18A-1108 CW#52592

Project and Maintenance Agreement for Green Infrastructure at Frick Environmental Center

("Agreement")

made and entered this 8 day of August, 2018 ("Effective Date")

BY AND BETWEEN

THE CITY OF PITTSBURGH,
a municipal corporation of the Commonwealth of Pennsylvania, located at 414 Grant Street, Pittsburgh, PA 15222 (the "**City**"),

AND

THE PITTSBURGH PARKS CONSERVANCY,
a 501(c)3 non-profit organization of the Commonwealth of Pennsylvania, located at 45 South 23rd Street, Suite 101, Pittsburgh, PA 15203 (the "**PPC**")

AND

THE PITTSBURGH WATER AND SEWER AUTHORITY,
a body corporate and politic of the Commonwealth of Pennsylvania, located at Penn Liberty Plaza 1, 1200 Penn Avenue, Pittsburgh, PA 15222 (the "**PWSA**");

WHEREAS, the City is the owner in fee of certain real property in Frick Park at 2005 Beechwood Boulevard in Pittsburgh, Pennsylvania, as described more particularly in Exhibit A, "Property Description", which is attached hereto and made a part hereof (the "Property"); and

WHEREAS, the PPC and the City have entered into a License and Cooperation Agreement dated December 18, 2013 (the "License Agreement"), whereby the City has agreed to license the Property to the PPC, and the PPC has agreed to assist the City with the rebuilding, maintenance, and operations of the Property and the provision of related programs at the Property for the benefit of the general public; and

WHEREAS, the PWSA has established a Green Infrastructure Matching Grant Program (the "Grant Program") to provide financial assistance to certain qualified property owners who desire to install green infrastructure on their properties. The Grant Program provides grants to qualified property owners to build infrastructure to manage stormwater runoff where the PWSA determines that a proposed green infrastructure project offers cost savings to the PWSA, achieves significant reduction of stormwater runoff, and provides environmental benefit; and

WHEREAS, one objective of the Grant Program is to increase the use of green infrastructure in the City of Pittsburgh and reduce stormwater runoff that would

otherwise have been discharged to the wastewater and stormwater system in the City of Pittsburgh, in order to improve and enhance water quality resources downstream (the "Conservation Objective"); and

WHEREAS, another objective of the Grant Program is to increase public awareness of green infrastructure techniques for stormwater management using signage and/or educational programs; and

WHEREAS, the PPC applied for and was awarded a grant under the Grant Program to design, construct, and install a green infrastructure project (the "GI Project") as part of the Frick Environmental Center Project on a certain portion of the Property ("GI Site"), which is further depicted on the "Site Map", which is attached hereto and incorporated herein as Exhibit B; and

WHEREAS, the PPC, or in the event of default by the PPC, the PWSA, has agreed to maintain the GI Project following the completion of construction in order to protect public health, safety, and welfare and maintain and enhance water quality; and

WHEREAS, the PWSA requires that as a condition of receiving funding for the GI Project, (1) the PPC must operate and maintain the GI Project for a twenty-five (25) year term, unless released from this Agreement pursuant to the provisions within; and (2) the PPC and the City must grant to the PWSA access over, under, along, and in the GI Site and the GI Project for a period of not less than the Term of this Agreement defined herein, for the purposes and upon the terms and conditions set forth in this Agreement; and

NOW THEREFORE, in consideration of the foregoing premises and recitals, which are incorporated herein as if set forth below in full, the mutual covenants contained herein, and the following terms and conditions, the parties hereto, intending to be legally bound hereby, covenant and agree as follows:

AGREEMENT

1. **Recitals.** The above recitals are incorporated herein by reference.

2. **Term of Agreement.** The term of this Agreement will commence on the Effective Date set forth above and will conclude on the earlier of the termination of the License Agreement or the twenty-five (25)-year anniversary of the Effective Date unless extended by the parties in writing or terminated earlier as permitted herein.

3. **Non-Delegation of Duties.** By entering into this Agreement, the City is neither intending to delegate its duties nor abdicate its constitutional responsibilities for municipal improvements.

4. **Scope of GI Project.** Subject to the terms and consideration set forth below and within the attached exhibits, the PPC has agreed to undertake the GI Project as part of

the Frick Environmental Center Project, to be reimbursed by the PWSA upon completion of the GI Project according to the terms and the conditions as set forth in the applicable grant agreement by and between the PWSA and the PPC (the "Grant Agreement").

The "Scope of the Project" is attached hereto and incorporated herein as ExhibitC. Signage requirements for the GI Project are set forth in the Grant Agreement.

5. Design and Construction of Project.

(a) The PPC covenants and agrees that it will complete the GI Project in accordance with the terms set forth herein and the Grant Agreement.

(b) The PPC will take all reasonable measures to secure the GI Site from pedestrians and other persons as necessary, so as to minimize the hazards to said persons posed by the construction being performed.

(c) Prior to initiating the GI Project, the PPC will submit to the PWSA its drawing set and technical specifications, which are included in Exhibit C, "Scope of Project", for the GI Project. The GI Project plans and specifications will be subject to the approval of the PWSA.

(d) The PPC will submit to the PWSA and to the City record drawings, which are included as a part of Exhibit C. Additionally, the PPC will provide photographs of the GI Project and the GI Site, to the City and to the PWSA once the construction of the GI Project is complete.

6. Maintenance Responsibility.

(a) This Agreement will serve as the signed statement by the City authorizing the PPC to install the GI Project as proposed herein. The City and the PPC will perform the maintenance activities as set forth on Exhibit D, "Maintenance Plan", which is attached hereto and incorporated herein. Performance of this work is subject to applicable law/union contracts. The PPC will provide the PWSA with written notice of changes in the Maintenance Plan, and any material changes relating to the GI Project will be subject to prior written approval of the PWSA.

(b) The PPC, or in the event of default by the PPC, the PWSA, as applicable at its sole expense, will cause to be performed the Maintenance Work reasonably necessary to keep the GI Project and GI Site in good working order and condition so that the GI Project is performing its intended design functions within expected tolerances. This includes, but is not limited to, all pipes and channels built to convey stormwater to the GI Project, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. At the conclusion of this

Agreement, the PPC and the City will meet with the PWSA to discuss continued maintenance of the GI Project.

(c) Neither the City nor the PWSA will be responsible for any damage or loss that may occur to any personal property of the PPC, or of any employees, agents, contractors, subcontractors, or volunteers that is located or stored on City property. The PPC will ensure that it and/or its contractor(s) takes reasonable measures to secure equipment and other property when not in use.

7. Destruction and Removal; Changes and Alterations.

(a) The City and the PPC covenant and agree for the Term of this Agreement, that no change in grades or other alterations within the GI Site will be made and that no buildings and/or other structures either overhead, underground, or upon the surface will be constructed within or abutting the GI Site unless the plans for such changes of grades, alterations, or structures will be first submitted to and approved in writing by the PWSA.

(b) The City and the PPC agree that they will not destroy or remove or allow to be destroyed or removed the GI Project from the Property or modify the GI Project in a manner that materially lessens its effectiveness during the term of this Agreement. It is understood and agreed that none of the following will constitute a breach of this covenant: (i) destruction, removal, or alteration of any such property or improvement as a result of a *Force Majeure Event*, as defined below or identified by the City, so long as it is an event that is beyond the reasonable control of the City, or (ii) the removal and disposal of any part of the green infrastructure on the GI Project, provided that simultaneously with or prior to such removal, any such green infrastructure will be replaced with other green infrastructure comparable (or better than, in terms of gallons of stormwater that is removed from the watershed) in all material respects to the removed green infrastructure and with equal or better effectiveness.

(c) Neither the City nor the PPC nor the PWSA will be liable for any delay in the performance of its obligations pursuant to this Agreement, to the extent that such delay is caused, directly or indirectly, by an occurrence of fire, flood, earthquake, elements of nature or acts of God, acts of war, terrorism, riots, civil disorders, rebellions or revolutions, power outages, or any other causes beyond the reasonable control of the City or the PPC or the PWSA (a "*Force Majeure* Event"). Upon the occurrence of a *Force Majeure* Event, the City and/or the PPC and/or the PWSA, as applicable, will be excused from any further performance of those of its obligations pursuant to this Agreement affected by the *Force Majeure* Event for as long as such *Force Majeure* Event continues and up to seventy-two (72) hours after. The City or the PPC or the PWSA, as applicable, will use commercially reasonable efforts to promptly recommence performance, to the extent possible.

(d) In the event that this Agreement is terminated by any party as permitted under this Agreement or in the event of bankruptcy or any other default of by PPC, the

City will not be obligated to repay any grant money obtained by the PPC from the PWSA or otherwise for the GI Project, nor is the City responsible to maintain the GI Project. Prior to removal of the GI Project, the City/the PPC will notify the PWSA of its intent.

8. Inspection by the PPC.

The PPC will conduct inspections of the GI Project, as needed, but no fewer than once *per* year. The purpose of the inspections is to ensure safe and proper functioning of the GI Project. The inspection will cover all of the GI Project and all GI Project-associated structures and areas, including, but not limited to, all berms, outlet structures, ponds, and access roads.

9. Recordkeeping.

The PPC will retain a record of maintenance activities and inspections related to the GI Project for a period of, at least, four (4) years. Such records will include photographs and verify that inspection and maintenance have been conducted pursuant to this Agreement. The PWSA and/or the City may request at any time that the PPC provide copies of any or all maintenance and inspection documentation during the prior four (4) years. The PPC will comply with any such requests within ten (10) business days after receipt of such request providing that it possesses the records requested.

10. Inspection by the PWSA.

The City and the PPC hereby grant permission to the PWSA and the PWSA's authorized agents and employees to enter upon the GI Site during normal daylight working hours or at any other reasonable time to inspect the GI Project in order to ensure the GI Project is being adequately maintained and is continuing to perform the design function. Inspection includes monitoring, sampling, testing, and examination to determine proper operation of the GI Project. The PWSA will have the right to temporarily install and/or place on or near any part of the GI Project such devices as are necessary to conduct monitoring, sampling, and/or testing of the discharges from the GI Project or the GI Project's effects. The PWSA has the right, but not the obligation to perform these inspection services. The City and the PPC reserve the right to request a copy of any test/sample results from PWSA. PWSA will provide those results that it possesses within ten (10) business days.

11. Failure of the PPC to Maintain the GI Project.

(a) Nuisance. The City, the PPC, and the PWSA agree that failure to adequately maintain the GI Project may constitute a public nuisance that is a threat to public health and safety and to the environment.

(b) The PWSA May Perform Maintenance. To the extent that the PPC fails to perform the Maintenance Work obligations in a timely manner, the PWSA reserves the

right to cure any deficiencies. In addition to any rights the PWSA may have under law or this Agreement, if the PWSA determines that the PPC has failed to adequately maintain the GI Project as determined by the PWSA, the PWSA may notify the PPC in writing of any deficiencies. Where deficiencies cause imminent threat to public health, safety, and/or the environment, the PWSA must contact the City and one or both parties may take immediate steps necessary to protect public health, safety, and/or the environment and charge the costs (including administrative costs) thereof to the PPC. If the PWSA undertakes a cure, it reserves the right to invoice the PPC for any costs incurred by the PWSA for such cure. When the PWSA charges its costs to the PPC pursuant to this Section, those charges will be due within thirty (30) days of the date of the bill.

12. No Waiver.

No delay or failure on the part of the PWSA or the City to exercise any rights, powers, or remedies herein provided will be construed as a waiver thereof or acquiescence of such breach or of any future breach.

13. Reproduction and Release of the Plans, Drawings, and Records.

The City and the PPC authorize the PWSA to reproduce and release copies of plans, drawings, and other records that it previously submitted or in the future submits to in connection with the GI Project.

14. Termination.

(a) The City and/or the PWSA will have the right to terminate this Agreement upon the material breach by the PPC of any of the terms or conditions of this Agreement, including but not limited to: 1) a failure to perform any obligation required hereunder; 2) a failure to procure and maintain necessary insurance; 3) union requirements prohibiting licensing of work permitted herein; and/or 4) upon dissolution of the PPC.

(b) In the event that the proposed termination is based on a failure to perform any obligation required hereunder, the City and/or the PWSA will notify the PPC in writing of the specific provisions of the Agreement under which the PPC is in default. The PPC will have ninety (90) days from the date of the notice of default in which to cure the default and to notify the City and the PWSA in writing of such cure. If the PPC fails to cure the default and notify the City within this period, or fails to promptly commence to cure a default that cannot be cured within ninety (90) days, the City and/or the PWSA will have the right, upon an additional thirty (30) days' written notice to the PPC, to finally terminate this Agreement and will have the right to discontinue operations of the PPC at the GI Site or to take any other action that the City and/or the PWSA believes is in its best interests.

(c) In the event that the proposed termination is based on subsection (2) through (4) of Section 14 (a), the City and the PWSA will only be required to provide thirty (30) days' prior written notice to the PPC to finally terminate this Agreement.

(d) The City will also have the right to terminate this Agreement with thirty (30) days' prior written notice to the PPC and the PWSA, where practicable, in the event of a public safety emergency that threatens the safety of park patrons. Prior to termination for this reason, the City will first attempt to work with the PPC and the PWSA for the parties to agree upon a cure for the emergency to the satisfaction of the City and the PWSA.

15. Amendments.

This Agreement may only be amended or modified by a written document signed by all parties hereto. The PWSA will only enter into an amendment if it determines, at its discretion, that the amendment is consistent with and in furtherance of the Conservation Objective.

16. Indemnity.

The PPC will, at all times, indemnify, hold harmless, and defend the PWSA and the City, their agencies, boards, commissions, officers, departments, agents, employees, elected officials, or other representatives and their respective successors and assigns against any claims which may result or are claimed to result from the negligence of the PPC in the construction, operation, maintenance, inspection, malfunction, repair, or replacement of the aforementioned GI Project and GI Site, as well as any and all costs and expenses incurred by indemnified parties to enforce the rights of the PWSA and/or the City as granted herein.

17. Entire Agreement.

This Agreement sets forth all agreements and understandings between the parties relating to the GI Project and there are no agreements or understandings, either oral or written, between them other than as are set forth in this Agreement and the Grant Agreement. Any agreement hereafter made will be ineffective to change, modify, or amend this Agreement in whole or part unless such agreement is in writing and has been executed by all parties.

18. Notices.

All notices, requests, demands, and other communications required or permitted under this Agreement will be in writing and sent to the party to be notified, at the following addresses:

Property Owner: The City of Pittsburgh
Attn: Director, Department of Public Works

414 Grant Street
Pittsburgh, PA 15219

PWSA: The Pittsburgh Water and Sewer Authority
Attn: Legal Department
Penn Liberty Plaza I
1200 Penn Avenue
Pittsburgh, PA 15222

PPC: The Pittsburgh Parks Conservancy
Attn: Director of Landscape and Facilities Maintenance
45 South 23rd Street
Pittsburgh, PA 15203-2120

Or to that other address as either party may give by notice to the other party. All such communications will be sent by United States registered or certified mail, return receipt requested, or a nationally-recognized delivery service guaranteeing next business day delivery, in each case with all delivery and postage charges prepaid, and will be deemed to have been received three (3) business days after deposit in the United States mail, as aforesaid, or one (1) business day after deposit in a nationally-recognized delivery service guaranteeing next business day delivery, as aforesaid.

19. Miscellaneous.

(a) The headings in this Agreement are for convenience only and are not a part of this Agreement. The headings do not in any way define, limit, describe, or amplify the provisions of this Agreement or the scope or intent thereof.

(b) Governing Law, Jurisdiction, and Venue. This Agreement will in all respects be governed and interpreted in accordance with the laws of the Commonwealth of Pennsylvania without regard to the conflicts of law doctrines thereof. The parties to this Agreement agree to submit to the jurisdiction of courts, whether federal or state, located in Pittsburgh, Pennsylvania.

