POLLUTION REDUCTION PLAN FOR MUNICIPAL SEPARATE STORM SEWER SYSTEM

West Chester University of Pennsylvania

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Acronyms / Abbreviations

WCU	West Chester University
PRP	Pollution Reduction Plan
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
BMP	Best Management Practice
PADEP	Pennsylvania Department of Environmental Protection
O&M	Operation and Maintenance
EHS	West Chester University Environmental Health and Safety Department
TSS	Total Suspended Solids
TN	Total Nitrogen
TP	Total Phosphorus

1 Purpose and Scope

West Chester University (WCU) has developed a revision to its original Pollution Reduction Plan (PRP) for its Municipal Separate Storm Sewer System (MS4). The original PRP was prepared in accordance with the requirements of the ***National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges from Small Municipal Separate Storm Sewer Systems Pollution Reduction Plan Instructions*** as required by the ***PAG-13 Authorization to Discharge Under the NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4)***. WCU has created a PRP to address discharges from the MS4 affecting the siltation impairments in Plum Run of the Brandywine Creek Watershed and pathogen and siltation impairments in Chester Creek. See the attached ***Requirements (Non-Municipal) Anticipated Obligations for the Subsequent NPDES Permit Term*** table revised 10/2/23 as seen in Appendix A.

The purpose of the PRP is to determine the University's existing pollutant load discharged to Plum Run of the Brandywine Creek Watershed, and to Goose Creek of the Chester Creek Watershed to select and develop stormwater Best Management Practices (BMPs) to be implemented over the next five-year MS4 permit term to reduce waterway pollutants of concern by minimum reduction percentages required by the Pennsylvania Department of Environmental Protection (PADEP). The term began March 16,2018 and concluded on March 15,2023 under the original permit schedule. On September 24, 2022, PADEP extended the permit term for an additional 2 years, expiring on March 15, 2025.

The University's PRP can be evaluated and may be amended over the permit term to meet the goal reductions. The purpose of this revision is to account for several BMPs installed during the permit term in the Brandywine Creek Watershed not included in the original PRP and to add alternative BMPs to meet the remaining siltation reduction requirements.

2 Permit Requirements

As stated in the ***PRP Instructions,*** each PRP is required to include the following elements:

1. Public Participation
2. Map
3. Storm Sewershed Pollutants of Concern
4. Determine Existing loading for Pollutants of Concern
5. Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading
6. Identify Funding Mechanisms
7. Identify Responsible Parties for Operations and Maintenance of BMPs

West Chester University's PRP addresses the requirements in the order as listed above. Relevant PRP instructions for each element have been included as bulleted items at the beginning of each section.

2.1 Public Participation

The PRP shall address the following elements related to Public Participation:

- The University shall make a complete copy of the PRP available for public review.
- The University shall publish, in a newspaper of general circulation in the area, a public notice containing a statement describing the plan, where it may be reviewed by the public, and the length of time the University will provide for the receipt of comments. The public notice must be published at least 45 days prior to the deadline for submission of the PRP to the DEP. Include a copy of the public notice with the PRP.
- The University shall accept written comments for a minimum of 30 days from the date of public notice. Include a copy of all written comments received from the public with the PRP.
- The University shall accept comments from any interested member of the public at a public meeting or hearing, which may include a regularly scheduled meeting of the governing body of the municipality or municipal authority that is the permittee.
- The University shall consider and make a record of the consideration of each timely comment received from the public during the comment period.
- The University shall consider and make a record of the consideration of each timely comment received form the public during the public comment period concerning the plan, identifying any changes made to the plan in response to the comment. Include a copy of the University's record of consideration of all timely comments received in the public comment period with the PRP.

West Chester University's original PRP public notice was published on August 15th, 2017 in The Daily Local Newspaper and the PRP was made available online for public review and comment on August 17th, 2017 at www.wcupa.edu/facilities and in person at West Chester University's Environmental Health and Safety (EHS) Office. The public was given thirty days to comment on the PRP. A public meeting to address the PRP was held on September 7th, 2017.

For the revision to the PRP in 2024, another public meeting was held to address revisions to the PRP on February 13, 2024.

A copy of the Public Notice, timely comments, and records of consideration are located in Appendix B for the 2017 and 2024 meetings.

2.2 Sewershed Map

The PRP shall address the following elements related to Sewershed Mapping:

- Attach maps that identify land uses and the storm sewershed boundaries associated with the MS4 that discharge to impaired surface waters and calculate the storm sewershed area that is subject to Appendix E of PAG-13. In addition, the proposed location(s) of structural BMP(s) that will be implemented to achieve the required pollutant load reductions must be identified on a map.
- The map may be the same as that used to satisfy MCM #3 of the PAG-13 General or Individual Permit, with the addition of land use, the storm sewershed boundary, and locations of proposed BMPs, or may be a different map. The map must be sufficiently detailed to identify the PRP Planning Area relevant to satisfying the requirements of Appendix E, and to demonstrate that BMPs will be located in appropriate storm sewersheds to meet the requirements.

West Chester University's storm sewershed covers 404.69 Acres located within West Chester Borough, West Goshen Township, East Bradford Township, and the Township of Westtown within Chester County. Within the Brandywine Creek watershed, 316.99 Acres (81.08%) of the campus is pervious and 73.97 Acres (18.92%) are impervious.13.74 Acres of the campus fall within the Chester Creek Watershed, 5.22 acres (38.02%) are pervious, and 8.52 acres (61.98%) are impervious. The University has 18 outfalls total, 5 are located on the University's North Campus and 13 are located on its South Campus.

Table 1 West Chester University Impervious and Pervious Area Totals by Watershed

	Impervious Area (acres)	**Pervious Area (acres)**	**Total (acres)**
Brandywine Creek Watershed	73.97	316.99	390.95
Chester Creek Watershed	8.52	5.22	13.74
West Chester University Total	82.49	322.21	404.69

135 acres within the Brandywine Creek Watershed on WCU's South Campus are protected natural lands called the Gordon Natural Area for Environmental Studies. Plum Run flows through the Gordon Natural Area which is home to trees, plants, and wildlife. The Gordon Natural Area provides many learning and volunteer opportunities to WCU students and the surrounding community.

As per PA DEP PRP requirements, maps identifying land use, storm sewershed boundaries, and proposed locations of structural BMPs required to achieve the required pollutant load reductions are attached in Appendix C.

2.3 Pollutants of Concern

The PRP shall address the following elements related to Pollutants of Concern:

- Identify the pollutants of concern for each storm sewershed or the overall PRP Planning Area.
- The term "nutrients" refers to "Total Nitrogen" (TN) and "Total Phosphorus" (TP) unless specifically stated otherwise in DEP's latest Integrated Report. The terms "sediment," "siltation," and "suspended solids" all refer to inorganic solids and are hereinafter referred to as "sediment."
- The term, “storm sewer shed" is defined in the PAG·13 General Permit as the land area that drains to the municipal separate storm sewer from within the jurisdiction of the MS4 permittee. This term is used in these instructions as well as the term "PRP Planning Area" (or "Planning Area"), which refers to all of the storm sewersheds that an MS4 must calculate existing loads and plan load reductions for.
- For all PRPs, MS4s shall calculate existing loading of the pollutant(s) of concern in lb./year; calculate the minimum reduction in loading in lb./year select Best Management Practice(s) to reduce loading; and demonstrate that the selected BMPs will achieve the minimum reductions.
- For PRPs developed for Appendix E, impaired waters, the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., “Excessive Algal Growth" and "Organic Enrichment/low D.O."), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.

As identified in Appendix A, ***MS4 Requirements (Non-Municipal) Anticipated Obligations for the Subsequent NPDES Permit Term*** table, West Chester University is required to implement BMPs to improve the siltation impairment of Plum Run within the Brandywine Creek Watershed and the siltation and pathogen impairment of Chester Creek. The University is not required to reduce Total Nitrogen or Total Phosphorus loads however the BMPs implemented for the siltation impairments may reduce the loading.

2.4 Determine Existing Loading for Pollutants of Concern

The PRP shall address the following elements related to determining the existing load for Pollutants of Concern:

- Identify the date associated with the existing loading estimate. Calculate the existing loading, in lbs. per year, for the pollutant(s) of concern in the PRP Planning Area.
- There are several possible methods to estimate existing loading, ranging from simplistic to complex. One method to estimate existing loading that is acceptable to DEP is to determine the percent impervious and pervious surface within the urbanized area of the storm sewershed and calculate existing loading by multiplying the developed impervious and developed pervious land areas (acres) by pollutant loading rates (lb./acre/year) ("simplified method").The MS4 may use loading rates for undeveloped land for areas outside of the urbanized area which flows into the urbanized area. Where structural BMPs are currently in place and are functioning, the existing loading estimate may be reduced to account for pollutant reductions from those BMPs.
- Use of DEP's simplified method is not required. Any methodology that calculates existing pollutant loading in terms of pounds per year, evaluates BMP-based pollutant reductions utilizing the BMP effectiveness values contained in 3800-PM-BCW0100m or Chesapeake Bay Program expert panel reports, uses average annual precipitation conditions, considers both overland flow and stream erosion, and is based on sound science may be considered acceptable.
- Whatever tool or approach that is used to estimate existing loading from the PRP Planning Area must also be used to estimate existing loading to planned BMPs. This avoids errors in percent pollutant removal calculations that would result if different methods were used. Later BMP design efforts will usually apply a more sophisticated method than used in planning to calculate load to a BMP. The design loading may not however be used to alter the assumed pollutant reduction by the BMP unless the PRP is revised to apply the more sophisticated method to the load from the storm sewershed as a whole.
- MS4s may claim "credit" for structural BMPs implemented prior to development of the PRP to reduce existing loading estimates. In order to claim credit, identify all such structural BMPs in Section D of the PRP along with the following information:
    - A detailed description of the BMP.
    - Latitude and longitude coordinates for the BMP.
    - Location of the BMP on the storm sewershed map.
    - The permit number, if any, that authorized installation of the BMP.
    - Calculations demonstrating the pollutant reductions achieved by the BMP.

  - The date the BMP was installed and a statement that the BMP continues to serve the function(s) it was designed for; and
  - The operation and maintenance (O&M) activities and O&M frequencies associated with the BMP.

- The MS4 permittee may optionally submit design drawings of the BMP for previously installed or future BMPs with the PRP.
- Existing loading must be calculated and reported for the portion of the Planning Area which drains to impaired waters as of the date of the development of the PRP. MS4s may not claim credit for street sweeping and other non-structural BMPs implemented in the past, and an MS4 may not reduce its obligations for achieving permit term pollutant load reductions through previously installed BMPs. If structural BMPs were implemented prior to development of the PRP and continue to be operated and maintained, the MS4 may claim pollutant reduction credit in the form of reduced existing loading.
- An MS4 may use all BMPs installed prior to the date of the load calculation to reduce its estimate of existing pollutant loading. For example, if a rain garden was installed ten years ago and is expected to remove 100 lbs. of sediment annually, and the overall annual loading of sediment in the storm sewershed is estimated to be 1,000 lbs. without specifically addressing the rain garden, an MS4 may not claim that the rain garden satisfies its obligations to reduce sediment loading by 10%.The MS4 may however use the rain garden to demonstrate that the existing load is 900 lbs. instead of 1,000 lbs., and that 90 lbs. rather than 100 lbs. needs to be reduced during the term of permit coverage.
- Each impairment identified on the MS4 Requirements Table ("Table") must be addressed in a PRP document. The Table listings for each MS4 are different because they reflect local conditions, which is why an MS4 must carefully interpret the information on the Table.
- For PRPs developed for impaired waters (Appendix E), the pollutant(s) are based on the impairment listing, as provided in the MS4 Requirements Table. If the impairment is based on siltation only, a minimum 10% sediment reduction is required. If the impairment is based on nutrients only or other surrogates for nutrients (e.g., "Excessive Algal Growth" and "Organic Enrichment/low D.O."), a minimum 5% TP reduction is required. If the impairment is due to both siltation and nutrients, both sediment (10% reduction) and TP (5% reduction) must be addressed. PRPs may use a presumptive approach in which it is assumed that a 10% sediment reduction will also accomplish a 5% TP reduction. However, MS4s may not presume that a reduction in nutrients will accomplish a commensurate reduction in sediment.
- All MS4s must use the BMP effectiveness values contained within DEP's BMP Effectiveness Values document (3800-PM-BCW0100m) or Chesapeake Bay Program expert panel reports for BMPs listed in those resources when determining pollutant load reductions in PRPs, except as otherwise approved by DEP. An example of other approaches that may be approved by DEP include the use of thoroughly vetted mechanistic models with self-contained BMP modules (e.g.,

Storm Water Management Model (SWMM), WinSLAMM) to demonstrate achievement of reduction targets. Application of these data intensive models could allow for a streamlining of the planning and design phases of BMPs that may provide future cost savings as municipalities move toward implementation of the plan. Such resources must be documented in the PRP and must reflect both overland flow and in-stream erosion components.

The University's existing sediment load and required ten percent reduction was calculated using ***Attachment B: Developed Land Loading Rates For PA Counties*** and ***Attachment C: The Chesapeake Boy PRP Example Using DEP Simplified Method of the National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Small Municipal Separate Storm Sewer Systems Pollution Reduction Plan Instructions***. The Chester County loading rates and watershed calculations may be found in Appendix D.

Brandywine Creek Watershed

West Chester University is required by the PADEP to reduce sediment impairment from stormwater discharges to the waters of Plum Run in the Brandywine Creek Watershed by ten percent during the current permit term. The tables below summarize the existing sediment load and required reduction for each watershed.

Table 2 Brandywine Creek Watershed Existing Sediment Load Calculation

	Percentage	Acres	Loading Rate	Total
Impervious	18.92%	73.97 Acres	1504.78 lbs./acre/year	111,304.06 lbs./yr
Pervious	81.08%	316.99 Acres	185.12 lbs./acre/year	58,680.26 lbs./yr
Total Existing Sediment Load				169,984.33 lbs./yr

Table 3 Brandywine Creek Watershed Required Sediment Reduction Calculation

Total Sediment Load Total	Reduction Multiplier	Reduction Total
169,984.33 lbs./yr	0.10	16,998.43 lbs./yr

Chester Creek Watershed

West Chester University is required to reduce sediment impairments from stormwater discharges to Chester Creek by ten percent and implement PADEP required controls for Pathogen impairments during the current permit term.

Table 4 Chester Creek Watershed Existing Sediment Load Calculation

	Percentage	Acres	Loading Rate	Total
Impervious	21.15%	8.52 Acres	1504.78 lbs./acre/year	12,816.64 lbs/yr
Pervious	14.09%	5.22 Acres	185.12 lbs./acre/year	967.04 lbs./yr
Existing Sediment Load				13,783.68 lbs/yr

Table 5 Chester Creek Watershed Required Sediment Reduction Calculation

Total Sediment Load Total	Reduction Multiplier	Reduction Total
13,783.68 lbs./yr	0.10	1,378.37 lbs./yr

The University stated in the original PRP report it would implement the PADEP required pollution control measures due to pathogen impairment of Chester Creek over the permit term as follows:

1. Map- WCU must develop a map of the storm sewershed associated with all outfalls that flow to Chester Creek by September 30th, 2019.
2. Inventory- Develop an inventory of all suspected and known sources of bacteria in stormwater within the storm sewershed by September 30th, 2020.
3. Investigate- Complete an investigation of each suspected bacteria source and include stormwater sampling if required under Illicit Discharge Detection & Elimination Program by September 2022.
4. Ordinance- Enforce ordinances that prohibit illicit and illegal connections and discharges of sewage into the MS4. All illicit and illegal connections and discharges of sewage must be reported in Annual MS4 Status Report along with corrective actions.
5. Standard Operating Procedure- WCU must enact a standard operating procedure that requires proper management of animal wastes on property owned by the University.
6. Documentation- The progress of investigations and source control efforts of pathogens must be documented in the Annual MS4 Status Reports.

The are no known or suspected sources of bacteria or pathogens from the WCU MS4 area within the Chester Creek Watershed. The WCU portion of the watershed consists of office buildings, parking lots and above ground detention basins. The buildings connect to public sewers owned and operated by West Chester Borough Public Works. West Chester Borough would be responsible for enforcing ordinances related to illicit and illegal connections and the University is not aware of any of their buildings violating this. The University has a Pet Waste Management Policy requiring all staff, students, on-campus business and visitors to picking up their animal's waste and disposing of it properly. There are minimal

animal wastes associated with the office buildings in the Chester Creek Watershed. Animal wastes would be limited to visitor or service animals.

2.5 Select BMPs to Achieve the Minimum Required Reductions in Pollutant Loading

The PRP shall address the following elements related to selecting BMPs to achieve the Minimum Required Reductions in Pollutant Loading:

- Identify the minimum required reductions in pollutant loading. Applicants must propose the implementation of BMP(s) or land use changes within the PRP Planning Area that will result in meeting the minimum required reductions in pollutant loading within the Planning Area. These BMP(s) must be implemented within 5 years of DEP's approval of coverage under the PAG-13 General Permit or an individual permit and may be located on either public or private property.

- If the applicant is aware of BMPs that will be implemented by others (either in cooperation with the applicant or otherwise) within the Planning Area that will result in net pollutant loading reductions, the applicant may include those BMPs within its PRP.

- Historic street sweeping practices should not be considered in calculating credit for future practices. All proposed street sweeping practices may be used for credit if the minimum standard is met for credit (see 3800-PM-BCW0100m).In other words, if sweeping was conducted 1/month and will be increased to 25/year in the future, the MS4 does not need to use the "net reduction" resulting from the increased sweeping; it may take credit for the full amount of reductions from 25/year sweeping.

- The names and descriptions of BMPs and land uses reported in the PRP should be in accordance with the Chesapeake Bay Program Model. The names and descriptions are available through CAST (log into www.casttool.org,select "Documentation," select "Source Data" and see worksheets named "Land Use Definitions" and "BMP Definitions").

- Opportunities for BMP installation vary across a municipality, and for that reason MS4s with multiple PRP obligations need not propose BMPs to address each impairment listed in the Table during the permit term. The existing loading must be calculated for the entire PRP Planning Area which drains to impaired waters but pollutant controls to be installed during the subsequent permit term may be located such that they reduce the load In one sub-watershed by less than 10% and by more than 10% in another (as long as the overall amount of lbs. reduced constitutes 10% of the existing loading for the entire PRP Planning Area)

- MS4s may propose and take credit for only those BMPs that are not required to meet regulatory requirements or otherwise go above and beyond regulatory requirements. For example, a BMP that was installed to meet Chapter 102 NPDES permit requirements for stormwater associated with construction activities may not be used to meet permit term minimum pollutant reductions unless the MS4 can demonstrate that the BMP exceeded regulatory requirements if this is done,

the MS4 may take credit for only those reductions that will occur as a result of exceeding regulatory requirements.

Brandywine Creek Watershed

WCU's primary BMP to address the minimum reduction requirements in the original report was stated to implement Stream Restoration along Plum Run in the Gordon Natural Area to address the siltation impairment in the Brandywine Creek Watershed. Per the ***NPDES Stormwater Discharges from Small Municipal Separate Storm Sewer Systems BMP Effectiveness Values***, as seen in Appendix E, Stream Restoration removes 44.88 lbs./ft/yr. Since the original PRP was prepared, multiple BMPs have been constructed and installed reducing the sediment load to the Brandywine Creek. This includes BMPs were not accounted for in the original PRP report and are now included in the report to document the progress and the additional BMPs needed to meet the permit requirements.

As part of the WCU Commons Building and Parking Facility, BMP #1 through 4 in Table 6 below were designed and constructed. The BMPs were designed to PADEP's latest Stormwater BMP Design Manual and were reviewed and approved by the Chester County Conservation District as part of the project's Construction and Erosion Control NPDES permit. The BMPs combined to provide a reduction of 2,842.33 pounds per year of TSS. WCU has also installed 256 trees, BMP #6, throughout the North Campus which receive runoff from the adjacent areas.

At the 2024 public comment meeting (See Appendix B), WCU Facilities staff provided updates about several other BMP's currently underway. The WCU Facilities staff retrofitted Alternative BMP #A10, the bioretention area by WCU Parking Lot L. The area consists of amended compost soils and plantings and and shown on drawings attached in Appendix F, Alternative BMP Alternative BMP A9 and A10 Drawings.

Table 6 Brandywine Creek Watershed BMPs Installed

BMP #	BMP Type	BMP Name / Description	Impervious Area Controlled	BMP Effectiveness Value	Quantity of BMP	Sediment Removed (#/Yr)
1	Infiltration Bed	University and Allegheny Halls	39,057 sf	95%		1,281.76
2	Infiltration Bed	Commons Building	26,850 sf	95%		933.04
3	Rain Garden	University Ave	17,774 sf	90%		552.60
4	Detention Vault	Commons Building Parking Facility	30,375 sf	10%		104.93
6	Tree Planting	North Campus	435 sf / tree	20% of lbs./ac/yr, 100 trees/ac	256 trees	770.45
A10	Bioswale (Retrofit)	WCU Parking Lot L	2 acres	56,800 sf		1,881.91
					Total	**5,524.69 lbs./yr**

Table 7 below summarizes the remaining minimum required sediment reduction amounts.

Table 7 Brandywine Creek Watershed Sediment Reductions

Existing Load	169,984.33 lbs/year
Percent Reduction	10%
Minimum Required Reduction	16,998.43 lbs/year
BMPs Installed to Date	5,524.69 lbs/year
Remaining Minimum Required Reduction	11,473.75 lbs/year

The University has continued planning for the stream restoration along Plum Run. In coordination with the Brandywine Red Clay Alliance and the Brandywine Conservancy, the University has identified a potential location within the Gordon Natural Area. The Brandywine Red Clay Alliance has performed separate analysis of Plum Run and successfully implemented preformed multiple stream restoration projects directly downstream of the WCU selected location. Continuing the restoration through portions in the WCU MS4 area will help to provide a cohesive restored stream and help prevent erosion in downstream areas.

Additional BMPs have also been identified as alternate measures to reduce the total sediment reduction. In the event funding or the design and permitting process of the stream restoration determines it is not feasible, these alternatives may be selected from. Eleven (11) projects involving the installation of new BMPs or retrofitting of existing BMPs to improve their function have been identified across the portion of the campus in the Brandywine Creek watershed. The proposed BMPs include new bioswales, detention basins, the retrofitting of existing detention basins, and the retrofitting of existing infiltration basins. Sediment removal efficiencies for each BMP are in accordance with the NPDES BMP Effectiveness Values table. Per the Appendix E table, a bioswale has a sediment removal efficiency of 90%, each infiltration basin has a sediment removal efficiency of 95%, and each detention basin has a sediment removal efficiency of either 60% or 70%, depending on if the basin includes an underdrain system.

The WCU Facilities staff are currently in the planning and design stages for retrofitting Alternative BMP #A8, Swope Detention Basin Conversion, and Alternative BMP #A9, WCU Sykes Student Union Parking Basin. Attached to this report in Appendix F is a copy of the current design plans for Alternative BMP A9. The completion of these projects is anticipated to remove an additional 8,722.45 lbs/yr of sediment for a total of 14,247.14 lbs/yr including the previously completed projects in Table 6. Additional BMPs will be required to be installed to meet the Brandywine Creek remaining minimum sediment removal amounts of 2,751.29 lbs/yr (16,998.43 lbs/yr from Table 7 minus 14,247.14 lbs/yr).

If Alternative BMP #A8 and A9 are successfully installed, the minimum required length of the Stream Restoration project however could be reduced to as little as 61 linear feet (2,751.29 lbs/yr divided by 44.88 lbs/yr/ft). The University will continue with the planning of the Stream Restoration project while evaluating if there are other Alternative BMPs which may be easier to implement to meet the remaining minimum required sediment removal.

Table 8 Brandywine Creek Proposed BMPs and Alternatives Removal Calculations

BMP #	BMP (New or Retrofit)	BMP Name / Description	Drainage Area	Impervious Area Controlled	TSS Removal Efficiency (%)	Sediment Removed (#/Yr)
5	Stream Restoration		N/A	44.88 lbs./ft/yr	300 LF	13,464
A1	Bioswale (New)	WCU Parking Lot S	<1 acre	32,000 sf	90%	994.9
A2	Detention Basin (Retrofit)	WCU Parking Lot Q	10 acres	291,790 sf	95%	10,156.49
A3	Bioretention (New)	South Parking Lot	7 acres	61,420 sf	95%	2,998.73
A4	Basin (Retrofit)	North side of WCU South Campus Apartments	11 acres	219,670 sf	60%	5,214.76
A5	Basin w/ Underdrain (Retrofit)	WCU South Campus Apartments Basketball Court	1 acre	38,025 sf	70%	935.97
A6	Basin w/ Underdrain (Retrofit)	South side of WCU South Campus Apartments	10 acres	192,340 sf	70%	5,374.73
A7	Basin w/ Underdrain (Retrofit)	WCU South Campus Apartments Buildings 181-182	5 acres	41,900 sf	70%	1,536.48
A8*	Basin (Retrofit)	Swope Detention Basin Conversion	9 acres	210,410 sf	60%	4,824.30
A9*	Basin (Retrofit)	WCU Sykes Student Union Parking Basin	7 acres	171,680 sf	60%	3,898.15
A11	Bioswale (New)	Tigue Road / Plum Run Trail	1 acre	29,380 sf	90%	967.67
A12	Bioswale (New)	New Street Parking Garage	1 acre	38,170 sf	90%	1,207.34
					Total	**51,573.82 lbs/yr**

*****The WCU Facilities staff are currently in the planning and design stages for retrofitting Alternative BMP #A8, Swope Detention Basin Conversion, and Alternative BMP #A9, WCU Sykes Student Union Parking Basin

Chester Creek Watershed

WCU proposes to alter the existing retention basin at 887 Matlack Street within its property within the Chester Creek Watershed. The retention basin will be converted to an infiltration basin with sand/vegetation. Infiltration facilities with sand, vegetation effectiveness value may be found in NPDES BMP Effectiveness Values Appendix E. The converted basin will exceed the required 10 percent reduction of 1,378.37 lbs./yr. Due to the limited size of the WCU MS4 area in the Chester Creek Watershed, no alternative BMPs are proposed.

Table 9 Chester Creek Watershed BMPs Sediment Removal Calculations

BMP #	BMP (New or Retrofit)	BMP Name / Description	Impervious Area Controlled	TSS Removal Efficiency (%)	Sediment Removed (#/Yr)
7	Infiltration Basin (Retrofit)	887 Matlack Street	61,288 sf	95%	2,011

Table 10 Chester Creek Watershed Sediment Reductions

Existing Load	13,783.68 lbs/year
Percent Reduction	10%
Required Reduction	1,378.37 lbs/year
Proposed Reduction	2,011 lbs/year

2.6 Funding Mechanisms

- Prior to approving coverage DEP will evaluate the feasibility of implementation of an applicant's PRP. Part of this analysis includes a review of the applicant's proposed method(s) by which BMPs will be funded. Applicants must identify all project sponsors and partners and probable funding sources for each BMP.

West Chester University initially intended to allocate $50,000 for the stream restoration in Brandywine Creek Watershed and $25,000 for the infiltration basin in the Chester Creek Watershed from West Chester University's Facilities Operations budget in the previous version of this report. Based on the Brandywine Red Clay Alliance’s recent experience in design, permitting, and construction costs for stream restoration along Plum Run, this funding would be insufficient. Design and permitting of the stream restoration project is now estimated to cost between $50,000 and $75,000 and construction costs are estimated at $100,000. WCU commits to funding the cost of implementing the plan without any monetary restrictions. If the project exceeds the allocated costs, WCU will either seek to allocate additional money or select an Alternative BMPs identified in the PRP.

The Alternative BMP A8 Swope Detention Basin Conversion and A9 WCU Student Union Parking Basin Retrofit are being funded as part of the University’s Facilities Operations budget.

2.7 Responsible Parties for Operation and Maintenance of BMPs

The PRP shall address the following elements related to establishing the Operation and Maintenance of BMPs and the responsible parties:

- Once implemented, the BMPs must be maintained in order to continue producing the expected pollutant reductions. Applicants must identify the following for each selected BMP:
    - The party(ies) responsible for ongoing O&M.
    - The activities involved with O&M for each BMP; and
    - The frequency at which O&M activities will occur.
- MS4 permittees will need to identify actual O&M activities in AnnualMS4 Status Reports submitted under the General Permit.

West Chester University will operate maintain and inspect the implemented BMPs in accordance with the latest Pennsylvania Stormwater BMP Manual in order to achieve the anticipated reductions.

