**

DATE DECEMBER 2012
 PROJECT NO 60214925
 FILE NO
 SHEET NO
 DRAWING NO

MIDDLETON, WISCONSIN		NO		REVISIONS	DRN CHK	DATE
DRN	TPJ	DES	TPJ	CHK	APP	
In Progress Review						
01/21/2013						
AECOM						
PREPARED BY: 1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562 T 608-836-9800 WWW.AECOM.COM						
MIDDLETON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 18 MONONA, WISCONSIN PUMP STATION EROSION CONTROL PLAN						
DATE DECEMBER 2012 PROJECT NO 60214925 FILE NO SHEET NO DRAWING NO						
C-9						

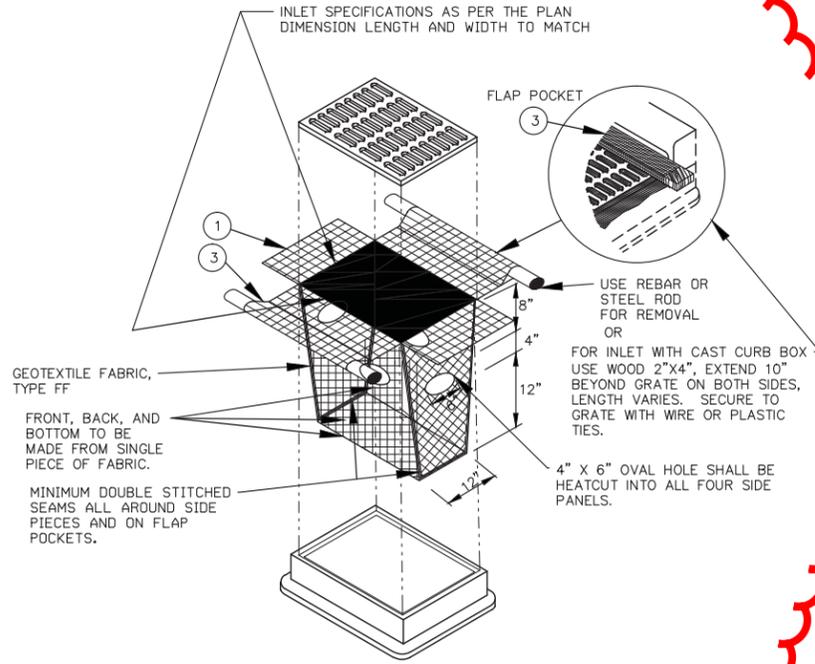
Plotted By: jacobson
 Plot File Date Created: Mar/01/2013 11:10 AM
 Layout-Sheet Name: 22X34
 File Name: L:\WORK\PROJECTS\60214925\000_CAD\001_DRAWINGS\SHEETS\SHEET_PS18_99-C-01.DWG

NOTES:
 TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

NOTES FOR WISDOT TYPE D INLET PROTECTION:

- 1 FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- 2 FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- 3 FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2"x4" IN SIZE.

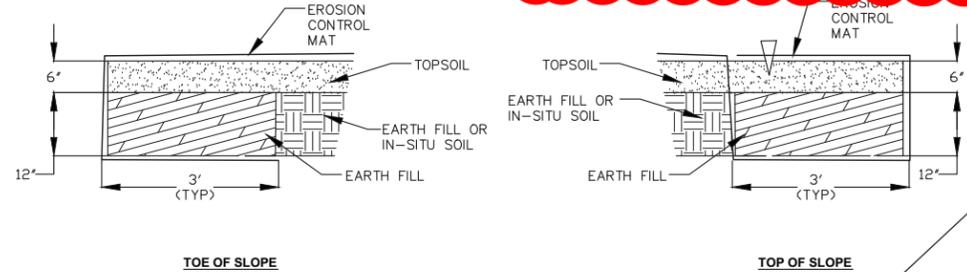


**INLET PROTECTION,
 WISDOT TYPE D**

NOT TO SCALE

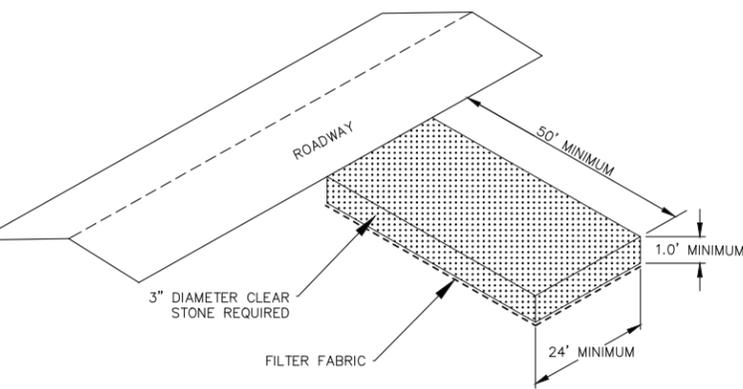
EROSION CONTROL NOTES:

1. DISTURBANCE FOR CONSTRUCTION NEAR DRAINAGE WAYS SHALL BE MINIMIZED TO THE GREATEST EXTENT POSSIBLE. CONTRACTOR SHALL NOT STOCKPILE EXCAVATED MATERIAL WITHIN 15' OF A DRAINAGE WAY WITHOUT EROSION CONTROL DEVICES IN PLACE BETWEEN THE STOCKPILE AND DRAINAGE WAY. IN NO CIRCUMSTANCE SHALL THE DRAINAGE WAY BE BLOCKED IN A MANNER THAT WOULD SIGNIFICANTLY IMPEDE FLOW THROUGH THE DRAINAGE WAY.
2. CONTRACTOR WILL CONDUCT A MINIMUM OF ONE EROSION CONTROL INSPECTION PER WEEK AND ONE INSPECTION AFTER ANY RAINFALL EVENT EXCEEDING 0.5 INCHES WITHIN A 24-HOUR PERIOD. ANY CORRECTIONS, ADDITIONS OR MAINTENANCE NEEDS NOTED IN THE INSPECTION SHALL BE COMPLETED WITHIN 24-HOURS OF INSPECTION. A COPY OF THE WEEKLY INSPECTION REPORTS WILL BE MAINTAINED ON THE CITY OF MADISON'S ACTIVE CONSTRUCTION SITE WEBSITE FOR CONSTRUCTION WITHIN THE CITY OF MADISON. A COPY SHALL BE PROVIDED TO THE OWNER'S REPRESENTATIVE ON A WEEKLY BASIS, AND A COPY SHALL BE KEPT IN THE FIELD DURING CONSTRUCTION.
3. TRENCHES SHALL BE BACKFILLED AT THE END OF EACH WORK DAY TO PRE-CONSTRUCTION GRADE. ALL EXCESS MATERIALS SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND SHALL NOT BE DISPOSED OF OR STORED WITHIN WETLANDS, WATERWAYS, OR FLOODPLAIN AREAS. THE CONTRACTOR MAY LEAVE THE TRENCH OPEN WHERE THEY LEAVE OFF AT THE END OF THE DAY BUT SHALL MINIMIZE THE PORTION OF THE TRENCH LEFT OPEN.
4. ALL EROSION CONTROL DEVICES LISTED ON THE PLANS MUST BE INSTALLED PRIOR TO CONSTRUCTION ON LANDS DRAINING FROM THE INSTALLATION.
5. STONE TRACKING PADS SHALL BE MAINTAINED THROUGHOUT THE PROJECT AND ACCUMULATED SEDIMENTS TRACKED ONTO PUBLIC ROADWAYS SHALL BE REMOVED AT THE END OF EACH WORK DAY AND AS DIRECTED BY THE ENGINEER. SEE WDNR TECHNICAL STANDARD 1057
6. STABILIZATION SCHEDULES AND REQUIREMENTS OF THE APPROVED EROSION CONTROL PLAN, AND PERMIT REQUIREMENTS SHALL BE FOLLOWED BY THE CONTRACTOR DURING CONSTRUCTION. CONTRACTOR SHALL HAVE COPIES OF THESE PERMITS AND THE EROSION CONTROL PLAN (PREPARED BY OTHERS) WITH THEM IN THE FIELD DURING CONSTRUCTION.
7. ANY SEEDING CONDUCTED AFTER OCTOBER 15TH SHALL BE STABILIZED WITH SOIL STABILIZER IN ADDITION TO THE MEASURES PRESCRIBED IN THE EROSION CONTROL PLAN. SEE WDNR TECHNICAL STANDARD 1050.
8. DRAINAGE WAY SLOPES DISTURBED DURING CONSTRUCTION SHALL BE BACKFILLED BY THE END OF THE WORK DAY AND THE CONTRACTOR SHALL TRACK THIS SLOPE WITH A BULLDOZER OR OTHER TRACK EQUIPMENT BY OPERATING THE VEHICLE UP AND DOWN THE SLOPE LEAVING BEHIND HORIZONTAL DEPRESSIONS IN THE SOIL.
9. SEED MIXTURE AND APPLICATION RATES SHALL COMPLY WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS, AND WDNR TECHNICAL STANDARD 1059.
10. FERTILIZER SHALL BE PLACED PER SECTION 629 OF THE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.
11. MULCHING SHALL BE PLACED PER SECTION 627 OF THE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION, AND WDNR TECHNICAL STANDARD 1058.
12. EROSION LOGS (SILT SOCK) AND EROSION MATS SHALL BE INSTALLED PER SECTION 628 OF THE WISDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.
13. EROSION MATTING SHALL BE IN ACCORDANCE WITH THE MATTING SPECIFIED IN THE APPROVED EROSION CONTROL PLAN. SEE WDNR TECHNICAL STANDARD 1052.
14. ALL EXCESS MATERIAL BEYOND THAT REQUIRED TO RESTORE ORIGINAL GRADE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF OFF-SITE BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE TO LOCATE A SUITABLE DISPOSAL AREA THAT COMPLIES WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
15. CONTRACTOR SHALL MONITOR AND REPAIR ALL DAMAGED OR DESTROYED EROSION CONTROL DEVICES. AREAS WHERE SEEDING HAS NOT ESTABLISHED WITHIN 45 DAYS OF SEEDING SHALL BE RESEEDED AND STABILIZED AT CONTRACTOR'S EXPENSE.
16. CONTRACTOR SHALL RETAIN ALL EMPTY CONTAINERS OR IDENTIFICATION TAGS OF POLYMER AND SEED AS EVIDENCE OF APPLICATION OF THESE EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE PROJECT HAS OBTAINED FINAL ACCEPTANCE.
17. THE CONTRACTOR MUST ADHERE TO THE EROSION CONTROL PLAN FOR THE PROJECT, INCLUDING STABILIZATION WINDOWS, TO BE IN COMPLIANCE WITH PERMITS OBTAINED FOR THIS PROJECT.
18. ANY CHANGES, INCLUDING STABILIZATION WINDOWS, TO THE APPROVED EROSION CONTROL PLAN MUST BE APPROVED BY THE OWNER, LOCAL GOVERNMENT AGENCIES WITH REVIEW AUTHORITY, AND WDNR.
19. INSTALL EROSION CONTROL LOGS ACROSS HARD SURFACE AREAS WHERE INDICATED ON DRAWINGS. STAKE LOGS AT ENDS TO HOLD IN PLACE.
20. INSTALL WISDOT TYPE D INLET PROTECTION IN STORM INLETS WHERE NOTED ON EROSION CONTROL PLAN. SEE WDNR TECHNICAL STANDARD 1060.
21. WDNR TECHNICAL STANDARDS ARE AVAILABLE AT [HTTP://DNR.WI.GOV/TOPIK/STORMWATER/STANDARDS/CONST_STANDARDS.HTML](http://dnr.wi.gov/topic/stormwater/standards/const_standards.html)
22. FOR ALL CATCH BASINS USE WISDOT TYPE D INLET PROTECTION.