(c) No Joint Venture. Nothing in this Agreement will be construed as creating a joint venture or partnership between the parties.

(d) No Third-Party Beneficiaries. Nothing in this Agreement is intended to confer a third-party beneficiary right upon any person or entity.

(e) Severability and Partial Invalidity. The provisions of this Agreement will be severable. In the event that one or more provisions of this Agreement or the application thereof for any reason or in any circumstance will to any extent be held to be invalid, illegal, or unenforceable in any respect, such provision will be severed and will be inoperative, and the remainder of this Agreement will remain in force to the fullest extent permitted by law.

(f) Exhibits Incorporated. All exhibits attached to this Agreement are hereby incorporated into and made a material part of this Agreement.

(g) Approval by PWSA Limited. No review, approval, and/or inspection by the PWSA of any plans, designs, specifications, drawings, work, or other materials submitted or performed by the PPC in connection with the GI Project will constitute a representation, warranty, or guaranty by the PWSA as to the substance or quality of the matter reviewed or approved.

20. Insurance.

In connection with the remaining GI Project Work to be performed after the execution date of this Agreement and the Work authorized hereunder, the PPC and any of its contractors will, at its/their cost, obtain and maintain insurance in the amounts specified in this Section and will keep the City and the PWSA as additional insureds on all policies for general liability insurance throughout the Term of this Agreement. Attached hereto as Exhibit E and incorporated herein is the "Certificate of Liability Insurance" evidencing the following, minimum, coverages specifically identifying the PPC as the insured and including the City and the PWSA as additional insureds, throughout the term of the Agreement. Insurance will be issued on an occurrence basis, non-cancelable, except upon thirty (30) days' prior written notice to the City and the PWSA:

	INDIVIDUAL OCCURRENCE	AGGREGATE
General Liability		
Bodily injury (including death)	$500,000	$1,000,000
Automobile Liability	$500,000	$1,000,000
Worker's Compensation	Statutory limits	

21. Waiver of Right of Subrogation.

The PPC hereby waives to the fullest extent permitted by law any right of subrogation that its insurance carriers may have from time to time against the City and the PWSA's officers, employees, and agents.

22. Prohibition Against Encumbrances.

The PPC will not create or permit to be created or to remain, and will discharge, any lien, encumbrance, or charge upon the GI Site or any part thereof having any priority or preference over or ranking on a parity with the estate, rights, and interest of the City in the GI Site or any part thereof.

23. Waiver of Mechanic's Liens.

The PPC will not cause or permit any work to be done upon or any materials or services furnished to any portion of the GI Site in connection with the improvement, alteration, or

repair thereof, except under a contract or contracts which effectively waive to the fullest extent permitted by law any right to file a mechanic's lien or claim against the GI Site of any part thereof.

24. Home Rule Charter Limitation/Authorizing Resolution.

The Agreement is subject to the Home Rule Charter of the City of Pittsburgh and the City's liability hereunder is zero dollars. This Agreement is entered into by the City pursuant to the authority conferred by Resolution No. 397 of 2018, effective June 28th, 2018.

25. Authorization by PWSA Board of Directors.

This Agreement is entered into by the PWSA pursuant to the authorization in Agenda Item No. 61 of 2016, passed May 20, 2016, and Agenda Item No. 28 of 2018, passed February 23, 2018.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, and intending to be legally bound hereby, the parties hereto have caused the Agreement to be duly executed the day and year first above written.

WITNESS:

THE PITTSBURGH PARKS CONSERVANCY

By: _____
Jayne Miller
President and CEO

Approved as to form:

_____
Legal Counsel

THE PITTSBURGH WATER AND SEWER AUTHORITY

By: _____
Robert A. Weimar
Executive Director

WITNESS:

CITY OF PITTSBURGH

By: _____
William M. Peduto
Mayor

WITNESS:

By: _____ 7/17/18
Director, Department of Public Works

EXAMINED BY: _____
Assistant City Solicitor

APPROVED AS TO FORM: _____
City Solicitor

COUNTERSIGNED: ______________________________
City Controller

8-8-18 52592

Department of City Controller
O.K.
7-25-18
M.W.B.
PITTSBURGH

EXHIBIT A

PROPERTY DESCRIPTION

Pittsburgh
Parks
Conservancy

PittsburghParks.org
45 South 23rd Street • Suite 101
Pittsburgh, PA 15203-2120
P: 412.682.7275 • F: 412.622.0160
Pittsburghparks.org

Maintenance Agreement
Exhibit A - Property Description
2016 Green Infrastructure Grant Frick Environmental Center- Permeable Pavers

Frick Environmental Center (FEC) in Frick Park is located at 2005 Beechwood Blvd in Pittsburgh, PA 15217 (coordinates: 40.4365° N, 79.9076° W). The Frick Environmental Center project is an urban renewal project that replaces a burned, dilapidated public building with a new campus of educational and recreational facilities and restore approximately 9.8 acres of historic landscape and woodlands within the 115-acre site of Frick Park.

Frick Environmental Center is located inside of Frick Park, a municipally-owned, public site. Pittsburgh Parks Conservancy has site control via a License & Cooperation Agreement with the City of Pittsburgh: executed 2/18/2013; expires 12/18/2028 with option to renew for an additional 15 years.

EXHIBIT B

SITE MAP

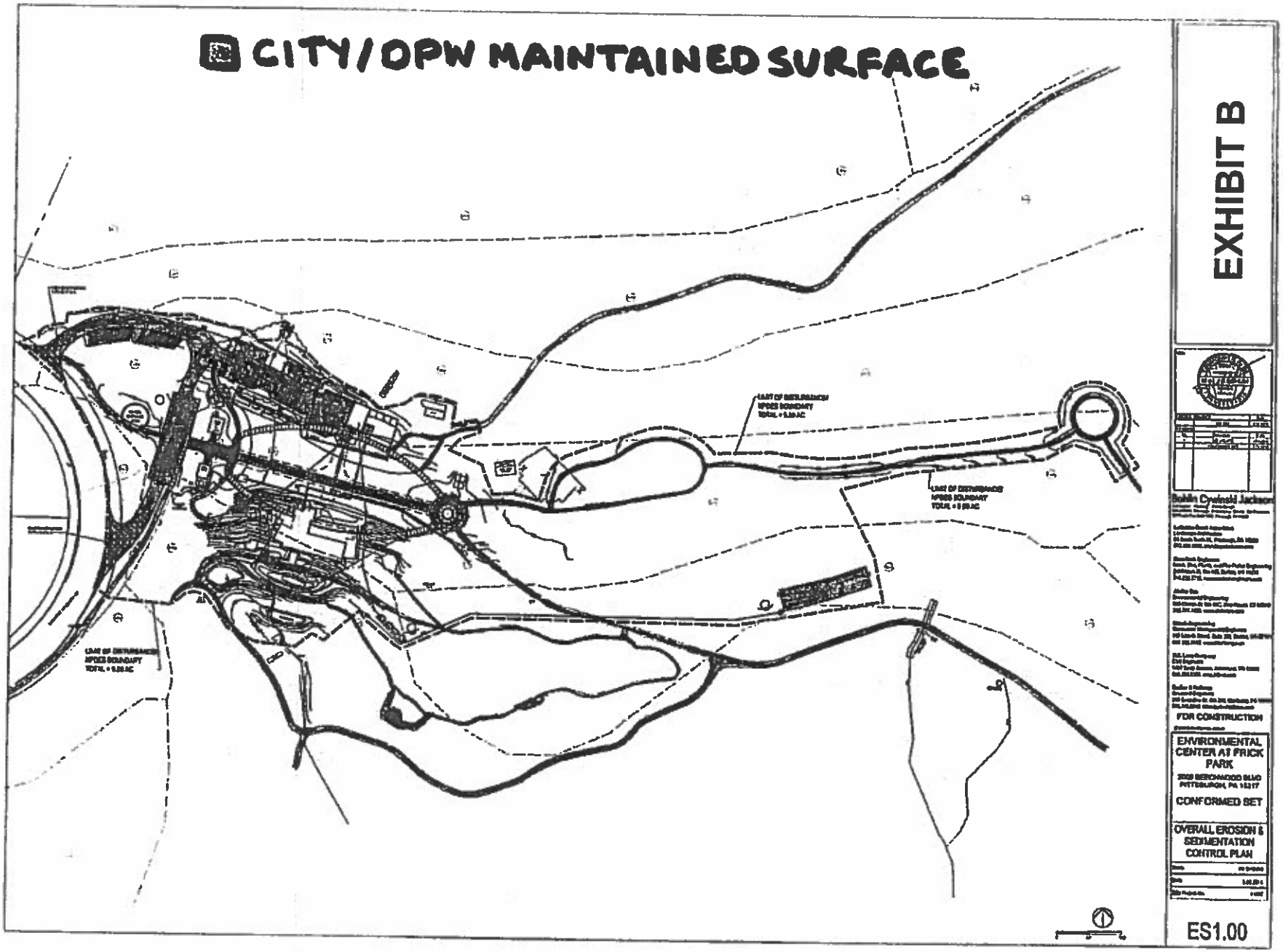

CITY/OPW MAINTAINED SURFACE
EXHIBIT B
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
CONFORMED SET
OVERALL EROSION & SEDIMENTATION CONTROL PLAN
ES1.00

EXHIBIT C

SCOPE OF THE PROJECT

Pittsburgh Parks Conservancy

PittsburghParks.org
45 South 23rd Street • Suite 101
Pittsburgh, PA 15203-2120
P: 412.682.7275 • F: 412.622.0160
Pittsburghparks.org

Maintenance Agreement
Exhibit C – Scope
2016 Green Infrastructure Grant Frick Environmental Center- Permeable Pavers

Pittsburgh Parks Conservancy will install permeable pavers at Frick Environmental Center (FEC) in Frick Park (2005 Beechwood Blvd in Pittsburgh, PA 15217).

The Frick Environmental Center project is an urban renewal project that replaces a burned, dilapidated public building with a new campus of educational and recreational facilities. The FEC project also restores approximately 9.8 acres of historic landscape and woodlands within the 115-acre site of Frick Park. The building and site are designed to achieve both LEED and Living Building Challenge (LBC) certifications, making FEC one of the greenest and only municipal- owned LBC building that is free and open to the public. The sustainability features of the project include water management and conservation in six areas:

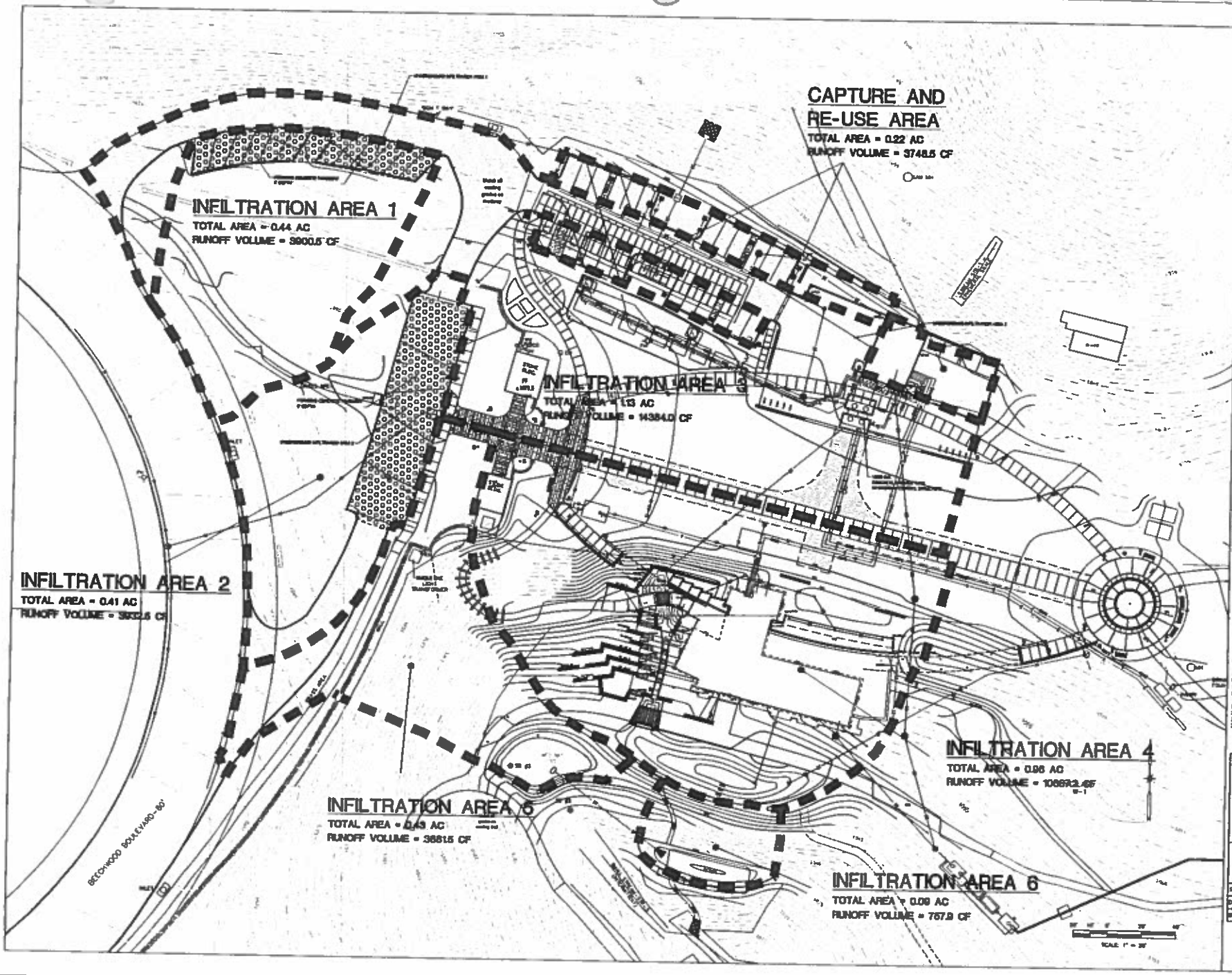
GI Implemented On Site	Surface Area Managed (sq. ft.)	Capture Capacity (annually)	Cost
Permeable Pavement (Infiltration Areas 1, 2)	37,000	7,833 gallons	$156,108
Gravel Retention Reservoir Capture and Reuse (Infiltration Area 3)	49,200	14,384 gallons	$241,000
Rain Barrels and Cistern	8,500	16,000 gallons capacity	$58,000
Constructed Wetlands (Infiltration Areas 4, 5, 6)	24,000	15,300 gallons capacity	$397,675
Biofilters: (bio swales: native trees, shrubs; vegetated buffer strips; grass swales)	174,000 (4 acres)	6,250 gallons (estimated @ 50 gal./ tree with 125 trees)	
Environmental Education Programs	N/A	1,000 students enrolled 20,000 visitors (estimated after 5 years)	$778,000 annually

Location:
Permeable pavers will be located along the driveway/ street at front ADA accessible entrance to the site in front of both gatehouses (infiltration area 2) and in the one-directional section of roadway that leads directly to Beechwood Blvd at the site exit (infiltration area 1).
(See attached Infiltration Area Plan for details).

Originally, it was planned that the pavers would be placed in the large designation parking area beneath a solar array, however, it was later realized that to provide maximize water conservation benefits from the pavers, uncovered locations would be best.

The permeable pavers will be installed with underground infiltration areas that capture the storm water and direct it to the rain garden landscape. Also, two monitoring wells will be installed at the Frick Environmental Center to monitor storm water capture performance data. Monitoring Well 1 will be located immediately adjacent to the largest permeable paver area in front of the main entrance to Frick Environmental Center near Infiltration Area 1. It will continue approximately 1.5m below surface, entering the gravel infiltration bed that lies below the permeable pavers. Monitoring Well 2 will be installed approximately 100 feet to the west of the first well, in the grass turf area, to serve as a control against which performance of the permeable paver system will be measured.