West Chester University's Environmental Health and Safety Department (EHS) will be responsible for creating and following an Inspections Checklist and Maintenance Guidance for each BMP. The inspections will take place annually prior to the Annual MS4 reporting period. Any O&M activities will be identified in the Annual MS4 Report. Facilities will be responsible for upkeep, maintenance, and any corrective actions that will need to be implemented upon a BMPs failure to produce the expected pollutant reductions.

Stream Restoration Operation and Maintenance

Routine maintenance of the vegetation surrounding the stream banks with the riparian forest buffer will include maintaining the grass cover until area is fully stabilized on a monthly basis. On a semi-annual basis, maintenance will include mowing the grass and meadow areas not under established tree canopies, removal of invasive plant species, replacement of lost or damaged trees, and removal of accumulated debris within the watercourse. For years 2 through 5, planned inspections of the stream can reduced to an annual basis while continuing the semi-annual vegetation maintenance. Additional inspections will be conducted following a major flooding event, i.e., greater than a 1-year storm event or after a bankfull event to check for erosion, bank stability, and sediment/debris accumulation in the stream and stream banks.

Tree Planting Operation and Maintenance

The areas directly around the trees shall be planted with a grass cover and will be regularly mowed. Application of a carefully selected herbicide around the protective tree shelters/tubes may be necessary. Once the tree canopy has expanded and shading is adequate, between 2 and 5 years from planting, growth of invasive species and other weeds will be naturally prevented, and the ground cover becomes

self-maintaining. Review of the new tree plantings would be undertaken annually to determine if replacement trees should be provided.

Bioretention/Bioswales/Aboveground Basins

The areas would be inspected at least twice a year (once in the spring and fall). This includes visual inspection of the inlet and outlet structures including underdrains for clogging, damage or deterioration. Routine maintenance of the bioretention areas includes weeding and removal of invasive species, placement of mulch in the spring, inspection of the plantings including replacement of damaged plantings, removal of any debris, and cutting of perennial plantings in the fall. If inspections find erosion then additional mulching, extensive replacement of the mulch, or stabilization may be needed. Additional inspections shall be conducted following a greater than 1-year storm event to check for clogging due to debris, erosion, or damaged areas.

Appendix A MS4 Requirement Table (Non-Municipal) Anticipated Obligations for Subsequent NPDES Permit Term

MS4 Name	NPDES ID	Individual Permit Required?	Reason	Impaired Downstream Waters or Applicable TMDL Name	Requirement(s)	Other Cause(s) of Impairment
Chester County						
West Chester University	PAG130169	No		Brandywine Creek	Appendix E-Siltation (4a)	
				Chester Creek	Appendix B-Pathogens (5), Appendix E-Siltation (5)	Cause Unknown (4a), Cause Unknown (5), Flow Alterations, Water/Flow Variability (4c)
				Plum Run	Appendix E-Siltation (4a)	Water/Flow Variability (4c)
Cumberland County						
Camp Hill State Correctional Institution	PAG133717	No		Cedar Run	Appendix B-Pathogens (5), Appendix E-Nutrients, Siltation (5)	
				Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
				Susquehanna River	Appendix C-PCB (5)	
				Yellow Breeches Creek	Appendix B-Pathogens (5)	
Naval Ships Parts Control Center	PAI133516	Yes	SP, IP	Unnamed Tributaries to Trindle Spring Run	Appendix E-Siltation (4a)	Cause Unknown (5)
				Trindle Spring Run	Appendix C-PCB, Priority Organics (5)	
				Susquehanna River	Appendix C-PCB (5)	
				Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
Dauphin County						
Dixon University Center	PAG133642	No			No known water quality impairments at this time. Must comply with all other permit requirements.	
PSU Harrisburg	PAG133607	No		Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	
				Unnamed Tributaries to Susquehanna River	Appendix E-Siltation (5)	Other Habitat Alterations (4c)
				Susquehanna River	Appendix C-PCB (5)	
PSU Hershey Medical Center (HMC)	PAG133606	No		Unnamed Tributaries to Swatara Creek	Appendix E-Siltation (5)	
				Chesapeake Bay Nutrients/Sediment	Appendix D-Nutrients, Siltation (4a)	

Appendix B Public Participation

West Chester University Public Notice

In accordance with the National Pollutant Discharge Elimination System (NPDES) Municipal Storm Sewer System (MS4) permit requirements, West Chester University (WCU) prepared a MS4 Report and Pollutant Reduction Plan (PRP). The PRP was originally adopted in 2018 and is proposed to be revised. The revisions include Best Management Practices (BMPs) constructed and installed by WCU since 2018 and changes to the locations and types of BMPs proposed to be installed to meet the remaining permit requirements.

Notice is hereby given that beginning February 1, 2024, the plan will be available on WCU's website (https://www.wcupa.edu/_information/AFA/Facilities/environmental-health-safety) and a hardcopy may be reviewed in person at the Environmental Health & Safety Office, 201 Carter Drive, Suite 100, West Chester, PA during business hours. The community is also invited to a public meeting on Wednesday April 23rd , 2024, 1:30PM at West Chester University's **Sciences & Engineering Center and the Commons (SECC) Room 101A**

This Public Comment Period is an opportunity for members of the public to read and comment on the draft revised MS4 Report and PRP. Written comments may be submitted to Gary Ludwig, Director of Environmental Health and Safety, 201 Carter Drive, West Chester, PA, 19383 or EHS@wcupa.edu through May 13, 2024.

WEST CHESTER UNIVERSITY PUBLIC PARTICPATION 2024 COMMENTS

Comments from the April 23rd, 2024 Public Meeting.

- Members of the University Public included West Chester University Staff including Department of Facilities Staff, Environmental Health and Safety Staff, and Brad Flamm, WCU Director of Sustainability. Discussions were held during the Question and Answer portion of the presentation about ongoing projects the University is preparing.

- 2 of the Alternative Locations, BMP #A8 and #A9 are currently in the design phase for removal of accumulated sediment, replacing their outlet structures, and reestablishing their ground covers to reestablish them as fully functioning stormwater basins. Alternative Location BMP #10 was recently retrofitted to reestablish it as a functioning bioretention system. Drawings of the projects #A9 and #A10 including a receipt for the plantings were provided from the Facilities Staff to the EHS Staff and Stantec after the meeting. The Pollutant Reduction Plan has been revised to include these 3 locations as projects to be completed for the Brandywine Creek Watershed.

Written Comments were also received by West Chester University.

- Dan Schatz, neighbor to West Chester University. Rev. Schatz had concerns about the current conditions of the detention basin at Swopes Student Union, Alternative BMP #A9. Due to the condition of the basin, he was asking for WCU to prioritize the basin retrofit and maintenance. As mentioned in the Public Meetings comment section, the University is currently in the design phase of a project to rehabilitate the basin and perform the types of repairs Rev. Schatz is requesting. Attached to this report in Appendix F are the current drawings prepared by Hunt Engineering Group for the basin repairs.

- Nur Ritter, Stewardship Manager of the Gordon Natural Area of West Chester University provided comments regarding the stream restoration project proposed as BMP #5. See attached email from May 2, 2024. Dr. Ritter's comments regarded specific siting, riparian buffer restoration, and restoration of the stream. The University is proposing to incorporate Dr. Ritter in meetings with the Design Team and site walks during the design phase of the stream restoration project.

RECORD OF CONSIDERATION

PRP Public Notice was published in: The Daily Local Newspaper

Date PRP public notice was published in newspaper: 4/5/2024

Date PRP was made available for public review/comment: 2/1/2024

End date for written receipt of public comments (30 days from the date of public notice): 5/13/2024

21ST CENTURY media

MediaNews Group

PHILADELPHIA GROUP

AFFIDAVIT OF PUBLICATION

390 Eagleview Boulevard • Exton, PA 19341

Environmental Health and Safety
West Chester University
823 S High ST
WEST CHESTER, PA 19383
Attention:

STATE OF PENNSYLVANIA,

The undersigned Richard L. Crowe, being duly sworn the he/she is the principal clerk of Daily Local News, Daily Local News Digital, published in Chester County for the dissemination of local or transmitted news and intelligence of a general character, which are duly qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

Environmental Health and Safety

Published in the following edition(s):

Daily Local News, Daily Local News Digital
04/05/24

Commonwealth of Pennsylvania - Notary Seal
MAUREEN SCHMID, Notary Public
Montgomery County
My Commission Expires March 31, 2025
Commission Number 1248132

Sworn to the subscribed before me this 4/5/24.

Maureen Schmid

Notary Public, State of Pennsylvania
Acting in County of Montgomery

West Chester University
Public Notice

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DLN 4/5; 1a

Advertisement Information

Client Id: 1440467 **Ad Id:** 2586895 **PO:** **Sales Person:** 018303

West Chester University Public Notice

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From: Dan Schatz <dschatz@post.harvard.edu>
Sent: Tuesday, April 30, 2024 12:36 PM
To: WCU-Environmental Health and Safety <EHS@wcupa.edu>; Ludwig, Gary <GLudwig@wcupa.edu>; WCU President <PRESIDENT@wcupa.edu>
Subject: Comment on stormwater drainage plan - Detention Basin A9

Dear Mr. Ludwig and others whom it may concern,

I am writing in regards to the pollution reduction plan for the Municipal Separate Storm Sewer System.

I live in a property adjoining the detention basin listed as A9 in the plan, behind the student union parking lot. Over the last several years, this detention basin has become an increasing nuisance and hazard to the community. As you are no doubt aware, the detention basin does not drain properly, putting it out of compliance with West Goshen regulations. There has now been water in the basin continuously for several years. As the situation has worsened, we have seen an massive increase in mosquitoes during the Summer months, creating a potential health risk for mosquito borne illnesses. Our quality of life has diminished because the issue has largely been ignored by the university.

In addition, the fence surrounding the basin has not been maintained in the 19 years I have lived here, and has holes large enough to fit a deer, or more worryingly, a child. The combination of a year round pond and the potential for a neighborhood child to wander into this area has created a

severe safety risk.

In the January 18 report, the A9 basin is listed with the note "potentially to be retrofitted." While it is good to know that the university is considering the issue, I am concerned that there is no date listed for retrofitting, or any assurance that it will ever actually happen.

I am begging you, for the sake of public health and children's safety, to move the retrofitting of this detention basin and repair of the fence surrounding it to the top of the priority list. Nobody wants to catch a preventable illness, or worse, see a child seriously injured or killed due to the university's negligence. I understand that this is not a prominently visible area of campus, but the potential risks necessitate swift action.

Finally, I'd like to emphasize that a well maintained detention basin in this location could be a positive asset to the university community. Students could be enlisted to seed the area with native species and turn what had been wasted space, and more recently a nuisance and hazard, into an outdoor classroom for biology and environmental science students. This would be ideal as a long term goal - but in the short term, it is essential that the university prioritize this repair, before it becomes a disaster.

Thank you for your attention. I have attached photographs of the basin and fence.

Sincerely,
Rev. Dan Schatz
dschatz@post.harvard.edu

From: Ritter, Nur P <NRITTER@wcupa.edu>
Sent: Thursday, May 2, 2024 8:55 AM
To: Ludwig, Gary <GLudwig@wcupa.edu>
Cc: Flamm, Bradley <BFLAMM@wcupa.edu>
Subject: Potential stream restoration in the Gordon

Hello Gary and Brad,

Sorry we've been playing phone tag, Gary. I thought I'd fill you in, as best as I can, on what I've done to date and my thoughts on the process. I know you're tied up at the conference, Gary, but if you want to talk, I should be in the office today and tomorrow after 1:30, or thereabouts. If those times don't work for you, just let me know and we can figure out some other times.

First, a little bit of background. In the winter of 2019, Jessica Schedlbauer and I went to the Gordon with John Jackson, David Arscott, and Melinda Daniels from Stroud Water Research Center, along with Charles Trout—who was working on the MS4 permitting at the time. I've attached the notes that Jessica took that day (they've been augmented and edited a bit, based on some subsequent work that Jessica and I did). One portion of the notes really stands out: "… it was made clear from the outset our meeting that streambank restoration often has the opposite of the intended effect and can lead to increased erosion problems or a shift in problems further downstream from the restoration target. It was suggested that we target upstream areas to increase stormwater infiltration and sediment retention before water enters the stream." So, essentially, the areas with the biggest bang for the buck within the context of MS4 requirements (i.e., downstream) likely aren't optimal in terms of actual restoration value.

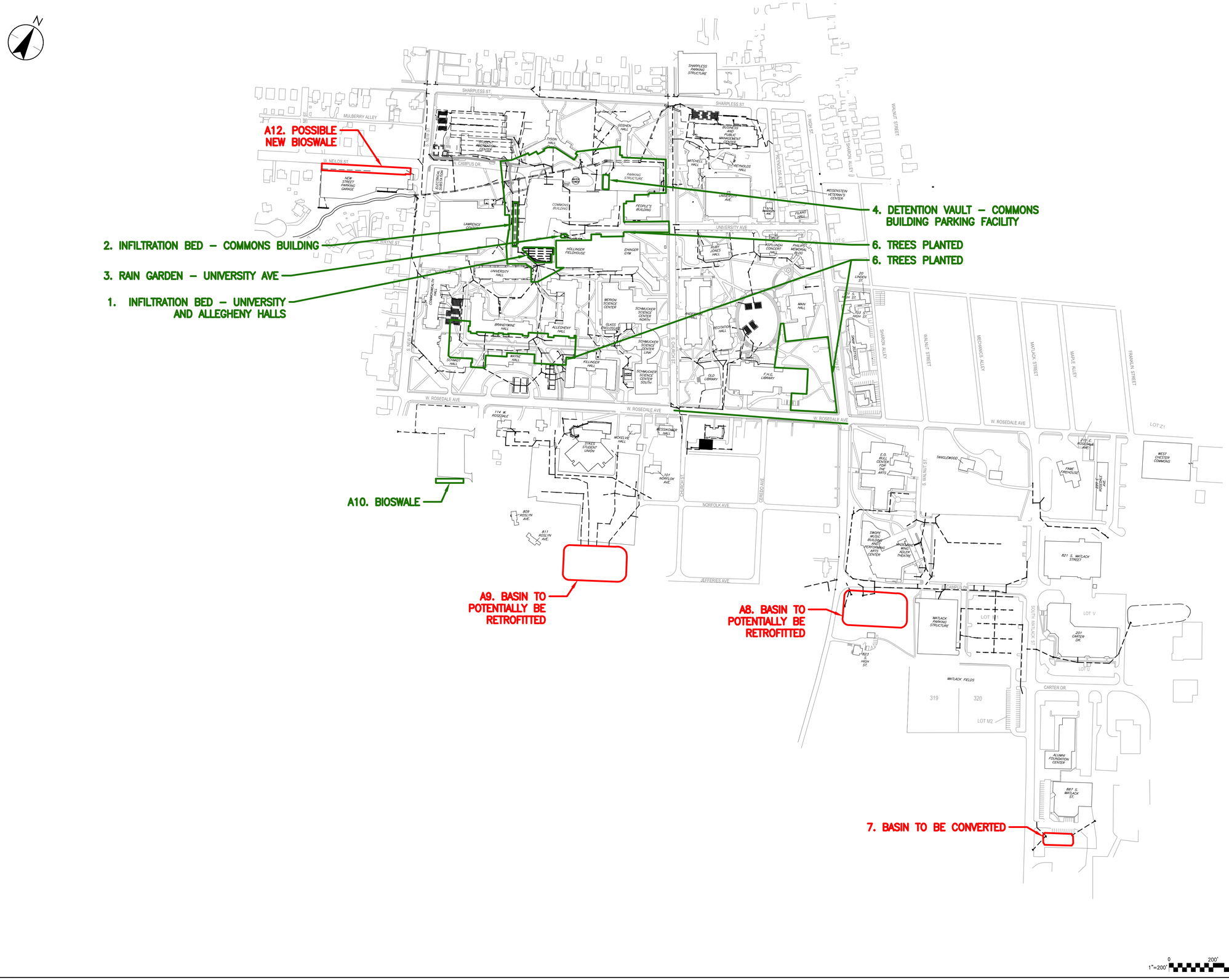
Last week, I went down to the portion of Plum Run that is being considered for restoration as part of meeting the University's MS4 requirements. I spent some time looking at WCU's property (i.e., the southwestern corner of the Gordon) and also took a look at the adjacent property that had been planted with trees as compensation for the Toll Brother's development of Tigue Farm.

I think there could be some value in restoring the floodplain area along the western portion of the Gordon, but the type of restoration that I'm envisioning might not fit well with Stantec's plans. That area is pretty well dominated by Reed Canarygrass, which has limited ecological value, and which seems to persist over the long term once it's established. I think that would be a good area for some shrub/small tree restoration, using the State Natural Heritage Program's 'Circumneutral Mixed Shrub Wetland' as a target community (see: https://www.naturalheritage.state.pa.us/Circumneutral%20Mixed%20Shrub%20Wetland.aspx). But one issue is that the restoration wouldn't best be done as a strip alongside the stream, which is how I'm assuming Stantec would likely want to structure their plantings. Looking at their estimated cost for the 400' of restoration ($100,000), I'm guessing that they were using some standard cost (in this case, $250/lin. ft.), and it would obviously add to the cost to undertake restoration of an additional area further from the stream. I'm also wondering whether the representatives from Stantec actually went down to that site, or if they were just working from remote imagery. Additionally, if they are planning to use any equipment on the restoration work, I'm not sure how they could access the site, without putting in a trail/road. But maybe they've already considered this and it's already reflected in their price.

I'd be happy to go out to the proposed restoration site with the Stantec representatives. I'd also be happy to go with them to look at some of the areas further upstream in the Gordon to look at the possibility of their installing erosion breaks and any sediment reduction options that they might recommend. One of the issues with doing any work in the forested portion of the Gordon (i.e., the upper reaches of the stream) is that we'd have to wait until the later fall/early winter to work in that area, because it would negatively impact the existing vegetation. But I realize that time is limited, hence, you might be better served with one of the other options.

Nur Ritter
Stewardship Manager
Gordon Natural Area
West Chester University of PA
nritter@wcupa.edu
T: 610-436-2722

Appendix C Sewershed Map



Stantec

Stantec Consulting Services Inc.
1060 Andrew Drive Suite 140
West Chester PA 19380-5602
Tel: (610) 840-2500
www.stantec.com

LEGEND

STORM INLET	
STORM MANHOLE	
STORM PIPE	
CLEANOUT	
ENDWALL	
STORMWATER BASIN BOUNDARY	
INSTALLED PRP BMP PROJECT BOUNDARY	
PLANNED PRP BMPS AND ALTERNATE BMP PROJECT BOUNDARY	

Revision	By	Appd	YYYY.MM.DD
File Name: 218011974 - NORTH CAMPUS	RB	RB	GI	2023.08.11
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

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Client/Project
WEST CHESTER UNIVERSITY

INLET MAP

WEST CHESTER, PA

Title
NORTH CAMPUS

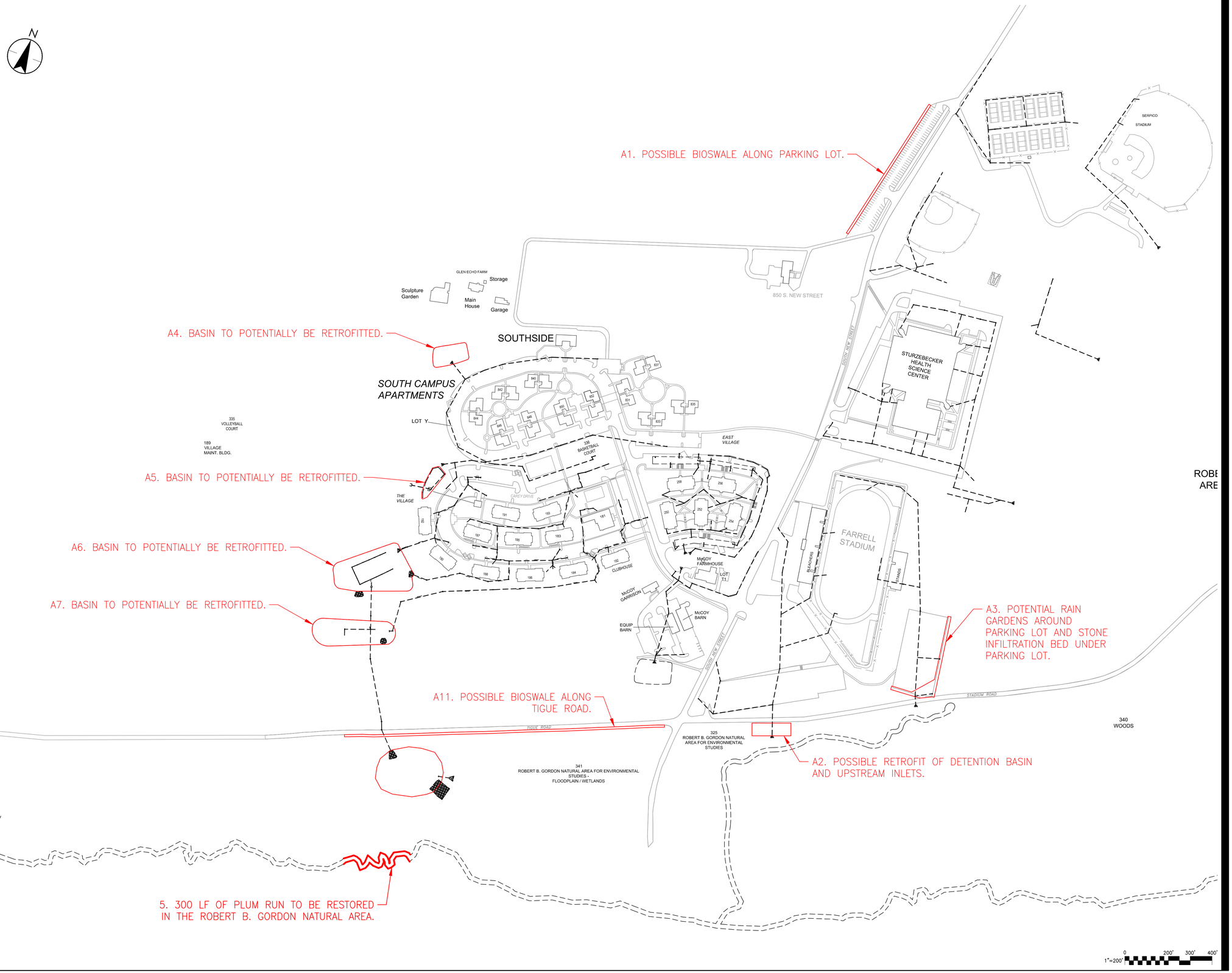
Project No.
218011974

Scale
1" = 200'

Revision
0

Sheet
1 of 1

Drawing No.
NC



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LEGEND

STORM INLET	
STORM MANHOLE	
STORM PIPE	
CLEANOUT	
ENDWALL	
STREAM	
STORMWATER BASIN BOUNDARY	
INSTALLED PRP BMP PROJECT BOUNDARY	
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Revision	By	Appd	YYYY.MM.DD
File Name: 218011974 - SOUTH CAMPUS	RB	RB	GI	2023.08.11
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Permit/Seal

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Client/Project
WEST CHESTER UNIVERSITY

INLET MAP

WEST CHESTER, PA

Title
SOUTH CAMPUS

Project No.
218011974

Scale
1" = 200'

Revision
0

Sheet
1 of 1

Drawing No.
SC

Appendix D Existing Loading

Title:	Loading Calculations	Revised By:	GKK
Project #:	218011974	Date:	6/17/2024
Prepared By:	TJN	Checked By:	GKK
Date:	10/17/2023	Date:	6/17/2024

BRANDYWINE CREEK WATERSHED AREA

Campus area within Brandywine Creek Watershed	17,029,782	sq. ft
Impervious Developed, Area	3,222,003	sq. ft
Pervious Developed, Area	13,807,867	sq. ft
Non Developed Area	-	sq. ft

Brandywine Creek PRP Sediment Loading Calculations

Land Cover	Area		TN		TP		TSS	
	(sf)	(ac)	#/ac/yr	lb/yr	#/ac/yr	lb/yr	#/ac/yr	lb/yr
Undeveloped Area	-	-		-		-		-
Impervious Developed	3,222,003	73.97	21.15	1,564.40	1.46	107.99	1504.78	111,304.06
Pervious Developed	13,807,867	316.99	14.09	4,466.32	0.36	114.11	185.12	58,680.26
Total	**17,029,869**	**390.95**		**6,030.72**		**222.11**		**169,984.33**

Required 10% Reduction due to Siltation:	**16,998.4**	**lb/year TSS**
Installed BMPS to date:	5,524.69	lb/year TSS
Remaining Minimum Required Reduction	**11,473.75**	**lb/year TSS**

BMPs to Reduce Siltation

BMP Name	BMP Effectiveness			BMP Area	Pollutant Removal
	TN	TP	Sediment		
(5) Stream Restoration	0.075 lb/ft/yr	0.068 lb/ft/yr	44.88 lb/ft/yr	300 lf	13,464.00 lb/yr
Total TSS Reduction					**13,464**

See attached BMP Loading Claculations for Previously Installed BMPs and Alternative BMPs

Title:	Loading Calculations	Revised By:	GKK
Project #:	218011974	Date:	6/17/2024
Prepared By:	TJN	Checked By:	GKK
Date:	10/17/2023	Date:	6/17/2024

CHESTER CREEK WATERSHED AREA

Campus area within Chester Creek Watershed	598,514	sq. ft
Impervious Developed, Area	371,131	sq. ft
Pervious Developed, Area	227,383	sq. ft
Non Developed Area	-	sq. ft

Chester Creek PRP Sediment Loading Calculations

Land Cover	Area		TN		TP		TSS	
	(sf)	(ac)	#/ac/yr	lb/yr	#/ac/yr	lb/yr	#/ac/yr	lb/yr
Undeveloped Area	-	-		-		-		-
Impervious Developed	371,131	8.52	21.15	180.20	1.46	12.44	1504.78	12,820.73
Pervious Developed	227,383	5.22	14.09	73.55	0.36	1.88	185.12	966.33
Total	**598,514**	**13.74**		**253.75**		**14.32**		**13,787.05**

Required 10% Reduction due to Siltation: 1,378.71 lb/year TSS

BMP to Reduce Siltation

BMP Name	BMP Effectiveness			BMP Area	Pollutant Removal
	TN	TP	Sediment		
(7) Rain Gardens / Bioretention	85%	85%	95%	1.407 imp. ac.	2,011 lb/yr
Total TSS Reduction					**2,011**

Installed PRP BMP Removal Calculations

BMP #	BMP	BMP Name / Description	DA (sf)	Latitude	Longitude	Receiving Waters	Date Installed or Implemented	Within MS4 Drainage Area	Zoning District	Impervious Area Controlled (SF)	TSS Removal Efficiency (%)	Sediment Removed (#/Yr)
	Green Roof	Commons Building Green Roof	< 1 acre	39° 57' 08.8"	-75° 36' 05.2"	Brandywine Creek	2019	Yes	N/A			
1	Infiltration Bed	University and Allegheny Halls	< 1 acre	39° 57' 05.5"	-75° 36' 06.4"	Brandywine Creek	2019	Yes	N/A	39,057	95%	1,281.76
2	Infiltration Bed	Commons Building	< 1 acre	39° 57' 09.9"	-75° 36' 05.4"	Brandywine Creek	2019	Yes	N/A	26,850	95%	933.04
3	Rain Garden	University Ave	< 1 acre	39° 57' 06.9"	-75° 36' 05.5"	Brandywine Creek	2019	Yes	N/A	17,774	90%	552.60
4	Detention Vault	Commons Building Parking Facility	< 1 acre	39° 57' 05.9"	-75° 36' 08.2"	Brandywine Creek	2019	Yes	N/A	30,375	10%	104.93
	Permeable Pavers		< 1 acre	39° 57' 07.0"	-75° 36' 06.0"	Brandywine Creek	2019	Yes	N/A			
6	Tree Planting	North Campus Tree Planting		39° 57' 07.0"	-75° 36' 06.0"	Brandywine Creek	2020-2024	Yes	N/A	111,360	20%	770.45
A10	Bioswale	WCU Parking Lot L	2 acres			Brandywine Creek		Yes	N/A	56,800	90%	1,881.91
										Total		**5,524.69**

Alternative BMP Removal Calculations

BMP #	BMP	BMP Name / Description	DA (sf)	Latitude	Longitude	Receiving Waters	Date Installed or Implemented	Within MS4 Drainage Area	Zoning District	Impervious Area Controlled (SF)	TSS Removal Efficiency (%)	Sediment Removed (#/Yr)
A1	Bioswale	WCU Parking Lot S	<1 acre			Brandywine Creek		Yes	N/A	32,000	90%	994.90
A2	Detention Basin	WCU Parking Lot Q	10 acres			Brandywine Creek		Yes	N/A	291,790	95%	10,156.49
A3	Bioretention	South Parking Lot	7 acres			Brandywine Creek		Yes	N/A	61,420	95%	2,998.73
A4	Basin	North side of WCU South Campus Apartments	11 acres			Brandywine Creek		Yes	N/A	219,670	60%	5,214.76
A5	Basin w/ Underdrain	WCU South Campus Apartments Basketball Court	1 acre			Brandywine Creek		Yes	N/A	38,025	70%	935.97
A6	Basin w/ Underdrain	South side of WCU South Campus Apartments	10 acres			Brandywine Creek		Yes	N/A	192,340	70%	5,374.73
A7	Basin w/ Underdrain	WCU South Campus Apartments Buildings 181-182	5 acres			Brandywine Creek		Yes	N/A	41,900	70%	1,536.48
A8	Basin	Swope Detention Basin Conversion	9 acres			Brandywine Creek		Yes	N/A	210,410	60%	4,824.30
A9	Basin	WCU Student Union Parking Basin	7 acres			Brandywine Creek		Yes	N/A	171,680	60%	3,898.15
A11	Bioswale	Tigue Road / Plum Run Trail	1 acre			Brandywine Creek		Yes	N/A	29,380	90%	967.67
A12	Bioswale	New Street Parking Garage	1 acre			Brandywine Creek		Yes	N/A	38,170	90%	1,207.34
Total												**38,109.53**

Appendix E BMP Effectiveness Value

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STORMWATER DISCHARGES FROM
SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS
BMP EFFECTIVENESS VALUES

This table of BMP effectiveness values (i.e., pollutant removal efficiencies) is intended for use by MS4s that are developing and implementing Pollutant Reduction Plans and TMDL Plans to comply with NPDES permit requirements. The values used in this table generally consider pollutant reductions from both overland flow and reduced downstream erosion, and are based primarily on average values within the Chesapeake Assessment Scenario Tool (CAST) (www.casttool.org). Design considerations, operation and maintenance, and construction sequences should be as outlined in the Pennsylvania Stormwater BMP Manual, Chesapeake Bay Program guidance, or other technical sources. The Department of Environmental Protection (DEP) will update the information contained in this table as new information becomes available. Interested parties may submit information to DEP for consideration in updating this table to DEP's MS4 resource account, RA-EPPAMS4@pa.gov. Where an MS4 proposes a BMP not identified in this document or in Chesapeake Bay Program expert panel reports, other technical resources may be consulted for BMP effectiveness values. Note – TN = Total Nitrogen and TP = Total Phosphorus.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Wet Ponds and Wetlands	20%	45%	60%	A water impoundment structure that intercepts stormwater runoff then releases it to an open water system at a specified flow rate. These structures retain a permanent pool and usually have retention times sufficient to allow settlement of some portion of the intercepted sediments and attached nutrients/toxics. Until recently, these practices were designed specifically to meet water quantity, not water quality objectives. There is little or no vegetation living within the pooled area nor are outfalls directed through vegetated areas prior to open water release. Nitrogen reduction is minimal.
Dry Detention Basins and Hydrodynamic Structures	5%	10%	10%	Dry Detention Ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Hydrodynamic Structures are devices designed to improve quality of stormwater using features such as swirl concentrators, grit chambers, oil barriers, baffles, micropools, and absorbent pads that are designed to remove sediments, nutrients, metals, organic chemicals, or oil and grease from urban runoff.
Dry Extended Detention Basins	20%	20%	60%	Dry extended detention (ED) basins are depressions created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms. Dry ED basins are designed to dry out between storm events, in contrast with wet ponds, which contain standing water permanently. As such, they are similar in construction and function to dry detention basins, except that the duration of detention of stormwater is designed to be longer, theoretically improving treatment effectiveness.