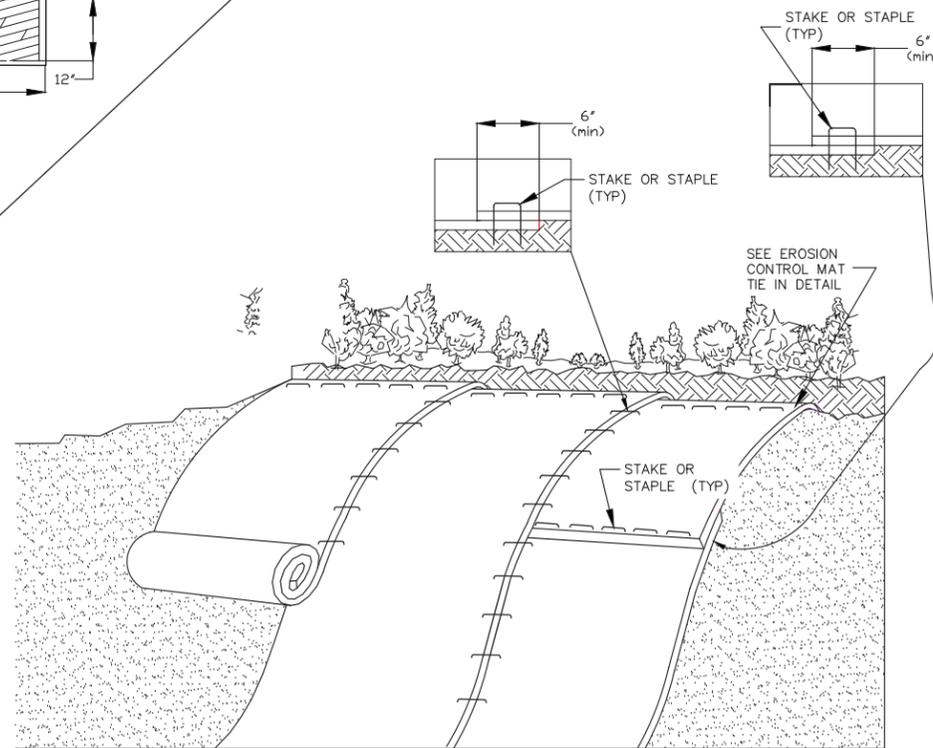
EROSION CONTROL MAT TIE IN DETAIL

NOT TO SCALE



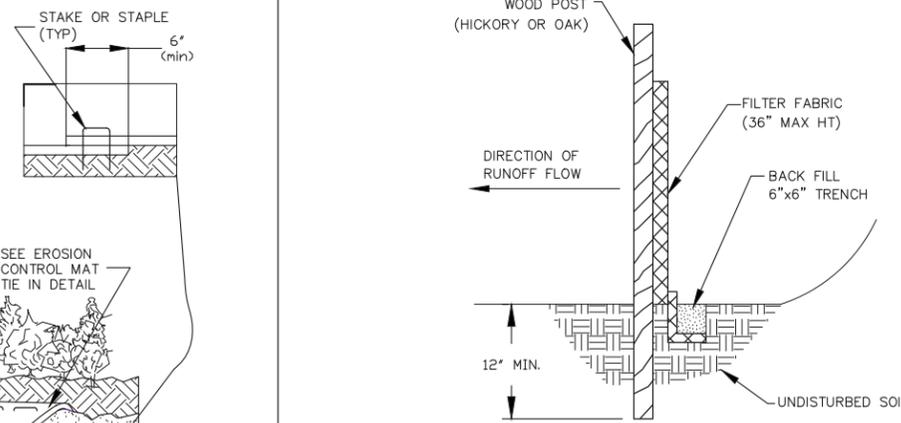
STONE TRACKING PAD

NOT TO SCALE



EROSION CONTROL SIDE SLOPE INSTALLATION DETAIL

NOT TO SCALE



SILT FENCE PLACEMENT DETAIL

NOT TO SCALE

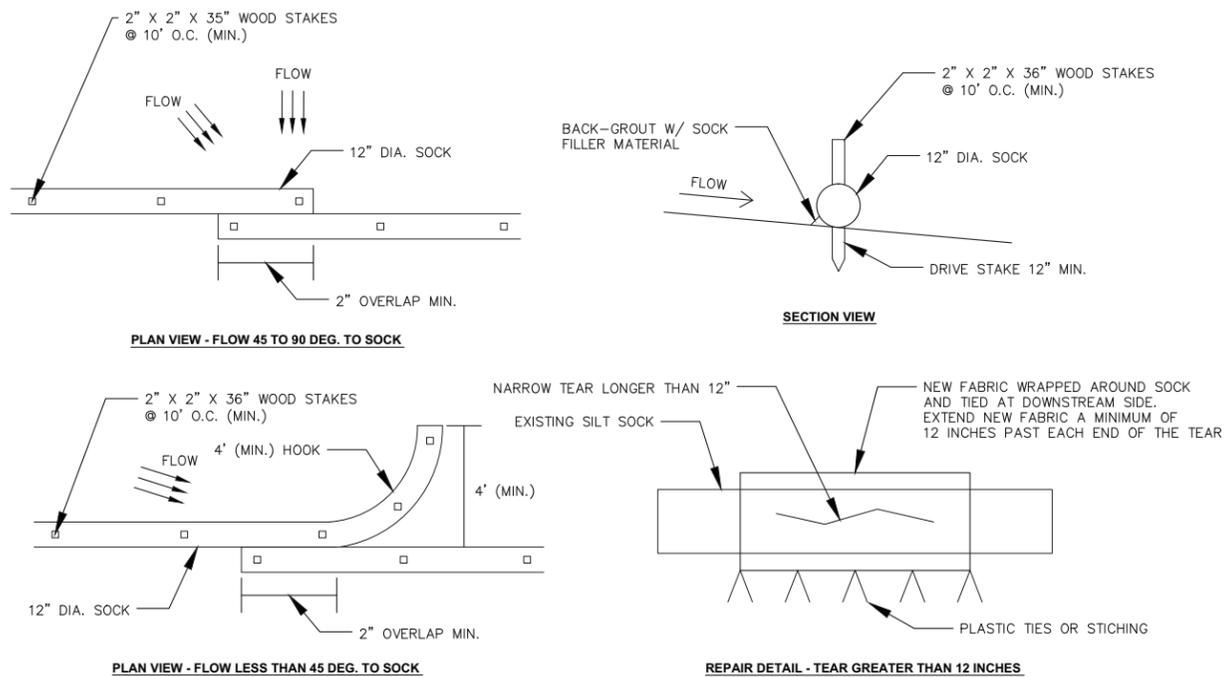
1. DIG A 6"x6" TRENCH ALONG THE INTENDED FENCE LINE.
2. DRIVE ALL POSTS INTO THE GROUND ON THE DOWNHILL SIDE OF THE TRENCH.
3. WIRE MESH MUST BE A MINIMUM OF 2" INTO THE GROUND AND NO MORE THAN 36" ABOVE THE ORIGINAL GROUND SURFACE.
4. INSTALL SILT FENCE ON THE UPHILL SIDE ALONG THE FENCE LINE AND BACKFILL.
5. WOOD POSTS MAY BE SPACED UP TO 3 FEET APART IF WIRE MESH IS NOT USED TO SUPPORT THE FABRIC. IF WIRE MESH IS USED, STEEL POSTS MAY BE SPACED UP TO 8 FEET APART.
6. FABRIC APPARENT OPENING SIZE (AOS) SHALL BE NO. 30 TO NO. 80 SIEVE SIZE IN AREAS OF COARSE GRAINED SOILS, AND NO. 50 TO NO. 80 SIEVE SIZE IN AREAS OF FINE GRAINED SOILS.

SHEBOYGAN, WISCONSIN		2013	2013	2013	2013	NO
DRN	TPJ	DES	TPJ	CHK	APP	
90% QC REVIEW SET 03-01-2013						DATE
MADISON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 18 MONONA, WISCONSIN						REVISIONS
EROSION CONTROL DETAILS						DRN/CHK
DATE 2013						
PROJECT NO 60214925						
FILE 99-C-01.dwg						
SHEET NO 85						
DRAWING NO						
99-C-01						



1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
 T 608-838-8900 WWW.AECOM.COM

PREPARED BY:



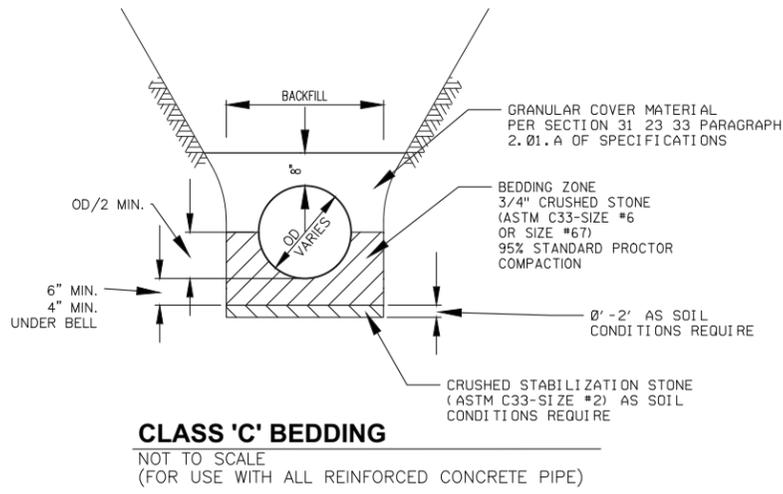
EROSION LOG INSTALLATION DETAIL

NOT TO SCALE

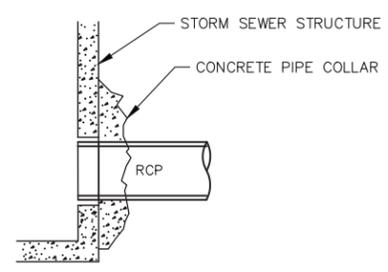
- NOTES:
- LOG MATERIAL PER WISDOT EROSION CONTROL PRODUCT ACCEPTABILITY LIST, TEMPORARY DITCH CHECKS. LOG FILLER TO BE COMPOST OR WOOD CHIPS (2" MAX.)
 - WHEN LOG IS USED ON A PAVED SURFACE CONCRETE BLOCKS SHALL BE USED TO SECURE LOG IN PLACE
 - ACCUMULATED SEDIMENT SHALL BE REMOVED FROM BEHIND LOG WHEN IT HAS REACHED A HEIGHT EQUAL TO HALF OF THE LOG HEIGHT.
 - SMALL HOLES OR RIPS LESS THAN 12" LONG MAY BE STICHED CLOSED USING PLASTIC ZIP TIES. LARGER RIPS SHALL BE FIXED PER THE REPAIR DETAIL. HEAVILY DAMAGED SECTIONS SHALL BE REPLACED ENTIRELY. MAINTAIN A 2' MINIMUM OVERLAP AT EACH END.
 - INSTALL LOG SIZE THAT IS IDENTIFIED IN THE PROJECT SPECIFICATIONS.

<p>MIDDLETON, WISCONSIN</p>		<p>In Progress Review 01/21/2013</p>	<p>NO</p>	<p>DRN CHK</p>	<p>DATE</p>
<p>DRN TPJ</p>	<p>DES TPJ</p>	<p>CHK</p>	<p>APP</p>		
<p>PREPARED BY:</p>		<p>AECOM</p>			
<p>MADISON METROPOLITAN SEWERAGE DISTRICT PUMP STATION 18 MONONA, WISCONSIN</p>		<p>1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562 T 608-836-8800 WWW.AECOM.COM</p>			
<p>PUMP STATION EROSION CONTROL DETAILS</p>					
<p>DATE DECEMBER 2012</p>					
<p>PROJECT NO 60214925</p>					
<p>FILE</p>					
<p>FILE NO</p>					
<p>SHEET NO</p>					
<p>DRAWING NO</p>					
<p>C-11</p>					

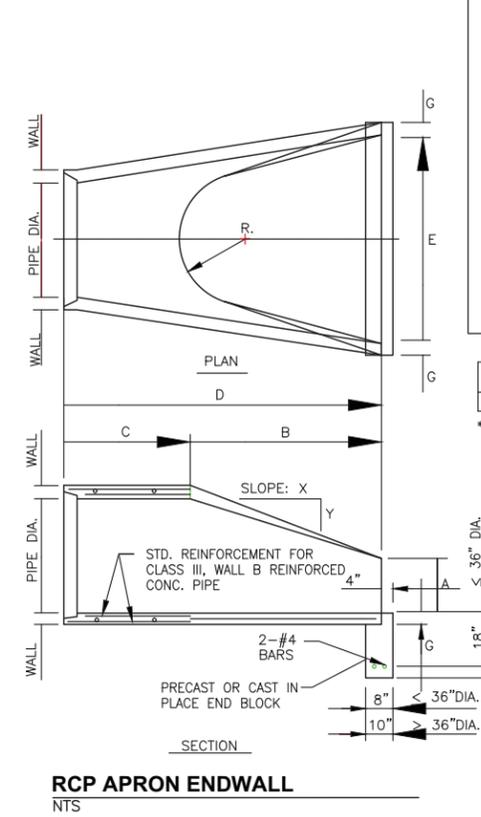
File: L:\work\projects\60214925\000_CAD\001_Drawings\Sheets\SHEET_PS18_C12-Details.dwg Time: Feb 06, 2013 4:05pm



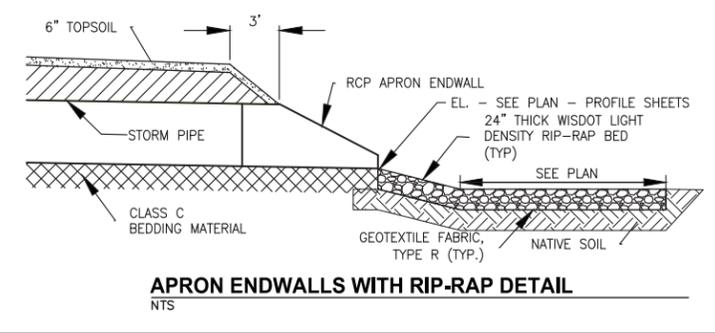
CLASS 'C' BEDDING
NOT TO SCALE
(FOR USE WITH ALL REINFORCED CONCRETE PIPE)