It is estimated that the permeable pavers will absorb rainfall at an estimated rate of 7,833 gallons annually (based upon area rainfall and combined surface area of both areas).



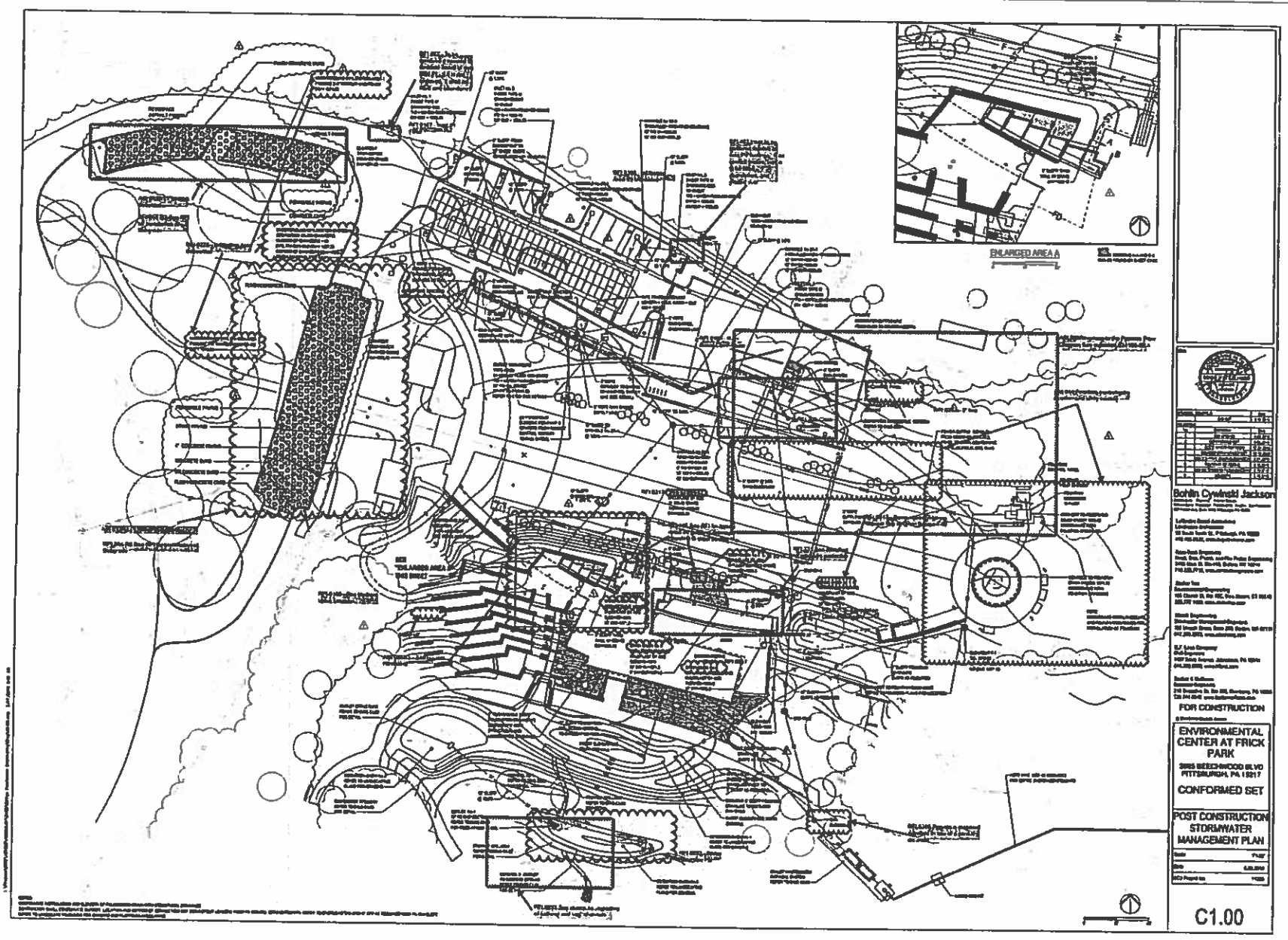
Bohlin Cywinski Jackson

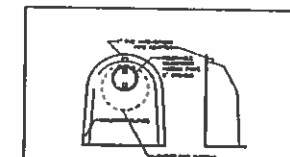
ENVIRONMENTAL CENTER AT FRICK PARK
2005 BEECHWOOD BLVD
PITTSBURGH, PA 15217

BID SET

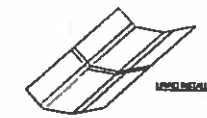
INFILTRATION AND RE-USE AREA PLAN

IAP1.00

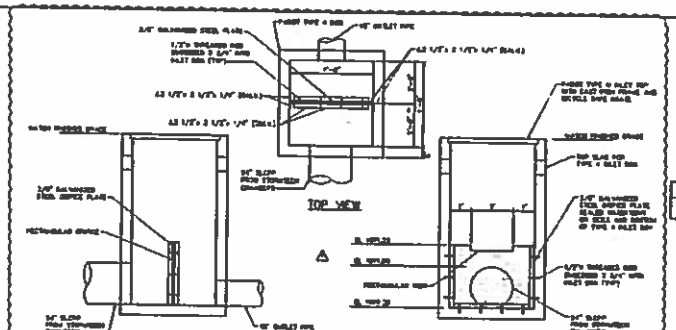

ENLARGED AREA A
Bohlin Cywinski Jackson
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
CONFORMED SET
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN
C1.00



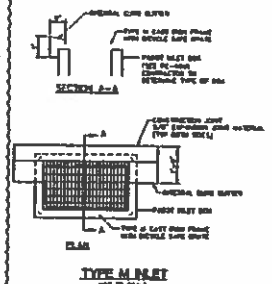
SNOUT OIL-WATER-DEBRIS SEPARATOR



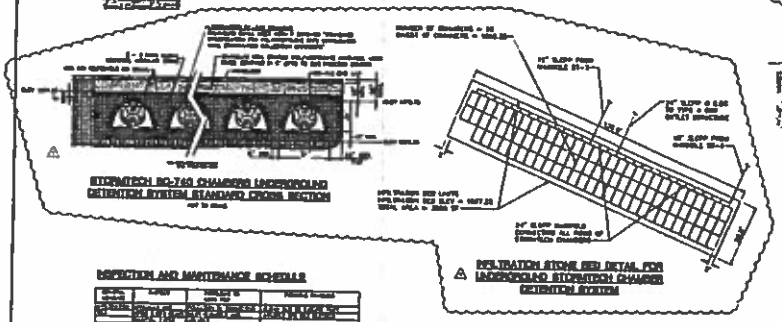
VEGETATED CHANNELS



OUTLET CONTROL STRUCTURE
PADOT TYPE 4 INLET BOX WITH ORIFICE PLATE

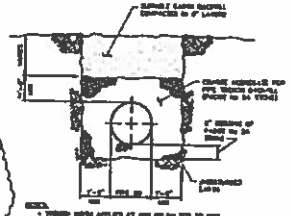


TYPE M INLET



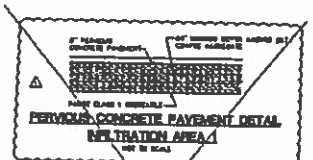
STORMTECH SC-740 CHAMBER UNDERGROUND DETENTION SYSTEM STANDARD CROSS SECTION

INFILTRATION STONE BED DETAIL FOR UNDERGROUND STORMTECH CHAMBER DETENTION SYSTEM

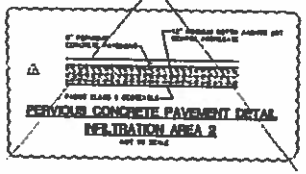


PIPE INSTALLATION DETAIL

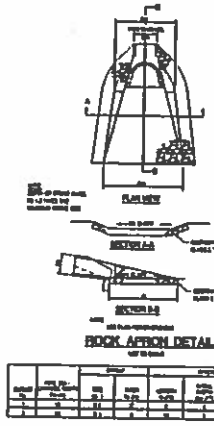
INSPECTION AND MAINTENANCE SCHEDULE



PERVIOUS CONCRETE PAVEMENT DETAIL
INFILTRATION AREA 1



PERVIOUS CONCRETE PAVEMENT DETAIL
INFILTRATION AREA 2



ROCK APRON DETAIL

SPECIFICATION OF GRADATION, PLACEMENT AND COMPACTION OF FILL

CONSTRUCTION SEQUENCE FOR INFILTRATION BED INSTALLATION

GENERAL NOTES:

STORMWATER CONTROLS MAINTENANCE PROGRAM

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FOR CONSTRUCTION

ENVIRONMENTAL CENTER AT FRICK PARK
3606 BEECHWOOD BLVD
PITTSBURGH, PA 15217

CONFORMED SET

POST CONSTRUCTION STORMWATER DETAILS

C1.01

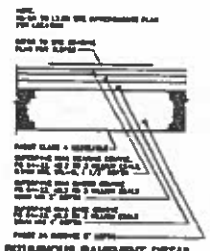
SOIL MIXTURE FOR BIORETENTION AREAS

BIORETENTION SOIL MIX

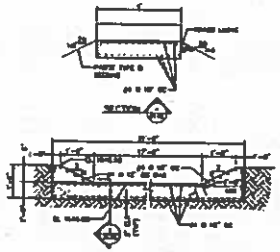
MATERIAL	CONTENT PERCENT

LANDSCAPE NOTES

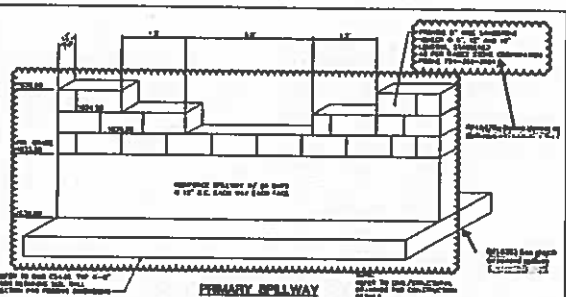
BIORETENTION NOTES



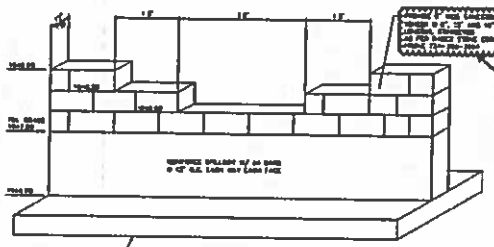
BITUMINOUS PAVEMENT DETAIL



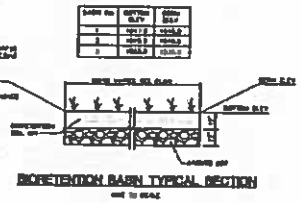
EMERGENCY SPILLWAY
DETENTION BASIN No 2



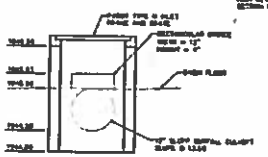
PRIMARY SPILLWAY
DETENTION BASIN No 3



PRIMARY SPILLWAY
DETENTION BASIN No 1



BIORETENTION BASIN TYPICAL SECTION



OUTLET STRUCTURE
DETENTION BASIN No 2

BASIN EMBANKMENT DETAIL

SPECIFIC BMP MAINTENANCE INSTRUCTIONS

Channels

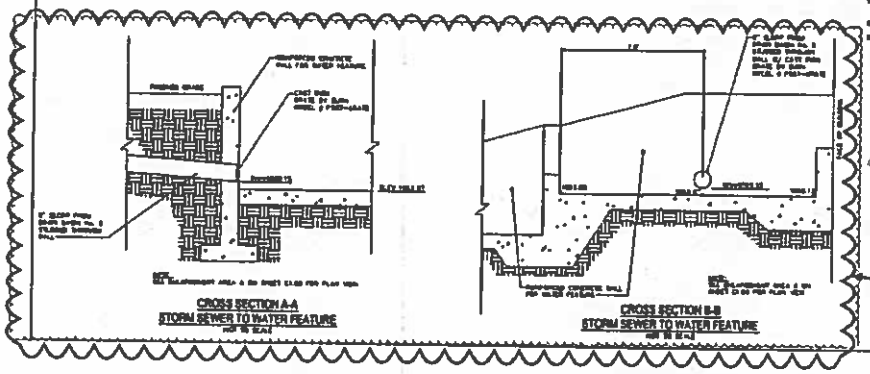
Diversion

RECOMMENDED CHRONOLOGICAL ORDER OF OPERATIONS

CRITICAL STAGES OF BMP INSTALLATION

RECYCLING AND/OR DISPOSAL OF PROJECT WASTE

MEASURES PROVIDED TO AVOID/MINIMIZE/MITIGATE POTENTIAL THERMAL IMPACTS



CROSS SECTION A-A
STORM SEWER TO WATER FEATURE

CROSS SECTION B-B
STORM SEWER TO WATER FEATURE

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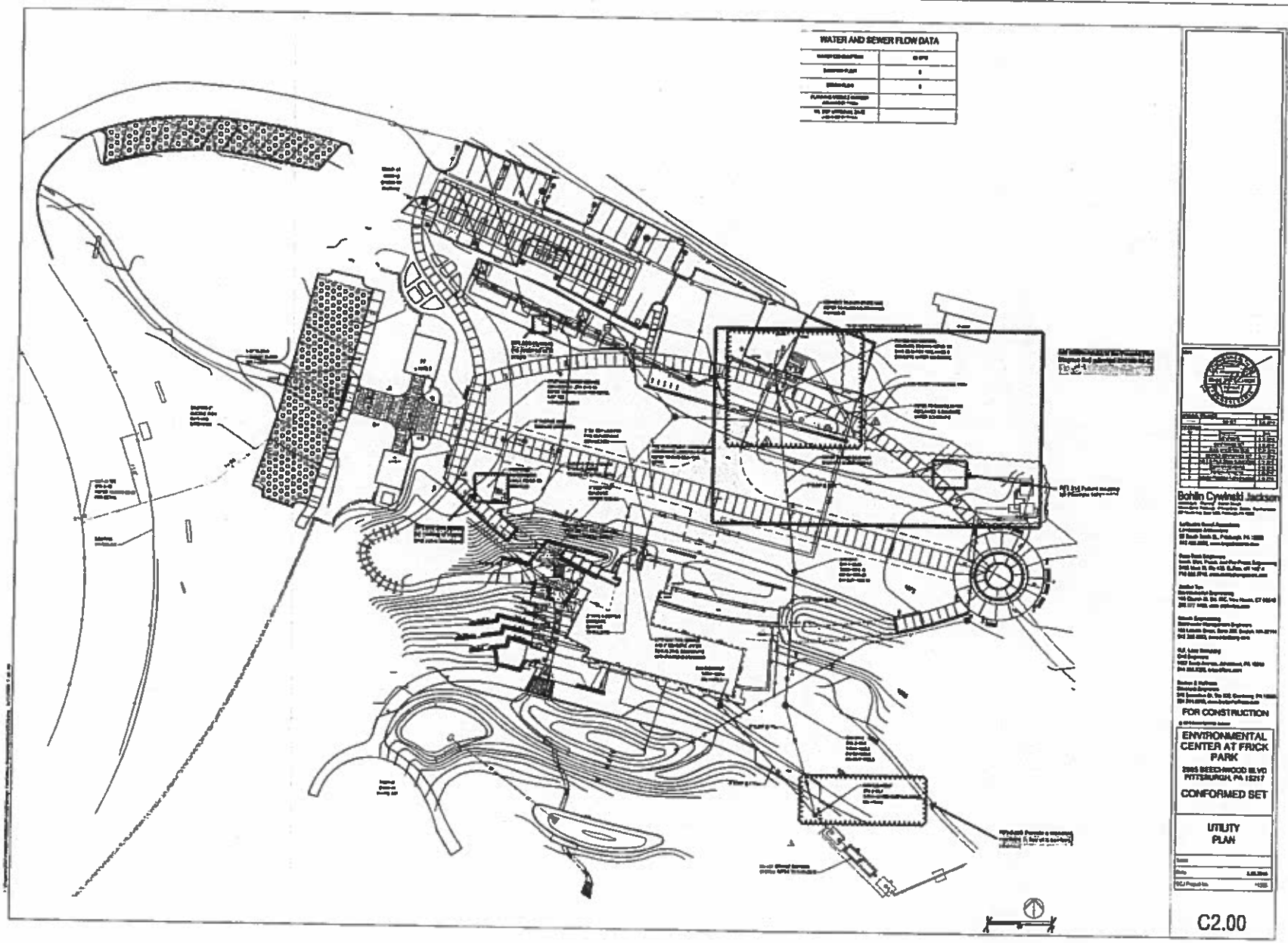
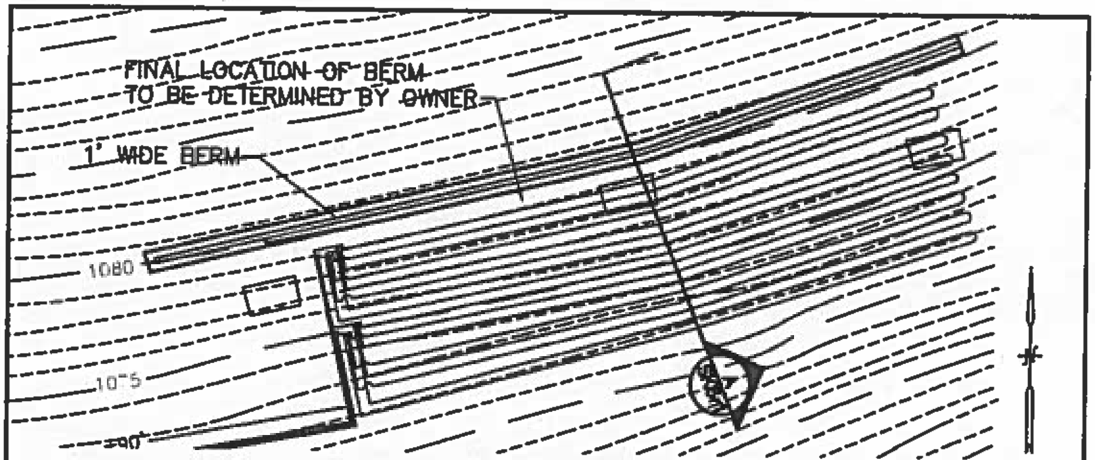
8005 BEECHWOOD BLVD
PITTSBURGH, PA 15217