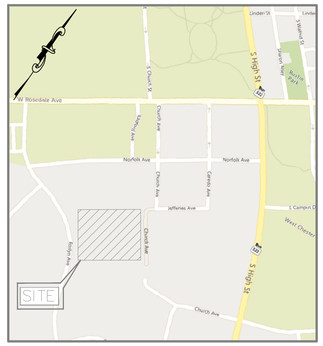
BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Infiltration Practices w/ Sand, Veg.	85%	85%	95%	A depression to form an infiltration basin where sediment is trapped and water infiltrates the soil. No underdrains are associated with infiltration basins and trenches, because by definition these systems provide complete infiltration. Design specifications require infiltration basins and trenches to be built in good soil, they are not constructed on poor soils, such as C and D soil types. Engineers are required to test the soil before approval to build is issued. To receive credit over the longer term, jurisdictions must conduct yearly inspections to determine if the basin or trench is still infiltrating runoff.
Filtering Practices	40%	60%	80%	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter. These systems require yearly inspection and maintenance to receive pollutant reduction credit.
Filter Strip Runoff Reduction	20%	54%	56%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.4 design ratio of filter strip length to impervious flow length is recommended for runoff reduction urban filter strips.
Filter Strip Stormwater Treatment	0%	0%	22%	Urban filter strips are stable areas with vegetated cover on flat or gently sloping land. Runoff entering the filter strip must be in the form of sheet-flow and must enter at a non-erosive rate for the site-specific soil conditions. A 0.2 design ratio of filter strip length to impervious flow length is recommended for stormwater treatment urban filter strips.
Bioretention – Raingarden (C/D soils w/ underdrain)	25%	45%	55%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in C or D soil.
Bioretention / Raingarden (A/B soils w/ underdrain)	70%	75%	80%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has an underdrain and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Bioretention / Raingarden (A/B soils w/o underdrain)	80%	85%	90%	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants. This BMP has no underdrain and is in A or B soil.
Vegetated Open Channels (C/D Soils)	10%	10%	50%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in C or D soil.
Vegetated Open Channels (A/B Soils)	45%	45%	70%	Open channels are practices that convey stormwater runoff and provide treatment as the water is conveyed, includes bioswales. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils. This BMP has no underdrain and is in A or B soil.
Bioswale	70%	75%	80%	With a bioswale, the load is reduced because, unlike other open channel designs, there is now treatment through the soil. A bioswale is designed to function as a bioretention area.
Permeable Pavement w/o Sand or Veg. (C/D Soils w/ underdrain)	10%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in C or D soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/ underdrain)	45%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/o Sand or Veg. (A/B Soils w/o underdrain)	75%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, no sand or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (A/B Soils w/ underdrain)	50%	50%	70%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in A or B soil.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Permeable Pavement w/ Sand or Veg. (A/B Soils w/o underdrain)	80%	80%	85%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has no underdrain, has sand and/or vegetation and is in A or B soil.
Permeable Pavement w/ Sand or Veg. (C/D Soils w/ underdrain)	20%	20%	55%	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms. Water filters through open voids in the pavement surface to a washed gravel subsurface storage reservoir, where it is then slowly infiltrated into the underlying soils or exits via an underdrain. This BMP has an underdrain, has sand and/or vegetation and is in C or D soil.
Stream Restoration	0.075 lbs/ft/yr	0.068 lbs/ft/yr	44.88 lbs/ft/yr	An annual mass nutrient and sediment reduction credit for qualifying stream restoration practices that prevent channel or bank erosion that otherwise would be delivered downstream from an actively enlarging or incising urban stream. Applies to 0 to 3rd order streams that are not tidally influenced. If one of the protocols is cited and pounds are reported, then the mass reduction is received for the protocol.
Forest Buffers	25%	50%	50%	An area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. The riparian area is managed to maintain the integrity of stream channels and shorelines, to reduce the impacts of upland sources of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals. (Note – the values represent pollutant load reductions from stormwater draining through buffers).
Tree Planting	10%	15%	20%	The BMP effectiveness values for tree planting are estimated by DEP. DEP estimates that 100 fully mature trees of mixed species (both deciduous and non-deciduous) provide pollutant load reductions for the equivalent of one acre (i.e., one mature tree = 0.01 acre). The BMP effectiveness values given are based on immature trees (seedlings or saplings); the effectiveness values are expected to increase as the trees mature. To determine the amount of pollutant load reduction that can credited for tree planting efforts: 1) multiply the number of trees planted by 0.01; 2) multiply the acreage determined in step 1 by the pollutant loading rate for the land prior to planting the trees (in lbs/acre/year); and 3) multiply the result of step 2 by the BMP effectiveness values given.
Street Sweeping	3%	3%	9%	Street sweeping must be conducted 25 times annually. Only count those streets that have been swept at least 25 times in a year. The acres associated with all streets that have been swept at least 25 times in a year would be eligible for pollutant reductions consistent with the given BMP effectiveness values.

BMP Name	BMP Effectiveness Values			BMP Description
	TN	TP	Sediment	
Storm Sewer System Solids Removal	0.0027 for sediment, 0.0111 for organic matter	0.0006 for sediment, 0.0012 for organic matter	1 – TN and TP concentrations	This BMP (also referred to as "Storm Drain Cleaning") involves the collection or capture and proper disposal of solid material within the storm system to prevent discharge to surface waters. Examples include catch basins, stormwater inlet filter bags, end of pipe or outlet solids removal systems and related practices. Credit is authorized for this BMP only when proper maintenance practices are observed (i.e., inspection and removal of solids as recommended by the system manufacturer or other available guidelines). The entity using this BMP for pollutant removal credits must demonstrate that they have developed and are implementing a standard operating procedure for tracking the material removed from the sewer system. Locating such BMPs should consider the potential for backups onto roadways or other areas that can produce safety hazards. To determine pollutant reductions for this BMP, these steps must be taken: 1) Measure the weight of solid/organic material collected (lbs). Sum the total weight of material collected for an annual period. Note – do not include refuse, debris and floatables in the determination of total mass collected. 2) Convert the annual wet weight captured into annual dry weight (lbs) by using site-specific measurements (i.e., dry a sample of the wet material to find its weight) or by using default factors of 0.7 (material that is predominantly wet sediment) or 0.2 (material that is predominantly wet organic matter, e.g., leaf litter). 3) Multiply the annual dry weight of material collected by default or site-specific pollutant concentration factors. The default concentrations are shown in the BMP Effectiveness Values columns. Alternatively, the material may be sampled (at least annually) to determine site-specific pollutant concentrations. DEP will allow up to 50% of total pollutant reduction requirements to be met through this BMP. The drainage area treated by this BMP may be no greater than 0.5 acre unless it can be demonstrated that the specific system proposed is capable of treating stormwater from larger drainage areas. For planning purposes, the sediment removal efficiency specified by the manufacturer may be assumed, but no higher than 80%.

Appendix F Alternative BMP A9 and A10 Drawings



LOCATION MAP
1" = 500'

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING SITE CONDITIONS.
2. DATUM:
   HORIZONTAL = PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83.
   VERTICAL = NAVD88
3. WATERSHED:
   BRANDYWINE CREEK, MAIN STEM
   PA CODE CHAPTER 93 WATER USE:
   WWF (WARM WATER FISHES)
   WATERSHED WAS IDENTIFIED USING THE WATERSHEDS OF CHESTER COUNTY MAP.
4. SOIL TYPE:
   UrlB, URBAN LAND–GLADSTONE COMPLEX, 0 TO 8 PERCENT SLOPES.
5. SOIL BOUNDARY:
   100 PERCENT OF SITE IS SOIL TYPE UrlB
6. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON SHALL BE CONSIDERED APPROXIMATE. THE UTILITY INFORMATION HAS BEEN DEVELOPED FROM THE GRADING, STORMWATER, & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993.
7. PLAN INFORMATION WAS OBTAINED FROM THE GRADING, STORMWATER & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993. PLAN INFORMATION WAS NOT OBTAINED FROM A SURVEY.
8. ACCORDING TO FEMA FIRM PANEL 42029C0210G, THE PROJECT SITE IS COMPLETELY WITHIN ZONE X – AREA OF MINIMAL FLOOD HAZARD.
9. COORDINATE THE LOCATION OF SITE IMPROVEMENTS WITH ALL UNDERGROUND UTILITY LOCATIONS AND PROTECT EXISTING INFRASTRUCTURE.

EXISTING LEGEND:

PROPERTY LINE	INLET
UNDERGROUND STORM LINE	MANHOLE
FENCE LINE	END WALL/SECTION
GUIDE RAIL LINE	RISER PIPE
MAJOR CONTOUR LINE	DOUBLE UNIT 24' LIGHT POLE
MINOR CONTOUR LINE	SINGLE UNIT 10' LIGHT POLE
	DECIDUOUS TREE

DEMO LEGEND:

FENCE TO BE REMOVED	
TREE PROTECTION FENCE	
LIMIT OF DISTURBANCE	
LIMIT OF CONTRACT LINE	

CIVIL ENGINEER'S CERTIFICATION OF CONFORMANCE:

I PETER C. MYERS, ON THIS DATE 09/21/2023, HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, THAT THE SWM SITE PLAN MEETS ALL DESIGN STANDARDS AND CRITERIA OF THE WEST GOSHEN TOWNSHIP STORMWATER ORDINANCE CHAPTER 71.

THIS 21ST DAY OF SEPTEMBER, 2023

Peter C Myers
PETER C. MYERS, PE — PE054696E, PA PE LICENSE #

SWM ACKNOWLEDGEMENT:

ANY REVISION TO THE APPROVED SWM SITE PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE MUNICIPALITY, AND A REVISED EROSION AND SEDIMENT CONTROL PLAN SHALL BE SUBMITTED TO, AND APPROVED BY, THE CONSERVATION DISTRICT OR MUNICIPALITY FOR A DETERMINATION OF ADEQUACY PRIOR TO CONSTRUCTION OF THE REVISED FEATURES.

THIS 21ST DAY OF SEPTEMBER, 2023

Peter C Myers
PETER C. MYERS, PE — PE054696E, PA PE LICENSE #

CIVIL ENGINEER / PLAN PREPARER

HUNT ENGINEERING COMPANY
PETER C. MYERS, PE
22 EAST KING STREET
P.O. BOX 537
MALVERN, PA 19355
OFFICE: (610) 644–4600
CELL: (610) 620–3947
FAX: (610) 644–2466
EMAIL: PMYERS@HUNTENGINEERING.COM
PA PE LICENSE #: PE054696E

OWNER

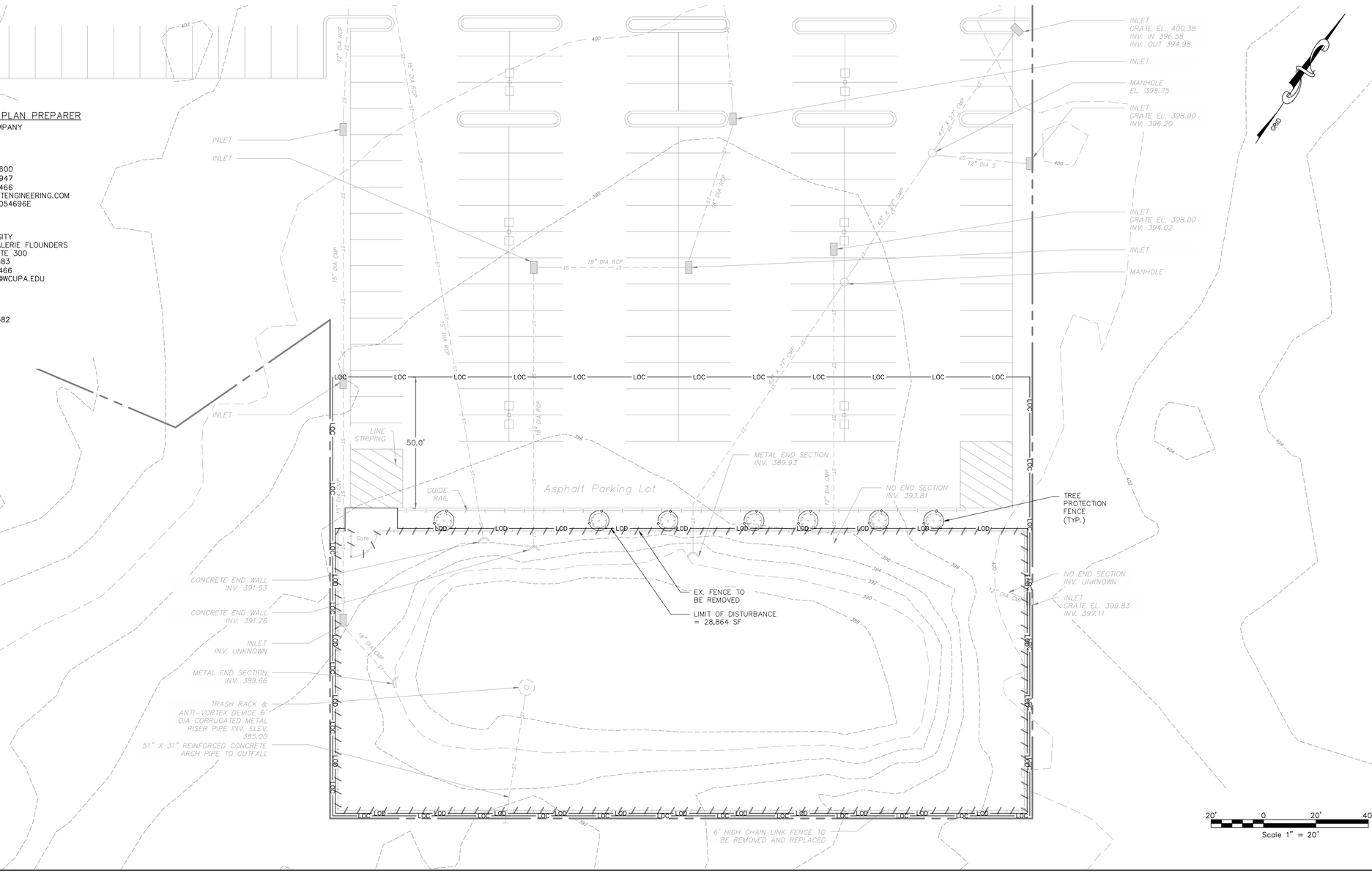
WEST CHESTER UNIVERSITY
POINT OF CONTACT: VALERIE FLOUNDERS
201 CARTER DRIVE, SUITE 300
WEST CHESTER, PA 19383
PHONE: (610) 436–3466
EMAIL: VFLOUNDERS@WCUPA.EDU

SITE ADDRESS

101 NORFOLK AVENUE
WEST CHESTER, PA 19382

PARCEL NUMBER

5205N0026000E



20' 0 20' 40'
Scale 1" = 20'

Before You Dig Anywhere
In... PENNSYLVANIA
STOP! CALL 1–800–242–1776 TOLL FREE
PA Act 287 OF 1974, as amended requires notification to one call system 3 working days for construction phase and 10 working days for design phase before you excavate.
PA ONE CALL SYSTEM, INC.

NO.	DATE	DESCRIPTION

SEAL:
COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — PETER C. MYERS — ENGINEER — 054-696-E

Date: 09–21–23

HUNT ENGINEERING COMPANY
P.O. Box 537 | 22 East King Street | Malvern, PA 19355
610.644.4600 | www.huntengineering.com

SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY

TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

EXISTING CONDITIONS & SITE DEMOLITION PLAN

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09–01–23	C–100
CHECKED BY	SCALE	
C. CAROLA	1" = 20'	SHEET NO. 1 OF 8

LOCATION MAP
1" = 500'

SITE DEMOLITION NOTES:

1. THE PURPOSE OF THE EXISTING CONDITIONS & SITE DEMOLITION PLAN IS TO SHOW EXISTING SITE TOPOGRAPHY, UTILITIES, AND REQUIRED SITE DEMOLITION.
2. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE EROSION & SEDIMENTATION CONTROL PLAN, DETAILS, AND NOTES PRIOR TO SITE CLEARING OR DEMOLITION ACTIVITIES.
3. THE CONTRACTOR SHALL DOCUMENT THE CONDITION OF ALL EXISTING FEATURES TO REMAIN, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, PRIOR TO THE START OF DEMOLITION OR CONSTRUCTION. ANY FEATURES DAMAGED OR DESTROYED SHALL BE REPAIRED OR REPLACED IN KIND TO THE SATISFACTION OF THE OWNER AT THE CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING BUILDINGS, AS NECESSARY, DURING CONSTRUCTION, AND PROVIDE PROTECTION FOR PEDESTRIAN AND VEHICULAR TRAFFIC THAT MAINTAINS NORMAL USAGE.
5. ALL ITEMS IDENTIFIED AS "TO BE REMOVED AND REINSTALLED" OR "TBR&R" SHALL BE CAREFULLY REMOVED IN A MANNER AS TO MAINTAIN THE CONDITION AND INTEGRITY OF THE ITEM, STORED AND PROTECTED FROM DAMAGE, AND REINSTALLED AS PART OF FINISHED CONSTRUCTION.
6. ALL EXCAVATIONS AND SUBSURFACE VOIDS SHALL BE BACKFILLED AND COMPACTED WITH SATISFACTORY SOIL MATERIAL TO SUBGRADE ELEVATION IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
7. ALL MISCELLANEOUS FOUNDATIONS FOR ITEMS SHOWN AS TO BE REMOVED (SIGNS, ETC...) SHALL BE COMPLETELY REMOVED.
8. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND EXTENTS OF DEMOLITION WORK WITH WEST CHESTER UNIVERSITY.
9. EXISTING SIDEWALKS, CURB OR ASPHALT PAVEMENT DISTURBED OR REMOVED SHALL BE REPLACED IN KIND.
10. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS HAVE BEEN DEVELOPED FROM INFORMATION MADE AVAILABLE THROUGH THE PA ONE CALL SYSTEM AND OTHER REFERENCE PLANS AS NOTED. THE EXTENT, EXACT LOCATION AND DEPTH OF UNDERGROUND UTILITIES HAS NOT BEEN INDEPENDENTLY VERIFIED BY THE PROFESSIONAL. ALL CONTRACTORS AND DESIGNERS ARE CAUTIONED TO COMPLY WITH THE REQUIREMENTS OF PENNSYLVANIA ACT 287 AND ALL AMENDMENTS.
11. THE CONTRACTOR SHALL PLACE A PA ONE CALL (1-800-242-1776) FOR DEMOLITION IMMEDIATELY FOLLOWING NOTICE TO PROCEED.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE EXISTING SITE CONDITIONS.
2. DATUM:
   HORIZONTAL = PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83.
   VERTICAL = NAVD88
3. WATERSHED:
   BRANDYWINE CREEK, MAIN STEM
   WATERSHED WAS IDENTIFIED USING THE WATERSHEDS OF CHESTER COUNTY MAP.
4. SOIL TYPE:
   UrlB, URBAN LAND-GLADSTONE COMPLEX, 0 TO 8 PERCENT SLOPES.
5. SOIL BOUNDARY:
   100 PERCENT OF SITE IS SOIL TYPE UrlB
6. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON SHALL BE CONSIDERED APPROXIMATE. THE UTILITY INFORMATION HAS BEEN DEVELOPED FROM THE GRADING, STORMWATER, & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993.
7. PLAN INFORMATION WAS OBTAINED FROM THE GRADING, STORMWATER & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993. PLAN INFORMATION WAS NOT OBTAINED FROM A SURVEY.
8. COORDINATE THE LOCATION OF SITE IMPROVEMENTS WITH ALL UNDERGROUND UTILITY LOCATIONS AND PROTECT EXISTING INFRASTRUCTURE.

EXISTING LEGEND:

PROPERTY LINE
UNDERGROUND STORM LINE
FENCE LINE
GUIDE RAIL LINE
MAJOR CONTOUR LINE
MINOR CONTOUR LINE

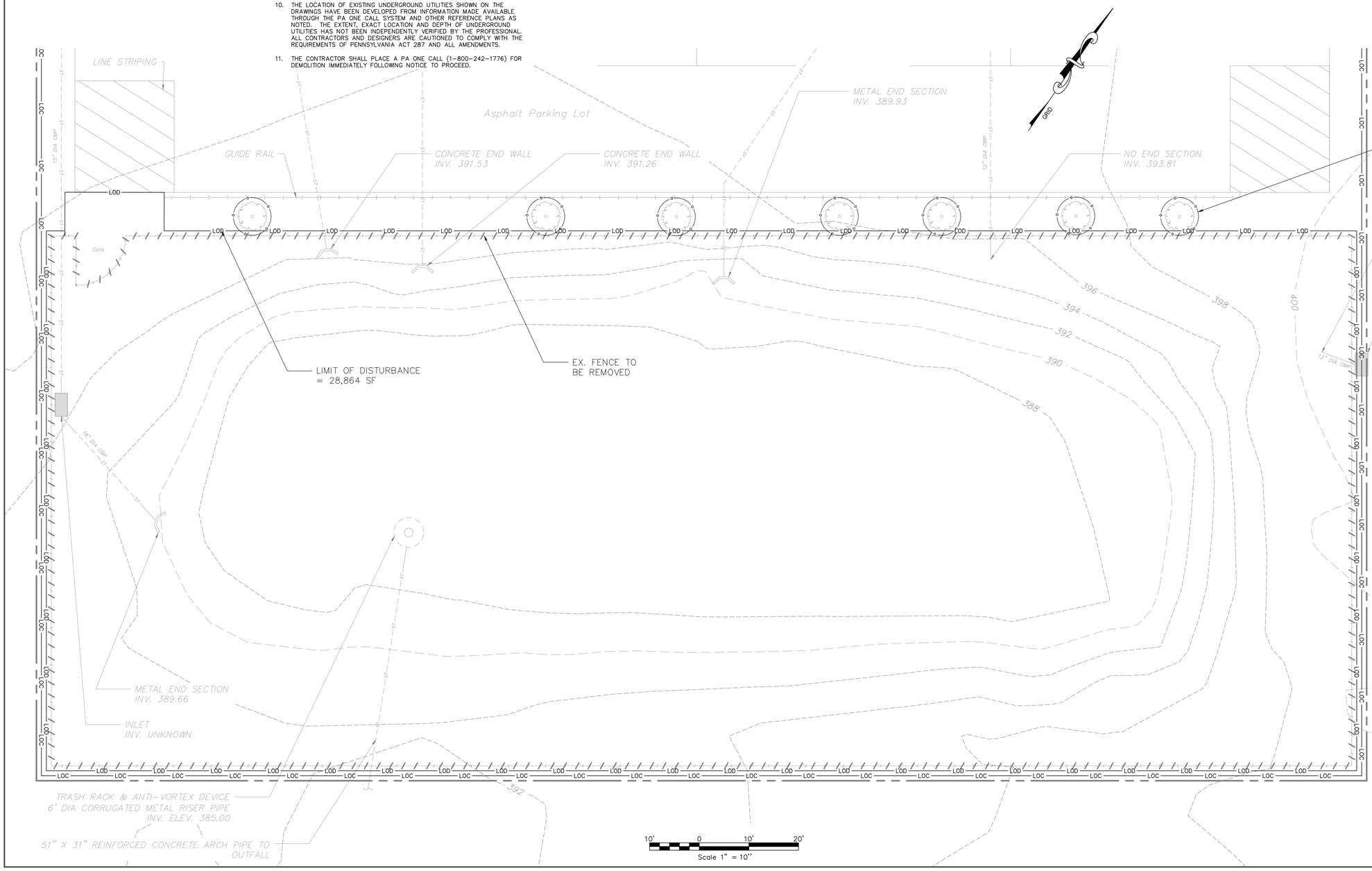
FENCE TO BE REMOVED
TREE PROTECTION FENCE
LIMIT OF DISTURBANCE
LIMIT OF CONTRACT LINE

INLET
MANHOLE
END WALL/SECTION
RISER PIPE
DOUBLE UNIT 24' LIGHT POLE
SINGLE UNIT 10' LIGHT POLE
DECIDUOUS TREE

DEMO LEGEND:
LOD
LOC

GENERAL NOTES:

1. ALL CONTRACTORS UTILIZING THIS PLAN AND THE INFORMATION CONTAINED THEREON ARE CAUTIONED TO COMPLY WITH THE REQUIREMENTS OF PENNSYLVANIA ACT 287. ALL LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS HAVE BEEN DEVELOPED FROM INFORMATION MADE AVAILABLE THROUGH THE DEPARTMENT, OTHER REFERENCE PLANS AS NOTED, LAND SURVEY, AND SUBSURFACE UTILITY ENGINEERING. THE EXTENT, EXACT LOCATION AND DEPTH OF UNDERGROUND UTILITIES HAVE NOT BEEN PHYSICALLY LOCATED. COMPLETENESS OR ACCURACY OF THE LOCATIONS AND DEPTHS OF UNDERGROUND UTILITIES OR STRUCTURES CANNOT BE GUARANTEED. THE CONTRACTORS ARE TO VERIFY THE DEPTH AND LOCATION OF ALL UTILITIES AND FACILITIES BEFORE THE START OF WORK. UTILIZE HAND EXCAVATION AS REQUIRED. WORK IS ALSO TO BE DONE IN ACCORDANCE WITH THE STANDARDS OF THE UTILITY COMPANIES WHOSE FACILITIES ARE IN THE PROXIMITY OF THE WORK. OTHER UTILITIES MAY BE PRESENT AT THIS LOCATION NOT SHOWN ON THIS PLAN. PURSUANT TO THE REQUIREMENTS OF PENNSYLVANIA ACT 287 OF 1974 AS AMENDED BY ACT 199 OF 2004 73P.S. §176 ET. SEQ., THE CONTRACTOR SHALL CONTACT THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776, AT LEAST 3 DAYS PRIOR TO EXCAVATION.
2. DO NOT SCALE THE DRAWINGS.
3. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE FEDERAL, STATE AND LOCAL CODES, AND ALL REGULATIONS APPURTENANT TO THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. ALL WORK SHALL BE DONE IN ACCORDANCE WITH PROJECT SPECIFICATIONS INCLUDING CURRENT APPLICABLE STANDARDS AND REQUIREMENTS. WHERE ANY STANDARDS SEEM IN CONFLICT WITH THESE DRAWINGS, NOTIFY THE DEPARTMENT OR FOR DIRECTION PRIOR TO PROCEEDING WITH WORK.
4. WEST CHESTER UNIVERSITY RESERVES THE RIGHT TO INSPECT ANY PORTION OF THE WORK AND REQUEST CORRECTION TO THEIR SATISFACTION FOR ALL WORK NOT COMPLETED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS. INSPECTION OR SITE OBSERVATION OF WORK BY THE PROFESSIONAL DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF CONFORMING TO THE DRAWINGS AND SPECIFICATIONS FOR ALL CONSTRUCTION.
5. ALL CONTRACTORS SHALL HAVE ALL REQUIRED SUBMITTAL APPROVALS PRIOR TO BEGINNING THE WORK OR ORDERING MATERIALS.
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, INVERTS, ELEVATIONS, AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH THE WORK. VARIATIONS BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DEPARTMENT, AND THE PROFESSIONAL, AND RESOLVED PRIOR TO PROCEEDING WITH THE WORK.
7. THE CONTRACTOR SHALL PROVIDE TEMPORARY DEWATERING OF EXCAVATIONS THROUGHOUT THE DURATION OF CONTRACT AT NO ADDITIONAL CONTRACT COST.
8. THE CONTRACTOR SHALL VERIFY THE STRUCTURAL CONDITIONS OF AFFECTED AREAS AND UTILIZE APPROPRIATE METHODS IN ORDER TO ASSURE THE STRUCTURAL INTEGRITY OF THE REMAINING STRUCTURAL COMPONENTS PRIOR TO DEMOLITION AND/OR EXCAVATION. CONTRACTOR SHALL NOT UNDERMINE EXISTING STRUCTURES.