CONCRETE PIPE COLLAR DETAIL
NTS



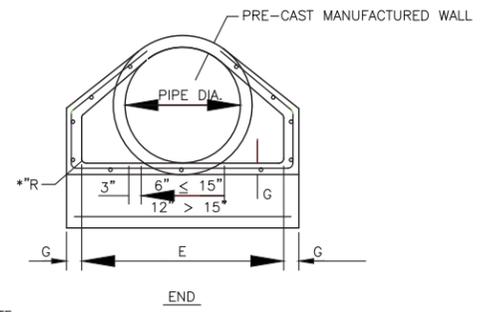
RCP APRON ENDWALL
NTS



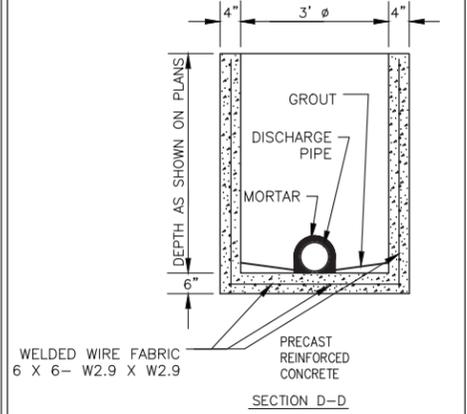
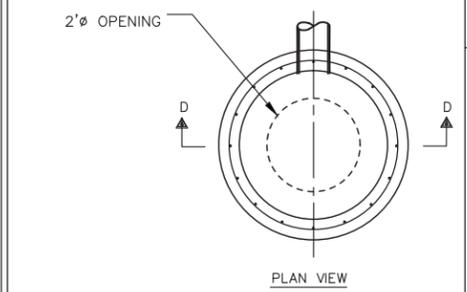
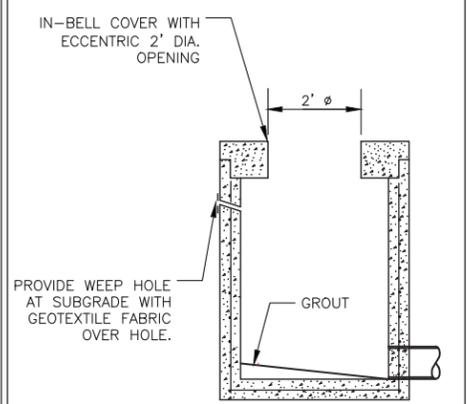
APRON ENDWALLS WITH RIP-RAP DETAIL
NTS

PIPE DIA.	T	A	B	C	D	E	G	R	SLOPE	WT. (lbs.)
12"	2	4	24	49	73	20	4	*	3:1	1,350

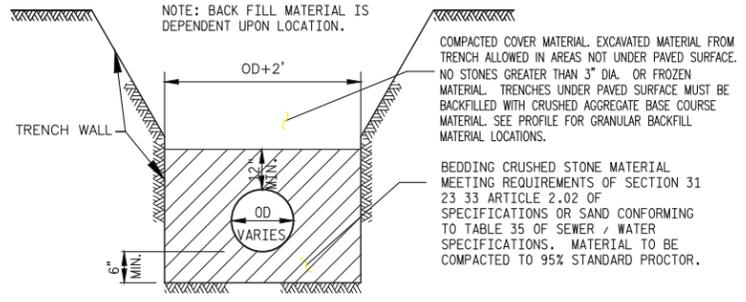
* RADIUS AS FURNISHED BY MANUFACTURER



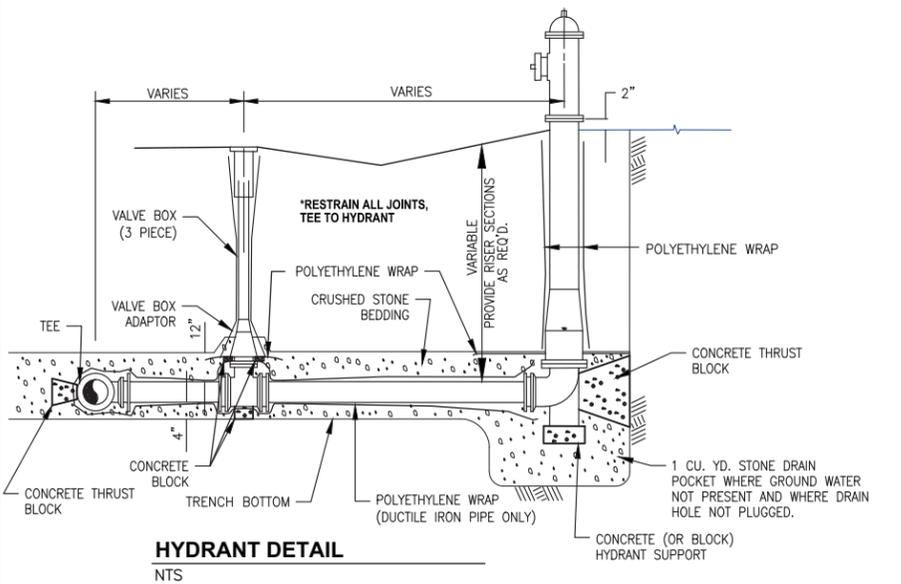
NOTE: JOINT TIE ENDWALLS AND TWO UPSTREAM PIPE SECTIONS TOGETHER FOR ALL PIPE DIAMETERS. SEE DETAIL.



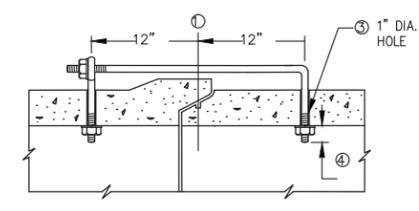
STORM INLET
NTS



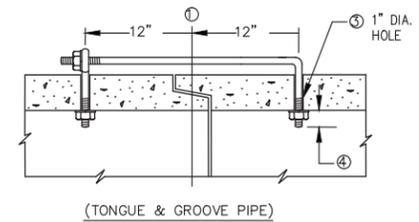
WATER MAIN BEDDING
NTS



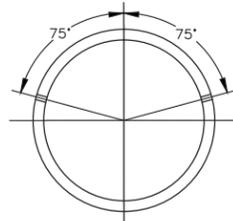
HYDRANT DETAIL
NTS



(MODIFIED BELL PIPE)
LONGITUDINAL SECTION

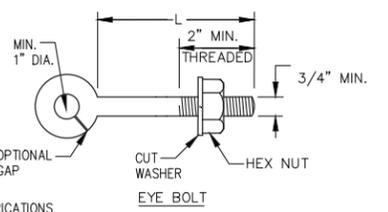
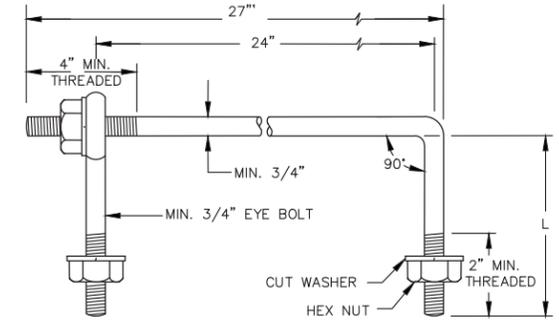


(TONGUE & GROOVE PIPE)



TRANSVERSE SECTION

NOTE: TWO EYE BOLTS MAY BE USED WITH A 30\"/>



PIPE EYE BOLT DIMENSION TABLE

PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
12" TO 15"	3 3/4"	5 3/4"
18" TO 24"	4 1/2"	6 1/4"
36"	5 1/2"	7"
48"	6 1/2"	
58"x91"	9"	
10'x8'	*	
12'x7'	*	

* PER MANUFACTURERS RECOMMENDATIONS

EYE BOLT AND TIE ROD
UNLESS OTHERWISE STATED IN THE CONTRACT, THE MATERIALS, FABRICATIONS AND WORK NECESSARY TO TIE REINFORCED CONCRETE PIPE WILL BE CONSIDERED INCIDENTAL TO OTHER ITEMS OF WORK.
① Q OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12" FROM C OF TONGUE AND GROOVE.
④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2".

JOINT TIE DETAIL
NTS

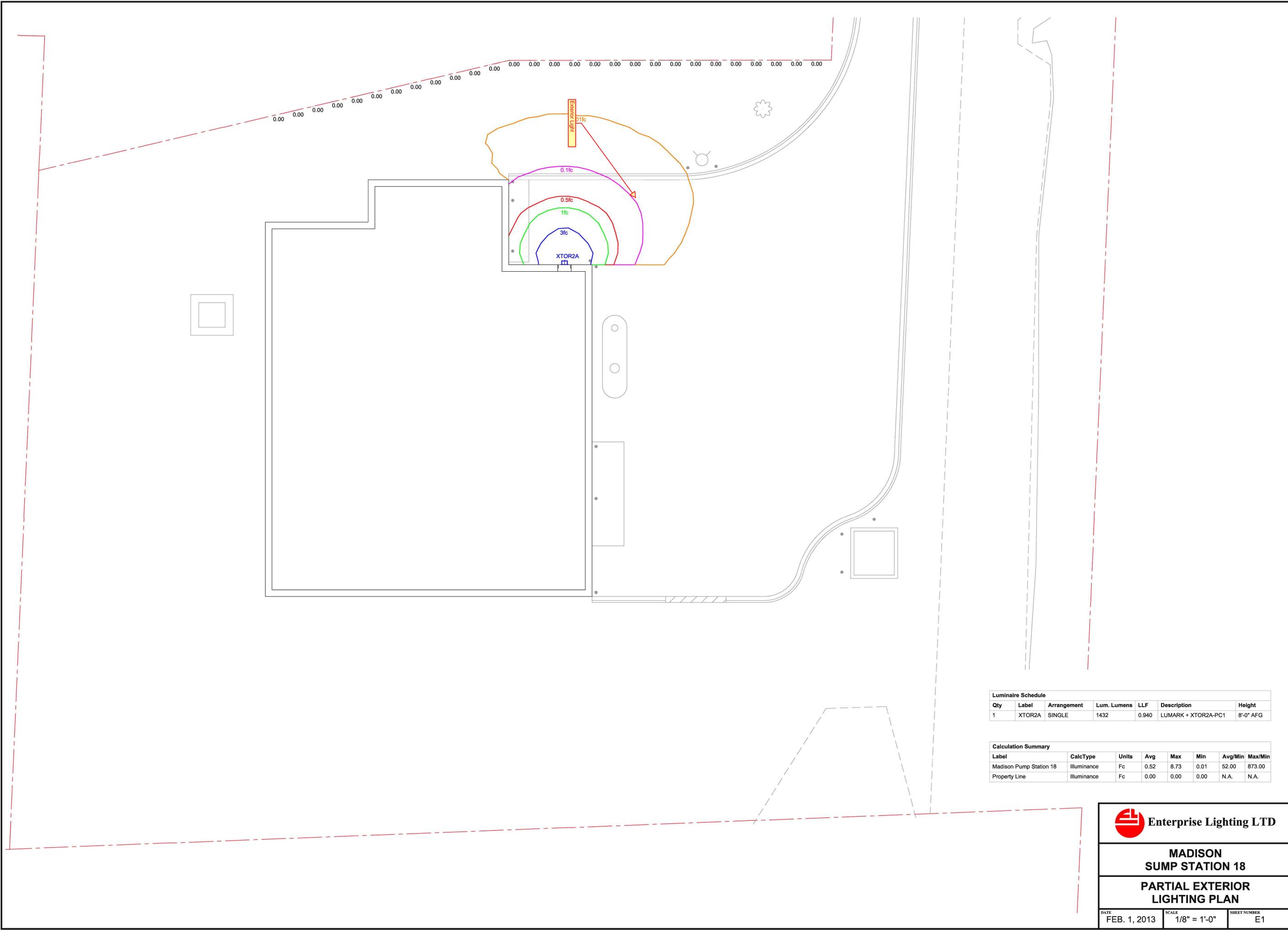
In Progress Review
01/21/2013

MIDDLETON, WISCONSIN
 DRN TPJ
 DES TPJ
 CHK
 APP

PREPARED BY:
AECOM
 1350 DEMING WAY SUITE 100 MIDDLETON, WI 53562
 T 608-836-8800 WWW.AECOM.COM

MADISON METROPOLITAN SEWERAGE DISTRICT
 PUMP STATION 18
 MONONA, WISCONSIN
PUMP STATION CONSTRUCTION DETAILS

DATE DECEMBER 2012
 PROJECT NO 60214925
 FILE NO
 SHEET NO
 DRAWING NO
C-12



Luminaire Schedule						
Qty	Label	Arrangement	Lum. Lumens	LLF	Description	Height
1	XTOR2A	SINGLE	1432	0.940	LUMARK + XTOR2A-PC1	8'-0" AFG

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Madison Pump Station 18	Illuminance	Fc	0.52	8.73	0.01	52.00	873.00
Property Line	Illuminance	Fc	0.00	0.00	0.00	N.A.	N.A.



**MADISON
SUMP STATION 18**

**PARTIAL EXTERIOR
LIGHTING PLAN**

DATE FEB. 1, 2013	SCALE 1/8" = 1'-0"	SHEET NUMBER E1
----------------------	-----------------------	--------------------



CARLISLE'S

GREENGRID® G4

ROOF GARDEN SYSTEMS

BEAUTIFUL • EFFICIENT • SMART



CARLISLE
SYNTEC SYSTEMS

Carlisle's GreenGrid G4 Roof Garden System

Carlisle's GreenGrid G4 Roof Garden System offers distinct advantages over more complex systems with its simplicity in design, pre-vegetated modules and removable modular features.

With the introduction of its GreenGrid Roof Garden System, Carlisle has given contractors and owners a premium, easy-to-install roof garden solution.



Carlisle's GreenGrid Advantages

GreenGrid Roof Garden Systems are an easy way to create a stunning vegetated rooftop with a minimum of worry. The new GreenGrid modules feature a very thin edge that is easily hidden by vegetation while maintaining their modular features that allow for easy installation and removal.

Stormwater Management

GreenGrid Roof Garden Systems help alleviate stormwater runoff through retention and detention of precipitation. This benefit can cut costs associated with required municipal on-site stormwater retention.

Lowered Heating & Cooling Costs

Roof Gardens are proven to lower the costs of heating and cooling your building. During the summer, plants in the GreenGrid modules transpire water and become a "sponge" for heat energy. For this reason, the temperature at the membrane and insulation level can be as much as 10°F below the ambient air temperature.

Reduce Urban Heat Island Effect

As a result of decreased plant life and the increased use of concrete and pavement, downtown urban areas can be six to eight degrees Fahrenheit warmer than their surroundings – a phenomenon known as the urban heat island effect. Installing a Carlisle GreenGrid Roof Garden can contribute to reduction of urban heat islands and moderation of city temperatures.