CONFORMED SET

POST CONSTRUCTION STORMWATER DETAILS

C1.02


WATER AND SEWER FLOW DATA
Bohlin Cywinski Jackson
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
CONFORMED SET
UTILITY PLAN
C2.00



PLAN VIEW

30' 15' 0' 30' 60'

SCALE: 1" = 30'

DRIP FIELD COVER MATERIAL SPECIFICATION

DRIP FIELD COVER SHALL CONSIST OF A HOMOGENOUS MIX OF SILT WITH LESS THAN 5% MAXIMUM CLAY CONTENT AND 80% SAND WITH THE GRADATION SPECIFIED BELOW. THE SOIL SHALL MEET THE FOLLOWING CRITERIA:

PH	6.5
ORGANIC MATTER	15%
MAGNESIUM	35 LB/AC
PHOSPHORUS (PHOSPHATE-P205)	75 LB/AC
POTASSIUM (POTASH-K20)	85 LB/C
SOLUBLE SALTS	NOT TO EXCEED 500 ppm

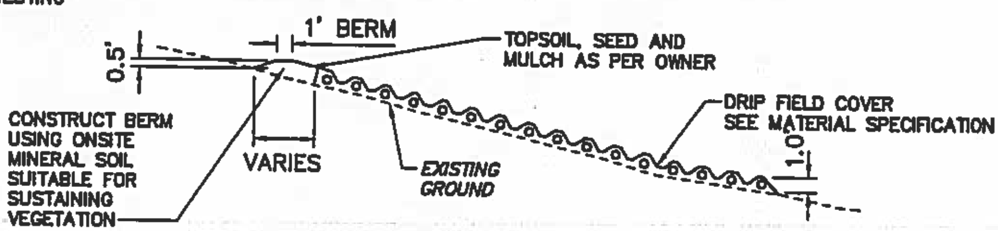
SAND GRADATION

SIEVE SIZE	
3/8"	100%
No 4	90-100%
No 30	20-60%
No 200	0-15%

MACRONUTRIENTS SHALL BE ADJUSTED TO IDEAL RANGES FOR MAINTAINING FOREST TREES AS PER PENN STATE SOIL TESTING

BERM SPECIFICATIONS

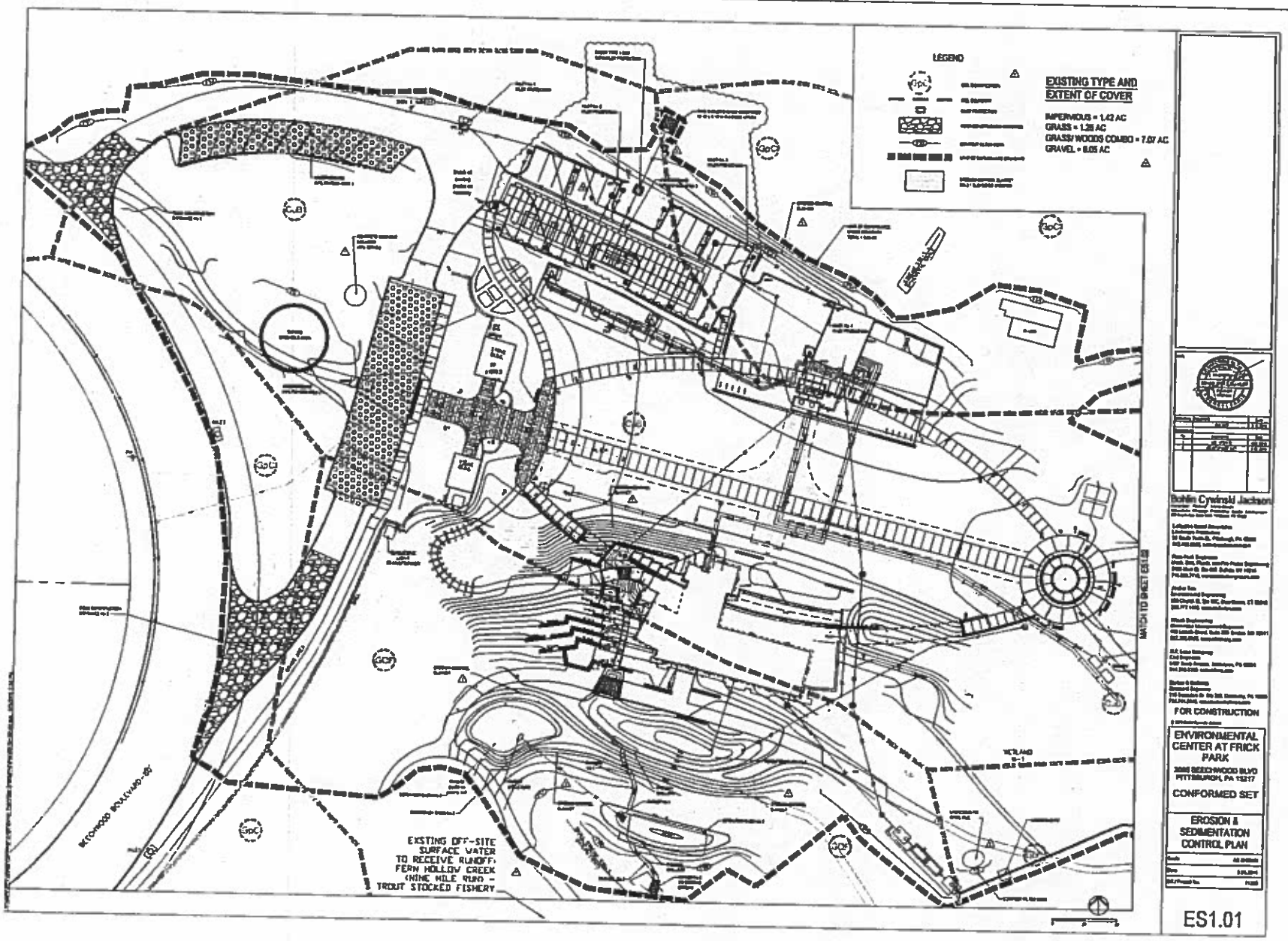
- TOPSOIL-USE THE TOPSOIL PILED ON SITE TO CONSTRUCT THE BERM
- SEEDING RATE: 5-8 LBS PER 1000 SQ FT SEED MIXTURE
- DENSE SHADE FESCUE MIXTURE CONTAINS A BLEND OF APPROXIMATELY 75% TALL FESCUE SUCH AS:
  - GREYSTONE
  - JUSTICE
  - VIRTUE II
- THIS DENSE SHADE MIXTURE ALSO CONTAINS FINE FESCUES SUCH AS:
  - RAZOR RED FESCUE
  - 7 SEAS CHEWING FESCUE
- PLANT IN EARLY SPRING OR EARLY FALL

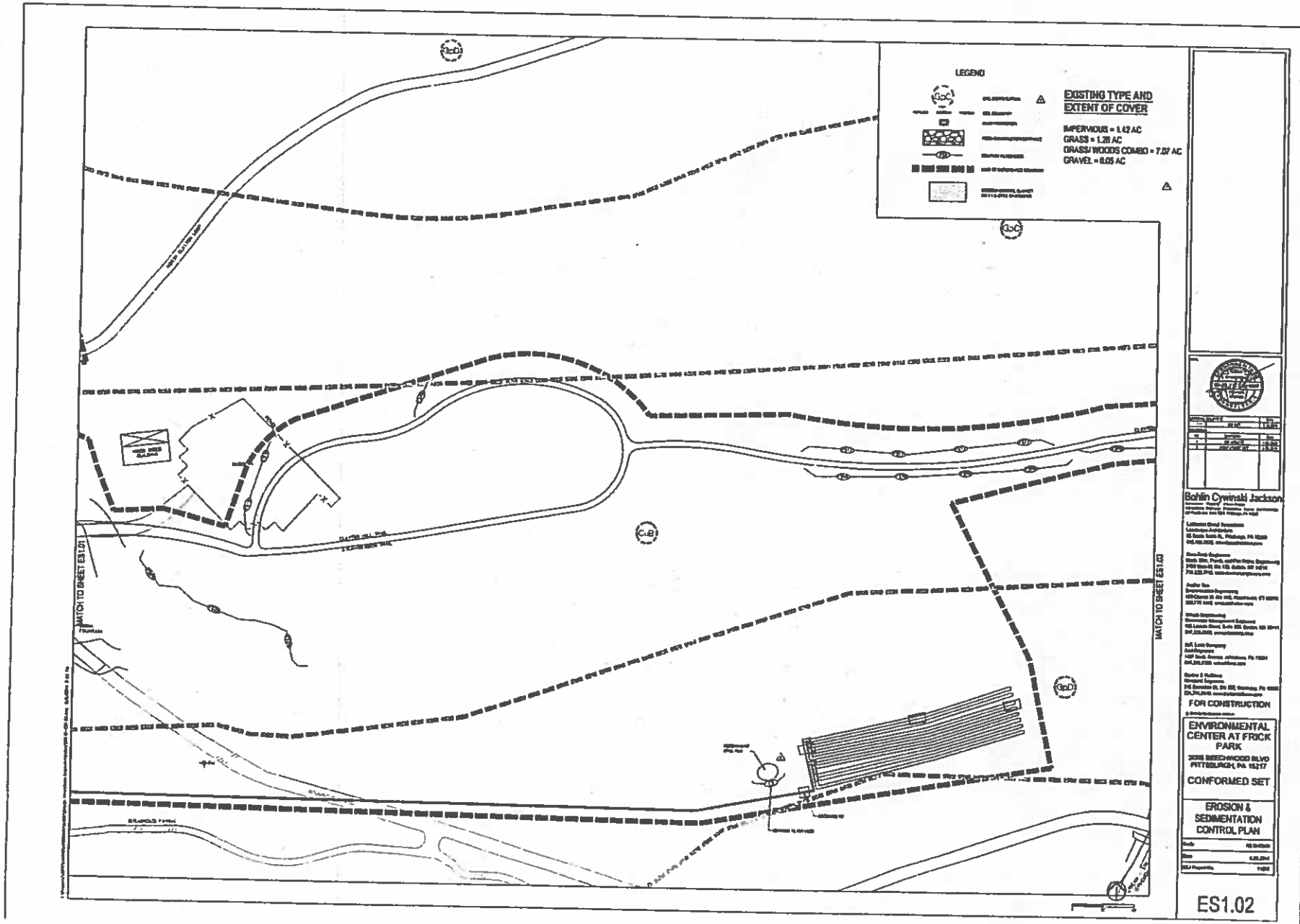


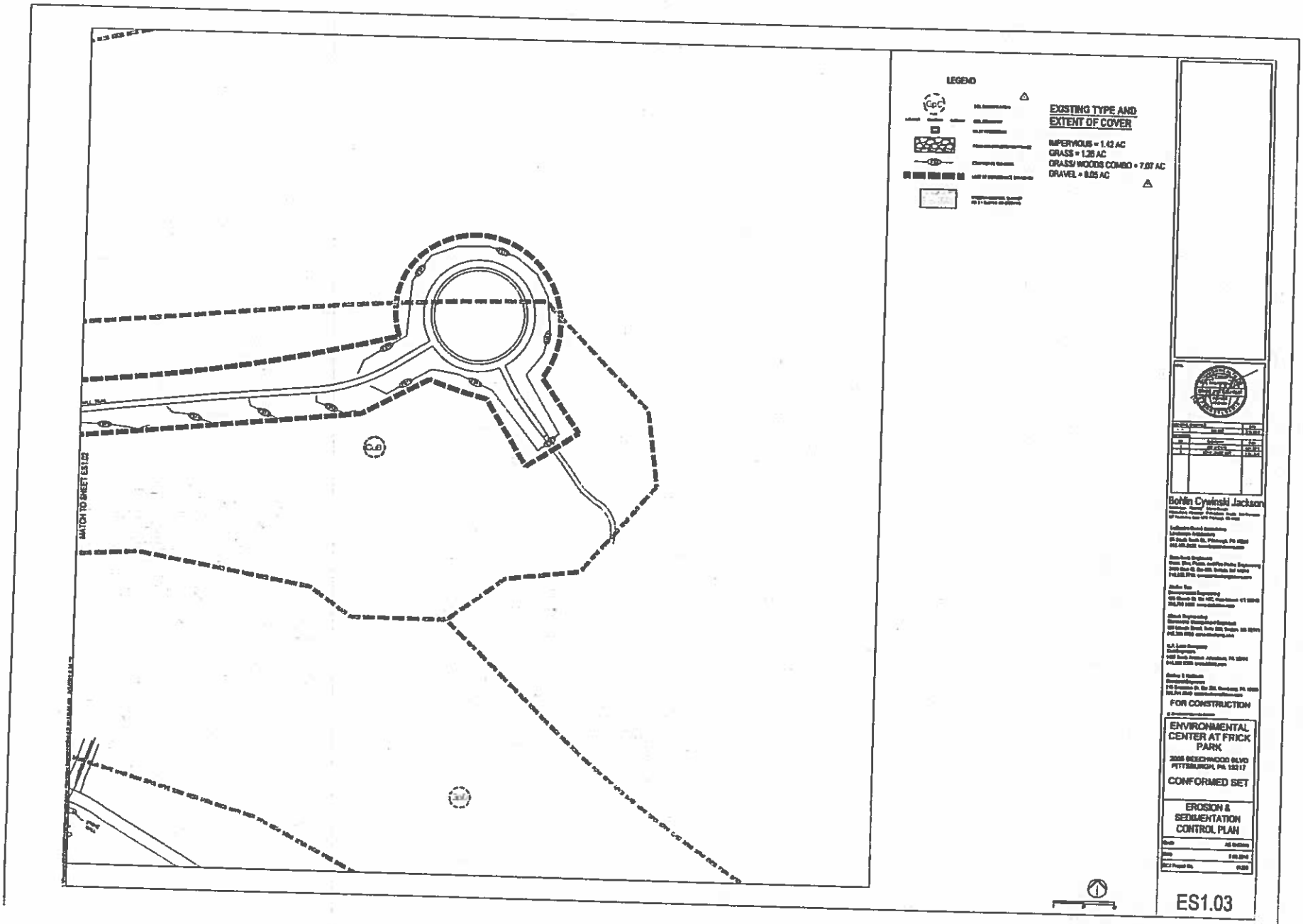
A SK6r1 **SECTION**
N.T.S.