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PA ONE CALL SYSTEM, INC.

NO.	DATE	DESCRIPTION

SEAL:
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
PETER C. MYERS
ENGINEER
054-696-E

Date: 09-21-23

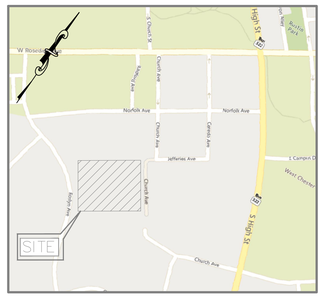
HUNT ENGINEERING COMPANY
P.O. Box 537 | 22 East King Street | Malvern, PA 19355
610.644.4600 | www.huntengineering.com

SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY

TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

EXISTING CONDITIONS & SITE DEMOLITION PLAN

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09-01-23	C-101
CHECKED BY	SCALE	
C. CAROLA	1" = 10'	SHEET NO. 2 OF 8



LOCATION MAP
1" = 500'

EXISTING LEGEND:

- PROPERTY LINE
- UNDERGROUND STORM LINE
- FENCE LINE
- GUIDE RAIL LINE
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- INLET
- MANHOLE
- END WALL/SECTION
- RISER PIPE
- DOUBLE UNIT 24' LIGHT POLE
- SINGLE UNIT 10' LIGHT POLE
- DECIDUOUS TREE

PROPOSED LEGEND:

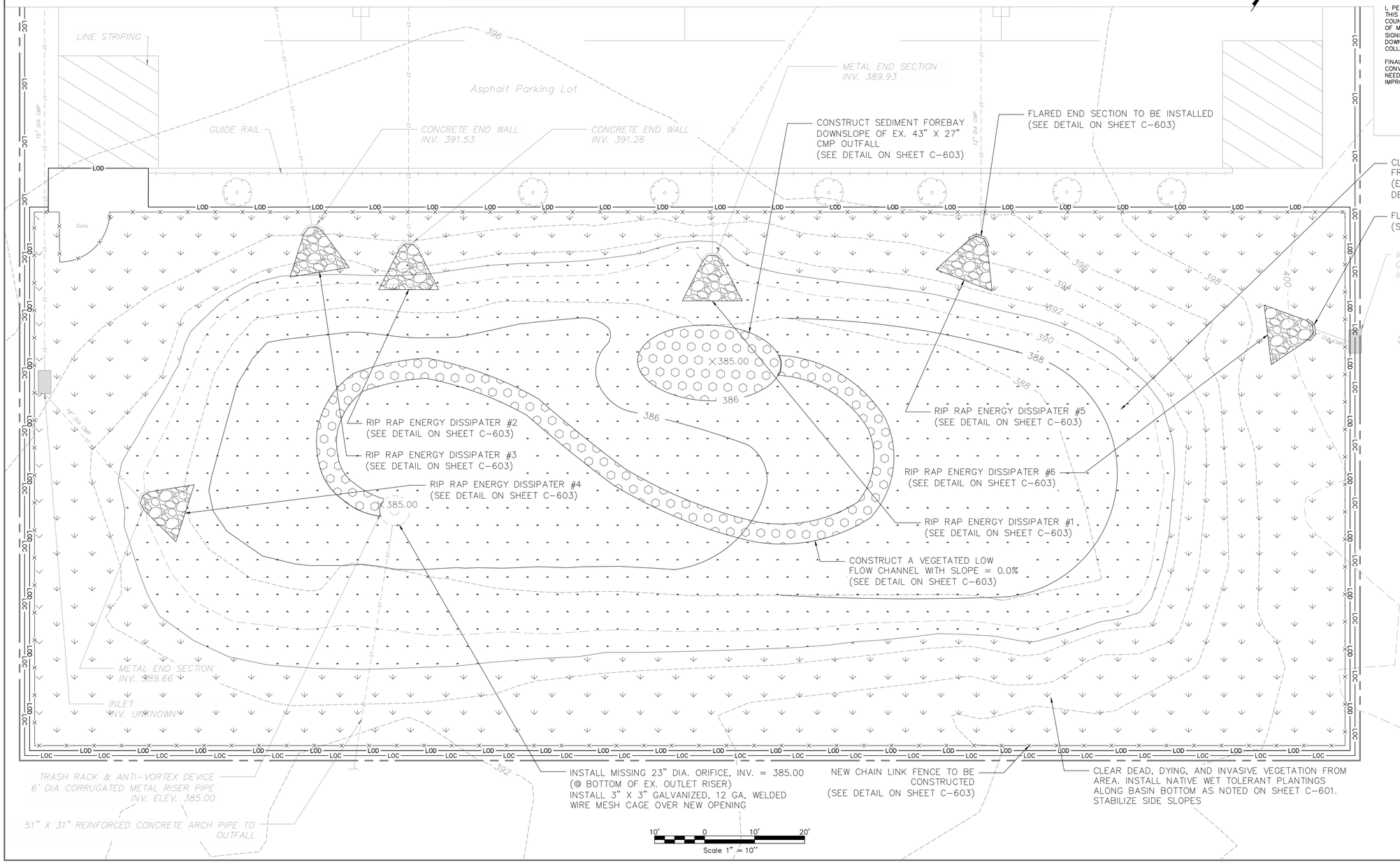
- CONTOUR LINE
- SPOT ELEVATION
- NEW FLARED END SECTION
- STONE
- MEADOW/GRASS
- BASIN BOTTOM (PLUG PLACEMENT)
- VEGETATED LOW FLOW CHANNEL

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED GRADING AND SITE IMPROVEMENTS ASSOCIATED WITH RENOVATIONS TO AN EXISTING BIO-RETENTION BASIN.
2. DATUM:
   HORIZONTAL = PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83.
   VERTICAL = NAVD88
3. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON SHALL BE CONSIDERED APPROXIMATE. THE UTILITY INFORMATION HAS BEEN DEVELOPED FROM THE GRADING, STORMWATER, & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993.
4. PLAN INFORMATION WAS OBTAINED FROM THE GRADING, STORMWATER & UTILITES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993. PLAN INFORMATION WAS NOT OBTAINED FROM A SURVEY.

O&M ACKNOWLEDGEMNT:

THE LANDOWNER ACKNOWLEDGES THAT, PER THE PROVISIONS OF THE MUNICIPALITY'S STORMWATER MANAGEMENT ORDINANCE, IT IS UNLAWFUL TO MODIFY, REMOVE, FILL, LANDSCAPE, ALTER OR IMPAIR THE EFFECTIVENESS OF, OR PLACE ANY STRUCTURE, OTHER VEGETATION, YARD WASTE, BRUSH CUTTING, OR OTHER WASTE OR DEBRIS INTO ANY PERMANENT STORMWATER MANAGEMENT BMP OR CONVEYANCE DESCRIBED IN THIS O&M PLAN OR TO ALLOW THE BMP OR CONVEYANCE TO EXIST IN A CONDITION WHICH DOES NOT CONFORM TO THIS O&M PLAN, WITHOUT WRITTEN APPROVAL FROM THE MUNICIPALITY.



OPERATIONS AND MAINTENANCE:

I _____, ACKNOWLEDGE THAT THE STORMWATER FACILITIES AND BMP'S ARE FIXTURES THAT CANNOT BE ALTERED OR REMOVED WITHOUT PRIOR APPROVAL BY THE MUNICIPALITY. I ACKNOWLEDGE THE RESPONSIBILITY OF PERPETUAL MAINTENANCE AND OPERATION OF THE STORMWATER BMP'S.

REFER TO STORMWATER OPERATIONS AND MAINTENANCE AGREEMENT FOR TOWNSHIP ACCESS TO INSPECT THE STORMWATER BASIN AND RIGHTS TO ACCESS THE FACILITY IN THE EVENT THE BASIN IS NOT PROPERLY MAINTAINED.

_____ _____ _____
(SIGNATURE) (DATE)

I _____, ACKNOWLEDGE THAT THE STORMWATER FACILITIES AND BMP'S ARE FIXTURES THAT CANNOT BE ALTERED OR REMOVED WITHOUT PRIOR APPROVAL BY THE MUNICIPALITY. I ACKNOWLEDGE THE RESPONSIBILITY OF PERPETUAL MAINTENANCE AND OPERATION OF THE STORMWATER BMP'S.

REFER TO STORMWATER OPERATIONS AND MAINTENANCE AGREEMENT FOR TOWNSHIP ACCESS TO INSPECT THE STORMWATER BASIN AND RIGHTS TO ACCESS THE FACILITY IN THE EVENT THE BASIN IS NOT PROPERLY MAINTAINED.

_____ _____ _____
(SIGNATURE) (DATE)

I _____, AM THE OWNER OF AND RESPONSIBLE FOR ONGOING INSPECTIONS, OPERATION, REPAIR, AND MAINTENANCE FOR EACH BMP OR CONVEYANCE AND HEREBY GRANT RIGHT OF ENTRY AND ACCESS FOR THE MUNICIPALITY FOR INSPECTIONS AND ENFORCEMENT OF THE LOWER OXFORD TOWNSHIP STORMWATER MANAGEMENT ORDIANCE AND ANY APPLICABLE O&M PLAN OR O&M AGREEMENT.

_____ _____
(SIGNATURE) (DATE)

I, PETER MYERS, ON THIS DATE _____, HEREBY CERTIFY THAT THIS DRAINAGE PLAN MEETS ALL REQUIREMENTS OF THE TOWNSHIP OF WEST GOSHEN, CHESTER COUNTY STORMWATER MANAGEMENT ORDINANCE. I, PETER MYERS, CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THAT THE PROPOSED GRADING ACTIVITIES SHALL NOT SIGNIFICANTLY INCREASE STORMWATER RUNOFF TO AND/ OR OTHERWISE ADVERSELY IMPACT DOWNSTREAM PROPERTIES EXCEPT AS MAY BE PART OF AN APPROVED STORMWATER RUNOFF COLLECTION AND MANAGEMENT PLAN.

FINAL AS-BUILT PLANS SIGNED AND SEALED BY A LICENSE PROFESSIONAL OF ALL BMPS, CONVEYANCES, AND RELATED IMPROVEMENTS SHOWN ON THE FINAL APPROVED PCSWM PLAN NEEDS TO BE PROVIDED TO THE TOWNSHIP AT THE CLOSE OF THE PROPOSED SITE IMPROVEMENTS AND PRIOR TO THE ISSUANCE OF ANY OCCUPANCY PERMIT.

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REGISTERED PROFESSIONAL
PETER C. MYERS
ENGINEER
054-696-E

Date: 09-21-23

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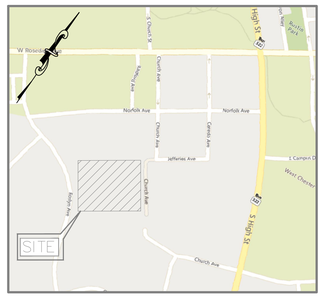
SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

GRADING PLAN

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09-01-23	C-300
CHECKED BY	SCALE	SHEET NO. 3 OF 8
C. CAROLA	1" = 10'	



LOCATION MAP
1" = 500'

EROSION AND SEDIMENTATION CONTROL PLAN NOTES:

THIS EROSION & SEDIMENTATION CONTROL PLAN WAS PREPARED FOR THIS PROJECT USING BMP'S SPECIFIED IN THE PENNSYLVANIA EROSION & SEDIMENTATION POLLUTION CONTROL MANUAL. THIS PLAN INCLUDES THE FOLLOWING:

1. A SEQUENCE OF CONSTRUCTION (SEE SHEET C-600) AND A LIMIT OF DISTURBANCE, THAT WILL BE ENFORCED THROUGH THE USE OF CONSTRUCTION FENCING AND TREE PROTECTION FENCING, THAT MINIMIZES THE EXTENT AND DURATION OF EARTH DISTURBANCE.
2. ABACT APPROVED CONTROLS, SUCH AS COMPOST FILTER SOCK, AND OTHER E&S CONTROLS, SUCH AS INLET SILT PROTECTION AND A ROCK CONSTRUCTION ENTRANCE, TO PROTECT EXISTING DRAINAGE FEATURES.
3. PROVIDES TREE PROTECTION FENCING AND TEMPORARY CONSTRUCTION FENCING TO PROTECT EXISTING VEGETATION.
4. DUE TO THE FEATURES LISTED IN 1 -3 ABOVE, THIS PLAN MINIMIZES THE GENERATION OF INCREASED RUNOFF DURING CONSTRUCTION.
5. IF THE CONTRACTOR ENCOUNTERS ANY SEEPS OR SPRINGS DURING CONSTRUCTION THEY MUST NOTIFY THE PROFESSIONAL IMMEDIATELY. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAINS, OR OTHER APPROVED METHOD.
6. SEDIMENT TRACKED ONTO ANY ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORKDAY, OR AS NEEDED, OR AS DIRECTED BY WEST CHESTER UNIVERSITY OR MUNICIPALITY AND DISPOSED OF IN A MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER OR SURFACE WATER.
7. ANY OFF-SITE WASTE AND BORROW AREA MUST HAVE AN E&S PLAN REVIEWED AND APPROVED BY WEST GOSHEN TOWNSHIP PRIOR TO BEING ACTIVATED.

EXISTING LEGEND:

PROPERTY LINE	INLET
UNDERGROUND STORM LINE	MANHOLE
FENCE LINE	END WALL/SECTION
GUIDE RAIL LINE	RISER PIPE
MAJOR CONTOUR LINE	DOUBLE UNIT 24' LIGHT POLE
MINOR CONTOUR LINE	SINGLE UNIT 10' LIGHT POLE
	DECIDUOUS TREE

NOTES:

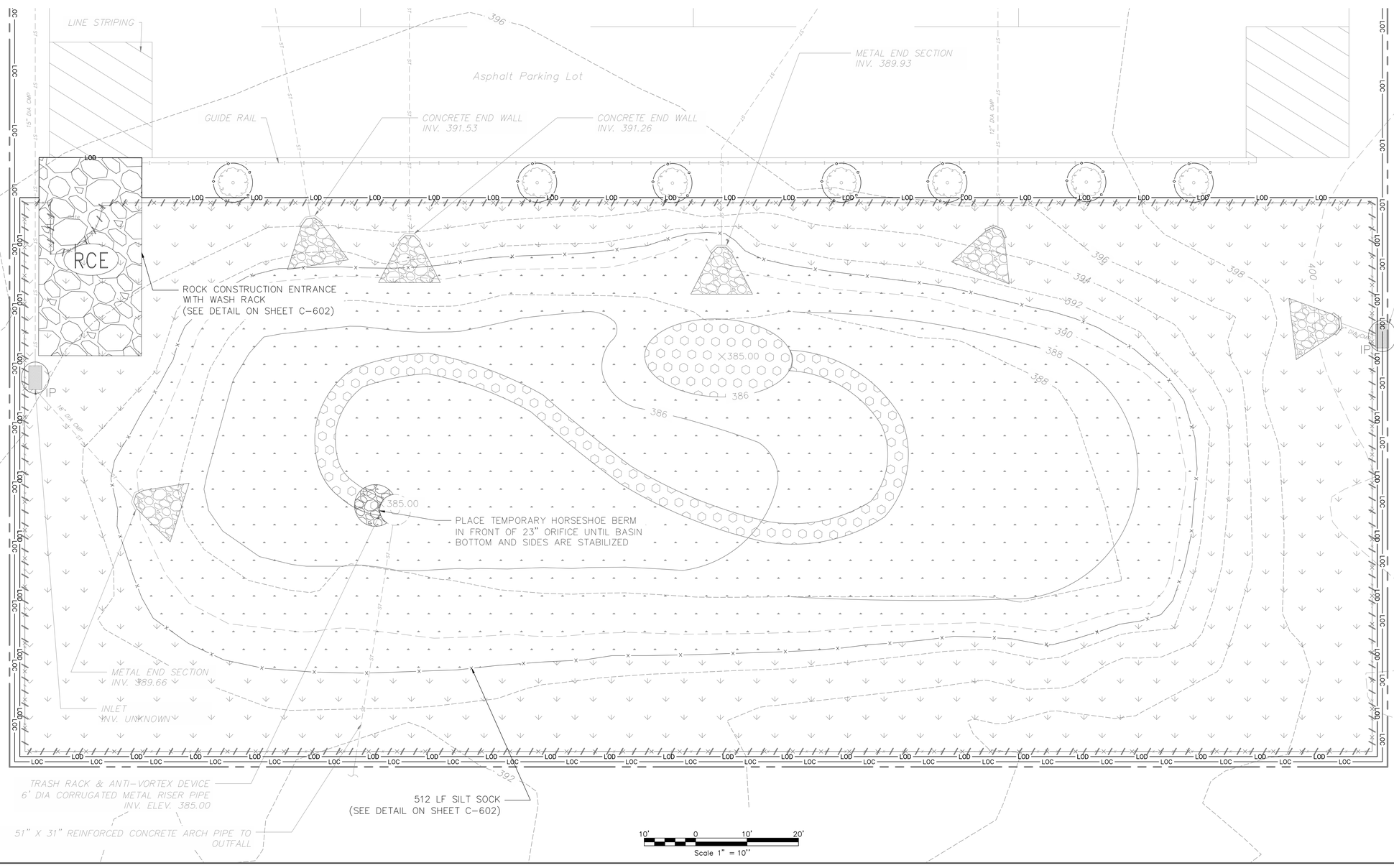
1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED EROSION CONTROL.
2. DATUM:
   HORIZONTAL = PENNSYLVANIA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, NAD 83.
   VERTICAL = NAVD88
3. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON SHALL BE CONSIDERED APPROXIMATE. THE UTILITY INFORMATION HAS BEEN DEVELOPED FROM THE GRADING, STORMWATER, & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993.
4. PLAN INFORMATION WAS OBTAINED FROM THE GRADING, STORMWATER & UTILITIES PLAN DEVELOPED BY BRINJAC, KAMBIC & ASSOCIATES ON FEBRUARY 26, 1993. PLAN INFORMATION WAS NOT OBTAINED FROM A SURVEY.

PROPOSED LEGEND:

CONTOUR LINE	
SPOT ELEVATION	
NEW FLARED END SECTION	
STONE	MEADOW/GRASS
BASIN BOTTOM (PLUG PLACEMENT)	VEGETATED LOW FLOW CHANNEL

E&S LEGEND:

IP	INLET PROTECTION
RCE	ROCK CONSTRUCTION ENTRANCE
SILT SOCK	



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Date: 09-21-23

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SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

EROSION CONTROL PLAN

DRAWN BY: M. MIXELL	DATE: 09-01-23	DRAWING NO.: C-500
CHECKED BY: C. CAROLA	SCALE: 1" = 10'	SHEET NO. 4 OF 8

EROSION CONTROL NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PROPER CONSTRUCTION, AND MAINTENANCE OF ALL EROSION AND SEDIMENTATION CONTROLS AND RELATED ITEMS INCLUDED WITHIN THESE PLANS. EROSION AND SEDIMENTATION CONTROLS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE GENERAL SITE DISTURBANCE WITHIN THE TRIBUTARY AREA OF THOSE CONTROLS BEGINS.
2. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE CONTRACTOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE <u>WEST GOSHEN TOWNSHIP.</u> THE CONTRACTOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
3. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM OF 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON–VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE CONTRACTOR SHALL STABILIZE ALL AREAS DISTURBED BY THE ACTIVITIES. DURING NON–GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.
4. AFTER FINAL STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED. CONTACT THE PROFESSIONAL PRIOR TO REMOVAL OF ANY EROSION AND SEDIMENT CONTROL FACILITIES. AREAS DISTURBED DURING THE REMOVAL OF THE CONTROLS MUST BE STABILIZED. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY, OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION. DURING NON–GERMINATING PERIODS, HAY OR STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.
5. DISTURBED AREAS WHICH ARE NOT AT FINISH GRADE AND WHICH WILL BE REDISTURBED WITHIN ONE YEAR MAY BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEED MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE EITHER AT FINISH GRADE OR WILL NOT BE RE–DISTURBED WITHIN ONE YEAR MUST BE SEEDED WITH A PERMANENT SEED MIXTURE AND MULCHED. ESTABLISH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETED. PERMANENT SEEDING SHALL BE AT THE RATES SPECIFIED BY THE LANDSCAPE PLANS. FERTILIZER AND LIME SHALL BE APPLIED AT THE MINIMUM RATES SPECIFIED BY THE LANDSCAPE PLANS AND SPECIFICATIONS.
6. SHOULD ANY MEASURES CONTAINED WITHIN THIS PLAN PROVE TO BE INCAPABLE OF ADEQUATELY REMOVING SEDIMENT FROM ON–SITE FLOWS PRIOR TO THE DISCHARGE OF OR STABILIZING OF SURFACES INVOLVED, ADDITIONAL MEASURES MUST BE IMPLEMENTED IMMEDIATELY BY THE CONTRACTOR TO ELIMINATE SUCH PROBLEMS.
7. THE LIMITS OF WORK AND DISTURBANCE SHOWN ON THIS PLAN ARE THE AREA EXTENT REQUIRED FOR CONSTRUCTION. THE CONTRACTOR SHALL ADHERE TO THESE LIMITS IN MINIMIZING DISTURBED LAND, AND ALL CONSTRUCTION SHALL BE CONDUCTED WITHIN THESE LIMITS.
8. SILT FENCING / COMPOST FILTER SOCK IS TO BE MAINTAINED, AND REPLACED IF NECESSARY, DURING THE ENTIRE CONSTRUCTION PERIOD UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
9. THE CONTRACTOR SHALL CLEAN AND MAINTAIN INLETS DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE TREATMENT FOR MOSQUITO CONTROL IN SUMPS DURING CONSTRUCTION.
10. A COPY OF APPROVED EROSION AND SEDIMENTATION CONTROL PLANS MUST BE POSTED AT THE CONSTRUCTION SITE AT ALL TIMES IN ACCORDANCE WITH STATE LAW AND MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE OPERATOR SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE LOCAL CONSERVATION DISTRICT, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.
11. DURING THE ENTIRE PERIOD OF CONSTRUCTION THE CONTRACTOR SHALL OBSERVE THE PROCEDURES FOR EROSION AND SEDIMENTATION CONTROLS IN ACCORDANCE WITH THE BEST MANAGEMENT PRACTICES CONTAINED WITHIN THE PADEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL.
12. CONDUCT ALL OPERATIONS AS SPECIFIED IN THE EROSION AND SEDIMENT POLLUTION CONTROL PLAN AND IN SUCH A MANNER TO MINIMIZE ACCELERATED EROSION AND RESULTING SEDIMENT POLLUTION TO THE WATERS OF THE COMMONWEALTH OF PENNSYLVANIA AND THE EXISTING STORM SEWER SYSTEM.
13. CONTROL THE ENTIRE GRADING AREA AT ALL TIMES, DURING CONSTRUCTION BY PLACING THE EROSION CONTROL DEVICES PRIOR TO DISTURBING THE EARTH AND THE STABILIZATION DEVICES AS SOON AS THE REQUIRED EARTHWORK HAS BEEN PERFORMED.
14. CLEAN THE SEDIMENT STRUCTURES PERIODICALLY DURING CONSTRUCTION AS SPECIFIED. DISPOSE OF USED AND DAMAGED SILT FENCING. INCORPORATE ACCUMULATED SEDIMENT INTO THE PROJECT SOIL MATERIALS OR REMOVE FROM THE SITE. DO NOT DEPOSIT SEDIMENT ADJACENT TO AREAS WHERE IT MAY ERODE AND DISCHARGE INTO THE EXISTING STORM SEWER SYSTEM.
15. WHERE DEWATERING OR PUMPING OF SEDIMENT LADEN WATER FROM UTILITY TRENCHES OR OTHER EXCAVATIONS IS NECESSARY, THE CONTRACTOR SHALL PREPARE A SEPARATE DEWATERING PLAN TO ADDRESS THE DISCHARGE OF SEDIMENT LADEN WATER. ALL PUMPING OF SMALL QUANTITIES OF SEDIMENT LADEN WATER, OR POTENTIALLY SEDIMENT LADEN WATER, SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A SEDIMENT FILTER BAG FOR PUMPED WATER, DISCHARGING OVER NON–DISTURBED AREAS.
16. SUBMIT A PLAN TO THE PROFESSIONAL FOR APPROVAL FOR PROPER DISPOSAL OF CONCRETE WASHINGS AND SLURRY. THE DISCHARGE OF CONCRETE WASHINGS OR SLURRY INTO SEWERS, WATERWAYS, DRAINAGE SWALES OR E&S CONTROL DEVICES IS STRICTLY FORBIDDEN.
17. TRANSPORTATION AND HANDLING OF SOIL SHALL MEET ALL LOCAL, STATE AND FEDERAL GUIDELINES AND REGULATIONS.
18. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF THE APPENDIX 64, EROSION CONTROL RULES AND REGULATIONS, TITLE 25, PART 1 DEPARTMENT OF ENVIRONMENTAL PROTECTION, SUBPART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.
19. THE CONTRACTOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTE AT THE SITE.
20. ALL EXISTING INLETS WITHIN THE LIMIT OF DISTURBANCE AND ALONG CONSTRUCTION ACCESS ROUTES SHALL HAVE INLET PROTECTION INSTALLED DURING CONSTRUCTION. SEDIMENT MUST BE REMOVED FROM STORM WATER INLET PROTECTION AFTER EACH RUNOFF EVENT.
21. FAILURE TO CORRECTLY INSTALL E&S BMPS, FAILURE TO PREVENT SEDIMENT–LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE, OR FAILURE TO TAKE IMMEDIATE CORRECTIVE ACTION TO RESOLVE FAILURE OF E&S BMPS MAY RESULT IN ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES BEING INSTITUTED BY THE PA DEPARTMENT OF ENVIRONMENTAL PROTECTION AS DEFINED IN SECTION 602 OF THE PENNSYLVANIA CLEAN STREAMS LAW. THE CLEAN STREAMS LAW PROVIDES FOR UP TO $10,000 PER DAY IN CIVIL PENALTIES, UP TO $10,000 IN SUMMARY CRIMINAL PENALTIES, AND UP TO $25,000 IN MISDEMEANOR CRIMINAL PENALTIES FOR EACH VIOLATION.
22. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
23. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE OPERATOR SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES. THE OPERATOR SHALL MAINTAIN AND MAKE AVAILABLE TO LOCAL CONSERVATION DISTRICT COMPLETE, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, REGRADING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.
24. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO THE BIORETENTION BASIN FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE BMP'S.
25. EROSION AND SEDIMENT BMP'S MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMP'S.
26. AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE LOCAL CONSERVATION DISTRICT TO AN ON–SITE MEETING. ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 1–800–242–1776 FOR BURIED UTILITIES LOCATIONS.
27. UPON INSTALLATION OF THE TEMPORARY SEDIMENT BASIN RISER(S), AN IMMEDIATE INSPECTION OF THE RISER(S) SHALL BE CONDUCTED BY A QUALIFIED SITE REPRESENTATIVE AND LOCAL CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING THAT THE RISER IS SEALED.
28. SEDIMENT BASINS MUST BE PROTECTED FROM UNAUTHORIZED ACTS OF THIRD PARTIES.
29. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMP'S MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGARDING, RESEEDING, REMULCHING, AND RENETTING, MUST BE PERFORMED IMMEDIATELY, IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
30. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.