Air Quality

GreenGrid Roof Garden systems help to purify the air by converting CO₂ into oxygen, which can help to reduce greenhouse gases.

Extends Roof Life

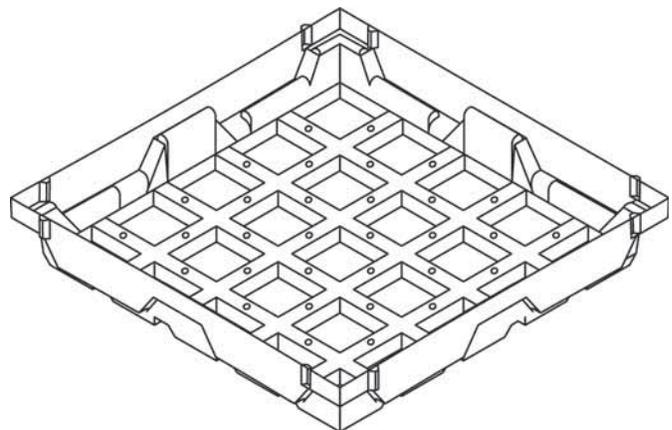
GreenGrid Roof Garden modules can protect roof membranes from ultraviolet radiation, extreme temperature fluctuations and puncture or other physical damage. Minimization of such exposure can improve the long-term performance of the roofing system.

Added Aesthetic Value

GreenGrid Roof Garden Systems provide urban environments with visually pleasing vistas and rooftop gardens. In urban environments, roof gardens also add value by converting space into areas usable for recreation by building occupants. In such locations, the scarcity of real estate makes the addition of a roof garden for such recreation a competitive alternative.

Maintenance

Maintaining your GreenGrid G4 Roof Garden system will help you maximize the benefits associated with a vegetated roof. Maintenance levels will be dependent upon the design of your GreenGrid Roof Garden. Since your GreenGrid Roof Garden is a living system, a specific maintenance program needs to be adopted and performed on a regular basis. Consult Carlisle for a specific maintenance plan for your design.





Benefits

- Single-source responsibility – roofing contractors can install both the waterproofing and GreenGrid in one installation
- No planting on the roof – modules are pre-vegetated prior to arriving on the jobsite.
- Easy to handle and fast to install
- Modules are easily moved for modifications or roof repair
- Building owners receive single-source warranty coverage

Features

- Module size:** 24" x 24" (4 sq ft)
(61cm x 61 cm) (3721 sq cm)
- Module depth:** 4.25 in (10.8 cm)
- Drain hole size:** .25 in (6.35 mm)
- Tray wall thickness:** 0.19 in (4.75 mm)
- Depth of water reserve:** 0.75 inch (1.91 cm)
- Saturated Weight:** 26 – 30 psf
- Maximum weight per tray:** 120 pounds
- Tray Material:** Black 100% pre-consumer recycled HDPE with UV inhibitors and stabilizers
- Filter fabric type:** Spunbonded polypropylene geotextile
- Growth Media:** Proprietary engineered blend of organic and inorganic components blended to satisfy FLL guidelines
- Vegetation:** Standard plant mixes are regional and typically include multiple species of sedum



800-479-6832 • P.O. Box 7000 • Carlisle, PA 17013 • Fax: 717-245-7053 • www.carlisesyntec.com

Carlisle is a trademark of Carlisle. GreenGrid and ABC Supply Co., Inc. are trademarks of American Builders & Contractors Supply Co., Inc. The GreenGrid System is a proprietary technology of ABC Supply. U.S. and International patents pending. WESTON is the exclusive licensee of the GreenGrid System in the U.S. All GreenGrid projects in the United States have been performed by Weston Solutions, Inc. or its designees pursuant to such license.

REPRINT CODE: 603486 - "GreenGrid Brochure" - 042012 - © 2012 Carlisle.



C A R L I S L E R O O F G A R D E N S Y S T E M S

ROOFGARDEN[®]



Carlisle SynTec

www.CarlisleRoofGardens.com

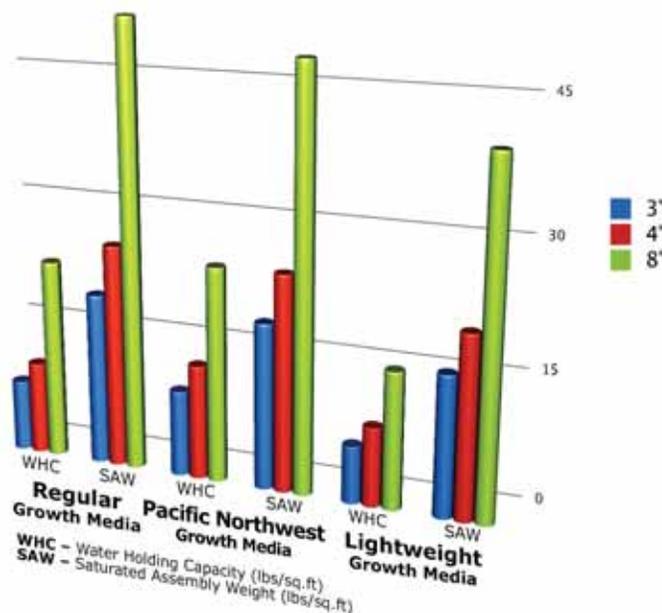


CARLISLE'S RoofGARDEN

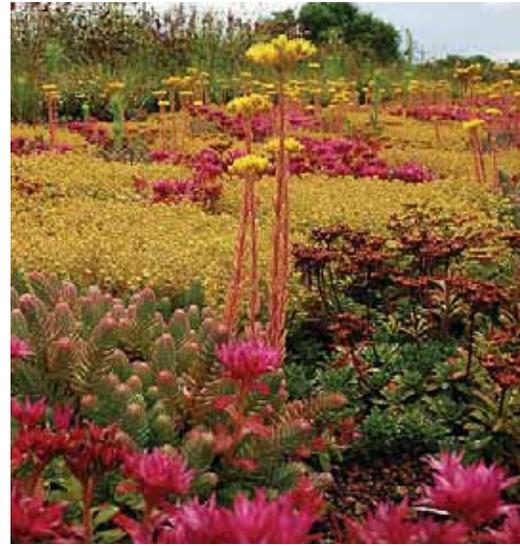
For more than 45 years, Carlisle's products have set the standard for quality and performance in the commercial roofing industry. Carlisle repeatedly raises the bar through steady development and continuous introduction of innovative new products and technologies. The Carlisle Roof Garden line is no different, providing architects and building owners a huge selection of vegetative roofing options. With these systems, Carlisle offers an unparalleled variety of single-source roof garden solutions that provide numerous benefits, including:

- Improved stormwater management
- Increased air and water purification
- Superior sound insulation
- Energy efficiency
- Beautiful, usable building space
- Possible federal, state and local tax incentives
- Significantly extended roof life

Cumulative Water Retention in a Carlisle Roof Garden System (Per Sq. Ft.)



A 10,000 square foot, 4" deep Carlisle Roof Garden can retain up to 13,000 gallons of rainwater



Carlisle's Roof Garden Advantage



Carlisle Roof Garden Growth Media

Carlisle Roof Garden Growth Media is a FLL-Compliant blend of carefully selected materials that are optimized for use with roof gardens. Made from lightweight and water-absorbing components, Carlisle Roof Garden Growth Media supports all species of roof garden plants with minimum maintenance.

CCW MiraDRAIN® G4 Drainage Composite

CCW MiraDRAIN® G4 Drainage Composite combines a filter fabric, moisture retention mat, high-strength drainage core and protection fabric into one easy-to-use product. MiraDRAIN® G4 reduces installation costs and increases system performance. In shallow assemblies, one layer of MiraDRAIN® G4 is the only component required between the roof membrane and Growth Media.



Carlisle Roof Garden Metal Edge and Drain Box

Carlisle Roof Garden Metal Edge and Drain Box are excellent for retaining growth media while allowing adequate drainage. Carlisle's completely aluminum design provides superior resistance to rust and corrosion.

Carlisle Vegetated Sedum Tiles

Carlisle Vegetated Sedum Tiles offer full vegetative coverage on the day of installation. Placed over at least 2.5" of Carlisle Roof Garden Growth Media, Carlisle Vegetated Sedum Tiles sparkle with multiple varieties of sedum, leaving you with immediate beauty and minimal maintenance.



Carlisle Roof Garden System Warranty

Carlisle Roof Garden System Warranty provides a single-source warranty for all components of the roof garden assembly, ensuring optimal performance.

KEEP COOL

ON A 90° DAY

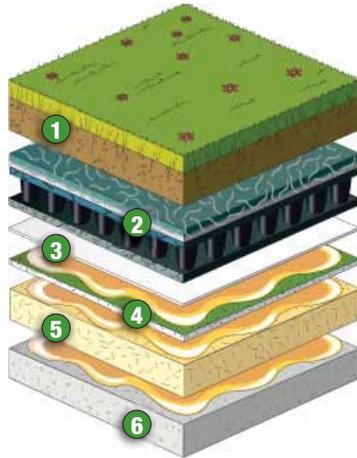
Reduces Heat Island Effects

Heat islands can occur in large cities where much of the vegetation has been replaced with roads and structures. Urban development can actually alter weather patterns, absorbing a significant amount of heat during the day and radiating it back into the atmosphere, which causes further warming. Roof Gardens keep these buildings cool through transpiration, cooling both the building and the surrounding atmosphere.



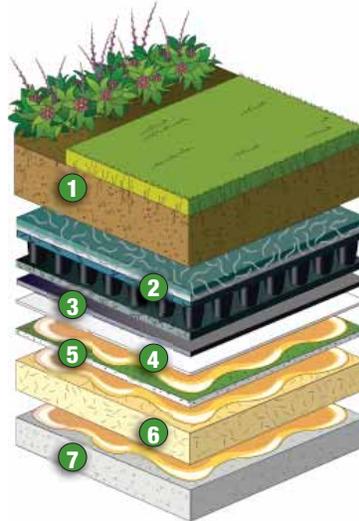
Carlisle's Traditional Roof Garden Assemblies

Carlisle offers a broad array of traditional Roof Garden Systems that incorporate a variety of waterproofing options with a full line of accessories to provide a high performance system. This includes a range of membranes that carry up to a 20-year warranty, engineered growth media and vegetation options.



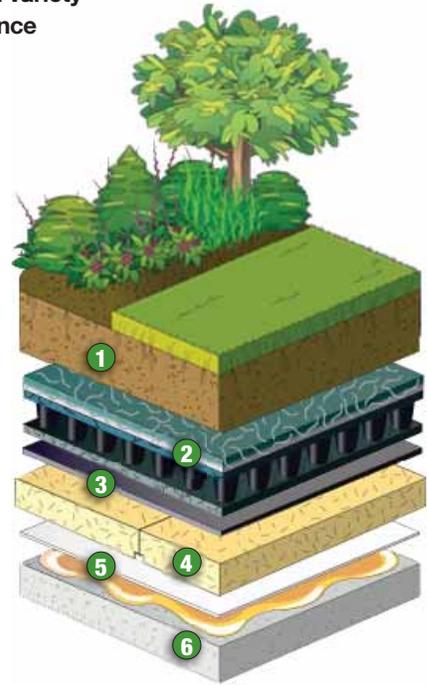
Shallow Assembly

1. Growth Media
2. MiraDRAIN® G4
3. Sure-Seal® EPDM or Sure-Weld® TPO Adhered Membrane
4. 1/2" DensDeck™ Prime
5. Approved Insulation
6. Substrate



Medium Assembly

1. Growth Media
2. MiraDRAIN® G4
3. 40-mil Root Barrier
4. Sure-Seal® EPDM or Sure-Weld® TPO Adhered Membrane
5. 1/2" DensDeck Prime
6. Approved Insulation
7. Substrate



Deep Assembly

1. Growth Media
2. MiraDRAIN® G4
3. 40-mil Root Barrier
4. Expanded Polystyrene Insulation with Drainage Channels
5. Sure-Seal® EPDM or Sure-Weld® TPO Adhered FleeceBACK® Membrane
6. Substrate

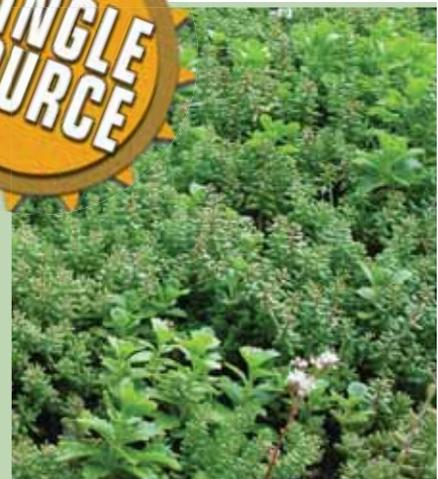
Roof Garden Warranties

Carlisle Roof Garden Overburden Warranty

Carlisle offers up to a 20-year overburden removal warranty covering the removal and replacement of the roof garden components if there is a need to investigate for a leak.

Carlisle Roof Garden Vegetation Warranty

Carlisle offers a 2-year vegetation warranty to ensure the proper establishment of plants and a minimum 50% coverage of vegetation within year one and 80% coverage by year two.



Investing in Roofing Solutions for Over 45 Years

800-4-SYNTEC • P.O. Box 7000 • Carlisle, PA 17013 • Fax: 717-245-7053 • www.carlisle-syntec.com

Carlisle, Sure-Seal, Sure-Weld, FleeceBACK, SecurTAPE, CCW and MiraDrain are Carlisle trademarks. DensDeck is a trademark of Georgia Pacific. Colbond is a trademark of Colbond Inc. LEED (Leadership in Energy and Environmental Design) Green Building Rating System is a trademark of U.S. Green Building Council. GreenGrid is a registered trademark of ABC Supply Co., Inc. The GreenGrid System is a proprietary technology of ABC Supply, U.S. and International patents pending.
REPRINT CODE: 602009 - "Roof Garden System Brochure" - 012711 © 2009 Carlisle.