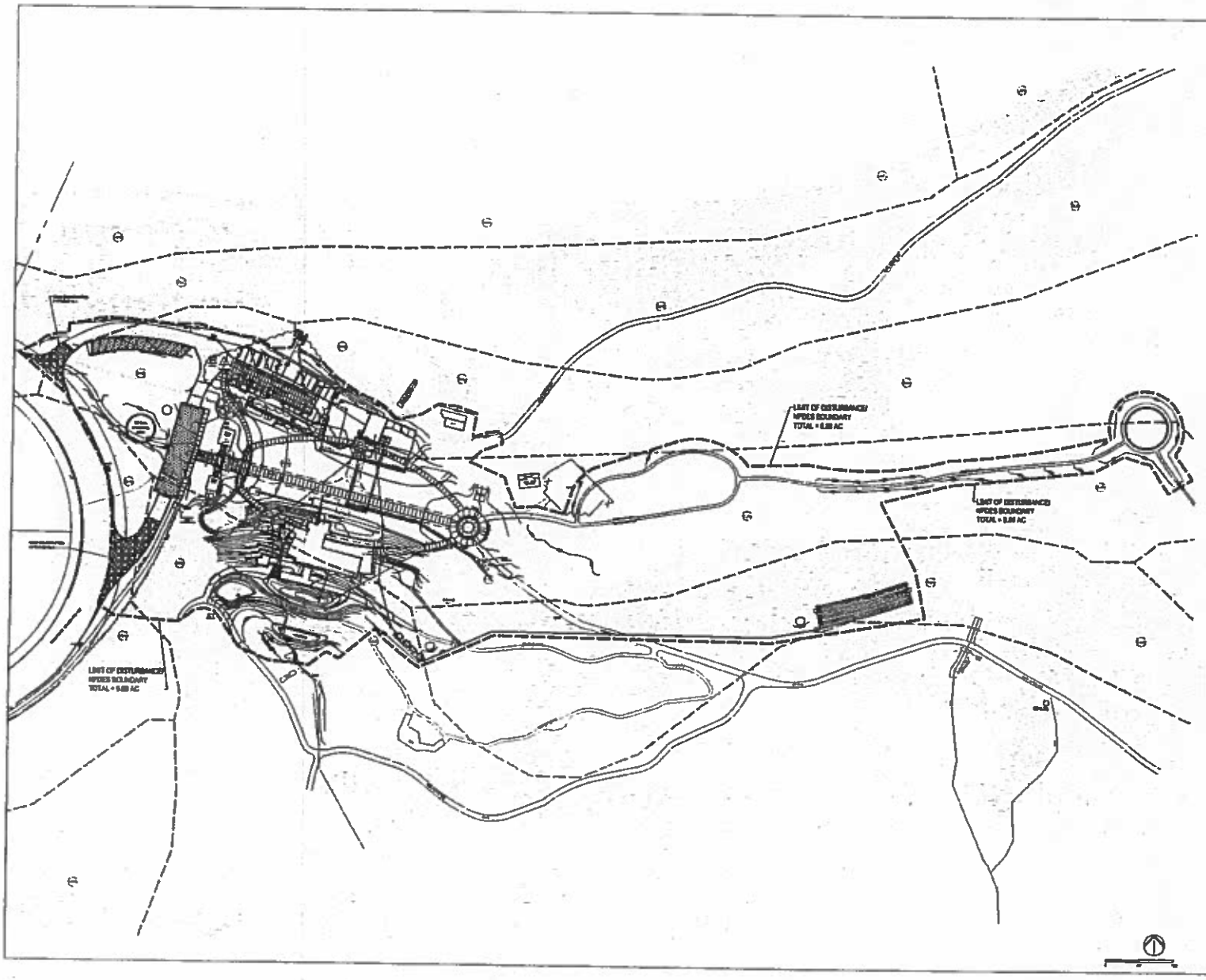
H.F. LENZ COMPANY
Engineers · Planners · Surveyors · Energy Consultants
1407 Scalp Avenue, Johnstown, PA 15904 Phone: 814-269-9300

PROJECT: ENVIRONMENTAL CENTER AT FRICK PARK DRIP FIELD	JOB NO. 2012-0058.01	SCALE AS SHOWN
	DRAWN BY JJS	SHEET NO. SK6-r1
	DATE 08/28/15	


LEGEND
EXISTING TYPE AND EXTENT OF COVER
IMPERVIOUS = 1.42 AC
GRASS = 1.26 AC
GRASS/WOODS COMBO = 7.07 AC
GRAVEL = 0.05 AC
BEECHWOOD BOULEVARD - 66'
EXISTING OFF-SITE SURFACE WATER TO RECEIVE RUNOFF: FERN HOLLOW CREEK (NINE MILE RUN) - TROUT STOCKED FISHERY
WETLAND
MATCH TO SHEET ES1.02
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
3990 BEECHWOOD BLVD
PITTSBURGH, PA 15217
CONFORMED SET
EROSION & SEDIMENTATION CONTROL PLAN
ES1.01


LEGEND
EXISTING TYPE AND EXTENT OF COVER
IMPERVIOUS = 1.42 AC
GRASS = 1.28 AC
GRASS/ WOODS COMBO = 7.07 AC
GRAVEL = 0.05 AC
MATCH TO SHEET ES1.01
MATCH TO SHEET ES1.03
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
2005 BEECHWOOD BLVD
PITTSBURGH, PA 15217
CONFORMED SET
EROSION & SEDIMENTATION CONTROL PLAN
ES1.02


LEGEND
EXISTING TYPE AND EXTENT OF COVER
IMPERVIOUS = 1.42 AC
GRASS = 1.26 AC
GRASS/ WOODS COMBO = 7.07 AC
GRAVEL = 0.05 AC
MATCH TO SHEET ES1.02
Bohlin Cywinski Jackson
FOR CONSTRUCTION
ENVIRONMENTAL CENTER AT FRICK PARK
CONFORMED SET
EROSION & SEDIMENTATION CONTROL PLAN
ES1.03



Bohlin Cywinski Jackson

FOR CONSTRUCTION

ENVIRONMENTAL CENTER AT FRICK PARK

2005 BEECHWOOD BLVD
PITTSBURGH, PA 15217

CONFORMED SET

OVERALL EROSION & SEDIMENTATION CONTROL PLAN

ES1.00

SECTION 321442 - PERVIOUS CONCRETE PAVEMENT WITH DETENTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

A. The Work described by this guide addresses the labor, materials and equipment necessary for construction of pervious concrete pavement, including subgrade testing and preparation for a stormwater storage layer for temporary detention or groundwater recharge in conformance with the plans, specifications and other contract documents, for streets, parking lots, driveways, paths, sidewalks and other pedestrian areas.

1.3 REFERENCES

A. American Concrete Institute

1. ACI 211.3R "Guide for Selecting Proportions for No- Slump Concrete"
2. ACI 305 "Hot Weather Concreting"
3. ACI 306 "Cold Weather Concreting"
4. ACI 522 "Report on Pervious Concrete"
5. ACI Flatwork Finisher Certification Program
6. ACI Field Technician Certification Program

B. American Society for Testing and Materials

1. ASTM C 29 "Test for Bulk Density (Unit Weight) and Voids in Aggregate"
2. ASTM C 33 "Specification for Concrete Aggregates"
3. ASTM C 42 "Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete"
4. ASTM C 94 Specification for Ready-Mixed Concrete
5. ASTM C 117 "Test Method for Material Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing"
6. ASTM C 138 "Test Method for Density (Unit Weight), Yield and Air Content (Gravimetric) of Concrete"
7. ASTM C 140 "Test Methods for Sampling and Testing Concrete Masonry Units and Related Units"
8. ASTM C 150 "Specification for Portland Cement"
9. ASTM C 172 "Practice for Sampling Freshly Mixed Concrete"
10. ASTM C 260 "Specification for Air-Entraining Admixtures for Concrete"
11. ASTM C 494 "Specification for Chemical Admixtures for Concrete"
12. ASTM C 595 "Specification for Blended Hydraulic Cements"
13. ASTM C 618 "Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete"
14. ASTM C 989 "Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars"

15. ASTM C 1077 "Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation."
16. ASTM C 1602 "Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete"
17. ASTM D 448 Classification for Sizes of Aggregate for Road and Bridge Construction
18. ASTM D 1557 "Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3)"
19. ASTM D 1751 Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 4
20. ASTM D 1752 Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
21. ASTM D 2434 Test Method for Permeability of Granular Soils (Constant Head)
22. ASTM D 3385 Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
23. ASTM D 5093 Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrometer with a Sealed-Inner Ring
24. ASTM D 5084 Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter (Falling Head, Method C)
25. ASTM E 329 Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

C. National Ready Mixed Concrete Association

1. NRMCA Pervious Concrete Contractor Certification

1.4 QUALITY ASSURANCE

A. Prospective Bidder/Contractors shall attend a pre-bid meeting where the pervious concrete pavement construction process will be described (see Section 1.8) by industry representatives from the Pennsylvania Aggregates and Concrete Association or other comparable entity.

B. With the bid, the Bidder/Contractor shall submit evidence of two successful pervious concrete pavement projects, each greater than 1,000 ft² (93 m²), including but not limited to the following:

1. Project name and address, owner name and contact information
2. Test results including density (unit weight), void content and thickness. This requirement may be waived by the Architect/Engineer provided the Bidder/Contractor demonstrates successful experience in the concrete industry and constructs test panel(s) for inspection and testing, per Section 1.06 of this guide.

C. 30% of the crew or at least one member, whichever is greater, shall be certified by the NRMCA Pervious Concrete Contractor Certification program.

D. 30% of the crew or at least one member, whichever is greater, shall be certified by the ACI Certified Concrete Flatwork Finisher program.

E. If the placing contractor and concrete producer have insufficient experience with pervious concrete pavement (less than two successful projects), the placing contractor shall retain an experienced consultant to monitor production, handling, and placement operations at the Contractor's expense.

F. Qualifications of testing laboratories -The testing laboratory shall have its laboratory equipment and procedures inspected at intervals not to exceed 2 years by a qualified national authority as evidence of its competence to perform the required tests and material designs. Acceptable national authority will include the AASHTO Materials Reference Laboratory (AMRL) and/or the Cement and Concrete Reference Laboratory (CCRL) as appropriate. In addition, testing machines and equipment must be calibrated

annually or more frequently by impartial means using devices of accuracy traceable to the National Bureau of Standards.

1. In fields other than those covered by the referenced ASTM standards, the testing laboratory shall accept only those assignments which it is able to perform competently by use of its own personnel and equipment. Any work to be subcontracted must be to laboratories meeting the same criteria.
2. The testing laboratory shall have demonstrated its competence in the applicable fields for a period of not less than 3 years.
3. The inspection and testing services of the testing laboratory shall be under the direction of a full-time employee registered as a professional engineer in the State of Ohio. He shall have a minimum of 5 years of professional engineering experience in inspection and testing of concrete construction.

1.5 SPECIAL EQUIPMENT

A. Pervious concrete requires specific equipment for compaction and jointing. The pervious concrete pavement shall be jointed and compacted using the methods listed, or alternatives as demonstrated and approved by the Architect/Engineer. For example, large installations may warrant mechanized placement techniques.

1. Rolling compaction shall be achieved using a steel pipe roller that spans the width of the section placed and exerts a vertical pressure of 10 psi (68.95 kPa) to 30 psi (206.85 kPa) on the concrete, or a hydraulically actuated rotating tube screed .
2. Plate compaction (for small areas) shall be achieved using a standard soil plate compactor that has a base area of at least two square feet and exerts a minimum of 10 psi (69 kPa) vertical pressure on the pavement surface (through a temporary cover of ¾ in. (19 mm) plywood).
3. When contraction joints are created in pervious pavements, they may be constructed by rolling, forming or sawing. Rolled joints shall be formed using a "pizza cutter roller" to which a beveled fin with a minimum depth of ¼ the thickness of the slab has been welded around the circumference of a steel roller. Sawed joints shall be constructed using an early entry or wet saw. Note: Sawed joints may exhibit some raveling, and any dust or slurry generated should be removed during the sawing operation.

1.6 SUBMITTALS

A. Administrative Requirements, for Submittal Procedures: Prior to commencement of the work the contractor shall submit the following:

1. Concrete materials:
    a. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water-cementitious ratio, and void content.
    b. Aggregate type, source and grading.
    c. Cement, supplementary cementitious materials and chemical admixture manufacturer certifications
2. Aggregate base materials: Washed aggregate type, source, grading and void content (percent porosity).
3. Qualifications: Evidence of qualifications listed under Quality Assurance in Section 1.3 of this guide.
4. Project details: Specific plans including a jointing plan, details, schedule, construction procedures and quality control plan.

5. Subcontractors: List all materials suppliers, subcontractors and testing laboratories to be used on the project.

1.7 TEST PANELS

A. Prior to construction, test panel(s) shall be placed, and approved by the Architect/Engineer. The Architect/Engineer may waive this requirement based on Contractor qualifications. At Contractor's option, test panels may be constructed on approved sections of project aggregate detention (or groundwater recharge) layer.

1. Test panel(s) shall be constructed in accordance with the plans and specifications. Regardless of qualification, the contractor is to place one test panel, a minimum 225 ft^2 (20.9 m^2) at the required project thickness, consolidated, jointed and cured using materials, equipment, and personnel proposed for the project, to demonstrate to the Architect/Engineer's satisfaction that in-place unit weights can be achieved and a satisfactory pavement can be installed at the site location.
2. Construction and removal of one test panel if necessary, shall be incidental to the pervious concrete pavement line item in the bid. Test panels may be placed at any of the specified pervious concrete pavement locations on the project or at another test site.
3. Quality: Test panels shall have acceptable surface finish, joint details, thickness, porosity and curing procedures and shall comply with the testing and acceptance standards listed in the Quality Control section of this specification. Test panels shall be tested for thickness in accordance with ASTM C 42; void structure in accordance with ASTM C 138 (Gravimetric Air Determination); and for core unit weight in accordance with ASTM C 140, paragraph 6.3.
4. Satisfactory performance of the test panels shall be determined by:

   a. Compacted thickness no less than ¼ in. (6.35 mm) less than specified thickness (T compacted ≥ T specified – ¼ in.); (T compacted ≥ T specified – 6.35 mm)

   b. Void Structure: 15 % minimum; 25 % maximum;

   c. Unit weight plus or minus 5 lb/ft^3 (80 kg/m^3) of the design weight. If measured void structure falls below 15 % or if measured thickness is greater than ¼ in. (6.35 mm) less than specified thickness or if measured weight falls less than 5 lb/ft^3 (80 kg/m^3) below unit weight, the test panel shall be removed at the Contractor's expense and disposed of in an approved landfill or recycling facility. If test panels are found to be satisfactory, they may be left in-place and included in the completed work, at no additional cost to the project.