OPERATIONS AND MAINTENANCE DURING CONSTRUCTION

MAINTAIN ALL EROSION AND SEDIMENT POLLUTION CONTROL FACILITIES REQUIRED TO PROTECT AREAS DURING CONSTRUCTION UNTIL STABILIZATION IS COMPLETE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PERIODICALLY CLEAN THESE FACILITIES AS NECESSARY. INSPECT COMPOST FILTER SOCK WEEKLY AND AFTER SIGNIFICANT RAIN EVENTS AND MAKE ALL REQUIRED REPAIRS OR REPLACEMENTS IMMEDIATELY. SCHEDULE CLEANING OF STRUCTURES IN ACCORDANCE WITH PADEP EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL LATEST EDITION.

EROSION CONTROL DEVICES SHALL REMAIN FUNCTIONAL THROUGHOUT THE DURATION OF CONSTRUCTION.

UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION BMP'S MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION BMP'S, BEFORE EACH ANTICIPATED RUNOFF EVENT, AFTER EACH RUNOFF EVENT, AND ON A WEEKLY BASIS. ALL SITE INSPECTIONS WILL BE DOCUMENTED IN AN INSPECTION LOG KEPT FOR THIS PURPOSE. THE COMPLIANCE ACTIONS AND THE DATE, TIME AND NAME OF THE PERSON CONDUCTING THE INSPECTION. THE INSPECTION LOG WILL BE KEPT ON SITE AT ALL TIMES AND MADE AVAILABLE TO LOT UPON REQUEST.

ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENTATION BMP'S FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMP'S OR MODIFICATIONS OF THOSE INSTALLED WILL BE NEEDED.

WHERE BMP'S ARE FOUND TO FAIL TO ALLEVIATE EROSION OR SEDIMENT POLLUTION, THE PERMITTEE OR CO–PERMITTEE SHALL INCLUDE THE FOLLOWING INFORMATION:

- a. THE LOCATION AND SEVERITY OF THE BMP'S FAILURE AND ANY POLLUTION EVENTS.
- b. ALL STEPS TAKEN TO, REDUCE, ELIMINATE AND PREVENT THE RECURRENCE OF THE NON–COMPLIANCE.
- c. THE TIME FRAME TO CORRECT THE NON–COMPLIANCE, INCLUDING THE EXACT DATES WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE.

AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMP'S MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMP'S MUST BE STABILIZED IMMEDIATELY. CONTACT THE PROFESSIONAL PRIOR TO REMOVAL OF E&S BMP'S.

SEDIMENT MUST BE REMOVED FROM STORMWATER INLET PROTECTION AFTER EACH RUN–OFF EVENT. ALL SEDIMENT MATERIAL COLLECTED BY THE CONTROL FACILITIES WILL BE CLEARED AND REDISTRIBUTED ON–SITE AND SEEDED, OR REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER. ANY FACILITIES FOUND TO BE DAMAGED OR MALFUNCTIONING SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

ANY SILT SOCK SECTION WHICH HAS BEEN TOPPED OR UNDERMINED MUST BE IMMEDIATELY REPLACED WITH ROCK FILTER OUTLETS. ROCK FILTER SHOULD EXTEND 1 FOOT ON EITHER SIDE OF UNDERMINED SILT SOCK.

<u>NOTE: SEE THIS SHEET FOR POST–CONSTRUCTION OPERATION AND MAINTENANCE REQUIREMENTS.</u>

POST CONSTRUCTION STORMWATER MANAGEMENT OPERATION AND MAINTENANCE:

LONG–TERM OPERATION AND MAINTENANCE OF THE STORMWATER MANAGEMENT PRACTICES/SYSTEMS (WHICH INCLUDES INSPECTION, REPAIR, REPLACEMENT, AND OTHER ROUTINE MAINTENANCE) IS THE RESPONSIBILITY OF THE USING AGENCY (WEST CHESTER UNIVERSITY).

A WRITTEN LOG MUST BE KEPT OF ALL PERIODIC INSPECTIONS, MAINTENANCE, AND REPAIRS OF STORMWATER MANAGEMENT PRACTICES. INSPECTIONS MUST BE LOGGED ONTO PADEP FORM 3150–FM–BWEW0083, DATED 02/2012 (OR AS LATER AMENDED). RECORDS MUST BE KEPT ON SITE AND SHALL BE KEPT FOR A MINIMUM OF 10 YEARS.

1. <u>STORMWATER COLLECTION SYSTEM:</u> ALL INLETS, STORM SEWERS AND CATCH BASINS SHALL BE INSPECTED AND CLEANED OUT TWICE ANNUALLY, OR MORE OFTEN IF HISTORICAL MAINTENANCE RECORDS SUGGEST A MORE FREQUENT CLEANING TO MAINTAIN DRAINAGE AND MINIMIZE AMOUNT OF SEDIMENT ENTERING THE STORMWATER MANAGEMENT PRACTICES/SYSTEMS. ANY SOURCES OF SEDIMENT CONTAMINATION SHALL BE IDENTIFIED AND CONTROLLED WHEN NATIVE SOIL IS EXPOSED OR EROSION CHANNELS ARE PRESENT. INLETS AND STORM SEWERS SHALL BE INSPECTED FOR SEDIMENT AND DEBRIS BUILDUP BIANNUALLY. SEDIMENT BUILDUP EXCEEDING 2 INCHES IN DEPTH OR THAT BEGINS TO CONSTRICT THE FLOW PATH SHOULD BE REMOVED. CLEAN OUT LEAVES, TRASH, DEBRIS, ETC. BIANNUALLY. MAKE ANY NEEDED REPAIRS IMMEDIATELY.

   TRAPS MUST REMAIN IN PLACE ON ALL STORMWATER INLETS TO MINIMIZE SEDIMENT AND DEBRIS ENTERING THE STORMWATER MANAGEMENT FACILITIES. INSPECT CONDITION OF ALL INLETS WITH WATER QUALITY DEVISES (CAST IRON HOODS) TO MAKE SURE THEY ARE FUNCTIONING PROPERLY. INSPECT, MAINTAIN AND REPAIR SUMPS AND TRAPS THROUGHOUT CONSTRUCTION UNTIL THE USING AGENCY HAS ACCEPTED STORMWATER COLLECTION FACILITIES. REMOVE ACCUMULATED SEDIMENT FROM TRAPS AND SUMPS WHEN THE ACCUMULATED DEPTH HAS REACHED HALF THE SUMP DEPTH.

   ONE YEAR AFTER CONSTRUCTION, AND EVERY FIFTEEN YEARS THEREAFTER, THE SEWERS SHALL BE TELEVISED AND INSPECTED. ANY FAILED INLETS, MANHOLES, HOODS OR STORM SEWER LINES SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

   MAINTAIN RECORDS OF ALL INSPECTIONS AND MAINTENANCE ACTIVITY.

2. <u>VEGETATIVE COVER</u>: ALL CONTRIBUTING DRAINAGE AREA TO THE STORMWATER MANAGEMENT SYSTEM MUST MAINTAIN A VEGETATIVE COVER IN GOOD CONDITION WITH ANY BARE SPOTS REVEGETATED. ALL DISTURBED AREAS SHOULD BE MAINTAINED TO PREVENT EROSION AND DEPOSITION OF MATERIAL INTO THE STORMWATER MANAGEMENT FACILITIES.

   MAINTAIN RECORDS OF ALL INSPECTIONS AND MAINTENANCE ACTIVITY.

   A. <u>GRASS COVER FOR AREAS WHERE SLOPES ARE GREATER THAN 5%:</u>
      MAINTENANCE REQUIREMENT – MAINTAIN GRASS COVER. RESTORE AND RE–SEED ANY ERODED / NON–VEGETATED AREAS IMMEDIATELY.
      MAINTENANCE SCHEDULE – INSPECT GRASS COVER ONCE PER MONTH AS WELL AS AFTER HEAVY STORM EVENTS UNTIL A MINIMUM OF 75% VEGETATIVE COVER HAS BEEN ESTABLISHED. UPON ESTABLISHMENT OF 75% VEGETATIVE COVER, INSPECTIONS SHALL CONTINUE ON QUARTERLY BASIS TO ENSURE AREAS ARE STABLE AND RUNOFF IS NOT CONTRIBUTING TO ANY EROSION. ANY AREAS WHERE VEGETATION FAILS TO THRIVE SHALL BE TILLED TO A DEPTH OF 6", RAKED, SEEDED AND STABILIZED WITH STRAW MULCH IMMEDIATELY. ANY AREAS WHERE EROSION BECOMES APPARENT SHALL BE REGRADED (PROVIDE A MINIMUM OF 6" OF TOPSOIL), RAKED, SEEDED AND STABILIZED WITH EROSION CONTROL MATTING. SOD CAN BE PLACED IN LIEU OF SEEDING AND MATTING.

   B. <u>GRASS COVER FOR OTHER AREAS WHERE SLOPES ARE LESS THAN 5%:</u>
      MAINTENANCE REQUIREMENT – MAINTAIN GRASS COVER. RESTORE AND RE–SEED ANY ERODED / NON–VEGETATED AREAS IMMEDIATELY.
      MAINTENANCE SCHEDULE – INSPECT GRASS COVER ONCE PER MONTH AS WELL AS AFTER HEAVY STORM EVENTS UNTIL A MINIMUM OF 75% VEGETATIVE COVER HAS BEEN ESTABLISHED. UPON ESTABLISHMENT OF 75% VEGETATIVE COVER, INSPECTIONS SHALL CONTINUE ON QUARTERLY BASIS TO ENSURE AREAS ARE STABLE AND RUNOFF IS NOT CONTRIBUTING TO ANY EROSION. ANY AREAS WHERE VEGETATION FAILS TO THRIVE SHALL BE TILLED TO A DEPTH OF 6", RAKED, SEEDED AND STABILIZED WITH STRAW MULCH IMMEDIATELY. ANY AREAS WHERE EROSION BECOMES APPARENT SHALL BE REGRADED (PROVIDE A MINIMUM OF 6" OF TOPSOIL), RAKED, SEEDED AND STABILIZED WITH EROSION CONTROL MATTING. SOD CAN BE PLACED IN LIEU OF SEEDING AND MATTING.

<u>NOTE: SEE THIS SHEET FOR OPERATION AND MAINTENANCE REQUIREMENTS DURING CONSTRUCTION.</u>

SEQUENCE OF CONSTRUCTION

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED.

THIS ANTICIPATED SEQUENCE OF CONSTRUCTION IS FOR EROSION CONTROL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING, PHASING, AND SCHEDULING OF ALL WORK.

THE CONTRACTOR SHALL COMPLY WITH ACT 287. PLACE PA ONE–CALL, SECURE SERIAL NUMBER FOR CONSTRUCTION AND LOCATE AND CONFIRM UNDERGROUND UTILITIES PRIOR TO ANY DISTURBANCES.

A PRE–CONSTRUCTION MEETING SHALL BE HELD AT THE SITE AT LEAST ONE (1) WEEK PRIOR TO CONSTRUCTION. THE MEETING SHALL BE SCHEDULED AND COORDINATED TO INCLUDE ALL CONTRACTORS INVOLVED WITH EARTH MOVING ACTIVITIES, WEST GOSHEN TOWNSHIP, WEST CHESTER UNIVERSITY, AND THE PROFESSIONAL (HUNT ENGINEERING).

<u>INSTALL THE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES (AS SHOWN ON SHEET C–500) PRIOR TO COMMENCING ANY EARTH DISTURBANCE ACTIVITIES.</u>

<u>CESSATION OF ACTIVITY ON ANY DISTURBED AREAS FOR FOUR (4) DAYS OR LONGER REQUIRES TEMPORARY STABILIZATION PER SPECIFICATIONS SHOWN ON SHEET C–600.</u>

1. THE ERECTION AND PLACEMENT OF E&S CONTROL DEVICES MUST BE PERFORMED PRIOR TO THE START OF EARTH DISTURBANCE ACTIVITIES.
2. INSTALL THE ROCK CONSTRUCTION ENTRANCE, THE CONCRETE WASHOUT AREA, ALL COMPOST FILTER SOCKS, AND ALL ROCK FILTER OUTLETS IN LOCATIONS SHOWN ON C–602.
3. MAINTAIN ALL EROSION CONTROLS DURING CONSTRUCTION, INCLUDING INLET PROTECTION PLACED AT ALL EXISTING INLETS ON SITE. MAINTAIN THESE CONTROLS FOR THE DURATION OF THE CONTRACT WORK AND AS LONG AS EROSIVE FORCES TRANSPORT SEDIMENT–LADEN RUNOFF.
4. COORDINATE WITH ALL EXISTING UTILITIES AND PROVIDE TEMPORARY FACILITIES AS REQUIRED TO KEEP UTILITIES IN WORKING CONDITION UNTIL PERMANENT LINES ARE INSTALLED.
5. DEMOLISH SITE FEATURES AS SHOWN ON THE DEMOLITION PLAN (C–100). DO NOT ADD MATERIALS IN THE LOCATION OF THE BASIN AS SHOWN ON C–300.
6. EXCAVATE AND REMOVE SEDIMENT BUILDUP IN THE BASIN TO THE DESIGNED TOP OF SOIL ELEVATION. **<u>NOTE: THIS IS A CRITICAL STAGE</u>**. WHEN EXCAVATION HAS PROCEEDED, THE CONTRACTOR MUST COMPLETE THE EXCAVATION BY GOING FROM ONE SIDE TO THE OTHER OR BY OTHER METHODS, SO THAT CONSTRUCTION EQUIPMENT DOES NOT TRAVERSE AND COMPACT THE SURFACE. SCARIFY THE SURFACE TO LOOSEN IT BEFORE THE PLACEMENT OF TOPSOIL. **<u>NOTE: THIS IS A CRITICAL STAGE</u>**. THE SURFACE MUST BE INSPECTED AND APPROVED BY THE PROFESSIONAL PRIOR TO THE PLACEMENT OF TOPSOIL. ANY AREAS THAT HAVE BEEN COMPACTED DURING EXCAVATION, AREAS WHERE WATER HAS BEEN ALLOWED TO POND OR AREAS THAT HAVE BEEN SUBJECT TO SEDIMENTATION OR EROSION MUST BE RE–MEDIATED PRIOR TO THE PLACEMENT OF TOPSOIL. REMEDIATION MAY INCLUDE, BUT IS NOT LIMITED TO REMOVAL OF SOILS CONTAMINATED BY SEDIMENT AND PLACEMENT WITH SUITABLE MATERIAL OR TILLING OR DISKING OF COMPACTED AREAS.
7. INSTALL THE PROPOSED FLARED END SECTIONS ON OUTLET PIPES AS SHOWN ON SHEET C–300.
8. INSTALL ALL NEW LANDSCAPING, PERMANENT SEEDING, AND PLANTINGS PER SHEET C–300 AND C–601.
9. COMPLETE SITE STABILIZATION. STABILIZATION REQUIRES A 70% COVER OF PERMANENT VEGETATION ON ALL DISTURBED AREAS. **<u>NOTE: THIS IS A CRITICAL STAGE</u>**. THE PROFESSIONAL AND THE CHESTER COUNTY CONSERVATION DISTRICT MUST BE NOTIFIED TO INSPECT AND APPROVE THE FINAL SITE STABILIZATION BEFORE E&S CONTROLS CAN BE REMOVED.
10. ONCE CONSTRUCTION IS COMPLETED, THE PROFESSIONAL MUST BE CONTACTED TO INSPECT ALL POST–CONSTRUCTION STORMWATER MANAGEMENT FACILITIES TO ENSURE THEY HAVE NOT BEEN IMPACTED BY CONSTRUCTION ACTIVITIES. **<u>NOTE: THIS IS A CRITICAL STAGE</u>**.
11. ONCE THE SITE HAS BEEN STABILIZED AND THE PROFESSIONAL HAS COMPLETED THEIR SITE INSPECTIONS AND APPROVED THE WORK, REMOVE ALL TEMPORARY E&S CONTROLS AND REMOVE ANY ACCUMULATED SEDIMENT FROM ALL DRAINAGE STRUCTURES. RESTORE ALL AREAS THAT HAVE BEEN DISTURBED BY REMOVAL OF THE TEMPORARY E&S CONTROLS PER THE PERMANENT STABILIZATION SPECIFICATIONS.

CLEAN FILL

IF THE SITE WILL NEED TO HAVE FILL IMPORTED FROM AN OFFSITE LOCATION, THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE AND THE DETERMINATION OF CLEAN FILL WILL RESIDE WITH THE GENERAL CONTRACTOR. IF THE SITE WILL HAVE EXCESS FILL THAT WILL NEED TO BE EXPORTED TO AN OFFSITE LOCATION, THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE RESTS ON THE GENERAL CONTRACTOR. IF ALL CUT AND FILL MATERIALS WILL BE USED ON THE SITE, A CLEAN FILL DETERMINATION IS NOT REQUIRED, UNLESS THERE IS A BELIEF THAT A SPILL OR RELEASE OR A REGULATED SUBSTANCE OCCURRED ON SITE.

ALL CONTRACTORS INVOLVED IN EARTHMOVING ACTIVITIES MUST USE ENVIRONMENTAL DUE DILIGENCE TO ENSURE THAT THE FILL MATERIAL ASSOCIATED WITH THE PROJECT QUALIFIES AS CLEAN FILL. DEFINITIONS OF CLEAN FILL AND ENVIRONMENTAL DUE DILIGENCE ARE PROVIDED BELOW. ALL FILL MATERIAL MUST BE USED IN ACCORDANCE WITH THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL" DOCUMENT NUMBER 258–2182–773.

CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON–WATER SOLUBLE, NON–DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE–USE).

CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP–1A AND FP–1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP–001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP–001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL.

ENVIRONMENTAL DUE DILIGENCE: THE CONTRACTOR MUST PERFORM ENVIRONMENTAL DUE DILIGENCE TO DETERMINE IF THE FILL MATERIALS ASSOCIATED WITH THE PROJECT QUALIFY AS CLEAN FILL. ENVIRONMENTAL DUE DILIGENCE IS DEFINED AS INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.

TEMPORARY STABILIZATION

1. HAY OR STRAW MULCH MUST BE APPLIED AT 3.0 TONS PER ACRE.
2. MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER.
3. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

CRITICAL STAGES OF CONSTRUCTION

A LICENSED PROFESSIONAL OR DESIGNEE SHALL BE PRESENT ON SITE DURING THE FOLLOWING STAGES OF CONSTRUCTION:

1. DURING THE EXCAVATION OF SEDIMENT FROM THE EXISTING BASIN.
2. THE COMPLETION OF SEDIMENT REMOVAL FROM THE BASIN PRIOR TO PLACEMENT OF TOPSOIL.
3. THE COMPLETION OF TOPSOIL REPLACEMENT.
4. THE COMPLETION OF FLARED END SECTION INSTALLATION.
5. AFTER ALL DISTURBED AREAS HAVE REACHED FINAL STABILIZATION TO INSPECT AND APPROVE STABILIZATION.
6. ONCE CONSTRUCTION IS COMPLETE, THE PROFESSIONAL MUST BE CONTACTED TO INSPECT ALL POST–CONSTRUCTION STORMWATER MANAGEMENT FACILITIES TO ENSURE THEY HAVE NOT BEEN IMPACTED BY CONSTRUCTION ACTIVITIES.

DUST CONTROL

THE CONTRACTOR SHALL EMPLOY CONSTRUCTION METHODS AND MEANS THAT WILL KEEP FLYING DUST TO THE MINIMUM. THE CONTRACTOR SHALL PROVIDE FOR THE SPRAYING OF WATER ON THE PROJECT AREA AND ON ROADS, STREETS, AND OTHER AREAS IMMEDIATELY ADJACENT TO THE PROJECT LIMITS AND WHEREVER TRAFFIC OR BUILDINGS THAT ARE OCCUPIED OR IN USE, ARE AFFECTED BY SUCH DUST CAUSED BY HIS HAULING OR OTHER OPERATIONS. THE MATERIALS AND METHODS USED FOR WATER SPRAYING SHALL BE SUBJECT TO THE APPROVAL OF THE PROFESSIONAL. THE CONTRACTOR SHALL PROVIDE FOR PROMPT REMOVAL FROM EXISTING PAVING ALL DIRT AND OTHER MATERIALS THAT HAVE BEEN SPILLED, WASHED UPON, TRACKED UPON, OR OTHERWISE DEPOSITED THEREON BY HIS HAULING AND OTHER OPERATIONS WHENEVER THE ACCUMULATION IS SUFFICIENT TO CAUSE THE FORMATION OF DUST, MUD, INTERFERE WITH DRAINAGE, DAMAGE PAVEMENTS, OR CREATE A TRAFFIC HAZARD. THE CONTRACTOR SHALL USE A VACUUM TYPE STREET SWEEPER TO REMOVE SUCH MATERIALS FROM PAVED SURFACES.

NO.	DATE	DESCRIPTION

SEAL:

PETER C. MYERS
054-696-E

Peter C Myers

Date: 09–21–23

HUNT ENGINEERING COMPANY
P.O. Box 537 | 22 East King Street | Malvern, PA 19355
610.644.4600 | www.huntengineering.com

SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

NOTES AND DETAILS

DRAWN BY: M. MIXELL
DATE: 09–01–23
CHECKED BY: C. CAROLA
SCALE:
DRAWING NO. C–600
SHEET NO. 5 OF 8

SCHEDULE OF SEEDING, PLUGS, SOIL SUPPLEMENTS AND MULCHING

1. PLANTING RESTRICTIONS

   A. PERMANENT LAWN SEEDING (GERMINATION PERIODS): FROM MARCH 15 TO MAY 30 THROUGH AND AUGUST 15 THROUGH OCTOBER 30. ALL OTHER TIMES REQUIRE TEMPORARY SEEDING OR THE INSTALLATION OF SOD.

   B. SODDING: FROM MARCH 1 THROUGH MAY 31 AND SEPTEMBER 1 THROUGH OCTOBER 31. FROM OCTOBER 31 THROUGH MARCH 1ST SODDING IS PERMITTED WHEN GROUND IS NOT FROZEN.

   C. TURF RENOVATION: MARCH 15 THROUGH MAY 30 AND AUGUST 15 THROUGH OCTOBER 30

2. INSTALL SEEDING AND SOIL SUPPLEMENTS IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS. ANY AREAS DISTURBED DURING CONSTRUCTION NOT IDENTIFIED WITH SPECIFIC PLANTINGS SHALL BE SEEDED WITH THE PERMANENT GRASS SEED MIXES.

3. ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED MUST BE MULCHED, SEEDED OR SODDED IMMEDIATELY. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES UNLESS AREAS ARE SODDED. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN ONE YEAR MAY BE SEEDED AND MULCHED WITH A QUICK GROWING TEMPORARY SEEDING MIXTURE AND MULCH. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTRIBUTED WITHIN 1 YEAR MUST BE SEEDED WITH A PERMANENT SEED MIXTURE AND MULCHED OR SODDED.

4. SOIL STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY. VEGETATION COVER WILL REQUIRE UNIFORM 70% COVERAGE TO BE CONSIDERED STABILIZED.

5. AREAS WHICH ARE TO BE TOP-SOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES (6 TO 12 INCHES ON COMPACTED SOILS) PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING I.E. YARDS.

SCHEDULE OF SEEDING, SOIL SUPPLEMENTS, AND MULCH

TEMPORARY SEEDING:

ANNUAL RYEGRASS 100%, APPLIED AT 10.0 LBS/ 1,000 SF WITH NOT LESS THAN 95% GERMINATION, NOT LESS THAN 85% PURE SEED, AND NOT MORE THAN 0.5% PERCENT WEED SEED.

FERTILIZER RATE = USE DRY FORMULATIONS IN THE AMOUNTS RECOMMENDED IN THE SOILS REPORT FROM A QUALIFIED TESTING LABORATORY. IF A SOILS REPORT IS NOT AVAILABLE, APPLY AT A 10-10-10 FERTILIZER AT A RATE OF 12.5 LB PER 1,000 SF.

LIME: PULVERIZED AGRICULTURE LIMESTONE APPLIED IN THE AMOUNTS RECOMMENDED IN A SOILS REPORT FROM A QUALIFIED TESTING LABORATORY. IF A SOILS REPORT IS NOT AVAILABLE, APPLY AT A RATE OF 240 LBS PER 1,000 SF.

MULCH: STRAW MULCH APPLIED AT A RATE OF RATE = 1,240 LBS PER 1,000 SY. MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER. STRAW MULCH MUST BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.

PERMANENT SEEDING:

SEED SPECIES AS FOLLOWS, WITH NOT LESS THAN 95% GERMINATION, NOT LESS THAN 85% PERCENT PURE SEED, AND NOT MORE THAN 0.5% PERCENT WEED SEED.

SOW SEED WITH SPREADER OR SEEDING MACHINE: DO NOT BROADCAST OR DROP SEED WHEN WIND VELOCITY EXCEEDS 5 MPH. EVENLY DISTRIBUTE SEED BY SOWING EQUAL QUANTITIES IN TWO DIRECTIONS AT RIGHT ANGLES TO EACH OTHER.

FULL SUN: BERMUDAGRASS (CYNODON DACTYLON) APPLIED AT 10 LBS/ ACRE

FULL SUN: KENTUCKY BLUEGRASS (POA PRATENSIS), A MINIMUM OF THREE CULTIVARS. APPLIED AT 10 LBS/ ACRE

SUN AND PARTIAL SHADE: BLEND OF KENTUCKY BLUEGRASS (POA PRATENSIS) 50%, CHEWINGS RED FESCUE (FESTUCA RUBRA) 30%, PERENNIAL RYEGRASS (LOLIUM PERENNE) 10%, REDTOP (AGROSTIS ALBA), 10% APPLIED AT 3-4 LBS / 1,000 SF.

SHADE: CHEWINGS RED FESCUE (FESTUCA RUBRA) 50%, ROUGH BLUEGRASS (POA TRIVALIS) 35%, REDTOP (AGROSTIS ALBA) 10%, APPLIED AT 5 LBS / 1,000 SF

LIME:
AGRICULTURAL LIMING MATERIAL CONTAINING A MINIMUM OF 80% CALCIUM EQUIVELENT AS FOLLOWS:

CLASS T: MINIMUM OF 99% PASSING THROUGH NO. 8 SIEVE AND MIN. OF 75% PASSING THROUGH NO. 60 SIEVE.

CLASS O: MINIMUM OF 95% PASSING THROUGH NO. 8 SIEVE AND MIN. OF 55% PASSING THROUGH NO. 60 SIEVE.

PROVIDE LINE IN FORM OF GROUND DOLOMITIC LIMESTONE.

FERTILIZER:

BONEMEAL: COMMERCIAL, RAW OR STEAMED, FINELY GROUND. MIN. 4% NITROGEN AND 10% PHOSPHORIC ACID

SUPERPHOSPHATE: COMMERCIAL, PHOSPHATE MIXTURE, SOLUBLE. MIN. 20% AVAILABLE PHOSPHORIC ACID.

COMMERCIAL FERTILIZER: COMMERCIAL-GRADE COMPLETE FERTILIZER OF NEUTRAL CHARACTER CONSISTING OF FAST AND SLOW RELEASE NITROGEN, 50% DERIVED FROM NATURAL ORGANIC SOURCES OF UREA FORMALDEHYDE, PHOSPHOROUS AND POTASSIUM IN THE FOLLOWING COMPOSITION:

COMPOSTION: 1 LB/ 1,000 SF OF ACTUAL NITROGEN, 4% PHOSPHOROUS, AND 2% POTASSIUM BY WEIGHT.