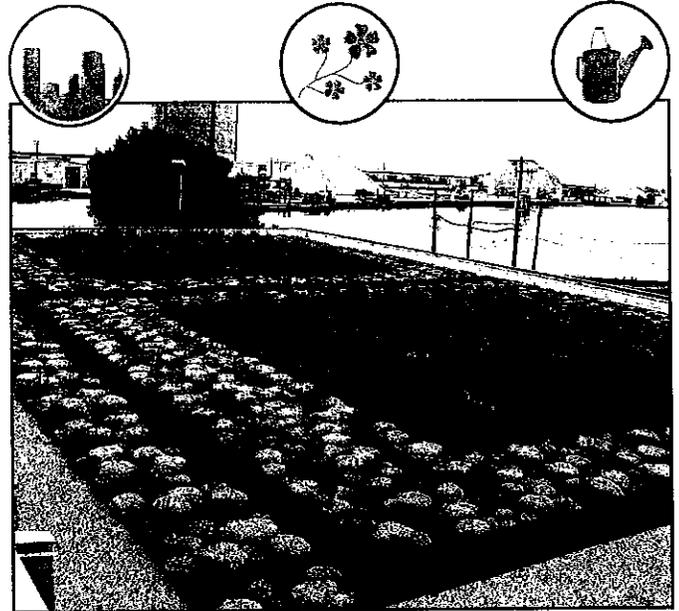


CARLISLE'S

GREENGRID®

EXTENSIVE ROOF GARDEN

The 4-inch GreenGrid Extensive Roof Garden System is composed of a 4-inch layer of growth media and drought-tolerant vegetation. The drought-tolerant vegetation is composed mostly of colorful sedum species and other dry habitat perennials, requiring little or no supplemental irrigation, fertilization or maintenance. These roof gardens are not intended for recreational uses but rather to act as a visually pleasing and functional roof extensions wherein the building owner will achieve the benefits associated with green roofs e.g., reduction of temperature extremes on the roof, prevention of mechanical damage to the roof, reduction of noise transmission into the building, increased energy efficiency and, most importantly, storm water management.



The GreenGrid Extensive Roof Garden System is also lightweight, approximately 15 pounds per square foot (wet), and weighs just slightly more than a conventional ballasted roof.*

The following are a few suggested plant species (USDA Hardiness Zones 4-8) for use in the 4-inch GreenGrid Extensive Roof Garden System:

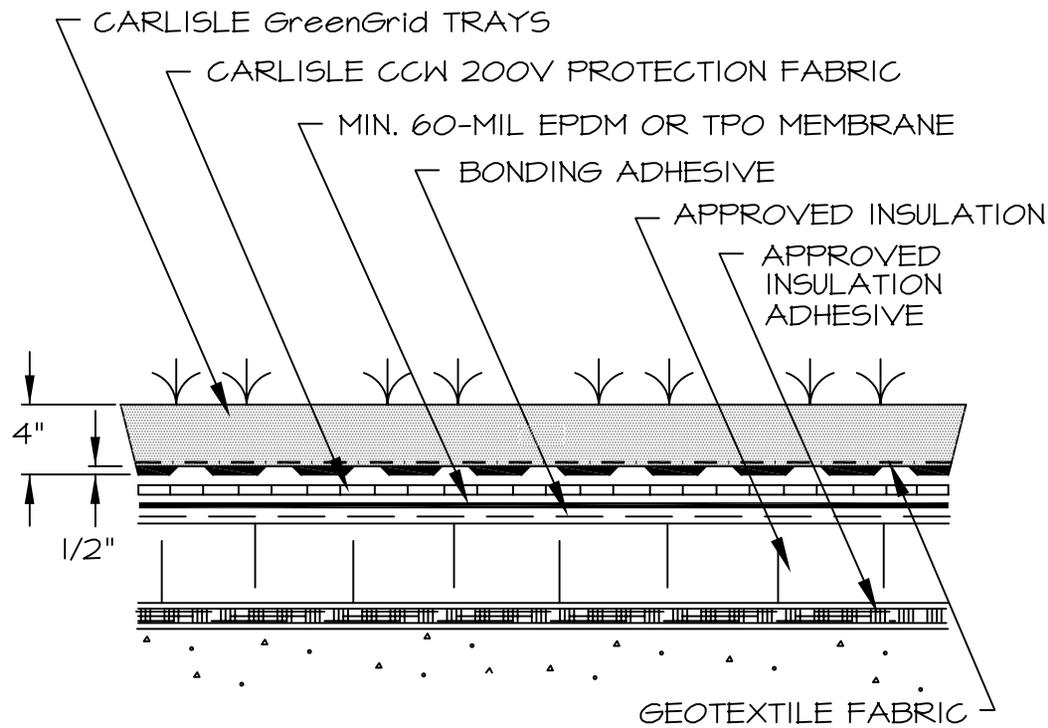
Species	Mature Height (in)	Mature Width (in)	Flower Color	Months in Bloom
<i>Allium schoenoprasum</i> 'Forescate'	12-18	18-24	Pink	May
<i>Sedum acre</i>	2-3	12-18	Yellow	June
<i>Sedum album</i>	3-6	12-18	White	JJ
<i>Sedum album</i> 'Coral Carpet'	3-6	12-18	White	JJ
<i>Sedum</i> 'Bailey's Gold'	3-6	12-18	Yellow	JJA
<i>Sedum cauticola</i> 'Lidakense'	8-12	6-8	Pink	AS
<i>Sedum hybridum</i> 'Immergrunchen'	3-6	18-24	Yellow	JJ
<i>Sedum kamtschaticum</i>	6-8	12-18	Yellow	MJJA
<i>Sedum reflexum</i>	6-8	12-18	Yellow	July
<i>Sedum rupestre</i> 'Forsteranum'	3-7	12-18	Yellow	JJ
<i>Sedum sexangular</i>	6-8	6-8	Yellow	JJ
<i>Sedum spurium</i> 'Dragon's Blood'	3-6	12-18	Rose red	JJ
<i>Sedum spurium</i> 'Fuldaglut'	3-6	12-12	Ruby red	JJ
<i>Sedum ternatum</i>	6-8	12-18	White	May
<i>Sedum X</i> 'Vera Jameson'	8-12	12-18	Magenta	August
<i>Sempervivum tectorum</i>	3-6	3-6	Red	July
<i>Sempervivum tomentosum</i>	3-6	3-6	Pink	July

Note: All standard orders contain a variety of five pre-selected sedum species. Custom plant selection is available upon request and subject to additional charges.
* Consult a structural engineer to determine load capabilities of the building prior to installation.

Investing in Roofing Solutions for Over 45 Years

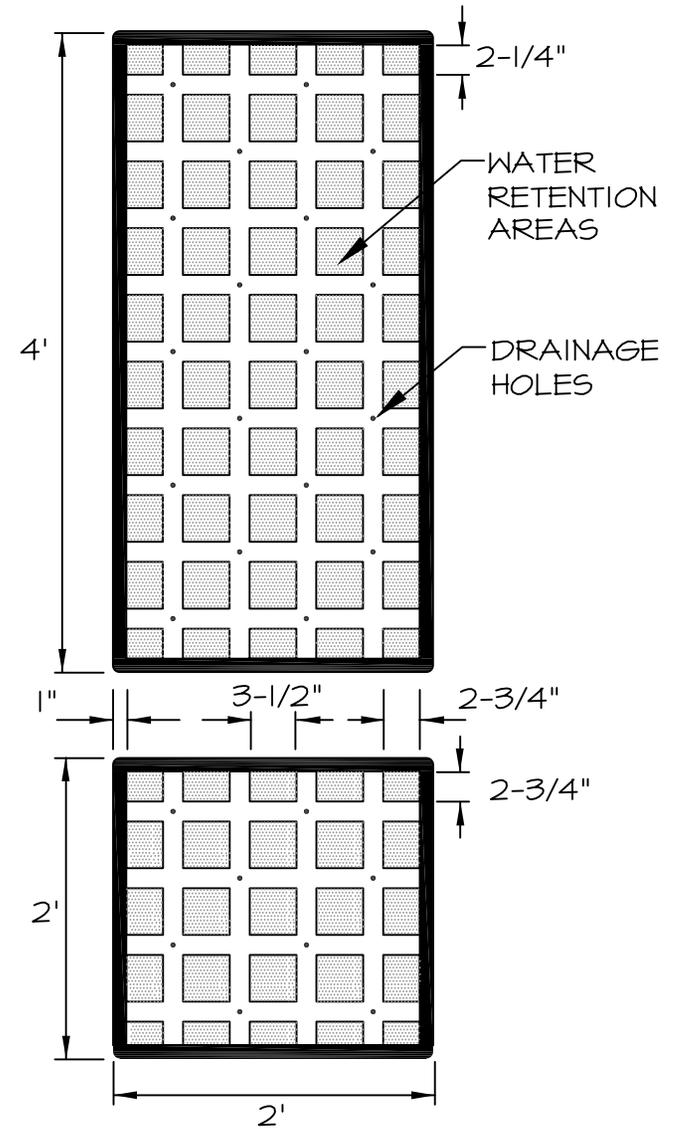
800-4-SYNTec • P.O. Box 7000 • Carlisle, PA 17013 • Fax: 717-245-7053 • www.carlisle-syntec.com

CARLISLE
Carlisle SynTec



NOTE:

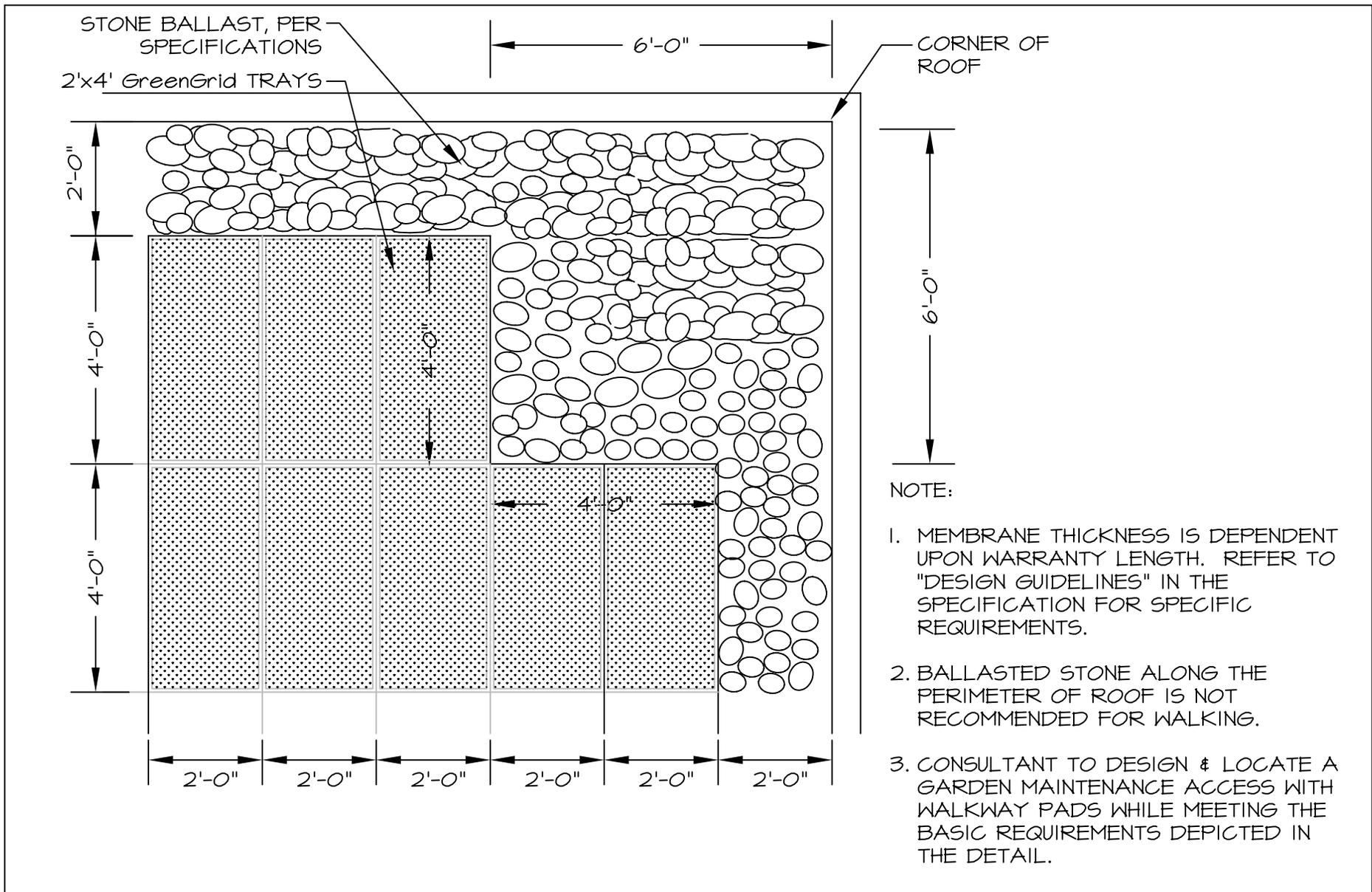
MEMBRANE THICKNESS IS DEPENDENT UPON WARRANTY LENGTH. REFER TO "DESIGN GUIDELINES" IN THE SPECIFICATION FOR SPECIFIC REQUIREMENTS.