1.8 PROJECT CONDITIONS

A. Weather Limitations

1. The Contractor shall not place pervious concrete for pavement when the ambient temperature is 40 °F (4 °C) or lower, unless otherwise permitted in writing by the Architect/Engineer.
2. The contractor shall not place pervious concrete for pavement when the ambient temperature is 90 °F (32 °C) or higher, unless otherwise permitted in writing by the Architect/Engineer.

1.9 PRE-PAVING CONFERENCE

A. A pre-paving conference with the Architect/Engineer shall be held within one week prior to beginning placing the pervious concrete. The contractor shall have the pervious concrete supplier, and the foreman that will form and place the concrete in attendance at this meeting.

B. As a guide for the meeting, the document Checklist for the Concrete Pre-Construction Conference (available from the National Ready Mixed Concrete Association or the American Society of Concrete Contractors) shall be used to review all requirements of the contract during the meeting. Meeting emphasis shall be on how paving with pervious concrete differs from paving with conventional concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Curing materials

1. Polyethylene sheeting - The primary method of curing pervious concrete shall be the placement of a waterproof covering, consisting of a minimum of 6 mil thick polyethylene sheeting.
2. Other moisture loss control - For prevention of moisture loss prior to the primary method of curing:

   a. Liquid membrane curing compound complying with ASTM C-309, Type 1, Class A unless other type approved by the Architect/Engineer, having a moisture loss, when applied at a rate of 200 ft^2 per gallon (4.9 m^2 per L) shall not be more than 0.055 gr./sq.cm.; or
   b. Monomolecular film (evaporation retardant), SikaFilm by Sika Corporation, EucoBar by Euclid Chemical Co., Confilm by BASF (Master Builders Technologies) or Catexol Cimfilm by Axim Concrete Technologies, or approved equal, applied per manufacturer's instructions.
   c. Soybean oil sealer is gaining in acceptance and use in certain regions. It reportedly reduces surface color markings from plastic sheeting, may enhance strength and does not reduce porosity.

2.2 PERVIOUS CONCRETE PAVEMENT

A. Cement: Portland cement Type I, Type II or V conforming to ASTM C 150 or Portland cement Type IP or IS conforming to ASTM C 595.

B. Supplementary Cementitious Materials:

1. Fly ash conforming to ASTM C 618
2. Ground Granulated Blast-Furnace Slag conforming to ASTM C 989

C. Admixtures:

1. Air entraining admixtures with ASTM C 260.
2. Chemical admixtures shall comply with ASTM C 494.

   a. Mid-range water reducing admixtures (water reducers) Type A or High Range water reducing admixtures Type F or G are permitted due to low water-cementitious ratios specified for pervious concrete.
   b. Extended set control admixtures (hydration stabilizers) meeting requirements of ASTM C 494 Type B Retarding or Type D Water Reducing/Retarding admixtures are permitted to be used when it is necessary to increase concrete placement time to 90 minutes or to improve finishing operations. This stabilizer suspends cement hydration by forming a protective barrier around the cementitious particles, which delays the particles initial set. If this mix heats up in the truck a standard retarder will not prevent premature hydration where the stabilizer will.

c. Viscosity modifying admixtures (VMA's) are permitted to facilitate discharge of the concrete from the truck and placement in the forms.

D. Aggregates for pervious concrete:

1. Coarse aggregate shall meet the size and grading requirements as defined in ASTM D 448 (or Standard Sizes of Coarse Aggregate, Table 4, AASHTO Specifications, Part I, 13th Ed., 1982 or later) and shall comply with ASTM C 33 and ODOT Item 703.02. Use No.67, No. 7, No. 8, No. 89 or No. 9 unless an alternate size is approved for use based on meeting the project requirements. Data for proposed alternate material shall be submitted for approval per Section 1.05A of this guide. Fine aggregate complying with ASTM C33, if used, shall not exceed 3 ft^3 per yd^3 (0.11 m^3 per 1.0 m^3).
2. Larger aggregate sizes may increase porosity but can decrease workability. Well graded aggregates shall be avoided as they may reduce porosity, and may not provide adequate void content.
3. Where available, natural rounded aggregates are recommended.

E. Water: Water shall be potable and comply with ASTM C 1602.

F. Mixture Proportions: The Contractor shall furnish a proposed mix design with proportions of materials prior to commencement of work. The data shall include unit weights determined in accordance with ASTM C 29 paragraph 11, jigging procedure. The composition of the proposed concrete mixture shall be submitted to the Architect/Engineer for review and/or approval and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements. Mixture performance will be affected by properties of the particular materials used. Trial mixtures must be tested to establish proper proportions and determine expected behavior. Concrete producers may have mixture proportions for pervious concrete optimized for performance with local materials. Appendix 6 of ACI 211.3R provides a guide for pervious concrete mixture proportioning. Proportions:

1. Aggregate/cementitious ratio: range of 4:1 to 5:1.
2. Concrete mixture unit weight: range of 105 lb/ft^3 to 130 lb/ft^3 (1680 kg/m^3 to 2080 kg/m^3) per ASTM C 29, paragraph 11, jigging procedure.
3. Concrete mixture void content: range of 15 % to 25%, per ASTM C 138, Gravimetric Air Determination.
4. Cementitious content: range of 500 lbs/yd^3 to 600 lb/yd^3 (297 kg/m^3 to 356 kg/m^3), total cementitious content.
5. Supplementary cementitious content: Fly ash: 25 % maximum; Slag: 25 % maximum, or Combined supplementary cementitious content: 35 % maximum.
6. Water - cementitious ratio: range from 0.27 to 0.35.
7. Aggregate content: The bulk volume of aggregate per cubic yard (cubic meter) shall be equal to 27 ft^3 (1 m^3) when calculated from the dry rodded density (unit weight) determined in accordance with ASTM C29 jigging procedure.
8. Admixtures: Admixtures shall be used in accordance with the manufacturer's instructions and recommendations. Dosage of air-entraining admixture shall be a minimum of 2 oz /cwt (130 mL/100kg) of cementitious material.
9. Mix Water: The quantity of mixing water shall be established to produce a pervious concrete mixture of the desirable workability to facilitate placing, compaction and finishing to the desired surface characteristics. Mix water shall be such that the cement paste displays a wet metallic sheen without causing the paste to flow from the aggregate. (A cement paste with a dull-dry appearance has insufficient mix water for hydration.) Insufficient mix water results in inconsistency in the mix and poor bond strength. High water content results in the paste sealing the void system primarily at the bottom and poor surface bond.

PART 3 - EXECUTION

3.1 GENERAL

A. The Architect/Engineer shall be notified at least 24 hours prior to all detention layer (or recharge bed) placement and pervious concrete paving work.

3.2 INSTALLATION

A. Groundwater Recharge Bed

1. Subgrade Preparation (a flat subgrade is preferred for a recharge bed)

   a. Existing subgrade under recharge bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to coarse aggregate bed placement.
   b. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 in. (152 mm) with a York rake or equivalent and light tractor.
   c. Bring subgrade of coarse aggregate recharge bed to line, grade, and elevations required.
   d. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of coarse aggregate.

2. Recharge Bed Installation

   a. Upon completion of subgrade preparation, the Architect/Engineer shall be notified and shall inspect at his discretion before the contractor may proceed with recharge bed installation.
   b. Filter fabric, with pipe or any other storage devices, and recharge bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of filter fabric at the contractor's expense.
   c. Place filter fabric in accordance with manufacturer's standards and recommendations. Adjacent strips of filter fabric shall overlap a minimum of 16 in. (406 mm). The contractor shall secure fabric at least 2 ft (610 mm) outside of bed and take steps necessary to prevent any runoff or sediment from entering the storage bed. For protection of existing adjacent building foundations, the contractor shall place impervious liner over filter fabric extending 6 ft (1829 mm) beyond toe of slope face at building face, and secure as recommended by manufacturer.
   d. Install coarse aggregate in 6 in. (152 mm) maximum lifts. Lightly compact each layer with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades required on the drawings.
   e. Install 1 in. (25 mm) nominal thickness choker base course size No. 57 (AASHTO) aggregate evenly over surface of stone bed, sufficient to allow placement of pavement, and notify the Architect/Engineer for approval.
   f. Following placement of bed aggregate, the filter fabric shall be folded back along all bed edges to protect from sediment washout along bed edges. At least a 2 ft (610 mm) strip shall be used to protect beds from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to beds are stabilized and vegetated. In addition, hay bales shall be placed at the toe of slopes which may be adjacent to beds to further prevent

sediment from washing into beds during site development. As the site is fully stabilized, excess filter fabric along the bed edges can be cut back to coarse aggregate edge.

B. Pervious Concrete Pavement

1. Pavement Thickness: Pavement thickness for all applications (excluding heavy traffic loads) shall be single-course placement 6 in. (152 mm) thick unless otherwise specified in the plans. Pavements for vehicles heavier than single axle service/delivery trucks will require special design thicknesses which may require two-course construction.
2. Formwork:

   a. Form materials are permitted to be of wood or steel and shall be the full depth of the pavement. Caution: protect impermeable membranes from puncture or tear when placing forms and form pins. Forms shall be of sufficient strength and stability to support mechanical equipment without deformation of plan profiles following spreading, strike-off and compaction operations. Forms may have a removable spacer of ½ in. to ¾ in. (13 mm to 19 mm) thickness placed above the depth of pavement. The spacers shall be removed following placement and vibratory strike-off to allow roller compaction. (Removable spacers may not be necessary if other means of strike-off and consolidation are used, such as a hydraulically actuated pipe roller screed.)
   b. The Contractor will be restricted to pavement placement widths of a maximum of 19 ft (5.8 m) [Note: Parking stall area is typically 19 feet (5.8 m) wide.], unless the Contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified to the satisfaction of the Architect/Engineer. Large scale mechanized placement of pervious concrete with slipform concrete paving machines or asphalt paving machines may preclude use of fixed forms.

3. Mixing and Hauling:

   a. Production: Pervious concrete shall be manufactured and delivered in accordance with ASTM C 94.
   b. Mixing: Mixtures shall be produced in central mixers or in transit (truck) mixers. When concrete is delivered in agitating or non-agitating units, the concrete shall be mixed in the central mixer for a minimum of 1.0 minute or until a homogenous mix is achieved. Concrete mixed in transit mixers shall be mixed at the speed designated as mixing speed by the manufacturer for 75 – 100 revolutions.
   c. Transportation: The pervious concrete mixture may be transported or mixed on site and discharge of individual loads shall be completed within one (1) hour of the introduction of mix water to the cement. Delivery times may be extended to 90 minutes when a hydration stabilizer is used.
   d. Discharge: Each truckload shall be visually inspected for consistency of concrete mixture. Water addition shall be permitted at the point of discharge to obtain the required mix consistency, provided a measurable quantity is discharged, and provided no more than 0.5 yd^3 (0.4 m^3) of concrete has been discharged. A minimum of 30 revolutions at the manufacturer's designated mixing speed shall be counted following the addition of any water to the mix, prior to further discharge. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practical and such that discharged concrete is incorporated into previously placed plastic concrete. If consolidation occurs during concrete discharge, placement shall be halted and wet concrete removed (this may happen towards the end of some loads).

4. Placing and Finishing:

   a. Prior to placing concrete, the subbase shall be soaked and in a wet condition at time of placement. Failure to provide a moist subbase will result in a reduction in strength of the pavement.
   b. Concrete may be deposited into the forms by mixer truck chute, conveyor or buggy.
   c. Unless otherwise permitted, the Contractor shall utilize a mechanical vibratory screed to strike off the concrete ½ in. to ¾ in. (13 mm to 19 mm) above final height, utilizing the form spacers described in Formwork. An alternative method to strike off and compact the concrete is to use a hydraulically actuated pipe roller screed as described under 1.04 Special Equipment. If approved by the Architect/Engineer in writing, the Contractor may place the pervious concrete with either slip form or vibratory form riding equipment with a following compactive unit that will provide a minimum of 10 psi (69 kPa) vertical force to the concrete. Similarly, strike off by hand straightedge may be permitted for sidewalks and other small areas followed by compaction.
   d. Care must be taken to prevent closing the void structure of pervious concrete. After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed. Internal vibration shall not be permitted. If vibration, internal or surface applied, is used, it shall be shut off immediately when forward progress is halted for any reason.
   e. Placed concrete shall not be disturbed while in the plastic state. Low spots after the screeding operation shall be over-filled for surface repair and tamped to desired elevation with hand tampers.
   f. Following strike-off, remove spacers and compact the concrete to the form level, utilizing a steel roller, a plate compactor on plywood or other method approved by the Architect/Engineer. Longitudinal rolling shall be followed immediately by cross rolling and joint rolling (if specified). Care shall be taken during compaction that sufficient compactive force is achieved without excessively working the concrete surface that might result in sealing off the surface porosity.
   g. Hand tampers and an edging tool with ¼ in. (6 mm) radius shall be used to compact the concrete along the slab edges immediately adjacent to the forms. After compaction, inspection and surface repair, no further finishing shall be performed on the concrete. Surface curing shall begin immediately.
   h. The pervious concrete pavement shall be compacted to the required cross-section and shall not deviate more than +/- 3/8 in. in 10 ft (+/- 9 mm in 3 m) from profile grade.

5. Jointing

   a. Joints in pervious pavements can be precluded at the option of the owner, who may, instead, choose to accept or prefer the appearance of random cracking.
   b. Although longer joint spacings may control cracking, for conservative design, contraction (control) joints shall be installed at regular intervals not to exceed 15 ft (4.6 m), and slab length shall not exceed 1½ times the width of the slab. Transverse contraction joints shall be installed at ¼ the depth of the thickness of the pavement. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened.
   c. Jointing plastic concrete: Joints installed in the plastic concrete may be constructed utilizing a small roller as described in the Special Equipment section of this guide specification. When this option is used it shall be performed immediately after roller compaction and prior to curing.
   d. Jointing hardened concrete: Saw-cuts shall be made as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking. Early entry sawing occurs later with pervious concrete than with conventional concrete. For either method, the curing cover shall be temporarily removed and the surface kept misted to prevent moisture loss during sawing. Sawdust or slurry shall be promptly removed to protect the pervious

concrete pores. After sawing, the curing cover shall be securely replaced for the remainder of the curing cycle.

e. Transverse construction joints: Transverse construction joints shall be installed whenever placing is suspended for 30 minutes or whenever concrete is no longer workable.

f. Isolation joints: Isolation joints shall be used when abutting fixed vertical structures such as light pole bases, building foundations, etc.

g. Edging, using a tool with ¼ in. (6 mm) radius, and additional compaction with hand tamping tools shall be performed along all form lines and along all isolation joints and construction joints to reduce potential for raveling under traffic.

6. Curing:

a. Curing procedures shall begin immediately, no later than 20 minutes, from the time the pervious concrete is discharged from the truck. Placing, finishing and tooled jointing and edging must be completed within the 20-minute window from discharge. The pavement surface shall be covered with a minimum of 6 mil thick polyethylene sheet or other approved covering material. Prior to covering, an evaporative reducer shall be sprayed above the surface when required due to ambient conditions (high temperature, high wind, and low humidity). The cover shall overlap all exposed edges and shall be secured (without using dirt or stone) to prevent dislocation due to winds or adjacent traffic conditions. For additional guidance on hot weather concreting, see ACI 305, and for cold weather concreting see ACI 306.

b. The low water/cementitious ratio and high amount of exposed surface of pervious concrete makes it especially susceptible to drying out. Immediately after screeding, the surface shall be kept moist and evaporation prevented using a spray applied curing compound and/or evaporation retarder immediately after screeding. Immediately after each transverse jointing the polyethylene sheet curing shall be applied then cross rolling shall be performed.

c. The curing cover shall remain securely in place for a minimum of 7 days, uninterrupted. No vehicular traffic shall be permitted on the pavement until curing is complete (7 days) and no truck traffic shall be permitted for at least 14 days. Pedestrian traffic may be permitted on the curing concrete after 24 hours. The Architect/Engineer may permit earlier traffic opening times.