COMPOSITION: NITROGEN, PHOSPHROUS, AND POTASSIUM IN AMOUNTS RECOMMENDED IN SOIL REPORTS FROM A QUALIFIED SOIL TESTING LABORATORY.

MULCH:
STRAW MULCH APPLIED AT A RATE OF RATE = 1,240 LBS PER 1,000 SY.

PLANTING NOTES

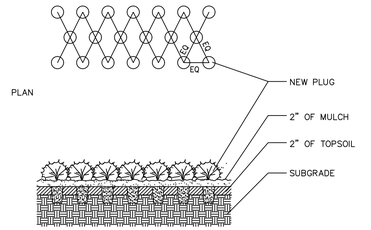
1. PROVIDING ALL LABOR, MATERIALS, AND ANY OTHER SERVICES DEEMED NECESSARY BY THE LANDSCAPE ARCHITECT ARE TO BE CONSIDERED PART OF THE IMPLEMENTATION OF THIS PLAN, AND INCLUDE BUT ARE NOT LIMITED TO THE SUPPLY AND INSTALLATION OF PLANTING MATERIALS, TAGGING, ACCURATE LAYOUT, TOPSOIL TESTING AND PROVIDING RELATED AMENDMENTS, MATERIALS CERTIFICATION, PRUNING, STAKING, WATERING, ADDITIONAL LABOR AND CLEAN UP.
2. BEFORE PERFORMING ANY WORK THE CONTRACTOR SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM AT 1-800-242-1776.
3. THE CONTRACTOR SHALL LOCATE ALL UTILITIES AND NOTIFY UTILITY COMPANIES PRIOR TO EXCAVATING PLANT PITS. PLANT LOCATIONS MAY BE ADJUSTED IN THE FIELD TO AVOID INTERFERENCE WITH UNDERGROUND UTILITIES. IN ADDITION, THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO COMMENCING WORK TO REVIEW THE EXISTING CONDITIONS. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF ANY MAJOR DISCREPANCIES WHICH AFFECT THE LANDSCAPE WORK PRIOR TO PROCEEDING WITH PLANT ACQUISITION AND INSTALLATION.
4. THE LANDSCAPE PLAN(S) SHALL NOT BE UTILIZED TO DETERMINE THE LOCATIONS, DIMENSIONS, OR MEASUREMENTS OF OTHER PROPOSED SITE STRUCTURES/IMPROVEMENTS. THE CONTRACTOR SHALL REFER TO THE APPROPRIATE DRAWINGS BY THE PROFESSIONAL FOR OTHER INFORMATION.
5. THE CONTRACTOR SHALL PERFORM A SOIL TEST, SUBMITTED TO AN APPROVED LABORATORY, AND SUBMIT THE RESULTS TO THE LANDSCAPE ARCHITECT BEFORE PERFORMING ANY WORK.
6. PLANT NAMES SHALL AGREE WITH THE NOMENCLATURE "STANDARD PLANT NAMES" AS ADOPTED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE.
7. THE LANDSCAPE CONTRACTOR SHALL TAG PLANT MATERIAL SPECIFIED, AND NOTIFY THE LANDSCAPE ARCHITECT AT LEAST 14 DAYS IN ADVANCE TO MEET AT THE NURSERY AND GAIN APPROVAL FOR THE SELECTED MATERIAL TO BE USED IN THE PROJECT. THIS DOES NOT NEGATE THE RIGHT OF THE LANDSCAPE ARCHITECT TO REJECT MATERIAL ON SITE. ALL REJECTED PLANT MATERIALS SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND REPLACED WITH ACCEPTABLE MATERIAL AT NO ADDITIONAL COST.
8. ALL PLANT MATERIALS PROVIDED SHALL MEET THE MINIMUM STANDARDS FOR HEALTH, FORM, ROOT CONDITION, ETC. OUTLINED IN THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1, (2004), OR MOST RECENT EDITION. NO SUBSTITUTIONS WILL BE ACCEPTED UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANT MATERIALS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY. THEY SHALL HAVE WELL DEVELOPED BRANCHES AND VIGOROUS FIBROUS ROOT SYSTEMS. THEY SHALL BE FREE FROM DISFIGURING KNOTS, SUN SCALD, INJURIES, ABRASIONS OF BARK, PLANT DISEASES, INSECT EGGS, BORERS, AND ALL FORMS OF INFESTATION. THEY SHALL HAVE BEEN GROWN FOR AT LEAST TWO (2) YEARS IN THE SAME USDA HARDINESS ZONE AND SIMILAR SOIL CONDITIONS AS THE SITE. ALL COLLECTED MATERIAL SHALL BE CLEAN SOUND STOCK AND FREE FROM DECAYING STUMPS. ALL PLANTS PROVIDED SHALL BE AN AVERAGE OF THE SIZE RANGE SPECIFIED. DECIDUOUS TREE CALIPER SHALL BE MEASURED AT A HEIGHT OF SIX (6) INCHES ABOVE THE FINISHED GRADE LEVEL AND SHALL BE A MINIMUM OF TWO AND ONE-HALF (2 ½) INCHES.
10. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING WHERE THE UNDERGROUND UTILITIES EXIST ON SITE. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING NEAR THESE UTILITIES. IF PLANT MATERIAL NEEDS TO BE RELOCATED BECAUSE OF UNDERGROUND UTILITIES OR OTHER CIRCUMSTANCES, IT SHALL BE DONE UNDER THE LANDSCAPE ARCHITECT'S DIRECTION IN THE FIELD. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO CHANGE PLANT MATERIAL LOCATIONS IN THE FIELD AT NO ADDITIONAL COST.
11. PLANTING SHALL BE CONDUCTED UNDER SEASONS WHICH ARE NORMAL FOR SUCH WORK. INSTALLATION OF PLANT MATERIALS OUTSIDE THE RECOMMENDED PLANTING SEASONS SHALL BE AT THE SOLE RISK AND RESPONSIBILITY OF THE CONTRACTOR. PLANTS SHALL BE INSTALLED DURING THE FOLLOWING SEASONS UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT:
    A. DECIDUOUS TREES AND SHRUBS: MARCH 15TH THROUGH MAY 30TH; SEPTEMBER 1ST TO DECEMBER 1.
    B. BROADLEAF EVERGREEN TREES AND SHRUBS: MARCH 15TH THROUGH MAY 30TH.
    C. GROUNDCOVER: MARCH 15TH THROUGH MAY 30TH.
12. ALL DISTURBED PERVIOUS AREAS EXCEPT PLANTING BEDS, SHALL BE SEEDED.
13. IT IS THE CONTRACTORS RESPONSIBILITY TO WATER PLANT MATERIAL DURING CONSTRUCTION AND UNTIL SUBSTANTIAL COMPLETION IS APPROVED BY THE LANDSCAPE ARCHITECT.
14. NO PESTICIDES OR HERBICIDES ARE PERMITTED. ANTI-DESICCANT IS REQUIRED TO BE APPLIED AT THE NURSERY BEFORE SHIPPING, IF SHIPPING OCCURS BETWEEN JUNE 1 AND SEPTEMBER 15 FOR REPLACEMENT TREES WHERE APPLICABLE.
15. DO NOT USE TREE WRAP OR TREE PAINT.
16. THE CONTRACTOR SHALL PROVIDE A ONE (1) YEAR GUARANTEE ON ALL PLANT MATERIAL FOLLOWING FINAL WRITTEN APPROVAL BY THE OWNER OR OWNER'S REPRESENTATIVE.
17. THE CONTRACTOR SHALL CONTACT THE USING AGENCY REPRESENTATIVE IN WRITING TO REQUEST A FINAL INSPECTION FOR ACCEPTANCE AT THE END OF THE ONE (1) YEAR GUARANTEE PERIOD.
18. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT QUANTITIES. SHOULD A DISCREPANCY ARISE BETWEEN THE PLANTING PLAN AND THE PLANT SCHEDULE, THE PLAN SHOULD GOVERN AS TO THE QUANTITY OF PLANT MATERIAL.

BIO-RETENTION BASIN LANDSCAPE PLUG LIST

AREA	13,865 SF			
QUANTITY (EA)	**BOTANICAL NAME**	**COMMON NAME**	**MIX %**	**RATE PER ACRE (EACH)**
4,160	PANICUM CLANDESTINUM TIOGA	DEERTONGUE TIOGA	0.3	13,068
4,090	CAREX VULPINOIDEA	FOX SEDGE	0.295	12,850
2,773	ELYMUS VIRGINICA	VIRGINIA WILDRYE	0.2	8,712
971	CAREX LURIDA	LURID SEDGE	0.07	3,049
971	CAREX SCOPARIA	BLUNT BROOM SEDGE	0.07	3,049
416	VERBENA HASTATA	BLUE VERVAIN	0.03	1,307
208	JUNCUS EFFUSUS	SOFT RUSH	0.015	653
69	AGROSTIS PERENNANS	AUTUMN BENTGRASS	0.005	218
69	ASCLEPIAS INCARNATA	SWAMP MILKWEED	0.005	218
28	HELENIUM AUTUMNALE	COMMON SNEEZEWEED	0.002	87
28	SCIRUPS CYPERINUS	WOOLGRASS	0.002	87
14	ASTER LANCEOLATUS	LANCE LEAVED ASTER	0.001	44
14	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.001	44
14	ASTER PUNICEUS	PURPLESTEM ASTER	0.001	44
14	LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	0.001	44
14	MIMULUS RINGENS	SQUARE STEMMED MONKEYFLOWER	0.001	44
14	SCIRPUS ATROVIRENS	GREEN BULRUSH	0.001	44

LOW FLOW SWALE LANDSCAPE PLUG LIST

AREA	745 SF			
QUANTITY (EA)	**BOTANICAL NAME**	**COMMON NAME**	**MIX %**	**RATE PER ACRE (EACH)**
112	PANICUM VIRGATUM	SWITCHGRASS	0.15	2,178
224	ANDROPOGON GERARDII	BIG BLUESTEM	0.3	4,356
410	SORGHASTRUM NUTANS	INDIAN GRASS	0.55	7,744



PLUG PLANTING DETAIL

NOT TO SCALE

NO.	DATE	DESCRIPTION

SEAL:

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — PETER C. MYERS — ENGINEER — 054-696-E

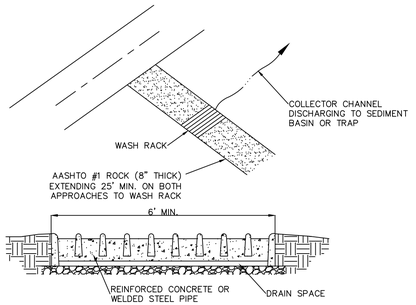
Date: 09-21-23

HUNT ENGINEERING COMPANY
P.O. Box 537 | 22 East King Street | Malvern, PA 19355
610.644.4600 | www.huntengineering.com

SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

NOTES AND DETAILS

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09-01-23	C-601
CHECKED BY	SCALE	SHEET NO. 6 OF 8
C. CAROLA		



NOTES:

WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

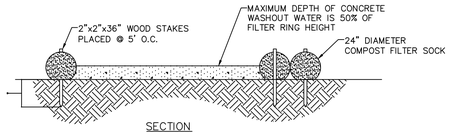
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

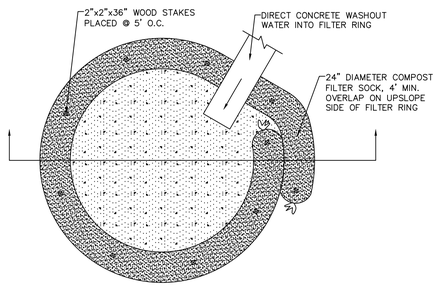
MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

STANDARD CONSTRUCTION DETAIL #3-2
ROCK CONSTRUCTION ACCESS WITH WASH RACK

NOT TO SCALE



SECTION



PLAN

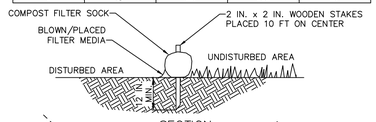
NOTES:

1. INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE.
2. 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.
3. AN IMPERVIOUS GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE FILTER SOCKS.

TYPICAL COMPOST FILTER SOCK CONCRETE WASHOUT DETAIL

N.T.S.

TEMPORARY COMPOST FILTER SOCK (TCFS) SPECIFICATIONS				
TCFS #	SIZE	MAX. SLOPE %	MAX. SLOPE LENGTH ALLOWED (FT)	ACTUAL SLOPE LENGTH (FT)
1	24"	8.6	356	58
2	24"	10.1	412	232
3	18"	9.3	304	55
4	18"	23.3	336	129
5	18"	4.8	372	9
6	18"	2.7	603	27



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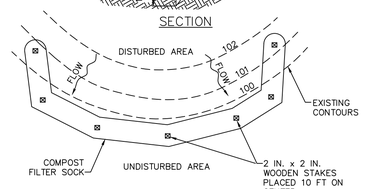


PLAN VIEW

NOTES:

SOCK FABRIC SHALL MEET STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.

TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.

ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.

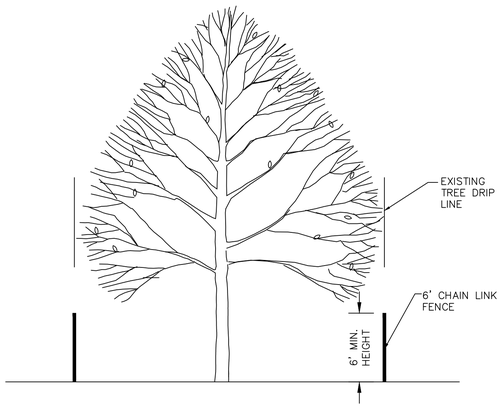
COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.

BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

STANDARD CONSTRUCTION DETAIL #4-1
COMPOST FILTER SOCK

NOT TO SCALE

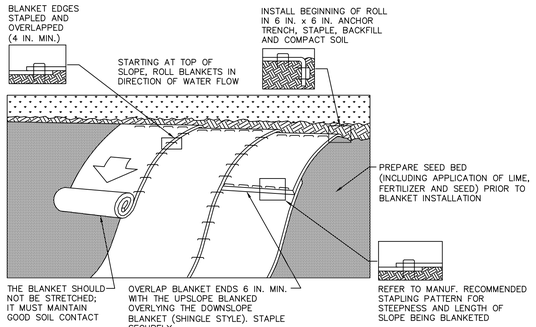


NOTES:

1. TREE PROTECTION FENCING MUST BE IN PLACE PRIOR TO EARTH MOVING ACTIVITIES.
2. POSTS SHALL BE SPACED NO GREATER THAN 8' O.C. AND SHALL BE MOUNTED ON PROPERLY ANCHORED AND BALLASTED SURFACE STATIONS.
3. PLACE PROTECTIVE FENCE AT THE DRIPLINE OF THE TREE. IF REGRADING OR PAVING INSTALLATION IS SHOWN WITHIN THE DRIP LINE OF THE EXISTING TREE TO REMAIN, THEN PLACE THE PROTECTIVE FENCE AT THE EDGE OF THE REGRADED OR PAVED AREA. IF WORK IS NEEDED WITHIN THE DRIPLINE, DO ALL NECESSARY BY HAND.

TEMPORARY EXISTING TREE PROTECTION FENCE DETAIL

NOT TO SCALE



NOTES:

SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.

PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.

SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.

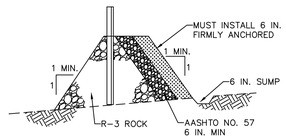
BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.

THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

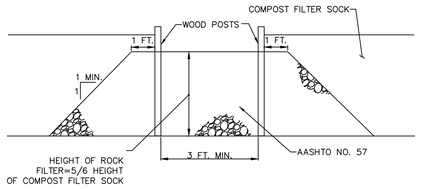
BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.

STANDARD CONSTRUCTION DETAIL #11-1
EROSION CONTROL BLANKET INSTALLATION

NOT TO SCALE



OUTLET CROSS-SECTION



UP-SLOPE FACE

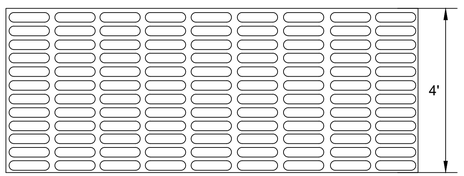
NOTES:

A ROCK FILTER OUTLET SHALL BE INSTALLED WHERE FAILURE OF A COMPOST FILTER SOCK HAS OCCURRED DUE TO CONCENTRATED FLOW. ANCHORED COMPOST LAYER SHALL BE USED ON UPSLOPE FACE.

SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.

STANDARD CONSTRUCTION DETAIL #4-6
ROCK FILTER OUTLET

NOT TO SCALE

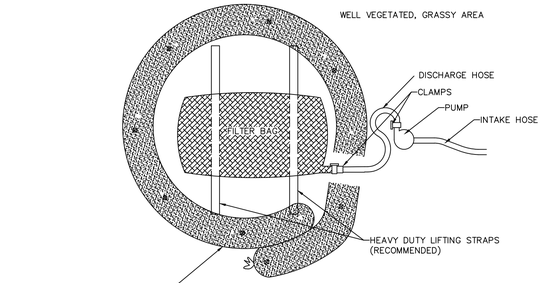


NOTES:

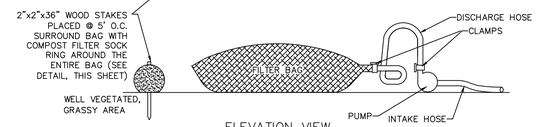
1. METAL "T" POSTS OR TREATED WOOD POSTS.
2. USE 6' HIGH POSTS DRIVEN INTO THE GROUND TO A DEPTH OF 1/3 OF THE HEIGHT OF THE POST (IE...2').
3. SPACE POSTS EVERY 8 FEET.
4. SECURE FENCING TO POSTS WITH NYLON CABLE TIES. WOOD STRIPS MAY ALSO BE USED TO PROVIDE ADDITIONAL SUPPORT AND PROTECTION BETWEEN TIES AND POSTS.
5. SEE SHEET C-101 EXISTING CONDITIONS AND DEMOLITION PLANS FOR LOCATIONS.

TREE PROTECTION FENCE DETAIL

NOT TO SCALE



PLAN VIEW



ELEVATION VIEW

NOTES:

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5% FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS. COMPOST BERM OR COMPOST FILTER SOCK SHALL BE INSTALLED BELOW BAGS LOCATED IN HQ OR EV WATERSHEDS, WITHIN 50 FEET OF ANY RECEIVING SURFACE WATER OR WHERE GRASSY AREA IS NOT AVAILABLE.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

STANDARD CONSTRUCTION DETAIL #3-16
PUMPED WATER FILTER BAG

NOT TO SCALE

NO.	DATE	DESCRIPTION

SEAL:

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — PETER C. MYERS — 054-696-E

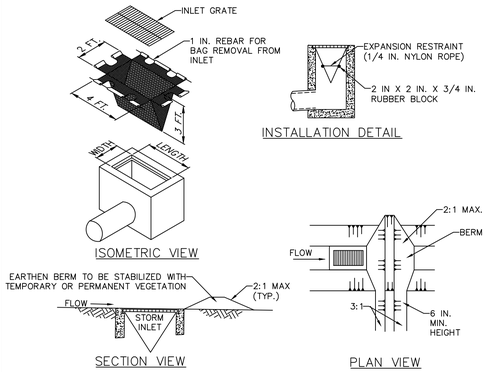
Date: 09-21-23

HUNT ENGINEERING COMPANY
P.O. Box 537 | 22 East King Street | Malvern, PA 19355
610.644.4600 | www.huntengineering.com

SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

NOTES AND DETAILS

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09-01-23	C-602
CHECKED BY	SCALE	SHEET NO. 7 OF 8
C. CAROLA		



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

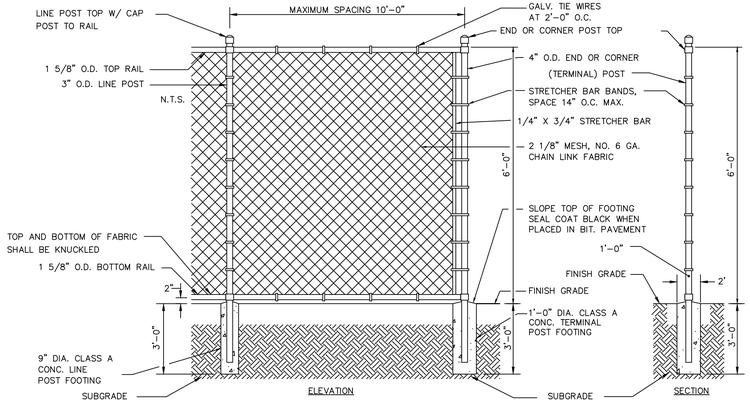
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

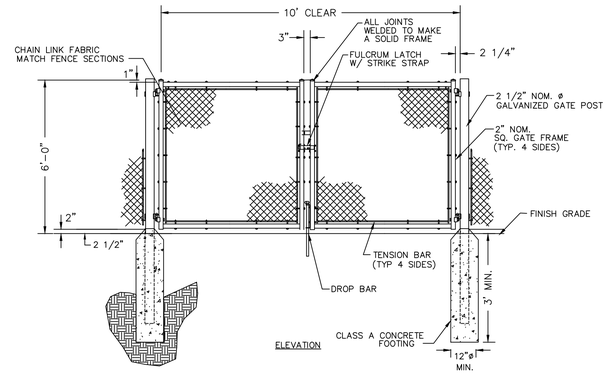
STANDARD CONSTRUCTION DETAIL #4-16
FILTER BAG INLET PROTECTION - TYPE M INLET

NOT TO SCALE



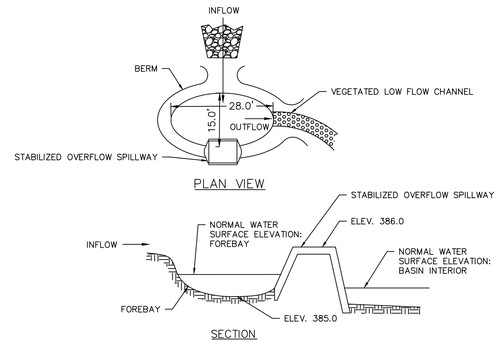
6' HIGH CHAIN LINK FENCE

NOT TO SCALE



10' WIDE DOUBLE LEAF CHAIN LINK GATE

NOT TO SCALE

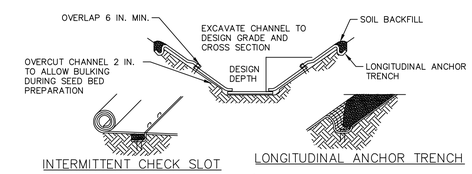


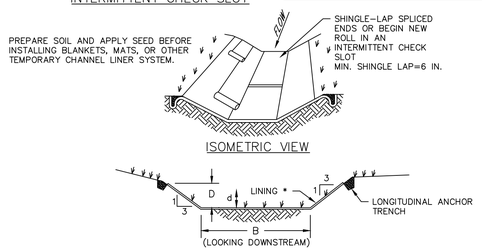
NOTES:

THE BERM SHOULD BE CONSTRUCTED OF NON-PERMEABLE SOILS OR CONCRETE. WHERE SOILS ARE USED, A SUITABLE TYPE OF HARD ARMOR (NORTH AMERICAN GREEN P300, OR APPROVED EQUAL) SHALL BE PROVIDED TO PREVENT SCOUR DURING OVERFLOW.

SEDIMENT FOREBAY

NOT TO SCALE





* SEE MANUFACTURER'S LINING INSTALLATION DETAIL FOR STAPLE PATTERNS, VEGETATIVE STABILIZATION FOR SOIL AMENDMENTS, SEED MIXTURES AND MULCHING INFORMATION

CHANNEL NUMBER	TEMPORARY OR PERMANENT	B BOTTOM WIDTH (FEET)	D DESIGN DEPTH (FEET)	d FLOW DEPTH (FEET)
1	PERMANENT	5.0	1.0	0.5

NOTES:

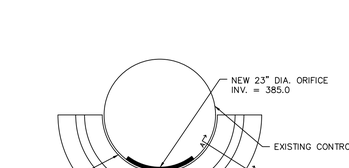
ANCHOR TRENCHES SHALL BE INSTALLED AT BEGINNING AND END OF CHANNEL IN THE SAME MANNER AS LONGITUDINAL ANCHOR TRENCHES.

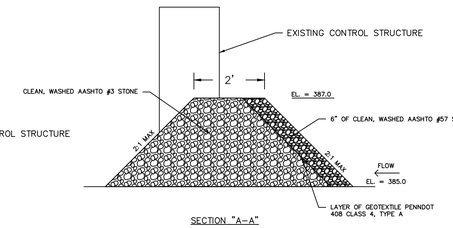
CHANNEL DIMENSIONS SHALL BE CONSTANTLY MAINTAINED. CHANNEL SHALL BE CLEANED WHENEVER TOTAL CHANNEL DEPTH IS REDUCED BY 25% AT ANY LOCATION.
SEDIMENT DEPOSITS SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OR AS SOON AS SOIL CONDITIONS PERMIT ACCESS TO CHANNEL WITHOUT FURTHER DAMAGE. DAMAGED LINING SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF DISCOVERY.

NO MORE THAN ONE THIRD OF THE SHOOT (GRASS LEAF) SHALL BE REMOVED IN ANY MOWING. GRASS HEIGHT SHALL BE MAINTAINED BETWEEN 2 AND 3 INCHES UNLESS OTHERWISE SPECIFIED. EXCESS VEGETATION SHALL BE REMOVED FROM PERMANENT CHANNELS TO ENSURE SUFFICIENT CHANNEL CAPACITY.

STANDARD CONSTRUCTION DETAIL #6-1
VEGETATED CHANNEL

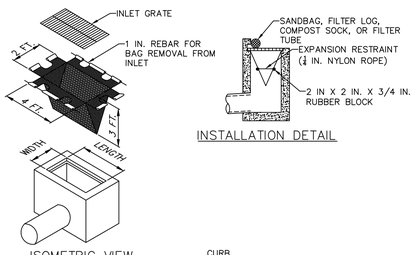
NOT TO SCALE





HORSESHOE BERM

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

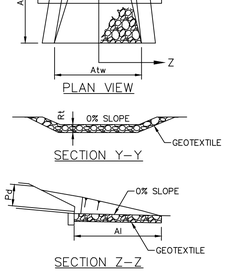
ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS, A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

STANDARD CONSTRUCTION DETAIL #4-15
FILTER BAG INLET PROTECTION - TYPE C INLET

NOT TO SCALE



NOTES:

ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.

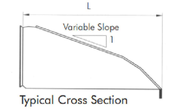
ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY.