GG-A

GreenGrid®
TRAY PROFILE

CARLISLE
Carlisle SynTec Incorporated



GG-G

GreenGrid®
 ROOF CORNER & PERIMETER DETAIL

CARLISLE
 Carlisle SynTec Incorporated

CONCRETE WALKWAY WITH INTERLOCKING PAVERS INSTALLED OVER 60-MIL EPDM OR TPO MEMBRANE TO SEGREGATE GREEN GRID AREA FROM REMAINING ROOF. ADDITIONAL ROW MAY BE REQUIRED TO WIDEN THE AREA, ALSO WHERE ROOF SLOPE CAUSES SLIDING OF PAVERS.

STONE BALLAST TO FILL VOIDS IN AN IRREGULAR OR CURVED LAYOUT

CARLISLE GreenGrid TRAY

60-MIL EPDM OR TPO MEMBRANE LOOSE LAID

MIN. 60-MIL EPDM OR TPO MEMBRANE, FULLY ADHERED

BONDING ADHESIVE

APPROVED INSULATION

INSULATION ADHESIVE

NOTE:

1. CONSULTANT TO DESIGN A SAFE WALKWAY LOCATION ON THE ROOF.
2. CONSULTANT TO LAYOUT WALKWAY TO AVOID THE EXCESSIVE IMPEDANCE OF WATER FLOW TO DRAINS.

GG-H

GreenGrid®

SEGREGATION DETAIL: BETWEEN GARDEN & EXPOSED SINGLE PLY ROOF

CARLISLE

Carlisle SynTec Incorporated

PHOENIX[®]

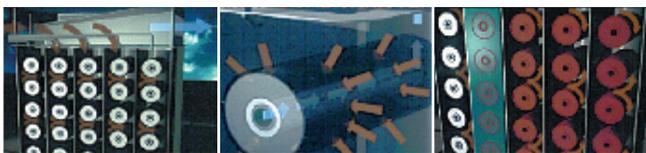
H₂S Removal System



The Solution to Hydrogen Sulfide Odors

Calgon Carbon Corporation's PHOENIX is a state-of-the-art hydrogen sulfide (H₂S) removal system. PHOENIX is simply the most effective means of removing airborne (H₂S), the most prevalent odorous compound present in wastewater treatment.

PHOENIX radial flow canisters, using our CENTAUR[®] HP carbon combined with our patented segmented reactor design, produce a system that can continuously remove up to 50 ppm of (H₂S) with 99% average efficiency.



Overall System Air Flow

Individual Canister View

Cyclical Water Wash Restores (H₂S) Capacity

The PHOENIX Process

The PHOENIX system works by directing the foul air down through a series of chambers containing the radial flow carbon canisters. As air passes thru the radial carbon beds, the hydrogen sulfide is catalytically converted to sulfuric acid (H₂SO₄). The loosely adsorbed and highly soluble sulfuric acid (H₂SO₄) is then washed off with water during the automated water regeneration process, thereby restoring the carbon's capacity for hydrogen sulfide (H₂S). The system's segmented design allows one chamber to be water regenerated while the rest of the system continues to treat (H₂S). This delivers a system that has virtually no treatment downtime.

PHOENIX Standard Features

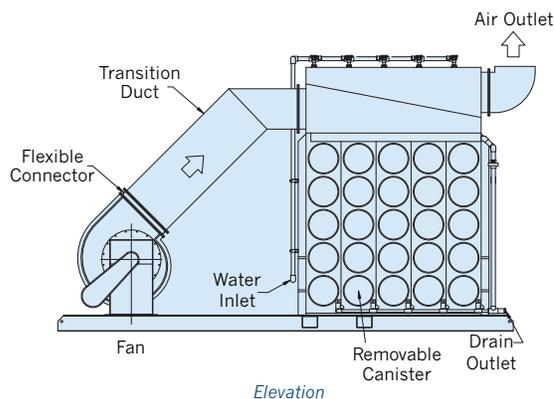
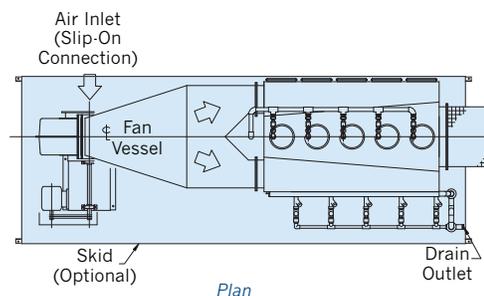
- PHOENIX reactor vessel, polypropylene construction with UV inhibitor
- Set of radial carbon canisters
- Automatic water regeneration package, NEMA 4X
- FRP fan with 480 V/3phase/60 Hz TEFC motor
- Transition ductwork
- Flow control damper
- Grease filter/mist eliminator (GF/ME)
- Pressure differential indicator

Optional Features

- Sound attenuation
- Explosion-proof package
- Fan motor starter/control panel with mounting stand
- Skid mounting (up to P-10000 model)

Applications

PHOENIX is ideally suited for municipal wastewater collection system applications such as pump stations and lift stations, as well as wastewater treatment plant processes such as headworks, sludge thickeners, and belt press rooms.



Making Water and Air Safer and Cleaner



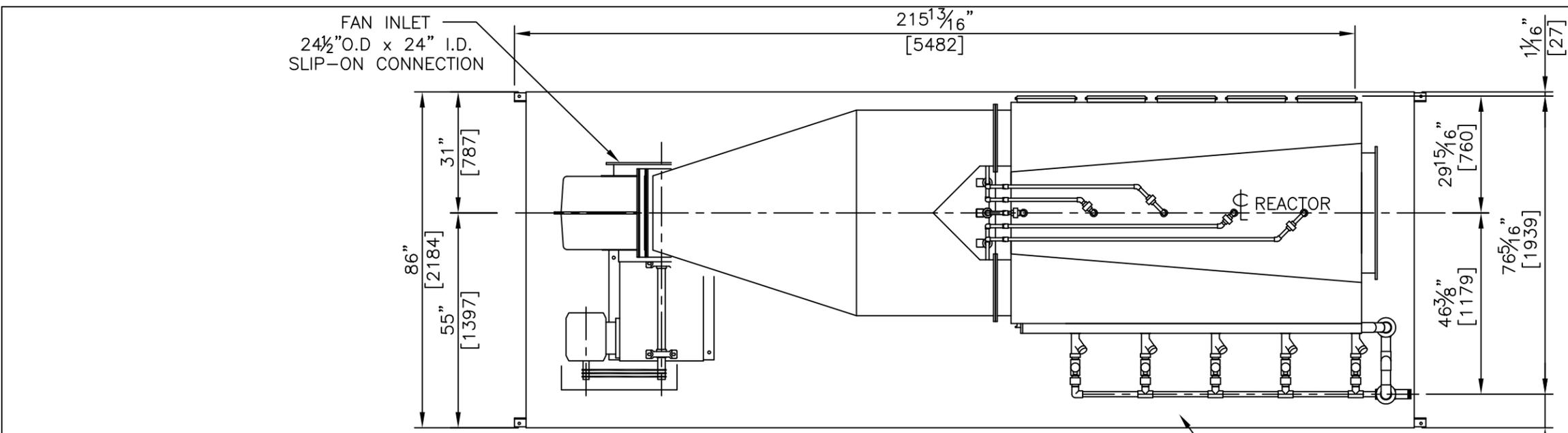
Corporate Headquarters
 Calgon Carbon Corporation
 500 Calgon Carbon Drive
 Pittsburgh, PA USA 15205
 800.422.7266
 412.787.6700
 412.787.6713 Fax
 www.calgoncarbon.com

European Operations
 Chemviron Carbon Corporation
 Zoning Industriel C de Feluy
 B-7181 Feluy, Belgium
 + 32 (0) 64 51 18 11
 + 32 (0) 64 54 15 91 Fax

Asia Operations
 Calgon Carbon Asia Pte Ltd.
 9 Temasek Boulevard
 #26-02 Suntec Tower Two
 Singapore 038989
 +65 6221 3500
 +65 6221 3554 Fax



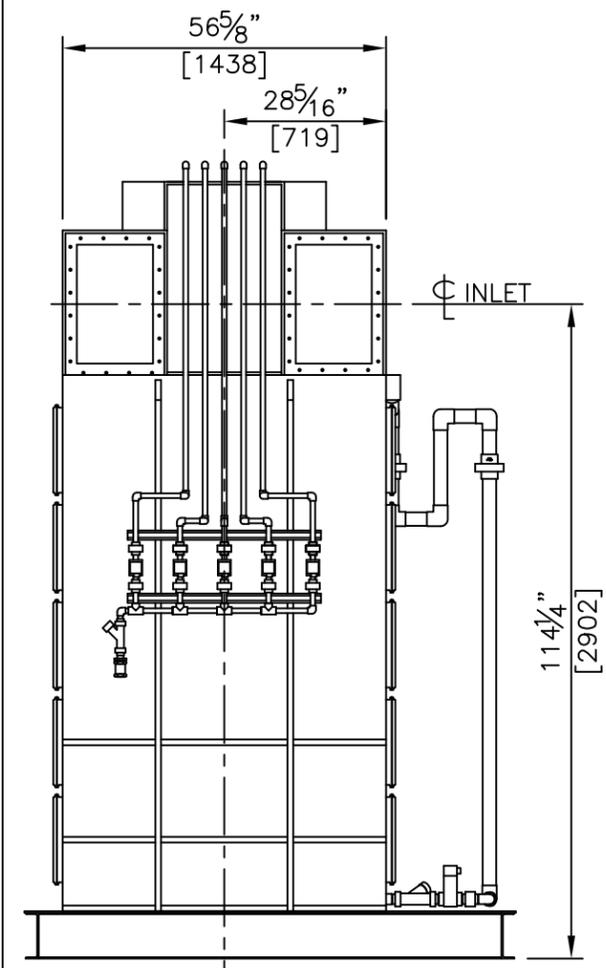
FAN INLET
24 1/2" O.D x 24" I.D.
SLIP-ON CONNECTION



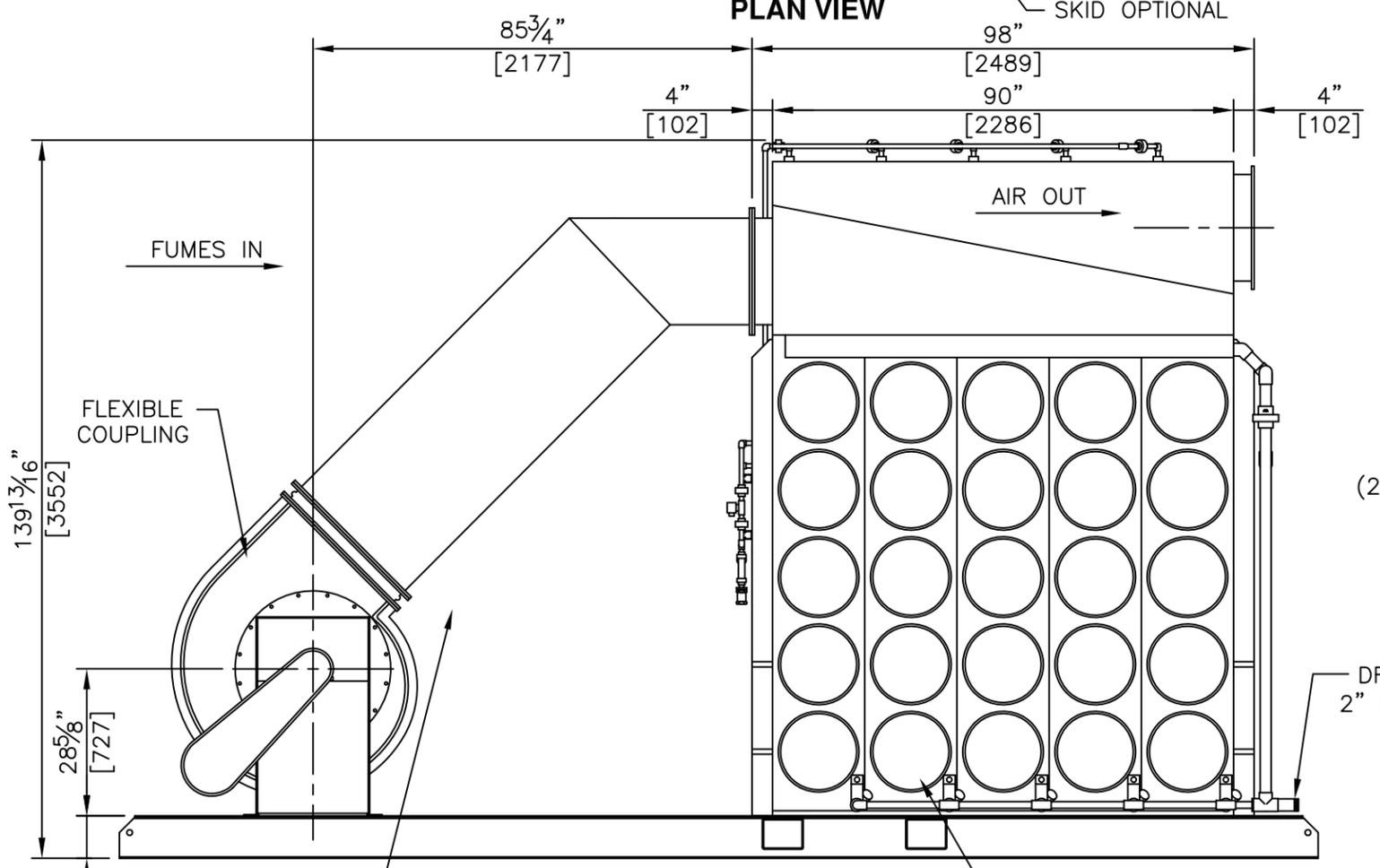
STANDARD FAN DATA	
MFG: NYB	H.P.: 30
MODEL: FE-241 MP	460/230V 3ph 60Hz
CAPACITY: 10,000 CFM	RPM: 2424
PRESSURE: 12" W.C.	TYPE: TEFC
ARRG'T: 9E	S.F.: 1.15
ROTATION: CW TAU	
ISOLATORS: NO	
BELT GUARD: YES	
FAN INLET DIA. - 24" I.D. (NOM.)	