7. Quality Control - Concrete:

a. The Architect/Engineer shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. All personnel engaged in concrete testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent.

b. Traditional concrete testing procedures for strength and slump control are not applicable to this type of pavement material. Procedures to be used per this guide specification include: ASTM C 172, ASTM C 29, ASTM C 42 and ASTM C 138.

c. Concrete tests shall be performed for each 150 yd^3 (115 m^3) or fraction thereof with a minimum of one set of tests for each day's placement.

d. Sampling - Plastic concrete shall be sampled in accordance with ASTM C 172.

e. Unit weight (Density) – Unit weight shall be measured in accordance with ASTM C 29. The measure is to be filled and compacted in accordance with ASTM C 29 paragraph 11, jigging procedure. The unit weight of the delivered concrete shall be +/- 5 lb/ft^3 (80 kg/m^3) of the design unit weight (density).

f. Void content - Void content of the plastic concrete shall be calculated as per ASTM C138 (Gravimetric Air Determination), and compared to the void percentage required by the hydraulic design. Unless otherwise specified, void content shall be between 15% and 25%.

g. After a minimum of seven (7) days, hardened concrete shall be tested at a rate of one set of three cores per 150 yd^3 (115 m^3) of concrete placed on one day or fraction thereof. Cores shall be drilled in accordance with ASTM C 42. The cores shall be measured for thickness, void structure and unit weight.

h. Thickness – Untrimmed hardened core samples shall be used to determine placement thickness. The average of all production cores when measured for length shall not be more than ½ in. (13 mm) less than the specified design thickness.

i. Core unit weight (density) and void content - The cores shall be tested for unit weight (density) and void content using ASTM C 140. Unit weight (density) of cores trimmed and tested in the saturated condition, per ASTM C 140, paragraph 6.3.1, shall be +/- 5 lb/ft^3 (80 kg/m^3) of the design unit weight. Void content shall be not be lower than 2% below the specified design void content. Void content shall calculated as follows:

$$\% \text{ Voids} = 1 - (Dd/Di) * 100$$

where: Dd = oven dried density of core

Di = immersed density of core

8. Basis of Payment

a. Pervious concrete pavement shall be paid for based on the square yards or square feet (square meters) of in-place product including materials and labor, thickness, and void content.

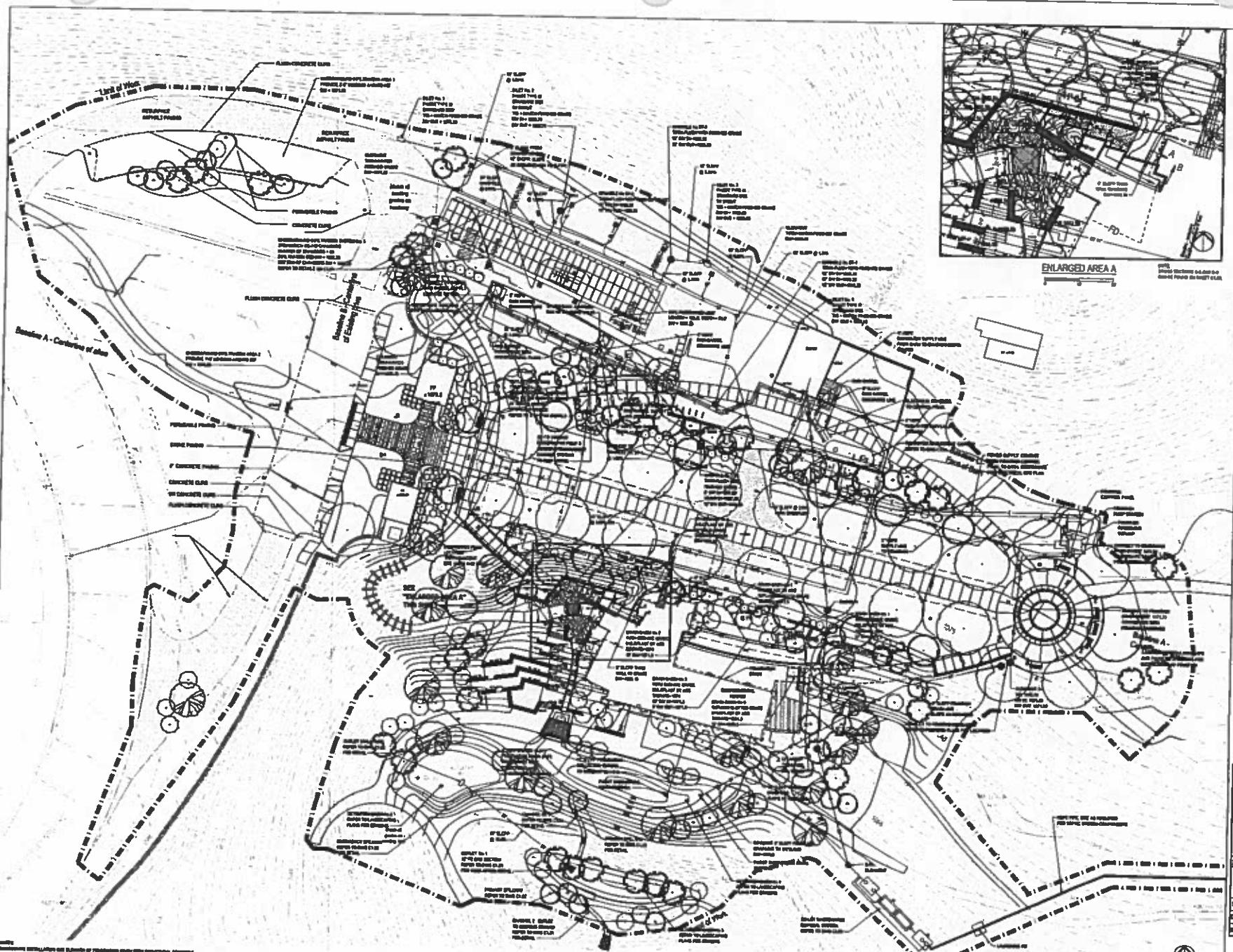
9. Performance/Maintenance

a. Excessive raveling – At or before 28 days after placement, any areas of excessive surface raveling, as determined by the Architect/Engineer, shall be removed and replaced or repaired by the Contractor, [optional language – a) at the unit price established in the contract; or b) at no additional cost to the project].

b. Surface drainage – At or before 28 days after placement, any areas of insufficient surface porosity, as determined by the Architect/Engineer, shall be removed and replaced by the Contractor, [optional language – a) at the unit price established in the contract; or b) at no additional cost to the project].

c. Maintenance – At or before 28 days after placement, the contractor shall submit to the Architect/Engineer a written maintenance plan to prevent the clogging of the pervious concrete pavement. The plan shall include periodic testing for porosity and methods to restore porosity if the rate drops below 75% of the original rate. Acceptable methods to restore levels of porosity are either to vacuum or power wash the pervious concrete sections. Fee for preparation of the maintenance plan shall be [optional language – a) at the unit price established in the contract; or b) at no additional cost to the project].

END OF SECTION 321442



Bohlin Cywinski Jackson

FOR RECORD

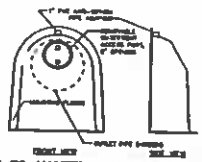
ENVIRONMENTAL CENTER AT FRICK PARK

3005 BEECHWOOD BLVD
PITTSBURGH, PA 15217

RECORD SET

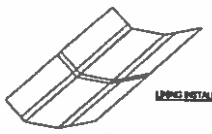
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

C1.00



SNOUT OIL-WATER-DEBRIS SEPARATOR

NOT TO SCALE



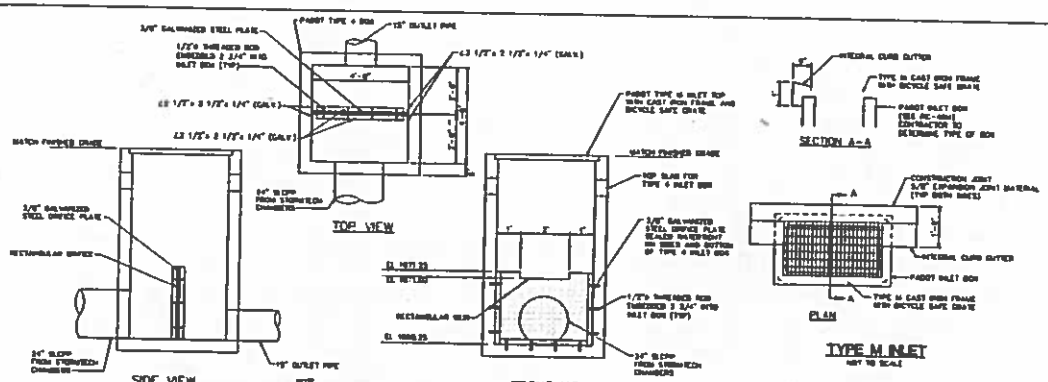
LINING INSTALLATION

CHANNEL CROSS SECTION

MARK	QUANTITY	CHANNEL WIDTH (B)	SIDE SLOPE (Z1)	SIDE SLOPE (Z2)	LENGTH
1	264	3.0	1	1	
2	48	1.0	1	1	

VEGETATED CHANNELS

NOT TO SCALE

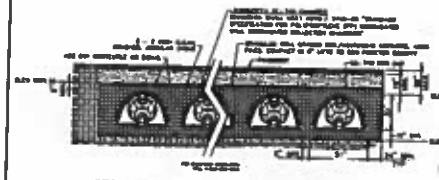


OUTLET CONTROL STRUCTURE
PADOT TYPE 4 INLET BOX WITH ORIFICE PLATE

NOT TO SCALE

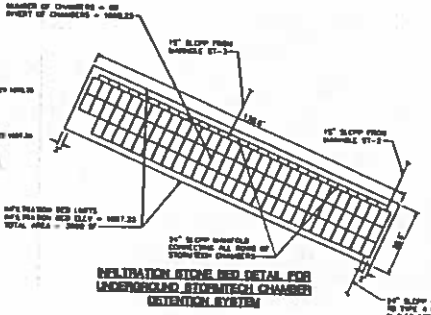
TYPE M INLET

NOT TO SCALE

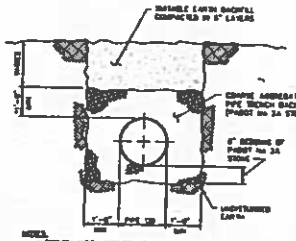


STORMTECH SC-740 CHAMBERS UNDERGROUND DETENTION SYSTEM STANDARD CROSS SECTION

NOT TO SCALE



INFILTRATION STONE BED DETAIL FOR UNDERGROUND STORMTECH CHAMBER DETENTION SYSTEM



PIPE INSTALLATION DETAIL

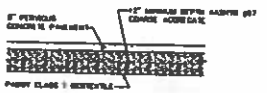
NOT TO SCALE

INSPECTION AND MAINTENANCE SCHEDULE

ACTIVITY	FREQUENCY	RESPONSIBLE PARTY
INSPECTION	ANNUALLY	
MAINTENANCE	AS NEEDED	

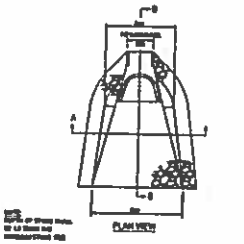
PERVIOUS CONCRETE PAVEMENT DETAIL
INFILTRATION AREA 1

NOT TO SCALE



PERVIOUS CONCRETE PAVEMENT DETAIL
INFILTRATION AREA 2

NOT TO SCALE



ROCK APRON DETAIL

NOT TO SCALE

MARK	APRON WIDTH (W1)	APRON LENGTH (L)	APRON THICKNESS (T)	APRON WIDTH (W2)	TRENCH WIDTH (W3)
1	8	8	1	4	1
2	10	10	1	4	1

SPECIFICATION OF GRADATION, PLACEMENT AND COMPACTION OF FILL

- PLACE ALL FILL IN MAXIMUM 8" THICK LOOSE LAYERS AND COMPACT IT TO A MINIMUM OF 95 PERCENT OF MAXIMUM DRY DENSITY AT WATER CONTENTS WITHIN 2 PERCENT OF OPTIMUM WATER CONTENT VALUES OBTAINED FROM THE MODIFIED PROCTOR TEST (ASTM D 1557-91, PROCEDURE C) USE A MANUAL TAMPER, PLATE OR TRAIL ROLLER, OR 3- PERCENT OF THE LOOSE LAYER PLACEMENT THICKNESS, IF, DUE TO THE GRANULAR NATURE OF THE FILL, THE MODIFIED PROCTOR TEST IS NOT APPLICABLE, USE THE RELATIVE DENSITY TEST (ASTM D 4253-93 AND D 4254-91) TO MINIMUM VALUES OF 75 PERCENT FOR SANDS AND 70 PERCENT FOR GRAVELS. RELATIVE DENSITY VALUE OF AT LEAST 80 PERCENT MUST BE ACHIEVED.

CONSTRUCTION SEQUENCE FOR INFILTRATION BED INSTALLATION

1. INSTALL AND MAINTAIN ADEQUATE EROSION AND SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION.
2. THE EXISTING SUBGRADE UNDER THE BED AREAS SHOULD NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO GEOTEXTILE AND STONE BED PLACEMENT.
3. WHERE EROSION OF SUBGRADE HAS CAUSED ACCUMULATION OF FINE SEDIMENTS AND/OR SURFACE PONDING, ALL SEDIMENTS SHOULD BE REMOVED WITH LIGHT EQUIPMENT AND PLACED UNDER TIRE TOOLS TRANSFERRED TO A MINIMUM DEPTH OF 6 INCHES WITH A HOE, BACK OR CONVEYANCE AND LIGHT TRACTOR. ALL FINE GRADING SHALL BE DONE BY HAND. ALL BED BOTTOMS SHOULD BE AT LEVEL GRADE.
4. GEOTEXTILE AND BED AGGREGATE SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION AND INSTALLATION OF STRUCTURES. GEOTEXTILES SHOULD BE PLACED IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDATIONS. ADJACENT STRIPS OF GEOTEXTILE SHOULD OVERLAP A MINIMUM OF 18 INCHES. IT SHOULD ALSO BE SECURED AT LEAST 4 FEET BEYOND OF BED IN SHOULD TO PREVENT ANY SUBSOIL OR SEDIMENT FROM ENTERING THE STORAGE BED. THIS CROSS STRIP SHOULD REMAIN IN PLACE UNTIL ALL BASE COURSE CONSTRUCTION IS DONE AND STABILIZED. AS ONE SIDE IS FULLY STABILIZED, EXCESS GEOTEXTILE ALONG BED EDGES CAN BE CUT BACK TO THE EDGE OF THE BED.
5. ONCE STABILIZED, INSTALL PERFORATED STORMTECH BED CONNECTANCE SYSTEM AS INDICATED IN THE PLANS.