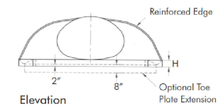
STANDARD CONSTRUCTION DETAIL #9-1
RIPRAP APRON AT PIPE OUTLET WITH FLARED END SECTION OR ENDWALL

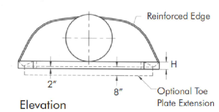
NOT TO SCALE

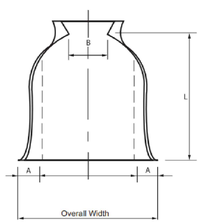
RIPRAP APRON DETAILS

BASIN OUTLET NO.	PIPE DIA. Do (in.)	d_{50} STONE SIZE (IN.) (from chart)	RIPRAP SIZE	La (ft) (from chart)	W_1 (ft)	W_2 (ft)	d (in)	FILTER STONE SIZE THCK.	
1	27	6	R-4	8.0	6.8	14.8	18	FS-2	4
2	18	6	R-4	8.0	4.5	12.5	18	FS-2	4
3	15	6	R-4	8.0	3.8	11.8	18	FS-2	4
4	18	6	R-4	8.0	4.5	12.5	18	FS-2	4
5	12	6	R-4	8.0	3.0	11.0	18	FS-2	4
6	12	6	R-4	8.0	3.0	11.0	18	FS-2	4









END SECTIONS FOR ROUND PIPES							
PIPE DIA.	GAGE	A (+/- 1") (IN.)	B (MAX.) (IN.)	H (+/- 1") (IN.)	L (+/- 4") (IN.)	W (+/- 2") (IN.)	OVERALL WIDTH (+/- 4")
12	16	6	6	6	21	24	36

FLARED END SECTION

NOT TO SCALE

NO.	DATE	DESCRIPTION

SEAL:

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — PETER C. MYERS — 054-696-E

Date: 09-21-23

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SYKES STORMWATER BASIN
WEST CHESTER UNIVERSITY
TOWNSHIP OF WEST GOSHEN
COUNTY OF CHESTER, PENNSYLVANIA

NOTES AND DETAILS

DRAWN BY	DATE	DRAWING NO.
M. MIXELL	09-01-23	C-603
CHECKED BY	SCALE	SHEET NO. 8 OF 8
C. CAROLA		

NORTH CAMPUS GEOTHERMAL PROJECT - PART A

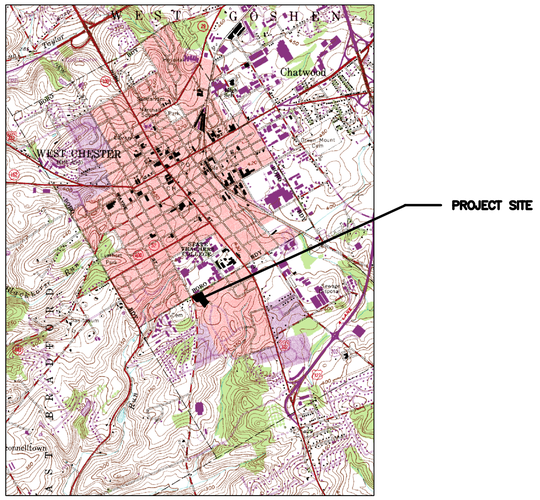
FOR

WEST CHESTER UNIVERISTY

West Chester, PA 19383

PROJECT NO. 76408-07

AUGUST 2008
REVISED OCTOBER 7, 2008
REVISED OCTOBER 17, 2008



LOCATION PLAN
NTS

TABLE OF CONTENTS

DWG.	SHT.	DESCRIPTION
G101	1	TITLE SHEET
G105	2	EROSION AND SEDIMENT CONTROL PLAN
G106	3	EROSION AND SEDIMENT CONTROL NOTES
G107	4	EROSION AND SEDIMENT CONTROL DETAILS

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W1 WWW.ALDERSONENGINEERING.COM

West Chester University

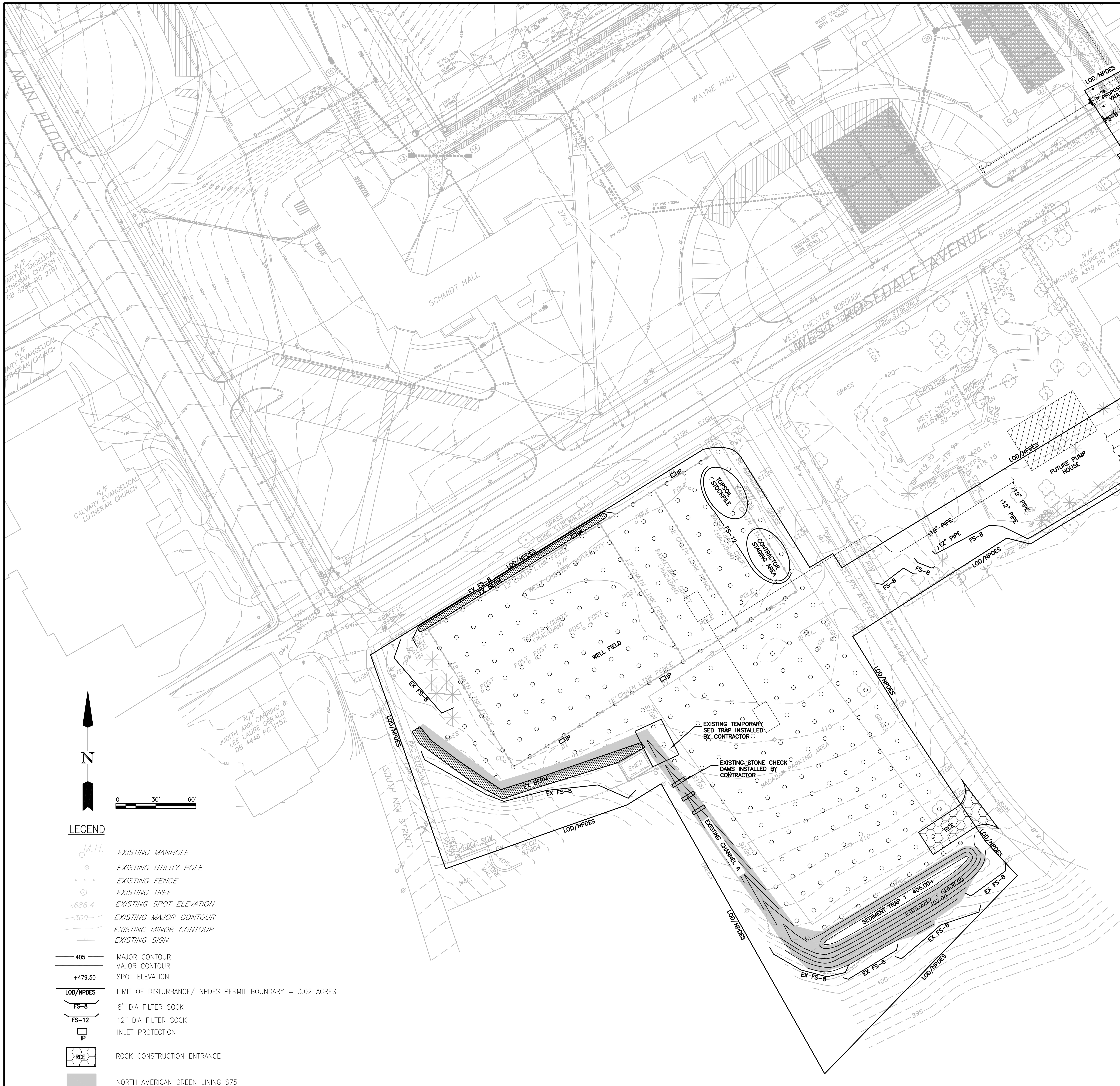
NORTH CAMPUS
GEOTHERMAL PROJECT - PART A
West Chester, Pennsylvania
WEST CHESTER UNIVERSITY

NO.	REVISION	BY	DATE
1	PER CCCD COMMENTS	KMW	10.7.08
2	PER CCCD COMMENTS	KMW	10.17.08

PROJECT NO.: 76408-07
CAD FILE: 76408-07
ENGR./ARCH.: BR
DESIGN BY: KW
DRAWN BY: KW
CHECKED BY: JB
DATE: 8-7-08

TITLE SHEET

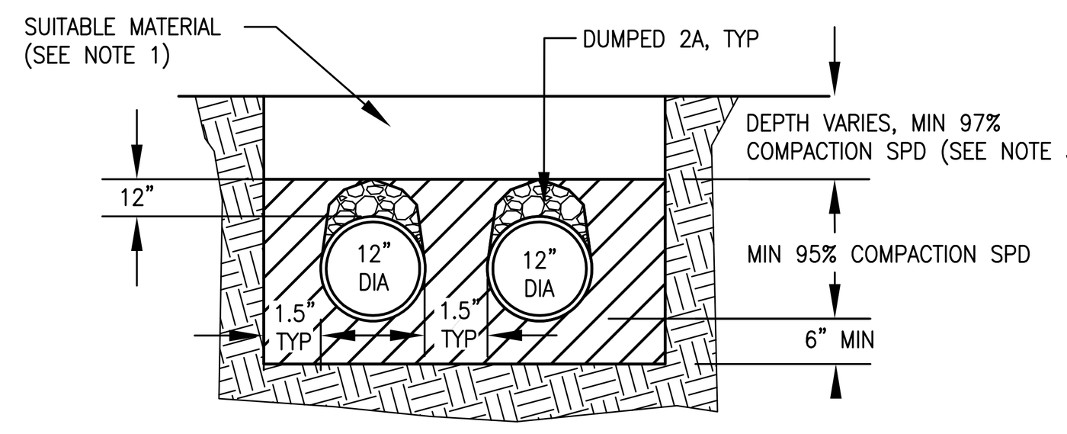
G101



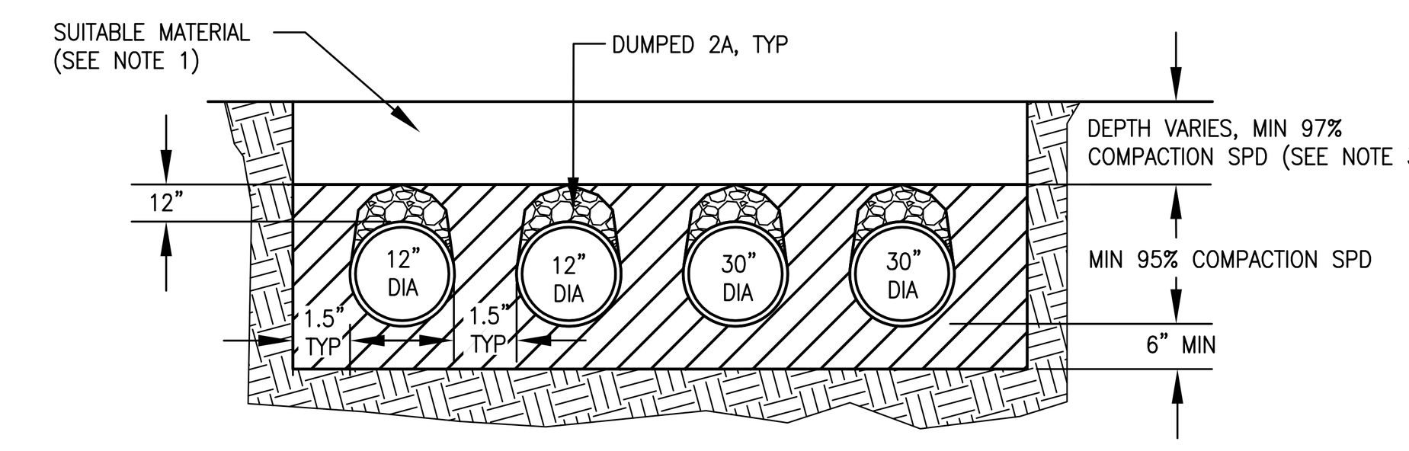
LEGEND

M.H.	EXISTING MANHOLE
	EXISTING UTILITY POLE
	EXISTING FENCE
	EXISTING TREE
x688.4	EXISTING SPOT ELEVATION
300	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING SIGN
405	MAJOR CONTOUR
	MAJOR CONTOUR
+479.50	SPOT ELEVATION
LOD/NPDES	LIMIT OF DISTURBANCE/ NPDES PERMIT BOUNDARY = 3.02 ACRES
FS-8	8" DIA FILTER SOCK
FS-12	12" DIA FILTER SOCK
IP	INLET PROTECTION
RCE	ROCK CONSTRUCTION ENTRANCE
	NORTH AMERICAN GREEN LINING S75

NOTES:
1. CONTRACTOR TO CALL PA 1 CALL BEFORE DIGGING.
2. A PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN MUST BE DEVELOPED AND IMPLEMENTED BY THE OPERATOR.
3. ALL SOILS WITHIN THE SITE ARE UoB, URBAN LAND-GLENELG COMPLEX.

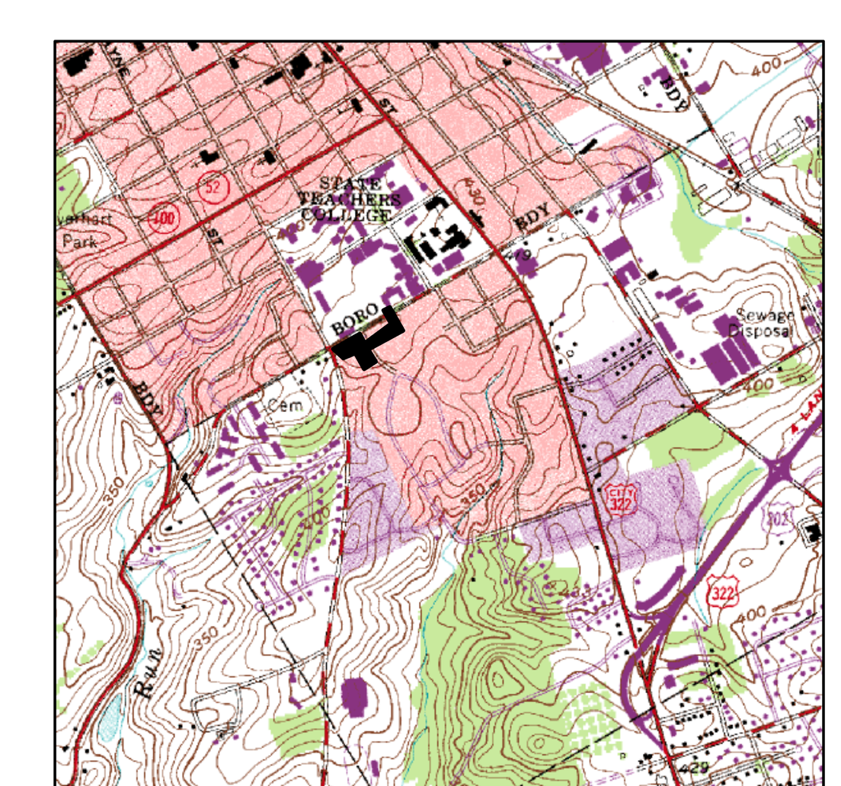


PIPE TRENCH DETAIL
WELL FIELD TO FUTURE PUMP HOUSE
SCALE: NONE



PIPE TRENCH DETAIL
FUTURE PUMP HOUSE TO PROPOSED VAULT
SCALE: NONE

NOTES:
1. MATERIAL CONTAINING NO DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN ONE-HALF THE THICKNESS OF THE COMPACTED LAYERS BEING PLACED.
2. PERMIT PLACEMENT OF BACKFILL MATERIAL IN LAYERS, LIFTS, 8" THICK WHEN USING VIBRATORY COMPACTION EQUIPMENT.
3. COMPACT TOP 3'-0" OF SUBGRADE TO 100% IN ACCORDANCE WITH PUBLICATION 408, SECTION 206.3.
4. PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 4" THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 12" ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



LOCATION MAP
SCALE : 1" = 2000'

CALL BEFORE YOU DIG!

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West Chester University

NORTH CAMPUS GEOTHERMAL PROJECT - PART A
West Chester, Pennsylvania
WEST CHESTER UNIVERSITY

NO.	REVISION	BY	DATE
1	PER CCCD COMMENTS	KMW	9-30-08

PROJECT NO.: 76408-07
CAD FILE: 76408-07
ENGR./ARCH.: BR
DESIGN BY: KW
DRAWN BY: KW
CHECKED BY: JB
DATE: 8-7-08

DRAWING INTENT IS TO INDICATE GENERAL ARRANGEMENT, DESIGN AND INTENT OF WORK AND IS PARTLY DIAGRAMMATIC.
DRAWING SHALL NOT BE SCALED.

ESC PLAN

G105

SEQUENCE OF CONSTRUCTION

1. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE, EACH STAGE SHALL BE COMPLETED AND IMMEDIATELY STABILIZED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING, GRUBBING AND TOPSOIL STRIPPING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
2. AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES INCLUDING BUT NOT LIMITED TO: THE LANDOWNER AND ALL APPROPRIATE MUNICIPAL OFFICIALS, A REPRESENTATIVE FROM THE CHESTER COUNTY CONSERVATION DISTRICT FOR AN ON SITE PRE-CONSTRUCTION MEETING.
3. **DO NOT COMPACT THE SOILS IN THE SEDIMENT TRAP AREA.**
4. FIELD MARK THE LIMITS OF DISTURBANCE AND INSTALL ALL FILTER SOCKS AND INLET PROTECTION AT EXISTING INLETS AS SHOWN ON THE PLANS.
5. INSTALL ROCK CONSTRUCTION ENTRANCE AND CONTRACTOR STAGING AREA.
6. ENSURE THAT ANY EXISTING FILTER SOCKS, INLET PROTECTION AND CHANNEL A ARE IN GOOD WORKING ORDER.
7. INSTALL SEDIMENT TRAP 1. TRAP MUST TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES. UPON INSTALLATION OF THE TEMPORARY SEDIMENT TRAP RISER, AN IMMEDIATE INSPECTION OF THE RISER SHALL BE CONDUCTED BY A QUALIFIED SITE REPRESENTATIVE AND THE CHESTER COUNTY CONSERVATION DISTRICT SHALL BE NOTIFIED IN WRITING THAT THE PROPER RISER IS INSTALLED AND SEALED, PER PLAN. SEDIMENT TRAP MUST BE PROTECTED FROM UNAUTHORIZED ACTS OF THIRD PARTIES.
8. ALL SEDIMENT LADEN WATER SHALL BE PUMPED THROUGH A PUMPED WATER FILTER BAG.
9. STOCKPILE TOPSOIL AS SHOWN ON PLAN. PLACE FILTER SOCK AT TOE OF STOCKPILE. STABILIZE STOCKPILE IMMEDIATELY AS PER THE SEEDING AND RESTORATION TABLE.
10. BEGINNING AT SEDIMENT TRAP 1, INSTALL CHANNEL A. ONLY BEGIN WHAT CAN BE INSTALLED AND STABILIZED IN THE SAME DAY.
11. BEGIN DRILLING FOR WELLS. MAINTAIN DRAINAGE TO EROSION AND SEDIMENT CONTROL DEVICES
12. REMOVE EXISTING PAVING TO BE REMOVED/REPLACED.
13. INSTALL PROPOSED PIPELINES AND UTILITIES.
14. UTILITY LINE TRENCH EXCAVATION NOTES:

    a. LIMIT ADVANCED CLEARING AND GRUBBING OPERATIONS TO A DISTANCE EQUAL TO TWO TIMES THE LENGTH OF PIPE INSTALLATION THAT CAN BE COMPLETED IN ONE DAY.
    b. WORK CREWS AND EQUIPMENT FOR TRENCHING, PLACEMENT OF PIPE, PLUG CONSTRUCTION AND BACKFILLING WILL BE SELF CONTAINED AND SEPARATE FROM CLEARING AND GRUBBING AND SITE RESTORATION AND STABILIZATION OPERATIONS.
    c. ALL SOIL EXCAVATED FROM THE TRENCH WILL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.
    d. LIMIT DAILY TRENCH EXCAVATION TO THE LENGTH OF PIPE PLACEMENT, PLUG INSTALLATION AND BACKFILLING THAT CAN BE COMPLETED THE SAME DAY.
    e. WATER THAT ACCUMULATES IN THE OPEN TRENCH WILL BE COMPLETELY REMOVED BY PUMPING BEFORE PIPE PLACEMENT AND/ OR BACKFILLING BEGINS. WATER REMOVED FROM THE TRENCH SHALL BE PUMPED THROUGH A FILTRATION DEVICE. ON THE DAY FOLLOWING PIPE PLACEMENT AND TRENCH BACKFILLING, THE DISTURBED AREA WILL BE GRADED TO FINAL CONTOURS AND IMMEDIATELY STABILIZED.

13. FINE GRADE DISTURBED AREAS TO ORIGINAL GRADES AND STABILIZE AS PER THE SEEDING RESTORATION TABLE. PLACE EROSION CONTROL MATTING ON ALL SLOPES EXCEEDING 4:1.
14. INSTALL PAVING AND RETURN ALL AREAS TO ORIGINAL PAVED CONDITIONS.
15. UPON COMPLETION OF RENOVATIONS IMMEDIATELY STABILIZE ALL REMAINING DISTURBED AREAS AND REPLACE TOPSOIL AT A MINIMUM 6 INCH DEPTH ON ALL DISTURBED AREAS TO BE PERMANENTLY REVEGETATED.
16. WHEN ALL AREAS HAVE BEEN STABILIZED, **CONTACT THE CONSERVATION DISTRICT FOR A CONSULTATION PRIOR TO REMOVAL OF TEMPORARY E&S CONTROLS, AND CHANNEL A.**
17. REMOVE CHANNEL A BEGINNING UPSLOPE AND REGRADE TO ORIGINAL CONDITIONS. ONLY REMOVE WHAT CAN BE REGRADED AND PERMANENTLY STABILIZED IN THE SAME DAY.
18. **PRIOR TO CONVERSION OF SEDIMENT TRAP 1 CONTACT THE CONSERVATION DISTRICT FOR A SITE INSPECTION AND APPROVAL.**
19. **CONVERT SEDIMENT TRAP 1 TO PERMANENT RAINGARDEN PER PCSM PLAN AND PERMANENTLY STABILIZE.**
20. COMPLETELY STABILIZE ANY REMAINING DISTURBED AREAS WITH PERMANENT SEED AND MULCH AS DIRECTED BY THE SEEDING RESTORATION AND MULCH APPLICATION RATES TABLES.
21. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATORS SHALL CONTACT THE CHESTER COUNTY CONSERVATION DISTRICT FOR A FINAL INSPECTION PRIOR TO THE REMOVAL OF THE BMP'S.
22. PERMANENT STABILIZATION IS DEFINED AS: A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

STANDARD EROSION AND SEDIMENTATION CONTROL PLAN NOTES

1. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.

2. THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF THE APPENDIX 64, EROSION CONTROL RULES AND REGULATIONS, TITLE 25, PART 1, DEPARTMENT OF ENVIRONMENTAL PROTECTION, SUBPART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.

3. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY, OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION.

3. AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INCORPORATED AT 1- 800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.

4. BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E & S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE CHESTER COUNTY CONSERVATION DISTRICT. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

5. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT CONTROL BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEANOUT, REPAIR, REPLACEMENT, RE-GRADING, RESEEDING, RE-MULCHING AND RE-NETTING MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS OR MODIFICATIONS OF THOSE INSTALLED WILT BE REQUIRED.

6. TOPSOIL STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SIDE SLOPES MUST BE 2:1 OR FLATTER.

7. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF ANY EXCESS MATERIAL AND MAKE SURE SITE(S) RECEIVING THE EXCESS HAS AN APPROVED EROSION AND SEDIMENT CONTROL PLAN THAT MEETS THE CONDITIONS OF CHAPTER 102 AND/OR OTHER STATE OR FEDERAL REGULATIONS.

8. ALL BUILDING MATERIALS AND WASTES MUST BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1., AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.

9. AN EROSION CONTROL BLANKET WILL BE INSTALLED ON ALL DISTURBED SLOPES STEEPER THAN 3:1 AND ALL AREAS OF CONCENTRATED FLOWS.

10. ANY SEDIMENT REMOVED FROM BMPS DURING CONSTRUCTION WILL BE RETURNED TO UPLAND AREAS ON SITE AND INCORPORATED INTO THE SITE GRADING.

11. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION

12. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.

13. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE THE DISTURBED AREAS. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE RE-DISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINAL GRADE OR WHICH WILL NOT BE RE-DISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.

14. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATORS SHALL CONTACT THE CHESTER COUNTY CONSERVATION DISTRICT FOR A FINAL INSPECTION PRIOR TO THE REMOVAL OF THE BMP'S.

15. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENTATION CONTROLS MUST BE REMOVED. AREA DISTURBED DURING REMOVAL OF THE CONTROLS MUST BE STABILIZED IMMEDIATELY. PERMANENT STABILIZATION SHOULD BE DEFINED AS "A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS".

16. SEDIMENT TRAP SHALL BE KEPT FREE OF ALL TRASH, CONCRETE WASH WATER AND OTHER DEBRIS THAT POSE THE POTENTIAL FOR CLOGGING THE TRAP OUTLET STRUCTURES AND/OR POSE THE POTENTIAL FOR POLLUTION TO WATERS OF THE COMMONWEALTH.

17. WHEN SEDIMENT HAS ACCUMULATED TO THE CLEAN OUT ELEVATION ON ANY STAKE, ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE ENTIRE TRAP BOTTOM.

18. ALL CHANNELS MUST BE KEPT FREE OF OBSTRUCTIONS SUCH AS FILL GROUND, FALLEN LEAVES & WOODY DEBRIS, ACCUMULATED SEDIMENT, AND CONSTRUCTION MATERIALS/WASTES. CHANNELS SHOULD BE KEPT MOWED AND/OR FREE OF ALL WEEDY, BRUSHY OR WOODY GROWTH. ANY UNDERGROUND UTILITIES RUNNING ACROSS/ THROUGH THE CHANNEL(S) SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL(S) REPAIRED AND STABILIZED PER THE CHANNEL CROSS-SECTION DETAIL.

19. FILL MATERIAL FOR THE EMBANKMENTS SHALL BE FREE OF ROOTS, OR OTHER WOODY VEGETATION, ORGANIC MATERIAL, LARGE STONES, AND OTHER OBJECTIONABLE MATERIALS. THE EMBANKMENT SHALL BE COMPACTED IN MAXIMUM 8" LAYERED LIFTS AT 95% DENSITY.

SITE STABILIZATION

1. THE CONTRACTOR SHALL PROTECT ALL EXPOSED AREAS AGAINST WASHOUTS AND SOIL EROSION. ALL GRASSED SWALES SHALL BE STABILIZED WITH THE MATTING SPECIFIED IN THE SWALE DETAIL.

2. ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED MUST BE STABILIZED IMMEDIATELY. DURING NONGERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN ONE (1) YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE REDISTURBED WITHIN ONE (1) YEAR MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS. SWALES AND STOCKPILES MUST BE STABILIZED IMMEDIATELY.

3. USE STRAW APPLIED AT A RATE OF 3 TONS PER ACRE, JUTE MATTING, OR OTHER SUITABLE MATERIALS.

4. EROSION CONTROL MATS AND BLANKETS SHALL BE INSTALLED PER SECTION 806 OF PADOT PUBLICATION 408.

SEEDING

1. TEMPORARY COVER

DEFINITION: ESTABLISHING A TEMPORARY COVER OF ANNUAL GRASS TO STABILIZE AREAS WHICH ARE SUBJECT TO EROSION, SEDIMENT, OR SOIL DEPLETION. SEE "SEEDING RESTORATION TABLE".

PURPOSE: TO PROVIDE SHORT-TERM RAPID COVER FOR THE CONTROL OF SURFACE RUNOFF AND EROSION, UNTIL PERMANENT VEGETATION OR OTHER STABILIZATION MATERIALS CAN BE ESTABLISHED.

2. PERMANENT COVER

DEFINITION: ESTABLISHING PERMANENT GRASS COVER TO STABILIZE AREAS WHICH ARE SUBJECT TO EROSION, SEDIMENT, OR SOIL DEPLETION. SEE SPECIFICATIONS "SEEDING RESTORATION TABLE" ROADSIDE; MOWED CONDITION FOR SEED MIX.

PURPOSE: TO PROVIDE PERMANENT VEGETATIVE COVER TO CONTROL SURFACE RUNOFF AND EROSION.

WHERE APPLICABLE: ON ALL SEDIMENT-PRODUCING AREAS WHERE IT IS FEASIBLE TO PREPARE SEEDBED, AND WHERE THE PERIOD OF EXPOSURE WILL BE MORE THAN TWELVE (12) MONTHS.

USE STRAW APPLIED AT A RATE OF 3 TONS PER ACRE, JUTE MATTING, OR OTHER SUITABLE MATERIALS FOR MULCHING PURPOSES.

SEEDING RESTORATION TABLE

RESTORATION CONDITION	TOPSOIL	LIME*	BASIC* FERTILIZER	STARTER FERTILIZER	* SEED MIX & SOWING RATE (% BY WEIGHT)
TEMPORARY COVER**	N/A	100#/ 1,000 SQ.FT.	N/A	10-6-4 @ 40# PER 1,000 SQ.FT.	100% ANNUAL RYEGRASS (95% PLS, 85% GERMINATION) SOW 1# PER 1,000 SQ.FT MARCH THRU MAY/AUGUST THRU SEPTEMBER
LAWNS	YES	4 TONS/ ACRE	10-20-20 1,000# PER/ACRE	10-6-4 @ 40# PER 1,000 SQ.FT.	20% KENTUCKY BLUE PRINCETON 105 (85% PLS, 75% GERMINATION) 60% FINE LAWN ELITE TALL FESCUE (95% PLS, 80% GERMINATION) 20% CHARISMATIC PERENNIAL RYEGRASS (95% PLS, 85% GERMINATION) SOW 6# PER 1,000 SQ.FT MARCH THRU MAY/AUGUST THRU SEPT.
BANK AREAS STEEPER THAN OR EQUAL TO 3:1 SWALES	YES	4 TONS/ ACRE	NO	12-18-10 @ 18# PER 5,000 SQ.FT. OR 18-24-10 @ 20# PER 5,000 SQ.FT.	60% ABERDEEN RED FESCUE (98% PLS, 85% GERMINATION) 40% CHARISMATIC PERENNIAL RYEGRASS (95% PLS, 85% GERMINATION) SOW 9# PER 1,000 SQ. YDS. MARCH THRU MAY/ AUGUST THRU SEPTEMBER

* UNLESS A LESSER RATE IS INDICATED BY SOIL TESTS.
** UNLESS OTHERWISE SPECIFIED IN THE EROSION AND SEDIMENT CONTROL PLAN.