- NOTES:
1. FLOW RATE - 10000 CFM (50 CANISTERS @ 200 CFM EACH)
 2. TOP REACTOR OUTLET AVAILABLE AS AN OPTION.
 3. SEE SHEET 2 THIS DRAWING FOR OPTIONAL EQUIPMENT AVAILABLE FOR THIS UNIT.
 4. ALLOW 36" CLEARANCE ON BOTH SIDES OF REACTOR FOR CANISTER REMOVAL.

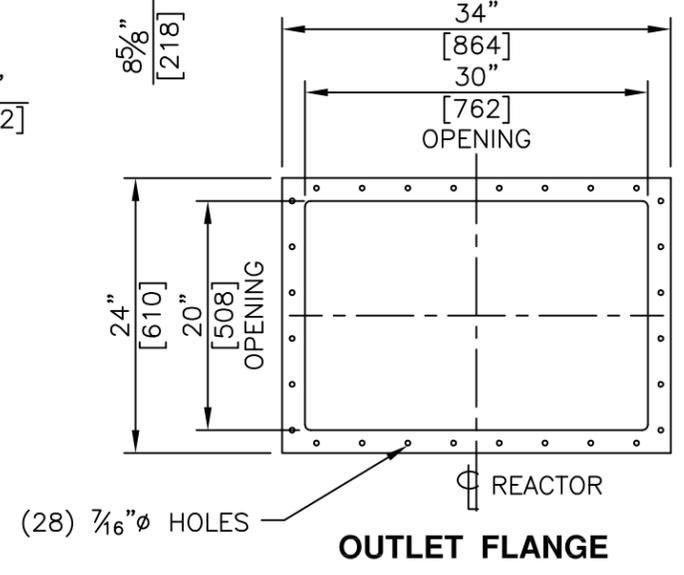
PLAN VIEW



SIDE ELEVATION
(FAN NOT SHOWN)



ELEVATION



THIS DRAWING AND DESIGN IS THE PROPERTY OF CALGON CARBON CORPORATION AND IS NOT TO BE REPRODUCED IN WHOLE OR IN PART NOR EMPLOYED FOR ANY PURPOSE OTHER THAN SPECIFICALLY PERMITTED IN WRITING BY CALGON CARBON CORPORATION. THIS DRAWING LOANED SUBJECT TO RETURN ON DEMAND.

	NAME	DATE
DRAFTER	BSC	4-25-00
DESIGNER		
CHECKER		
APPROVAL		
PROJECT No.	PHOENIX II	

**FOR INFORMATION ONLY
NOT FOR CONSTRUCTION**

REV	DESCRIPTION	APP	DATE
2	CHANGE REACTOR DESIGN	EHH	2/21/03
1	UPDATE DWG FORMAT		9-1-02

REVISIONS

TOLERANCES (unless otherwise specified)			
ANGULAR	±0°30'	DECIMAL (2 PLACES)	±.010
FRACTIONAL	±1/16"	DECIMAL (3 PLACES)	±.005
DECIMAL (1 PLACE)	±.015	DECIMAL (4 PLACES)	±.0005



CLIENT			
TITLE PHOENIX 10000 AUTOMATIC REGENERATION STANDARD GENERAL ARRANGEMENT			
DWG. Size	B	SHEET No.	1 OF 2
DWG. No.	96-96-0166		SCALE NTS
			REV. 2

Find your Growing Zone

Zip Code

Go



©2004 Horticopta, Inc.



50% Off All Trees, Shrubs, Fruit Bearing, Perennials, and Roses. Sale Ends Thursday at Midnight!

[Home / Swamp White Oak](#)

[Click here to get back in stock notice](#)
[Reviews](#) [Shipping Fees](#) [Plant Types & Container Sizes](#)

Swamp White Oak

The Swamp White Oak tree, *Quercus bicolor*, is a beautiful native tree with lustrous, heavy textured leaves with wavy margins.

This rugged oak grows well in either upland or swampy areas. It is tolerant of poorly drained sites and frequently is found in heavy mucky soils. For a tree named Swamp White Oak, it has surprisingly good drought tolerance!

The Swamp White Oak is a rapidly growing tree that flowers in spring. The acorns mature and are shed in September or October of the same year.

The Swamp White Oak is a long-lived tree that may reach 300 to 350 years old. The name bicolor refers to the two-colored leaf, shining dark green above and velvety white pubescence below, turning golden in the fall.

This deciduous tree has a rounded open habit. Swamp Oak trees transplant easily and it casts dense shade.

The sweet acorns are eaten by whitetail deer, mallards, wood ducks, wild turkeys, squirrels, woodpeckers, and smaller rodents.

Shade tree

Wildlife tree

Widely adaptable

Enter Zip Code for estimated delivery:

Go

Plant Facts

Family	Quercus bicolor
Foliage	Green Above, White Underneath
Mature Height	50 - 60 feet
Mature Spread	50 - 60 feet
Soil	Widely Adaptable
Zones	4-8
Moisture	Tolerates Damp
Mature Form	Pyramidal to Broad
Growth Rate	Moderate
Sun Exposure	Full Sun - Partial Sun
Flower Color	Insignificant
Fall Color	Yellow to Purple

02/27/2013 11:26:44 -10.149.2.204-Web1



HORTICOPIA®

The leading source of horticultural information software for the Green Industry since 1991.

[Home](#) [Products](#) [The Gallery](#) [Samples](#) [Plant Lists](#) [Free Demo](#) [Ordering](#) [Support](#) [About Us](#)

Like 59  [follow us on Facebook](#)

[Plant List](#)

Genus: *Acer*

Previous Plant: *Acer platanoides* "Maculatum"

Next Plant: *Acer platanoides* "Pond (Emerald Lustre™)"

[Fast Growing Tree Nursery](#)

[www.Fast-Growin..](#)

Get Privacy, Shade or Fruit Fast. Get Low Prices + 1 Year Warranty!



***Acer platanoides* 'Olmsted'**
Norway Maple, Harlequin Maple

Family: *Aceraceae* (Maple)



©2010 Horticipia, Inc.

Photography by: Dr. Edward F. Gilman

Type:	Tree
Hardiness range:	4A - 7A
Height:	30' to 45' / 9.20m to 13.80m
Spread:	15' to 18' / 4.60m to 5.40m
Growth rate:	Average
Exposure:	Partial shade or partial sun to full sun
Persistence:	Deciduous, broadleaf
Bloom color:	Green
Bloom season:	Spring
Leaf color:	Green
Fruit color:	Brown, green
Water requirements:	Moist
Soil pH requirements:	Acidic, neutral, alkaline, slightly alkaline
Soil type:	Sandy, clay, loamy
Native habitat:	
Form:	Columnar, upright or erect

Complete information for this plant may be found in the HORTICOPIA® Professional *Woodies Plus* Library. The pictures in our published products are in a significantly higher resolution than the website samples and **do not** have the Horticipia copyright imbedded in the image. In the latest version, pictures are sized for a 1280 x 1024 monitor resolution). Click [here](#) for a sample full-sized picture.

HORTICOPIA®



Plant information

Plant pictures

Search, View

and Print!

Landscape

Garden Centers

Educators

Students



[Site Map](#)

Direct comments to [Acer platanoides 'Olmsted' at Horticipia.com](#)
Copyright 2006-2011, Horticipia, Inc., All Rights Reserved

[Home](#) [Plant Pictures & Identification](#),
[Horticultural Information](#), and [Landscaping](#)



Pyramidal European Hornbeam

Carpinus betulus 'Fastigiata'



An attractive, columnar tree with dense branches when young, spreading into a broad cone shape with age. Clean looking dark green foliage turns yellow-orange in fall. Great for screens and street trees.

Care Information

Follow a regular watering schedule during the first growing season to establish a deep, extensive root system. Watering can be reduced after establishment. Feed with a general purpose fertilizer before new growth begins in spring. Pruning time: winter.

Design Ideas

Well proven tree for boulevards, parks and institutional landscapes. Nice shade tree for narrow suburban yards and for visually dividing closely placed multistory homes. The favorite form for allees and pleached effects in the European style. In a windrow, hornbeam makes a fine large scale visual screen or windbreak.

Companion Plants

Great with evergreen Oriental Spruce, (*Picea orientalis* 'Arovirens') and Austrian Pine, (*Pinus nigra*). Exceptional color companions include Autumn Gold Maidenhair, (*Ginkgo biloba* 'Autumn Gold') and River's Purple European Beech, (*Fagus sylvatica* 'Riversii').

History

The European hornbeam is native to Europe eastward to central Asia. It has been in cultivation for so long there is no date of introduction. It was introduced into North America during colonial times. This fastigate form was introduced in 1883.

Lore

Hornbeam is a favorite tree for the art of pleaching, which is a form of topiary on a monstrous scale. This species withstands frequent shearing and is often planted into allees in Britain.

Botanical Pronunciation: kar-PY-nus BET-ew-lus

Key feature: Fall Color

Plant type: Tree

Deciduous/evergreen: Deciduous

Cold hardiness zones: 4 - 8

Light needs: Full sun

Sunset climate zones: 2 - 9, 14 - 17

Water Needs: Once established, needs only occasional watering.

Average landscape size: Moderate growing to 35 to 45 ft. tall, 25 to 35 ft. wide.

Growth rate: Moderate

Growth habit: Pyramidal

Special features: Fall Color

Landscape uses: Espalier, Firescaping/Fire Wise, Mass Planting, Windbreak, Woodland Garden

Flower color: Yellow

Blooms: Inconspicuous

Foliage color: Dark Green

Item no.: 2277

This page located at <http://www.monrovia.com/plant-catalog/plants/694/pyramidal-european-hornbeam.php>

Home My Account Order Status Wish Lists Gift Certificates View Cart Sign in or Create an account



FREE SHIPPING
ON ORDERS OVER \$100 U.S. ONLY

Advanced Search | Search Tips



LEARNING CENTER CUSTOMER SERVICE CALL US TOLL-FREE 1-877-356-7333

[Home](#) [Learning Center](#) [Tree & Shrub Care Guides](#) [Cedar & Arborvitae](#) Northern White Cedar

Product Categories

- Tree Health**
- Pest Control**
- Seeds**
- Tools & Gadgets**
- Books**
- Pond & Water Garden**
- Birding & Wildlife**

Popular Brands

- BioCare
- Lawn & Garden Products
- Trailblazer
- TreeHelp
- Oak Stump Farms
- Pond Logic
- Aeroxon
- Bonide
- Shake-Away
- Chapin
- [See all brands](#)

Our Newsletter

Your First Name:

Your Email Address:

SUBSCRIBE ME

Northern White Cedar



TreeHelp Product Suggestions:
[Custom Care Kits](#)
[Check for seed availability](#)

- | | | |
|---|--|--|
| A Hedge of Northern White Cedar
<small>G. Lumis</small> | Leaf and Cones of Northern White Cedar
<small>G. Lumis</small> | Bark of Northern White Cedar
<small>G. Lumis</small> |
|---|--|--|

Scientific Name: Thuja occidentalis
Other Common Names: white cedar, eastern white cedar, American arborvitae

Summary
Foliage: Needled Evergreen
Height: 40 to 45 feet
Spread: 15 feet
Shape: Narrow pyramidal
Growth Characteristics: Slow to moderate growing

The Northern White Cedar is a very adaptable landscape plant with fragrant foliage. The leaves are glossy and green, covering the trunk from the ground up and the branches are upsweeping. The trunk is dark, grayish brown and shreds. Excellent for hedges. The yellowish-brown fall foliage is often considered unattractive. Cultivars include 'Affinity', 'Emerald', 'Hills Dark Green', 'Nigra', 'Sunkist', 'Techny', 'Wareana Lutescens', 'Fastigiata', 'Columnaris', and 'Pyramidalis'.

Plant Needs
Zone: 3-8
Light: Full sun to light shade
Moisture: Prefers humidity
Soil Type: Prefers moist soils, but tolerant of clay and dry soils.

Care
Fertilize with formulations that promote woody, strong growth rather than excessive foliar growth. Avoid storm damage by pruning young trees to a single trunk. In winter, use twine or burlap to protect branches from breakage. Take care not to overprune as the tree does not recover well.

Problems
Damage from browsing deer can be common. Roots are quite shallow, so can be easily uprooted in wind and storms. Prone to bagworms

Popular Products



TreeHelp Annual Care Kit
\$27.95
★★★★★
[Choose Options](#)



Rapitest Mini pH Tester
\$6.76
★★★★★
[Add To Cart](#)

New Products



Citrus Leafminer Trap & Lure
\$24.95
[Pre-Order Now](#)



Stainless Steel Bird Spikes, 50 ft.
\$189.95
[Add To Cart](#)

[Fast Growing Tree Nursery](#) Get Privacy, Shade or Fruit Fast. Get Low Prices + 1 Year Warranty! www.Fast-Growing-Trees.com

[Precision Tree](#) 703-593-4406 for a free estimate Serving entire DC metro area! www.precisiontreeva.com

[Fast-Growing Trees](#) Midwest Grown, Direct to You. Up to 200 Different Tree Species! www.naturehills.com

[Green Giant Arborvitae](#) On Sale Now \$1.97 Each While Supplies Last www.lownecreeknursery.com

AdChoices 

Home
About.com Landscaping

Share

'Emerald Green' Arborvitae Trees

By [David Beaulieu](#), About.com Guide

Free Landscaping Newsletter!