GENERAL NOTES:

- DO NOT SCALE DRAWINGS.
- PROPOSED CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE STATE AND LOCAL CODES, ORDINANCES AND REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE.
- ALL MAPPING AND LOCATIONS OF EXISTING UTILITIES WERE OBTAINED FROM SURVEY PREPARED BY OTHERS. ALL DATA CONCERNING THESE EXISTING CONDITIONS WAS ACQUIRED BY THE USE OF LEGS COMPANY FOR USE IN DESIGNING THIS PROJECT. ITS ACCURACY OR COMPLETENESS IS NOT GUARANTEED BY THE USE OF LEGS COMPANY AND IN NO EVENT IS IT TO BE CONSIDERED A PART OF THE CONTRACT DOCUMENTS. CONTRACTORS MUST VERIFY ALL ITEMS PERTAINING TO EXISTING SITE CONDITIONS.
- THE CONTRACTOR SHALL EXERCISE CAUTION AND EMPLOY CAREFUL EXCAVATION AS THERE IS DANGER DURING INSTALLATION OF THIS FACILITIES TO AVOID DAMAGE TO OR CONFLICT ON EXISTING UTILITIES. THE CONTRACTOR SHALL PERFORM EXPLORATORY EXCAVATIONS AS DIRECTED AND/OR REQUIRED BY THE ENGINEER TO ASCERTAIN THE HORIZONTAL AND VERTICAL ALIGNMENT OF EXISTING UTILITIES PRIOR TO CONSTRUCTION IN AFFECTED AREAS AND SHALL BE APPROPRIATE ADJUSTMENTS IN THE FIELD IF CONFLICTS OCCUR. NO SEPARATE PAYMENT SHALL BE MADE FOR SUCH INCIDENTAL PROVISIONS AND SHALL BE INCLUDED IN THE COST OF WORK ITEMS FOR WHICH PAYMENT SHALL BE MADE.
- CONTRACTOR IS RESPONSIBLE TO MAINTAIN USE OF ALL UTILITIES WITHIN THE CONSTRUCTION WORK AREA DURING CONSTRUCTION WHEN WORK IS IN PROGRESS AT ALL TIMES.
- CONTRACTOR IS RESPONSIBLE TO STABILIZE AND MAINTAIN ALL UTILITY POLES WITHIN THE CONSTRUCTION WORK AREA THAT MAY BE AFFECTED BY THE CONSTRUCTION.
- MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS SUPPLEMENTED WITH THE LATEST EDITION OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS PUBLICATION 408 AND ALL SUPPLEMENTS THERETO AND THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION STANDARDS FOR ROADWAY CONSTRUCTION RC-1M24 TO RC-99M, AND ALL SUPPLEMENTS THERETO.
- ALL DISTURBED AREAS EXCEEDING THE LIMITS OF WORK SHALL BE RESTORED TO EXISTING CONDITIONS AT THE FULL EXPENSE OF THE CONTRACTOR UNLESS OTHERWISE DIRECTED BY THE OWNER.
- ALL CONCRETE WORK SHALL COMPLY WITH THE SPECIFICATIONS AND THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", ACI 318-08 OR THE LATEST REVISION THEREOF.
- ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT THE END OF 28 DAYS.
- ALL REINFORCEMENT STEEL TO BE GRADE 60 DEFORMED BARS.
- MINIMUM SPLICE FOR REINFORCEMENT STEEL IS 36 BAR DIAMETERS UNLESS OTHERWISE NOTED.
- WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A-185 SPECIFICATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK NECESSARY TO ESTABLISH LINES, LOCATIONS, GRADES, BENCHMARKS, AND ELEVATIONS OF THE WORK FROM EXISTING FACILITIES.
- THE CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES AS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED TO THE DEPTHS INDICATED. ALL EXCAVATED MATERIAL NOT REQUIRED OR SUITABLE FOR FILL SHALL BE REMOVED AND DISPOSED OFF SITE.
- UNLESS OTHERWISE INDICATED ON THESE DRAWINGS, REMOVE TREES, SHRUBS, BRUSH, AND OTHER VEGETATION WHERE INTERFERE WITH INSTALLATION OF NEW CONSTRUCTION, REMOVING INCLUDES CUTTING OFF STUMPS AND ROOTS.
- DURING EXCAVATION EXTREME CARE SHOULD BE TAKEN BY THE CONTRACTOR TO AVOID UNNECESSARY CUTTING OF ROOTS. WHICH ROOTS ARE CUT THEY SHOULD BE PROPERLY DRESSED SO AS NOT TO KILL THE TREE.
- ALL TRENCH EXCAVATION SIDE WALLS GREATER THAN 5 FEET IN DEPTH SHALL BE SLOPED, SHORED, SHEETED, BRACED, OR OTHERWISE SUPPORTED BY MEANS OF THE SUFFICIENT STRENGTH TO PROTECT THE WORKMEN WITHIN THEM IN ACCORDANCE WITH APPLICABLE RULES AND REGULATIONS ESTABLISHED FOR CONSTRUCTION BY THE DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND BY LOCAL ORDINANCES. EXCEPT AND TRENCH EXCAVATIONS IN OR ENTIRELY ON STONE SHALL NOT BE GREATER THAN 20 FEET IN DEPTH UNLESS A STEP IS PROVIDED.
- ALL TRAFFIC LINE PAINTING TO BE PADOT TYPE I, IN ACCORDANCE WITH THE LATEST EDITION OF THE PADOT 408, SECTION 962.
- ALL TRAFFIC SIGNS TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE PADOT 408, SECTION 1103.

Bohlin Cywinski Jackson
Architecture Planning Interior Design
Architecture Historic Preservation Landscape Architecture
GA Pittsburgh Inc. 436 Seventh Ave. 15219
Landscape Architecture
Landscape Architecture
Architecture
Architecture
Civil Engineering
Mechanical Engineering
Electrical Engineering
Structural Engineering
Civil Engineering
Surveyor & Geotechnical Engineering

No.	Description	Date
1		
2		
3		
4		
5		
6		
7		
8		

FOR RECORD

ENVIRONMENTAL CENTER AT FRICK PARK
2005 BEECHWOOD BLVD
PITTSBURGH, PA 15217

RECORD SET

POST CONSTRUCTION STORMWATER DETAILS

Scale	AS SHOWN
Date	10.14.2016
BCJ Project No.	11288

C1.01

EXHIBIT D

MAINTENANCE PLAN

Frick Environmental Center Maintenance Responsibilities - City of Pittsburgh and Pittsburgh Parks Conservancy
Last Updated June 9, 2016

No.	Item	City	City Contractor	PPC	PPC Contractor
	City of Pittsburgh Maintenance Plan				
1	Mow or Trim All Turf Areas as Required - See Exhibit B City/DPW Maintained Grasses	X			
2	Collect Leaves in Fall, Mulch or Remove (as Requested by PPC)	X			
3	Provide and install mulch and soils as required	X			
	City of Pittsburgh Site Maintenance				
4	Maintain All Drives and Parking Surfaces and Signage - See Exhibit B City/DPW Maintained Surfaces	X		X (Signage)	
5	Preventative Maintenance of Permeable Pavers (Perform Spring and Fall)			X	
6	Snow Plow All Hard Surfaced Drives - See Exhibit B	X			
7	Supply and Spread Ice Melt (urea/carbamyl diamide OR calcium magnesium acetate as needed) on Hard Surfaced Drives - See Exhibit B	X			
8	Maintain all existing trails - Exhibit B City/DPW Managed Surfaces	X			
9	Maintain, repair, replace sidewalks currently maintained by City - See Exhibit B	X			
10	Maintain all street and park lighting	X			
11	Pick Litter Per Regular Park Maintenance Schedule	X			
12	Empty Trash and Recycling Cans Outside FEC Facility per Regular Park Maintenance Schedule	X			
	PPC Required FEC Facility Maintenance				
13	Routine maintenance, repair and replacement of the exterior of the FEC Facility including structure, roof and foundation			X	X
14	General custodial cleaning and refinishing			X	X
15	Trash Collection for the Interior of the Building (Trash, Recycling, Compost)			X	
16	Clear Clogged Drains			X	
17	Plumbing Repairs			X	
18	Door Hardware Repairs			X	X
19	Light Bulb Replacement			X	X
20	Clean, Mop & Stock Restrooms once per day on all days when FEC is in use (FEC Facility and Barn)			X	
21	Testing, Maintenance and Monitoring of New Systems, Equipment and Improvements Installed at FEC Facility During Project Including:			X	
22	HVAC (Preventative Maintenance and Repairs)				
23	Geothermal System (Preventative Maintenance and Repairs)				X
24	Electrical - Solar Array and Support Structure				X
25	Electrical - Branch Circuits				X
26	Fire Sprinklers (Dry and Wet Systems)				X
27	Backflow Preventors				X
28	On Lot Sewage Treatment System and Drip Field				X
29	Rainwater Harvest Systems (Barrels, Cistern, Associated Plumbing)				X
30	Fire Alarms				X
31	Emergency Lighting System				X
32	Natural Ventilation System and Controls				X
33	Security Alarms				X
34	Window Systems (Controls & Cleaning)				X
	Maintenance, Repair & Replacement for all Parts, Components and Systems located in, on, around the Premises that exclusively service Premises:				X
35	Windows, Interior Walls, Floors, Ceilings				
36	Steps Serving the FEC Facility				X
37	Ramps Serving the FEC Facility				X
38	Audio-Video Cable, Data Cable, Voice and Telephone Cable				X
39	Roof and Rain Conductors				X
40	Installation, Maintenance and Replacement of any electrical/communications utilities installed at PPC's request not borne by utility				X
41	Maintenance, Repair and Replacement of all fixtures, including sinks, commodes, urinals, drinking fountains, cooking appliances				X
42	Interior and Exterior Painting of the FEC Facility				X
43	Interior and Exterior Lighting (repair and replacement)				X
44	Green Infrastructure Equipment and Monitoring Services				X
	PPC Horticulture & Ecological Restoration				X
45	Shape and prune all perennial plants (herbaceous and woody specimens)			X	
46	Fertilize and cultivate (provide weed control, pest and soil management) for all perennial plants			X	
47	Miscellaneous items such as operating irrigation systems, water and feeding horticulture, installing temporary fencing to protect plantings			X	
48	Provide technical assistance to City parks crews, contractors and agents in maintenance of turf and other plantings			X	
49	Provide overall site aesthetic management and work with City crews, contractors and agents to mandate adherence to standards established			X	
50	Recruit, supervise and manage horticultural and ecological restoration assistance from park volunteers			X	
51	Provide expertise for planning an implementing a high quality natural areas restoration and ongoing management and maintenance plan			X	
52	Per Director's discretion provide assistance for restoration and management activities or significant projects as requested	X			
53	Provide or facilitate additional training and education for DPW staff as needed			X	
	City of Pittsburgh Forest Management - Frick Woods				
54	Remove Dead Trees	X			
55	Assist PPC with Removal of Invasive Species	X			
56	Assist PPC with Planting Efforts	X			
	PPC Additional Center Maintenance and Operation Duties				
57	Provide management consistency across Premises			X	
58	Operate and maintain commercial aspects of premises			X	
59	Undertake sanitation operations for the interior of the FEC Facility			X	
60	Operate, maintain and provide public programming to the extent funding permits			X	
61	Move and maintain any moveable furniture			X	
62	Maintain and operate fountains (fountain at end of allee, rainwater basevale and sculpture)			X	
63	Maintain stormwater wetlands			X	
64	Operate and maintain on lot sewage treatment system (plumbing and electrical)			X	
65	Operate and maintain sewage drip field (plumbing and electrical)			X	
	Miscellaneous O&M Needs Not Specified in Exhibits to Agreement				
66	Onsite Management of Compost (Include Empty Exterior Compost Receptacles)				
67	PPC Rental Events - Private & Public Parties			X	
68	PPC Rental Event - Waste Management Related to Event			X	
69	Removal of Plant Debris (weeds, branches, etc.) by Request	X			
70	Clean and Maintain Barn including Restrooms			X	
71	Clean FEC Facility Interior and Exterior (incl graffiti removal)			X	
72	Pick Up of Recycling from Barn (1x/2 weeks)	X			
73	Haul Away Trash from Barn (1x/week)	X			
74	Drinking Water Fountain Cleaning (incl Winterization, Start Up, Filter Change)			X	
75	Electrical - including light bulb replacement, fixture repairs, emergency lighting system inspection and maintenance			X	
76	Plumbing Associated with FEC Facility (water service lines, water heater, on lot sewage treatment system and drip field)			X	
77	Repair, Rehab, Replace Water and Sewer Site Infrastructure - Previously Existing	X			
78	Maintain Allee Stone Surface (Power Wash 1x/Year) - See Exhibit C-1	X			
79	Maintain Permeable Pavers in Driveway - Vacuum (1x/Year), Jet Vac Truck (1x/5years)	X			
80	Repair and/or Replace Broken Windows			X	
81	Repair and/or Replace Restroom Accessories (e.g. Mirrors, Soap Dispensers, Stalls, Light and Plumbing Fixtures)			X	
82	Repair, Refinish and/or Replace - Restroom Flooring and Wall Tile Surfaces			X	
83	Irrigation System			X	
84	Purchase and Provide Supplies (Ice Melt, Deicing Chemicals)	X			
85	Purchase and Provide Supplies (Cleaning Solutions)			X	
86	Purchase and Provide Supplies (Trash and Recycling bags for exterior receptacles)	X			
87	Purchase and Provide Supplies (Trash, recycling and compost bags for interior receptacles)			X	
88	Purchase and Provide Supplies (roll towels, toilet paper, hand soap, etc.)			X	
89	Purchase and Provide Landscape Maintenance Supplies (e.g. rakes, blowers, spreaders, etc.)			X	
90	Signage FEC Site (Incl Donor Recognition)			X	
91	Signage FEC Interior (Incl Donor Recognition)			X	
92	Signage FEC Exterior (Incl Donor Recognition)			X	
93	Signage - ROW and Driveway	X			
94	Present Work Plan for Coordination with City of Pittsburgh Department of Public Works - No Later Than January 15 of Each Year			X	
95	Review and Approve Annual Work Plan - Approve by Feb 15 Each Year	X			
96	Repair, Rehab, Replace Electrical Service - Show Are Pole to Manhole	X			
97	Coordination of Repair, Rehab, Replacement of Electrical Conduit and Line - ROW	X			
98	Repair, Rehab, Replace, Electrical Conduit and Line - Park Property			X	
99	Coordination of Repair of Transformer Owned By Duquesne Light			X	
	Remaining Capital Expense				TOTAL
100	Design, Purchase, Install and Maintain all annual flowering plants (Incl Slavery to Freedom Garden)			X	
101	Design, Purchase, Install and Maintain all perennial Plantings			X	
102	Design, Purchase, Install and Maintain all tree and flower containers			X	
103	Design, Purchase, Install and Maintain all landscape and woodland trees			X	

EXHIBIT E

CERTIFICATE OF LIABILITY INSURANCE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 05/18/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Donna Sebesta	
Simpson & McCrady LLC 310-330 Grant Street Suite 1320 Pittsburgh PA 15219-2233	PHONE (A/C, No, Ext): (412)281-2222	FAX (A/C, No): (412)281-3437
	E-MAIL ADDRESS: donna@simpson-mccrady.com	

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: The Cincinnati Insurance Company	
INSURER B: Northstone Insurance Company	
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Pittsburgh Parks Conservancy
45 S. 23rd Street
Suite 101
Pittsburgh PA 15203

COVERAGES **CERTIFICATE NUMBER:** 18-19 Master **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☒ POLICY ☐ PRO-JECT ☐ LOC OTHER:			EPP0477992	03/01/2018	03/01/2019	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Abuse & Molestation	$ 1,000,000 $ 500,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $ 1,000,000
A	AUTOMOBILE LIABILITY ☒ ANY AUTO OWNED AUTOS ONLY ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ONLY ☒ NON-OWNED AUTOS ONLY			EPP0477992	03/01/2018	03/01/2019	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Underinsured motorist	$ 1,000,000 $ $ $ $ 1,000,000
A	☒ UMBRELLA LIAB ☒ OCCUR EXCESS LIAB ☐ CLAIMS-MADE DED ☒ RETENTION $ 0			EPP0477992	03/01/2018	03/01/2019	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N ☐ N/A If yes, describe under DESCRIPTION OF OPERATIONS below			WCN6001692	03/01/2018	03/01/2019	☒ PER STATUTE ☐ OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ 500,000 $ 500,000 $ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Pittsburgh Water and Sewer Authority and the City of Pittsburgh are named as additional insureds regarding the Frick Environmental Center for permeable pavers parking project

CERTIFICATE HOLDER

Pittsburgh Water and Sewer Authority

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Donna Sebesta