NOTES:
1. MULCHING MATERIALS, CONSTRUCTION AND MAINTENANCE WILL BE IN ACCORDANCE WITH THE SPECIFICATIONS CONTAINED IN SECTION 805, PENNDOT PUBLICATION 408.

2. SEE MULCH APPLICATION RATES TABLE.

3. DURING NONGERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES.

PPC PLAN

A PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN MUST BE DEVELOPED AND IMPLEMENTED BY THE OPERATOR/CONTRACTOR.

SOILS DESCRIPTIONS FROM SOILMAP.PSU.EDU

SOIL SERIES	SEASONAL WATER TABLE	DEPTH TO BEDROCK (IN.)	FLOODING POTENTIAL	PROFILE PERMEABILITY	BULK DENSITY	ROCK FREE KF FACTOR
UoB	>60 IN	VERY DEEP	NONE	MODERATE	1.40 GM/CM3	0.32

SOIL SHORT DESCRIPTION:
UoB - URBAN LAND-GLENELG COMPLEX, 0-8 PERCENT SLOPES. NOT PRIME FARMLAND. WELL DRAINED.

NPDES PERMIT NOTES

1. UPON REDUCTION, LOSS OR FAILURE OF THE BMP'S, THE PERMITEE AND CO-PERMITEE SHALL TAKE IMMEDIATE ACTION TO RESTORE THE BMP'S OR PROVIDE AN ALTERNATIVE METHOD OF TREATMENT.

2. WHERE E&S BMP'S ARE FOUND TO BE INOPERATIVE OR INEFFECTIVE DURING AN INSPECTION, OR ANY OTHER TIME, THE PERMITEE AND CO-PERMITEE SHALL IMMEDIATELY CONTACT THE CHESTER COUNTY CONSERVATION DISTRICT, BY PHONE OR PERSONAL CONTACT, FOLLOWED BY THE SUBMISSION OF A WRITTEN REPORT WITHIN 5 DAYS OF THE INITIAL CONTACT.

3. PERMITEE'S REQUESTING A RENEWAL OF COVERAGE UNDER GENERAL PERMIT MUST SUBMIT TO THE CHESTER COUNTY CONSERVATION DISTRICT AN ADMINISTRATIVELY COMPLETE AND ACCEPTABLE NOI, AT LEAST 90 DAYS PRIOR THE THE EXPIRATION DATE OF THE COVERAGE.

4. PERMITEE'S REQUESTING A RENEWAL OF COVERAGE UNDER INDIVIDUAL PERMIT MUST SUBMIT TO THE CHESTER COUNTY CONSERVATION DISTRICT AN ADMINISTRATIVELY COMPLETE AND ACCEPTABLE NOI, AT LEAST 180 DAYS PRIOR TO THE EXPIRATION DATE OF THE COVERAGE.

5. NOTICE OF TERMINATION. WHERE ALL STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY THAT ARE AUTHORIZED BY THIS PERMIT ARE ELIMINATED, AND BMP'S IDENTIFIED IN THE POST CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLAN HAVE BEEN INSTALLED, THE PERMITEE OR CO-PERMITEE OF THE FACILITY MUST SUBMIT A NOTICE OF TERMINATION (NOT) FORM THAT IS SIGNED IN ACCORDANCE WITH PART B.1.C (SIGNATORY REQUIREMENTS) OF THIS PERMIT TO THE CHESTER COUNTY CONSERVATION DISTRICT.

MULCHING

1. APPLY MULCHES AT THE RATES SHOWN IN MULCH APPLICATION RATES TABLE.

2. STRAW AND HAY MULCH SHOULD BE ANCHORED IMMEDIATELY AFTER APPLICATION TO PREVENT BEING WINDBLOWN. A TRACTOR-DRAWN IMPLEMENT MAY BE USED TO "CRIMP" THE STRAW OR HAY INTO THE SOIL. THIS METHOD IS LIMITED TO SLOPES NO STEEPER THAN 3:1. THE MACHINERY SHOULD BE OPERATED ON THE CONTOUR. (NOTE: CRIMPING OF HAY OR STRAW BY RUNNING OVER IT WITH TRACKED MACHINERY IS NOT RECOMMENDED.)

3. ASPHALT, EITHER EMULSIFIED OR CUT-BACK, CONTAINING NO SOLVENTS OR OTHER DILUTING AGENTS TOXIC TO PLANT OR ANIMAL LIFE, UNIFORMLY APPLIED AT THE RATE OF 31 GALLONS PER 1000 SQ. YD. MAY BE USED TO TACK MULCH.

4. SYNTHETIC BINDERS (CHEMICAL BINDERS) MAY BE USED AS RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH PROVIDED SUFFICIENT DOCUMENTATION IS PROVIDED TO SHOW THEY ARE NON-TOXIC TO NATIVE PLANT AND ANIMAL SPECIES.

5. LIGHTWEIGHT PLASTIC, FIBER, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

MULCH APPLICATION RATES

MULCH TYPE	APPLICATION RATE (MIN.)			NOTES
	PER ACRE	PER 1000 SQ FT	PER 1000 SQ YD	
STRAW	3 TONS	140 LB	1240 LB	EITHER WHEAT OR OAT STRAW, FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	3 TONS	140 LB	1240 LB	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES

MAINTENANCE PROGRAM

1. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENTATION BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENTATION BMP'S AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL SITE INSPECTIONS WILL BE DOCUMENTED IN AN INSPECTION LOG KEPT FOR THIS PURPOSE. THE COMPLIANCE ACTIONS AND THE DATE, TIME AND NAME OF THE PERSON CONDUCTING THE INSPECTION. THE INSPECTION LOG WILL BE KEPT ON SITE AT ALL TIMES AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST.

2. ALL PREVENTIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING, MUST BE PREFORMED IMMEDIATELY. IF EROSION AND SEDIMENTATION BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS OR MODIFICATIONS OF THOSE INSTALLED WILL BE NEEDED.

3. WHERE BMPS ARE FOUND TO FAIL TO ALLEVIATE EROSION OR SEDIMENT POLLUTION, THE PERMITTEE OR CO-PERMITTEE SHALL INCLUDE THE FOLLOWING INFORMATION:

    a. THE LOCATION AND SEVERITY OF THE BMP'S FAILURE AND ANY POLLUTION EVENTS.
    b. ALL STEPS TAKEN TO, REDUCE, ELIMINATE AND PREVENT THE RECURRENCE OF THE NON-COMPLIANCE.
    c. THE TIME FRAME TO CORRECT THE NON-COMPLIANCE, INCLUDING THE EXACT DATES WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE.

4. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.

5. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES THE ELEVATION DEPICTED IN THE DEVICE DETAILS. SEDIMENT DEPOSITS MUST ALSO BE REMOVED AFTER EACH RAINFALL REGARDLESS OF THE DEPOSITION ELEVATION. REMOVED DEPOSITS SHALL BE PLACED ON THE EXISTING EXPOSED SITE OUT OF THE WAY OF CONSTRUCTION AND ABOVE SEDIMENT DEVICES. IF A DEPOSIT IS TRANSPORTED BY TRUCK OVER LOCAL ROADS, IT SHALL BE DONE IN A MANNER WHICH KEEPS ROADS FREE OF SEDIMENT. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE DEVICES ARE NO LONGER REQUIRED MAY BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED, AND SEEDED.

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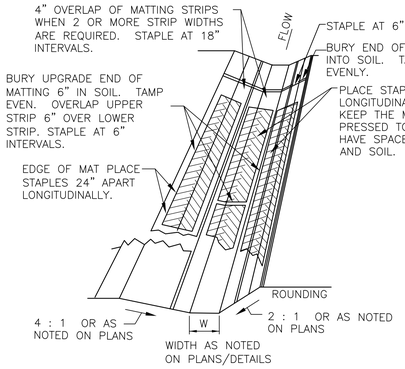
NORTH CAMPUS GEOTHERMAL PROJECT - PART A
West Chester, Pennsylvania
WEST CHESTER UNIVERSITY

NO.	REVISION	BY	DATE
1	PER CCCD COMMENTS	KMW	5.30.08
2	PER CCCD COMMENTS	KMW	10.7.08

PROJECT NO.: 76408-07
CAD FILE: 76408-07
ENGR./ARCH.: BR
DESIGN BY: KW
DRAWN BY: KW
CHECKED BY: JB
DATE: 8-7-08

ESC NOTES

G106



CONSTRUCTION SPECIFICATIONS:

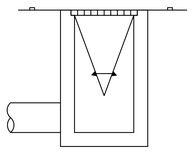
1. MAT WIDTH IS 48"+1". SEE "SITE STABILIZATION" FOR DETAILS OF JUTE MAT. USE SEED MIX SPECIFIED. MULCH IS NOT REQUIRED. WHEN TOPSOIL IS SPECIFIED IN THE AREA ADJACENT TO THAT WHERE SOIL STABILIZATION MATTING IS TO BE CONSTRUCTED. IT SHALL ALSO BE PLACED AT THE SAME DEPTH IN THE AREA WHERE SOIL STABILIZATION MATTING IS REQUIRED TO THE INSTALLATION OF THE MATTING.

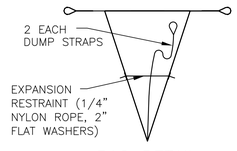
2. 11 GAUGE (0.1205) WIRE OR HEAVIER LATERAL SPACING OF STAPLES TO BE AT EDGE OF MAT, AT OVERLAP OF MATS AND AT BREAK IN GROUND OR MIDPOINT OF MAT WHERE NO BREAKS OCCUR FOR THAT MAT.

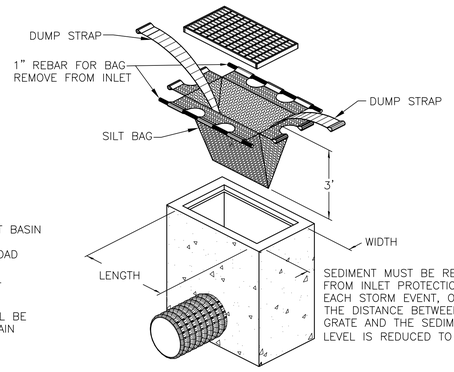
3. THE CONTRACTOR HAS THE OPTION OF SUPPLYING EITHER JUTE OR NORTH AMERICAN GREEN S75 MATTING. HOWEVER, JUTE WILL ONLY BE ALLOWED IN DITCHES HAVING A GRADE OF 2% OR LESS. THERE ARE NO RESTRICTIONS FOR NORTH AMERICAN GREEN S75 MATTING.

SOIL STABILIZATION MATTING PLACEMENT

SCALE: NONE





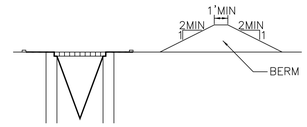


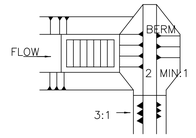
-MAXIMUM DRAINAGE AREA = 1/2 ACRE.
INLET PROTECTION IS NOT REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS REQUIRED FOR ALL INSTALLATIONS.
-EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED.
-SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

CHANNEL INLET PROTECTION NOTE: EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR TO REMAIN PERMANENTLY.

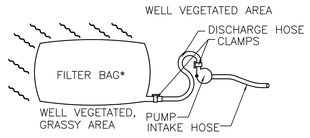
INLET PROTECTION

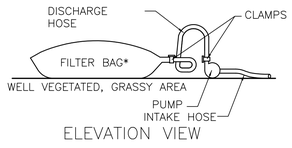
SCALE: NONE





CHANNEL OR ROADSIDE SWALE INLET PROTECTION





PUMPED WATER FILTER BAG

SCALE: NONE

NOTES:
1. FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS.

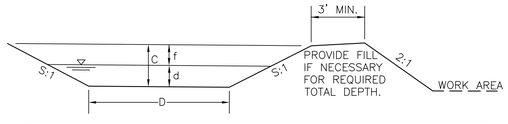
2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED.

3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREAS, AND DISCHARGED ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH SHALL BE PROVIDED. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.

4. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED.

5. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.

6. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.



SWALE	TOTAL DEPTH, C (FT.)	SWALE GRADE	BOTTOM WIDTH D	SIDE SLOPES, S:1 LEFT , RIGHT	SWALE LINING
A	1.10	4%	0	3:1	S75

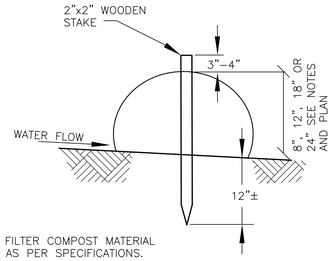
SWALE LINING SHALL BE AS PER NORTH AMERICAN GREEN
SWALE LINING SHALL BE INSTALLED ACROSS THE BOTTOM AND UP SIDE SLOPES TO DESIGN DEPTH.

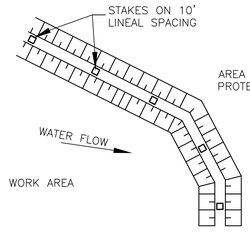
NOTES:
1. ALL CHANNELS MUST BE KEPT FREE OF OBSTRUCTIONS SUCH AS FILL GROUND, FALLEN LEAVES AND WOODY DEBRIS, ACCULMULATED SEDIMENT, AND CONSTRUCTION MATERIALS/WASTES. CHANNELS SHOULD BE KEPT MOWED AND/OR FREE OF ALL WEEDY, BRUSHY OR WOODY GROWTH. ANY UNDERGROUND UTILITIES RUNNING ACROSS/THROUGH THE CHANNEL(S) SHALL BE IMMEDIATELY BACKFILLED AND THE CHANNEL(S) REPAIRED AND STABILIZED PER THE CHANNEL CROSS-SECTION DETAIL.

2. VEGETATED CHANNELS SHALL BE CONSTRUCTED FREE OF ROCKS, TREE ROOTS, STUMPS OR OTHER PROJECTIONS THAT WILL IMPEDE NORMAL CHANNEL FLOW AND/OR PREVENT GOOD LINING TO SOIL CONTACT. THE CHANNEL SHALL BE INITIALLY OVER-EXCAVATED TO ALLOW FOR THE PLACEMENT OF TOPSOIL.

SWALE DETAIL

SCALE: NONE





FILTER SOCK

SCALE: NONE

NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS, OR EQUAL.

2. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER SOCK IN A FUNCTIONAL CONDITION AT ALL TIMES AND IT SHALL BE ROUTINELY INSPECTED.

3. WHERE THE SOCK REQUIRES REPAIR, IT WILL BE ROUTINELY REPAIRED.

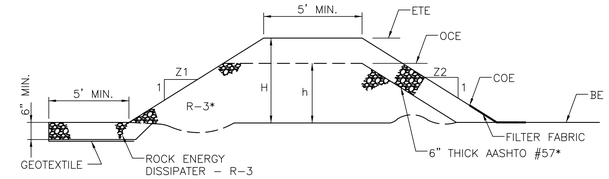
4. THE CONTRACTOR SHALL REMOVE SEDIMENTS COLLECTED AT THE BASE OF THE SOCK WHEN THEY REACH 1/3 OF THE EXPOSED HEIGHT OF THE SOCK, OR AS DIRECTED BY THE ENGINEER.

5. THE COMPOST FILTER SOCK WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

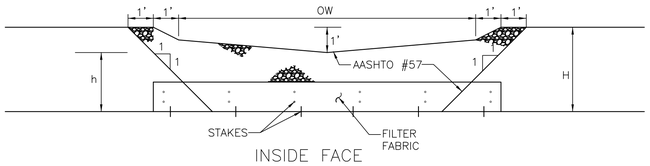
6. FILTER SOCKS MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH SOCK SECTION MUST EXTEND AT LEAST 8' UPSLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT.

7. (SEE PLAN)
FS-8 = 8" FILTER SOCK
FS-12 = 12" FILTER SOCK
FS-18 = 18" FILTER SOCK
FS-24 = 24" FILTER SOCK

TYPICAL SOCK FOR MINIMAL GRADES SHOWN. FOR STEEPER GRADES, I.E. 2:1 SLOPES INCREASE BERM SIZE AS DETERMINED ON SITE BY ENGINEER.



SECTION THROUGH SPILLWAY*



INSIDE FACE

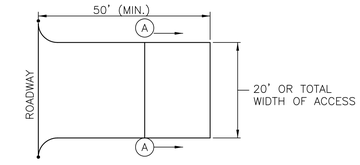
TRAP NO.	Z1 (FT)	H (FT)	h (FT)	Z2 (FT)	EMBANK. TOP ELEV. ETE (FT)	OUTLET CREST ELEV. OCE (FT)	CLEAN OUT ELEV. COE (FT)	BOTTOM ELEV. BE (FT)	OUTLET WIDTH OW (FT)
1	3	3	2	3	408.00	407.00	405.55	405.00	6

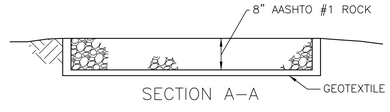
* EMBANKMENT OUTLET COMPOSED ENTIRELY OF ROCK; MAIN BODY R-3 OR LARGER, INSIDE FACE ASSHTO #57 STONE OR SMALLER.

CLEAN OUT STAKE SHALL BE PLACED NEAR CENTER OF EACH TRAP. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES THE CLEAN OUT ELVEATION MARKED ON THE STAKE.

EMBANKMENT SEDIMENT TRAP

SCALE: NONE

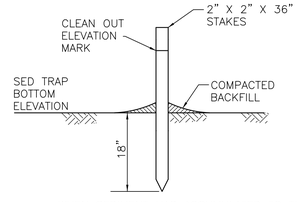




ROCK CONSTRUCTION ENTRANCE

SCALE: NONE

MAINTENANCE:
ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE.



WHEN SEDIMENT HAS ACCUMULATED TO THE CLEAN OUT ELEVATION ON ANY STAKE, ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE ENTIRE TRAP BOTTOM.

CLEAN OUT MARKER

SCALE: NONE

BUCHART HORN, INC.
Engineers, Architects and Planners

ALDERSON ENGINEERING, INC.
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407 LAKESIDE DRIVE
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West Chester University

NORTH CAMPUS
GEOTHERMAL PROJECT - PART A
West Chester, Pennsylvania
WEST CHESTER UNIVERSITY

NO.	REVISION	BY	DATE
1	PER CCCD COMMENTS	KMW	9.30.08

PROJECT NO.: 76408-07
CAD FILE: 76408-07
ENGR./ARCH.: BR
DESIGN BY: KW
DRAWN BY: KW
CHECKED BY: JB
DATE: 8-7-08

ESC DETAILS

G107

CONSTRUCTION SEQUENCE FOR THE RAIN GARDEN

1. PROTECT INFILTRATION BASIN AREA FROM COMPACTION DURING ALL CONSTRUCTION.

2. PROTECT RAIN GARDEN FORM SEDIMENT AT ALL TIMES DURING CONSTRUCTION. HAY BALES, DIVERSION BERMS AND/OR OTHER APPROPRIATE MEASURES HSLALL BEUSED AT THE TOE OF SLOPES THAT ARE ADJACENT TO RAIN GARDENS TO PREVENT SEDIMENT FROM WASHING INTO THESE AREAS DURING SITE DEVELOPMENT.

3. AFTER ALL CONSTRUCTION FOR WELLS AND REPAVING HAS BEEN COMPLETED, PERMANENTLY STABILIZED, INSPECTED AND APPROVED BY THE CONSERVATION DISTRICT COMMENCE CONVERSION OF THE SED TRAP TO A RAIN GARDEN.

4. EXCAVATE RAIN GARDEN TO PROPOSED INVERT DEPTH AND SCARIFY THE EXISTING SOIL SURFACES. INSTALL AND STABILIZE PERMANENT EMERGENCY SPILLWAY WITH NORTH AMERICAN GREEN P300, OR EQUAL LINING. DO NOT COMPACT IN-SITU SOILS.

5. BACKFILL RAIN GARDEN WITH AMENDED SOIL AS SHOWN ON THIS SHEET. OVERFILLING IS RECOMMENDED TO ACCOUNT FOR SETTLEMENT. LIGHT HAND TAMPING IS ACCEPTABLE IF NECESSARY.

6. PRESOAK THE PLANTING SOIL PRIOR TO PLANTING VEGETATION TO AID IN SETTLEMENT.

7. COMPLETE FINAL GRADING TO ACHIEVE PROPOSED DESIGN ELEVATIONS, LEAVING SPACE FOR THE 3" TOP LAYER OF MULCH AS SPECIFIED IN THE DETAIL ON THIS SHEET.

8. REMOVE ANY ACCUMULATED SEDIMENT PRIOR TO PLANTING NATIVE VEGETATION. PLANT NATIVE VEGETATION ACCORDING TO RAIN GARDEN PLANT LIST AND SUPPLIER'S RECOMMENDATIONS. ONLY PLANT FROM MID-MARCH THROUGH THE END OF JUNE, OR FROM MID-SEPTEMBER THROUGH MID-NOVEMBER.

9. MULCH UP TO ELEVATION 408.00 AND PERMANENTLY STABILIZE ALL OTHER AREAS WITH SEED.

10. CONTACT CONSERVATION DISTRICT FOR AN INSPECTION OF THE RAIN GARDEN.

11. AFTER APPROVAL BY THE CONSERVATION DISTRICT, REMOVE SEDIMENT CONTROL DEVICES.

12. WATER VEGETATION AT THE END OF EACH DAY FOR TWO WEEKS AFTER PLANTING IS COMPLETED.

OPERATION AND MAINTENANCE OF THE RAIN GARDEN

THE SURFACE SHALL BE COMPACTED AS LITTLE AS POSSIBLE TO ALLOW FOR SURFACE PERCOLATION THROUGH THE SOIL LAYER.

WHILE VEGETATION IS BEING ESTABLISHED, PRUNING AND WEEDING MAY BE REQUIRED.

DETRITUS MAY ALSO NEED TO BE REMOVED EVERY YEAR. PERENNIAL PLANTINGS MAY BE CUT DOWN AT THE END OF THE GROWING SEASON.

MULCH SHOULD BE RE-SPREAD WHEN EROSION IS EVIDENT AND BE REPLENISHED AS NEEDED. ONCE EVERY 2 TO 3 YEARS THE ENTIRE AREA MAY REQUIRE MULCH REPLACEMENT.

DURING PERIODS OF EXTENDED DROUGHT, RAIN GARDEN PLANTS MAY REQUIRE WATERING.

SHRUBS SHALL BE INSPECTED TWICE PER YEAR TO EVALUATE HEALTH.

HEAVY MACHINERY AND/OR VEHICULAR TRAFFIC OF ANY TYPE SHALL BE AVOIDED SO AS NOT TO COMPACT THE INFILTRATION AREA.

THE SLOPE OF THE RAIN GARDEN BOTTOM SHALL BE LEVEL, WITH A SLOPE NO GREATER THAN 1%, TO ASSURE EVEN WATER DISTRIBUTION AND INFILTRATION.

USE OF FERTILIZER SHALL BE KEPT TO A MINIMUM.

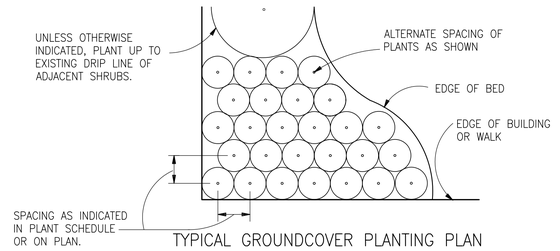
INSPECT THE COMPLETED RAIN GARDEN AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN 72 HOURS. MOSQUITO'S SHALL NOT BE A PROBLEM IF THE WATER DRAINS IN 72 HOURS. MOSQUITOES REQUIRE A CONSIDERABLY LONG BREEDING PERIOD WITH RELATIVELY STATIC WATER LEVELS.

INSPECT FOR AND REMOVE OR REPAIR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET, SIGNS OF WATER CONTAMINATION/SPILLS, AND SLOPE STABILITY IN THE BERMS. PROPERLY DISPOSE OF SEDIMENT.

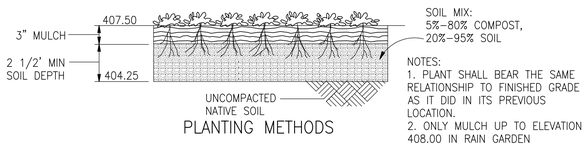
MOW AREA AROUND THE RAIN GARDEN ONLY AS APPROPRIATE FOR VEGETATIVE COVER SPECIES.

MAINTENANCE INSPECTIONS: A REPRESENTATIVE OF THE OWNER WILL INSPECT THE RAIN GARDEN AFTER EACH RAINFALL EVENT GREATER THAN 2 INCHES AND AT LEAST ONCE EACH YEAR. ALL MAINTENANCE COSTS WILL BE BORNE BY THE OWNER.

MAINTENANCE RECORDS: RECORDS OF ALL MAINTENANCE AND REPAIRS PERFORMED SHALL BE PROVIDED TO THE PA DEPARTMENT OF ENVIRONMENTAL PROTECTION AND/OR COUNTY UPON REQUEST.



TYPICAL GROUNDCOVER PLANTING PLAN



PLANTING METHODS

PLANTING METHODS FOR RAIN GARDEN

SCALE: NONE

RAIN GARDEN PLANT LIST

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
	41	RUDBECKIA HIRTA	BLACK EYED SUSAN	QUART CONT	4' O.C.
	21	ECHINACEA PUPUREA	PURPLE CONEFLOWER	QUART CONT	4' O.C.
	20	PANICUM VIRGATUM	SWITCHGRASS	QUART CONT	4' O.C.
	33	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	QUART CONT	4' O.C.
	24	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	QUART CONT	5.5' O.C.

INSTALL PLANTS AS SHOWN IN RAIN GARDEN PLAN, THIS SHEET. PLANT QUALITY TO BE APPROVED BY OWNER OR OWNER'S REPRESENTATIVE BEFORE INSTALLATION.

LEGEND

- EXISTING TREELINE
- EXISTING TREE
- x688.4 EXISTING SPOT ELEVATION
- 300 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING SIGN
- 405 MAJOR CONTOUR
- +479.50 SPOT ELEVATION
- NORTH AMERICAN GREEN LINING P300, OR EQUAL

SEDIMENT TRAP CONVERTED TO RAIN GARDEN

NOTE:
PRE - IMPERVIOUS AREA = 56800SF
POST - IMPERVIOUS AREA = 56800SF (SAME)
20% OF IMPERVIOUS AREA = 11360SF
EQUATION: 11360SF X 1" RAINFALL (.0833FT) = 946.67CF
STORAGE REQUIRED = 946.67 CF
STORAGE PROVIDED = 2500 CF

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West Chester University

NORTH CAMPUS
GEOTHERMAL PROJECT - PART A
West Chester, Pennsylvania
WEST CHESTER UNIVERSITY

NO.	REVISION	BY	DATE
1	PER CCCD COMMENTS	KMW	10.12.08
2	PER CCCD COMMENTS	KMW	10.17.08

PROJECT NO.: 76408-07
CAD FILE: 76408-07
ENGR./ARCH.: BR
DESIGN BY: KW
DRAWN BY: KW
CHECKED BY: JB
DATE: 8-7-08

PCSM PLAN

G108

Sam Brown's Wholesale Nursery, LLC.
366 Paoli Pike
Malvern PA 19355

Order	ORD0014043
Date	4/3/2024
Page	1

Bill To:

West Chester University
Accounts Payable
201 Carter Drive
West Chester PA 19383

Ship To:

West Chester University
Josh Braid
Accounts Payable
201 Carter Drive

Purchase Order No.	Customer ID	Salesperson ID	Shipping Method	Payment Terms	Req Ship Date	Master No.
	0000370			Net 30	4/3/2024	104,089

Ordered	Shipped	B/O	Item Number	Description	Discount	Unit Price	Ext. Price
41	41	0	RUDEA01GPE	RUDBECKIA F Deamii 1 GAL	$0.00	$10.00	$410.00
21	0	21	ECPUR01GPE	ECHINACEA Purpurea 1 GAL.	$0.00	$10.00	$210.00
20	0	20	PAHME01GPE	PANICUM V Heavy Metal 1 GAL.	$0.00	$11.00	$220.00
33	0	33	SCBHE01GPE	SCHIZACHYRIUM Blue Heaven or Standing Ov	$0.00	$11.00	$363.00
24	0	24	VIDEN03GXX	VIBURNUM Dentatum -3 gallon	$0.00	$30.00	$720.00

Subtotal	$1,923.00
Misc	$0.00
Tax	$0.00
Freight	$0.00
Trade Discount	$0.00
Total	$1,923.00