Enter email address

[Sign Up](#)

[Discuss in my forum](#)

Plant Taxonomy of 'Emerald Green' Arborvitae:

Plant [taxonomy](#) classifies 'Emerald Green' Arborvitae under *Thuja occidentalis*. 'Emerald Green' arborvitae is one of its [cultivars](#). The common name for these [conifers](#) is often misspelled, "arbor vitae" (technically, when spelled as two words, it's a part of the human anatomy, not a tree). The term is Latin and means "tree of life," due to the alleged medicinal value of its resin. Oddly, this is a case in which a plant's [common name and scientific name](#), while different, are both Latin!



'Emerald Green' Arborvitae
Courtesy Missouri Botanical Garden

Plant Type for 'Emerald Green' Arborvitae:

'Emerald Green' arborvitae is an [evergreen](#) in the Cypress family. Although some might say they are, technically, tall shrubs, they are commonly referred to as "trees."

USDA Plant Hardiness Zones for 'Emerald Green' Arborvitae Trees:

'Emerald Green' arborvitae should be grown in [zones](#) 2-7.

Characteristics of 'Emerald Green' Arborvitae Trees:

'Emerald Green' arborvitae usually reaches just 12'-14', with a spread of 3'-4'. Its foliage comes in flat sprays and, if you look closely, the needles appear covered in scales.

Plant Care for 'Emerald Green' Arborvitae Trees:

If the typical dimensions for this plant are still too big for your needs, they can be pruned in early spring (before any new growth) to a size with which you are more comfortable. Since this tree is not drought-tolerant, water well during hot summers and mulch generously to hold in some of that water.

Sun and Soil Requirements for 'Emerald Green' Arborvitae Trees:

Although not drought-tolerant, 'Emerald Green' arborvitae does fine in full sun (it doesn't mind partial shade, however). Grow in a well-drained soil.

Uses for 'Emerald Green' Arborvitae Trees in Landscaping:

A slim tree of medium height, 'Emerald Green' arborvitae is often planted in a row -- as a decorative border planting, wind screen or privacy screen. Because it is evergreen, its usefulness in any of these capacities extends throughout the year in the North. Occasionally, the tree is also used as a [specimen](#).

Leyland Cypress vs. 'Emerald Green' Arborvitae Trees:

Its cold hardiness makes 'Emerald Green' arborvitae a solid choice for Northern landscapers, who might otherwise use [Leyland cypress](#), a favorite in zone 6 and higher. 'Emerald Green' arborvitae would also be the choice over Leyland cypress in cases where a tall tree would be inappropriate. Whereas the latter reaches at least 60' at maturity, 'Emerald Green' arborvitae usually reaches just 12'-14'. These differences notwithstanding, the two trees have a similar look and are both popular, particularly as ["living wall" privacy screens](#).

Related Searches [Usda Plant Hardiness Zones](#) [Arborvitae Trees Plant](#) [Thuja Occidentalis Emerald Green](#) [Emerald Green Arborvitae Trees](#) [Thuja Occidentalis Emerald](#)

Text Only | Home | A-Z Directory | MaineStreet | Campus Map | Calendar | Search: Go

Cooperative Extension: Cranberries



[Give Now](#) | [Apply to UMaine](#) | [Parents](#)

Highbush Cranberry (not a true cranberry)

Viburnum trilobum, also known as *Viburnum opulus var. americanum* L. Ait

Some Other Common Names: American cranberrybush, guelder rose, dog rowan, *European cranberry tree, marsh alder, red elder, dog elder, gatten tree, whitten tree, ople tree, snowball tree, crampbark



Highbush Cranberry

Introduction: The highbush cranberry is actually not a cranberry at a “drupes” as they are known taxonomically, strongly resemble cranberry and taste. They also mature in the fall, as cranberries do. The two plant however. Both are native to North America, but the highbush cranberry member of the Caprifoliaceae, or **Honeysuckle family**, in contrast to cranberry, which is a *Vaccinium*, a member of the Ericaceae—Heathe Honeysuckle family is comprised of about 400 species, with 11 tree sp shrub species—that are native to North America. They are located mos regions and in tropical mountains. In North America, the highbush cra British Columbia east to Newfoundland, south to Washington state and Virginia, with an isolated population in New Mexico. According to the Conservation Service, the highbush cranberry is listed as ‘endangered’ in Ohio, and ‘rare’ in Pennsylvania.

Plant Description: Considered a large and hardy deciduous shrub rate of up to 3 ft. per year, the plant is typically 8 to 15 feet tall by arching stems and a very dense, rounded form, making it a popular landscaping choice for use as a screening hedge [For a s be spaced 2 to 3 ft. apart.]. It is noted for attracting wildlife, especially birds which benefit greatly from the fruit, which ca well into mid winter. It is tolerant of frost, likes sun or semi-shade, and is successful in most soil types but does best in we is rich and loamy. Established plants can tolerate drought, but they are helped by supplemental watering during such period

- **Leaves:** Opposite, simple, 3-lobed and 2 to 4 inches long. They are superficially similar to many maple leaves, have a somewhat wrinkled surface and impressed venation. They are glossy dark green in the summer but often che to yellow-red or red-purple in the fall. The petiole is grooved and has round, raised glands near the base.
- **Flowers:** It produces flat-top clusters of showy white flowers in June. The clusters are 2 to 3 inches across, with outer ring of larger, sterile flowers. Although the flowers are hermaphrodite (having both male and female organs) are presumably self-fertile, there is some debate about that so it is probably best to grow at least two different culti in order to ensure fruit and fertile seed production. The flowers are also pollinated by insects.
- **Fruit:** Nearly round drupe (drupe: a fleshy fruit with a central stonelike core containing 1 or more seeds) about 1/3 : diameter with a single large seed, bright red, juicy and quite acid, like a cranberry. The seeds ripen from August begin to produce fruit until approximately five years of age.

Edible Qualities: The fruits/drupes can be eaten raw (though not very tasty that way) *or* cooked, and like cranberries, t and so have a tart, acid taste (the taste is best after a frost and when picked slightly under-ripe). They are an excellent sub: are likewise used in preserves, jams/jellies, sauces, *etc.*, which make delicious condiments for meat and game. The ja pleasant flavor.



Gardening Help

Plant Finder

[Lawn, Landscape & Garden Design](#)
[Advice, Tips & Resources](#)
[Plants of Merit](#)
[Sustainable Gardening](#)
[Gardening Education & Classes](#)
[Visit the Center for Home Gardening](#)
[Gardening Help Site Map](#)

Gardening Help Search

[Become a Master Gardener](#)
[Determine Your Growing Zone](#)
[Plant Finder](#)

Euonymus alatus 'Compactus'

[Back to Previous Page](#)


☆☆☆☆ [See Comments](#)
Tried and True Recommended
 by 10 Professionals

Common Name: dwarf-winged burning bush

Type: Deciduous shrub

Family: Celastraceae

Zone: 4 to 8

Height: 9 to 11 feet

Spread: 9 to 11 feet

Bloom Time: May to June

Bloom Color: Green, Yellow

Bloom Description: Yellow/green

Sun: Full sun to part shade

Water: Medium

Maintenance: Low

Flowers: Flowers not Showy

Leaves: Good Fall Color

Tolerates: Clay Soil, Black Walnuts

Uses: Hedge

 Invasive: [Where is this species invasive in the US?](#)

Culture

Easily grown in average, medium, well-drained soil in full sun to part shade. Adaptable shrub which tolerates a wide range of soils except for wet, poorly-drained ones. Also tolerates considerable shade. Strong, branching growth habit enables plant to tolerate heavy pruning.

Noteworthy Characteristics

'Compactus' is a popular burning bush cultivar. It is a deciduous shrub which is not all that "compact" since it typically grows in a mound to 10' tall with a slightly larger spread, though it can easily be kept shorter by pruning. It features elliptic to obovate, dark green leaves (to 3" long) which turn bright red in fall (sometimes more pinkish in shade). Fall color can be spectacular and gives rise to the common name. Small, yellowish-green flowers appear in May but are not showy. Small fruits (1/3" red capsules) appear in fall, but are usually hidden by the foliage. Corky bark ridges on the branches of *Euonymus alatus* give rise to the additional common name of winged euonymus for the species. However, the corky ridges are absent or very reduced in size on the stems of 'Compactus'. For a truly compact burning bush, see *Euonymus alatus* 'Rudy Haag' which typically grows from 3-5' tall.

Problems

No serious insect or disease problems.

Garden Uses

Versatile shrub with outstanding fall color. Specimen, group or mass. Hedge, screen, shrub border or foundation plant.

Similar Plants



Euonymus alatus
'Odom' LITTLE
MOSES



Euonymus alatus



Euonymus alatus
'Rudy Haag'



Euonymus atropurpureus

Alternatives for the Lower Midwest



Aesculus pavia



Euonymus atropurpureus

[Back to Previous Page](#)

Thank You!

The Garden wouldn't be the Garden without our Members, Donors and Volunteers.

[Support the Garden.](#)

Become a Member!
Members get more.

Sign up for our e-newsletter

[Submit](#)

Info for

- Members
- Visitors
- Gardeners
- Horticulturists
- Educators
- Researchers

Main Navigation

- Visit
- Things To Do
- Gardens & Gardening
- Learn & Discover
- Sustainability & Conservation
- Plant Science
- About

Quick Links

- Support the Garden
- Members
- Shop
- Volunteer
- Jobs
- Media
- Contact



Missouri Botanical Garden
4344 Shaw Blvd., St. Louis, MO 63110
(314) 577-5100 [hours and admission](#)

Butterfly House
Faust Park, 15193 Olive Blvd.
Chesterfield, MO 63017
(636) 530-0076 [hours and admission](#)

Shaw Nature Reserve
Hwy. 100 & I-44 Gray Summit, MO 63039
(636) 451-3512 [hours and admission](#)

[Privacy Policy](#) | [Conditions](#) | [Copyright](#) | [Affiliations](#) | [Site Map](#)

Gardening Help

Plant Finder

[Lawn, Landscape & Garden Design](#)
[Advice, Tips & Resources](#)
[Plants of Merit](#)
[Sustainable Gardening](#)
[Gardening Education & Classes](#)
[Visit the Center for Home Gardening](#)
[Gardening Help Site Map](#)

Gardening Help Search

[Become a Master Gardener](#)
[Determine Your Growing Zone](#)
[Plant Finder](#)

Spiraea japonica 'Little Princess'

[Back to Previous Page](#)


★★★★☆, [See Comments](#)

Tried and True Recommended by 10 Professionals

Common Name: Japanese spirea

Type: Deciduous shrub

Family: Rosaceae

Zone: 4 to 8

Height: 1.5 to 2.5 feet

Spread: 2 to 3 feet

Bloom Time: May to July

Bloom Color: Pink

Bloom Description: Pink

Sun: Full sun

Water: Medium

Maintenance: Low

Flowers: Showy Flowers

Leaves: Good Fall Color

Wildlife: Attracts Butterflies

Tolerates: Clay Soil, Air Pollution, Deer

Uses: Erosion Control, Hedge

Invasive: [Where is this species invasive in the US?](#)

Culture

Easily grown in average, medium, well-drained soil in full sun. Tolerates a wide range of soils. Remove faded flower clusters to promote additional bloom. Prune in late winter to early spring.

Noteworthy Characteristics

This Japanese spiraea cultivar is an upright, rounded, deciduous shrub which typically forms a compact mound to 30" tall. Features numerous pink flowers in flat-topped clusters (corymbs) in late spring to mid-summer. Attractive to butterflies. Oval, sharply toothed, mint green leaves take on attractive red hues in autumn.

Problems

No serious insect or disease problems. Susceptible to many of the diseases and insects that attack other members of the rose family, including leaf spots, fireblight, powdery mildew, rots, aphids, leaf roller and scale.

Garden Uses

Effective in borders, cottage gardens, rock gardens and as low hedges or edging. Excellent for foundation plantings.

Similar Plants



Spiraea prunifolia



Spiraea thunbergii



Spiraea thunbergii
'Ogon'



Spiraea x vanhouttei

[Back to Previous Page](#)

Thank You!

The Garden wouldn't be the Garden without our Members, Donors and Volunteers.

[Support the Garden.](#) ▶

Become a Member!
Members get more.

Sign up for our e-newsletter

Info for

- Members
- Visitors
- Gardeners
- Horticulturists
- Educators
- Researchers

Main Navigation

- Visit
- Things To Do
- Gardens & Gardening
- Learn & Discover
- Sustainability & Conservation
- Plant Science
- About

Quick Links

- Support the Garden
- Members
- Shop
- Volunteer
- Jobs
- Media
- Contact



Missouri Botanical Garden
4344 Shaw Blvd., St. Louis, MO 63110
(314) 577-5100 *hours and admission*

Butterfly House
Faust Park, 15193 Olive Blvd.
Chesterfield, MO 63017
(636) 530-0076 *hours and admission*

Shaw Nature Reserve
Hwy. 100 & I-44 Gray Summit, MO 63039
(636) 451-3512 *hours and admission*

[Privacy Policy](#) | [Conditions](#) | [Copyright](#) | [Affiliations](#) | [Site Map](#)